



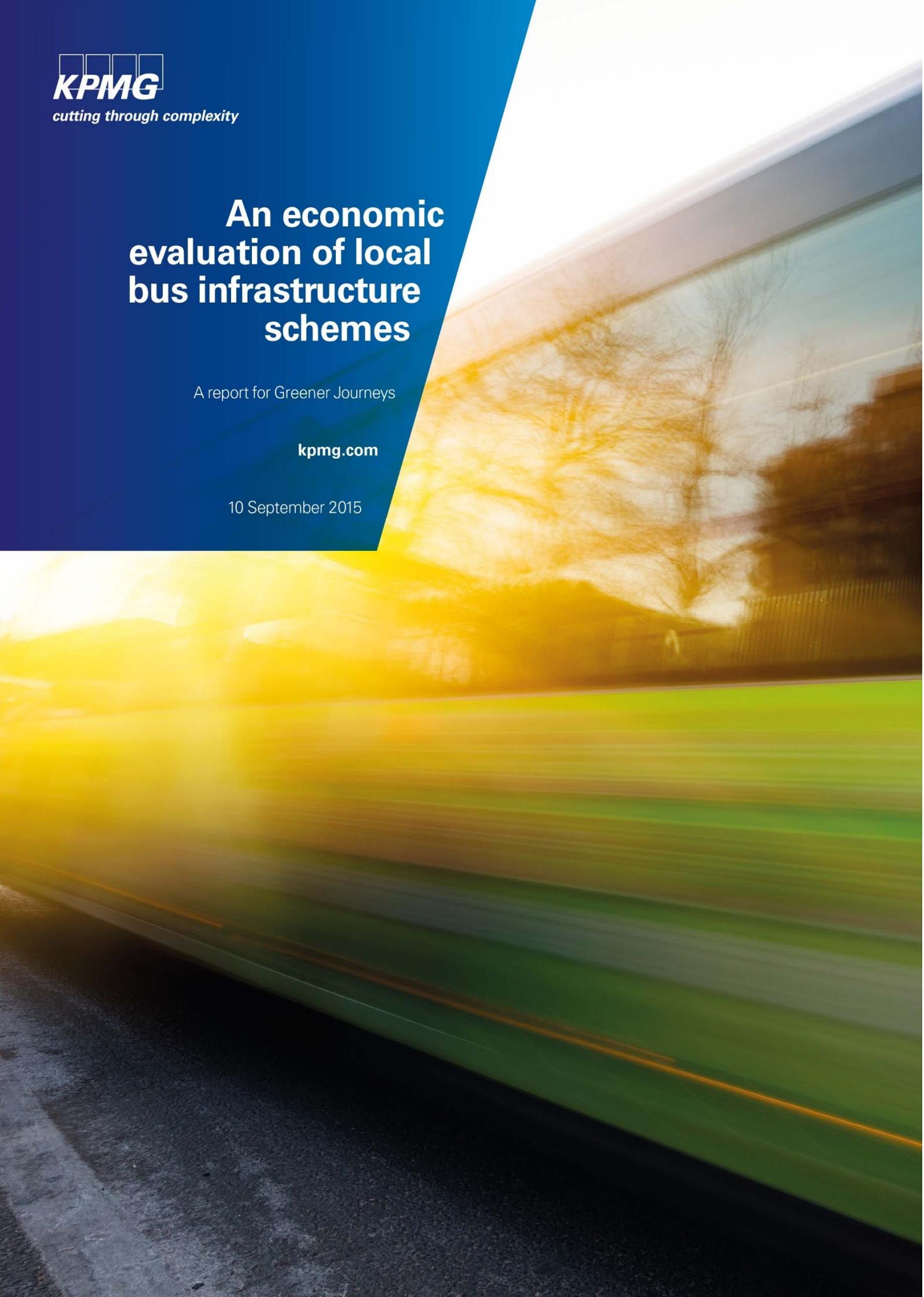
cutting through complexity

An economic evaluation of local bus infrastructure schemes

A report for Greener Journeys

kpmg.com

10 September 2015



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1 Executive summary

This report was originally published on the 10 September 2015. Since then, Greener Journeys has commissioned research on the wider social benefits of the bus, which identified a wider range of benefits to individuals and society as a whole from the provision of local bus services¹. Underpinned by this research, we have updated the ex-post evaluations contained in this report by estimating additional benefits based on outturn demand data. KPMG, June 2017.

Introduction

There is a growing interest in the importance of towns and cities to our economic and social welfare, in what makes them successful and how we can shape their development. Transport networks and local bus services are a particularly important part of this agenda. The ease at which we can get around influences where we live and work, where we are educated, how easily we can attend to our healthcare needs, as well as the leisure and retail activities that we participate in.

Building on earlier Greener Journeys' work on 'Buses, Devolution and the Growth Agenda'², this project considers how we can improve decision-making in regard to investing in local bus infrastructure.

The work considers the costs and benefits of investing in local bus services and the merits of establishing a systematic programme of monitoring and evaluation of the impact of local bus infrastructure schemes, the benefits they can deliver and the lessons that can be learnt from their planning, design, delivery and operation.

Need for evidence

Recent stakeholder consultations run by Greener Journeys have established a need to build a stronger evidence base on the economic, social and environmental impacts arising from investing in bus infrastructure. The consultations have highlighted challenges and opportunities for investment in the context of devolution and the 'growth agenda'. Opportunities arise from the fact that local communities have greater control over investment decisions but challenges arise from increased levels of competition for funding across a wide range of growth initiatives. Respondents to the consultation felt that it is now more important than ever to make sure that evidence is available to support decision-makers in prioritising schemes that deliver the greatest returns.

For those areas choosing to invest in transport infrastructure schemes, monitoring and evaluation will be required to:

- Make sure that schemes are effectively implemented.
- Help realise the expected benefits from schemes.
- Provide accountability and transparency.
- Find out what works and improve future decision-making.

In this context, our work seeks to improve decision-making in the area of local transport policy by providing evidence on the benefits and the lessons learnt from the implementation and delivery of bus infrastructure projects, and as well as providing recommendations on the evaluation process.

¹ KPMG (2016), "A study on the value of local bus services to society"

² KPMG (2015) Buses, devolution and the growth agenda: A guide to investing in local bus infrastructure, February 2015
<http://www.greenerjourneys.com/wp-content/uploads/2015/02/CRT033097A-Bus-Review-PRINT.pdf>

through the networks. This, coupled with better travel information, smarter ticketing and improved safety and security can help operators manage customer touch-points

Benefits of improved connectivity

The bus industry and the transport sector as a whole had done much in recent years to promote the role of transport networks in delivering wider economic, social and environmental benefits.

Figure 2 shows how investment in transport networks can impact productivity, competitiveness and economic output, as well as improving the environment, quality of life and the overall attractiveness of towns and cities.

Figure 2: Economic, social and environmental impact of investment in local bus infrastructure



Source: KPMG Analysis

By reducing the impedances to travel, businesses can better:

- Connect with potential suppliers, enabling them to access higher-quality and/or lower-cost inputs.
- Connect with potential customers, enabling them to supply markets further afield.

- Connect with a wider pool of talent in the labour market, allowing skills to be better matched to employment opportunities.

It will also be easier for individuals to:

- Participate in the labour market, going to work or staying in work longer.
- Access a wider range of jobs, increasing the chances that they can find a position that provides a better match for their skills.
- Connect with leisure and retail opportunities, allowing them to access a wider range of products or reach similar products at cheaper prices.

The estimation of the impact of capital investment on the value of economic output and number of jobs is difficult and various methodologies have been applied as part of the development of Growth Deals. Whilst each of the methods have advantages and disadvantages⁴, it is important to base decisions on reliable evidence and apply a consistent approach across schemes to facilitate the identification of priorities.

New case study evidence

A core part of the work has involved undertaking ex-post evaluations of a series of local bus infrastructure schemes, considering the extent to which scheme objectives and specific targets have been met, investigating positive and negative aspects of the project delivery and determining whether or not they have delivered value for money.

The case studies were selected based on a range of criteria including: level of capital investment, availability of base-line data, stakeholder engagement and support, timing of the delivery (established schemes but not so long after scheme opening for 'institutional memory loss' to take hold) and type of scheme.

The selected schemes comprise:

- Fastway in West Sussex.
- Mansfield public transport interchange.
- South East Hampshire Bus Rapid Transit (Eclipse).

For each case study, we aimed to establish:

- The extent to which the scheme achieved its objectives.
- The extent to which the schemes provided value for money.
- The contributing factors to the realisation of outcomes.
- Aspects of good practice and lessons learnt which can be transferred to other schemes.

The evaluation is split into a performance and a process evaluation. Firstly, the performance evaluation analyses key performance metrics against project targets. These mainly include: demand/patronage, car traffic, footfall, customer satisfaction and journey times. These have also been compared with similar metrics in neighbouring areas or a bigger region to determine the impact of external factors. Secondly, the process evaluation is a qualitative assessment of the project delivery taking account of delivery arrangements such as partnership agreements, timescales, costs and post-opening improvements. Lessons learnt from the project performance and delivery are summarised at the end of the evaluations.

⁴ See Department for Transport (2014) Understanding and Valuing the Impacts of Transport Investment, <https://www.gov.uk/government/publications/transport-appraisal-in-investment-decisions-understanding-and-valuing-the-impacts-of-transport-investment>

Each evaluation includes an analysis of the original business case and a comparison with actual scheme performance to estimate the ex-post value for money of the project. Comparing ex-ante and ex-post value for money assessments also allows us to check the accuracy of the initial project forecasts and forecasting methodology, and establish whether the investment delivered the expected benefits.

The ex-post evaluations show that each of the three case study schemes met the objectives they were designed to achieve which included improvements to transport accessibility, economic performance, safety and environmental impacts. In most cases, the project also sought to improve the image of public transport and increase demand for public transport services.

Performance across key metrics and against set targets varies across projects, with some schemes meeting targets in line with expectations and some significantly exceeding them. It is evident that external factors outside the decision-makers' control related to the economic performance and employment in the area can play an important role in influencing demand and further scheme development.

Importantly, all schemes exceeded patronage growth targets, with demand for Fastway services increasing by 160% over the ten year period between September 2003 and September 2013, Mansfield Public Transport Interchange showing 7% growth in the first year of operation and patronage for Eclipse growing by 48% over the first two years of the service.

A process evaluation of project delivery shows that project implementation worked well, in part thanks to partnership agreements between the local authority, operators and local stakeholders. Having the right design and delivery experts in charge also positively influenced the success of the scheme. More innovative schemes such as the Fastway project, involving the implementation of one of the UK's first guided busways, may have been delivered or designed slightly differently if best practice regarding this type of schemes had been available. However, no significant issues that could have been avoided have been found in the delivery of these projects. Finally, approaching the project with strong customer focus as opposed to an engineering focus was found to be an important factor contributing to a successful project delivery.

An ex-post business case analysis based on limited outturn performance data for each scheme shows that the schemes assessed are likely to have delivered good value for money, higher than initially forecasted. For each £1 of investment the case study schemes have delivered the following benefits in return:

- Fastway - up to £6.0
- Mansfield public transport interchange - up to £6.8
- South East Hampshire Bus Rapid Transit (Eclipse) - up to £8.1

[Establishing a programme for the evaluation of local bus infrastructure](#)

With major scheme funding now included in local Growth Deals, responsibilities for monitoring and evaluation of government interventions sit with the local decision makers who are required to develop robust and rigorous plans for monitoring and evaluation.

It is not yet clear how monitoring and evaluation of local transport schemes will work in practice under Devolution but there is scope for the DfT to:

- Provide enhanced and consistent guidance to local decision-makers on the evaluation of transport schemes.
- Sponsor evaluations of particularly large and complex schemes.
- Undertake, periodically, a meta-analysis of evaluations of local bus schemes (potentially extended to also include to rail, tram and road schemes) so the lessons learnt can be shared amongst scheme promoters.

By finding out and documenting whether the intervention has achieved its goals, the benefits of ex post monitoring and evaluation include delivering better outcomes from existing schemes and improving the planning, design and implementation of new schemes. In this regard, lessons can be learnt from the Highways Agency's Post Opening Evaluation (POPE) programme which identifies the extent to which the expected impacts of highway schemes have materialised and informs thinking on current and future national scheme appraisal methods. POPE studies are undertaken for each major scheme one year and five years after opening.

This report is structured as follows:

- Section 2 provides a review of the existing evaluation requirements of HM Treasury and the Department for Transport (DfT) as well as supplementary guidance from independent think tanks and other organisations.
- Section 3 provides a summary of three case studies looking at the evidence base on the actual impacts of local bus infrastructure schemes. These include a new bus interchange, busways and bus priority measures. The case studies not only assess the evidence of the costs and benefits of specific schemes but they also include lessons learnt from those associated with their development and operation.
- Section 4 provides a discussion of the wider economic and social benefits of transport projects and the methods which can be employed to identify and estimate these. The case studies included within this report represent the first phase of work to establish evaluation evidence and are based wholly on existing data and therefore focus on the achieved delivery of transport outputs and outcomes. A second phase of work will follow in the autumn, which will incorporate new social and market research on the wider economic impacts of the bus projects.
- Section 5 reviews the merits of establishing an on-going programme of scheme evaluation with reference to the Highways Agency's⁵ Post Opening Project Evaluation (POPE) process. It will develop recommendations for how a similar programme could be established for local bus infrastructure schemes.

⁵ Now Highways England

2 Existing evaluation frameworks

The policy appraisal and evaluation cycle

There are two types of evaluation typically included in the policy appraisal and evaluation cycle recommended by the HM Treasury, including:

- *Ex ante* evaluation to decide whether a project should be implemented – often referred to as project appraisal.
- *Ex post* evaluation to assess the effects of a project after implementation.

While serious *ex ante* evaluations are obviously needed, *ex post* evaluations can be more important in the long run for influencing policy decisions. They should receive more attention and more resources than they currently do as they can produce hard evidence on outcomes and impacts, which can be fed back in to the scheme appraisal, as well as capturing lessons learnt to improve the design of future projects.

Monitoring and evaluation are distinct activities – Monitoring asks whether delivery is proceeding as planned and evaluation asks whether the intervention has achieved its desired objectives.

Existing evaluation frameworks

The HM Treasury Magenta Book provides guidance on the underlying principles relating to monitoring and evaluation of public sector projects and programmes. However, it is designed to be able to be applied to a vast range of policies and programmes. It does not, therefore, facilitate practical application to the monitoring and evaluation of bus investments.

The main existing sources of detailed guidance for bus investments produced by the Department for Transport (DfT) include:

- Local Sustainable Transport Fund (LSTF) Monitoring and Evaluation Framework.
- Monitoring and Evaluation Framework for Local Authority Major Schemes (LAMS).
- Better Bus Area (BBA) Monitoring and Evaluation Framework.

Additional detailed guidance has been produced by other bodies, and include:

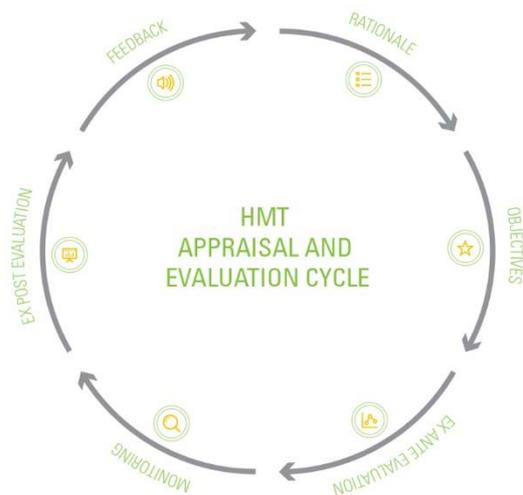
- LSTF Monitoring and Evaluation Guidance, Passenger Transport Executive Group.
- Guidance for transport impact evaluations, Tavistock Institute.

There are various elements that an effective evaluation framework should cover.

Scope of the evaluation

There is a need for proportionality when planning and designing an evaluation. All three sets of DfT guidance recommend and require a proportionate approach to evaluation depending on the size and nature of the project.

Figure 3: HMT policy cycle



The DfT guidance requires all projects to monitor and report on a core set of scheme inputs and outputs, while larger projects are required to monitor and report on additional output and outcome metrics. All three frameworks require only a selected sample of projects undertake a full impact evaluation, with projects selected for full evaluation based on the scale and nature of the scheme. The BBA framework explicitly highlights the need to select schemes for full evaluation based on their ability to fill evidence gaps.

We believe this is the right approach to take. Evaluation is a time consuming and costly exercise when done robustly and resource should be directed at the evaluation of projects where the outcomes of the evaluation add value, and supplement the existing evidence with robust conclusions.

Coverage of outcomes and impacts

In order to fully evaluate bus infrastructure projects, the evaluation needs to capture as full a range of outputs, outcomes and impacts as possible.

The DfT frameworks are relatively consistent in their requirements for the core monitoring of outputs required by all projects, and focus on the specific scheme deliverables. In terms of the outcomes measured and monitored in the case of the larger projects there is some variation in what is required.

The BBA framework limits its required outcome monitoring to transport metrics, such as bus patronage, bus mileage, journey times, and passenger satisfaction. Inclusion of metrics relating to carbon emissions and modal shift are also recommended but monitoring of these is optional.

The LSTF and LAMS frameworks include a more explicit requirement to consider wider impacts such as the economy and carbon emissions, and they include guidance on which metrics should be monitored to assess performance in these areas. The LAMS framework extends this to also cover noise and accident metrics.

However, even these specified outcomes and impacts represent a narrow set of the full spectrum of outcomes and impacts resulting from bus infrastructure projects and evaluations should attempt to cover as wide a set of impacts as possible. In order to achieve this the LAMS framework recommends the application of logic mapping.

Logic mapping

Logic maps are a key element of evaluation frameworks. A logic map is a diagram reflecting the logic of an intervention and the causal relationship between inputs and outputs. It not only helps the evaluator clarify how the investment will meet the established objectives, but it also can help identify those metrics which need to be monitored and measured to assess the success of the scheme post implementation.

Logic maps should be developed by all relevant stakeholders together to help reach agreement on the project objectives and how to achieve them. A key recommendation is also that selected outcomes are SMART (specific, measureable, achievable, realistic and time-bound). Finally, it is important to have clear evaluation questions that will be the focus of the analysis such as: 'has the project provided good value for money?' An example of a logic map applied to an illustrative bus infrastructure investment is shown in Figure 4.

Logic mapping is a helpful tool as part of the evaluation framework, in order to capture a wider set of impacts than is currently promoted. As can be seen in the example below, these may include environmental benefits, health benefits, employment and GVA.

As part of the logic mapping exercise, practitioners should also identify the anticipated pathways to the impacts. The identification of these will help to establish the most effective evaluation approach and the appropriate evaluation methodology.

Causality

The need to identify causality as part of the full evaluation is highlighted across the three frameworks, however while emphasising its importance, the LAMS and LSTF frameworks do not provide guidance on how this should be achieved. The BBA framework does go some way to provide examples of the ways in which controls and comparisons can be achieved, however it provides little in the way of detailed practical guidance.

For those projects selected for full evaluation, there should be a greater emphasis on the need to identify the causal relationships, in order to be able to attribute changes in the output and outcome metrics to the project itself and identify the ultimate impacts.

Transport projects are inherently difficult to evaluate robustly, and do not tend to lend themselves to experimental approaches. However more detailed practical guidance should be included as part of the evaluation framework, on how to assess causality and the methods which can be used to accurately establish robust comparisons, for example based on the characteristics of the project. The PTEG guidance for monitoring and evaluation of LSTF and the Tavistock Institute guidance for transport impact evaluations both provide detailed and practical guidance to help practitioner, and could usefully be incorporated into DfT guidance.

Responsibility and funding

The move towards decentralisation has put greater emphasis on local authorities taking responsibility for monitoring and evaluation and puts an onus on the development of monitoring and evaluation plans for projects at the local level. There is inconsistency, however, across local transport projects, regarding where responsibility for evaluation of publicly funded transport infrastructure projects lies.

Responsibility for monitoring of BBAs falls to local authorities. However responsibility for co-ordinating the evaluation of BBA projects falls to the DfT. According to the guidance, the evaluation will be based on the monitoring data provided to the DfT by local authorities, and will cover a sample of projects, selected based on the type of scheme, in order to address specific evidence gaps.

The DfT evaluation framework for LSTF and LAMS also require local authorities to undertake their own monitoring of the schemes and to report this to the DfT. However, unlike the BBA programme, local authorities are also expected evaluate their own schemes, if they are selected for full evaluation. For the LSTF programme, the extent to which additional funding is made available for evaluation is decided on a case basis following submission of monitoring and evaluation plans. There is no mention of additional funding being available for the evaluation of selected LAMS programmes.

Given the resources and funding required to undertake a meaningful and robust evaluation, we would recommend that the DfT takes a role in funding and co-ordinating evaluation across bus infrastructure projects, in order to ensure that high quality evaluations are undertaken which genuinely add value and fill evidence gaps, and that findings and lessons from these can be shared and used to inform the design and delivery of bus projects at the local level going forward.

Figure 4: Example logic map



3 Case study evaluations

A core part of the work of this study has involved undertaking ex post evaluations of a series of local bus infrastructure schemes in the form of individual case studies. The case studies consider the extent to which scheme objectives and specific targets have been met, and the value for money they have delivered. The case studies also investigate positive and negative aspects of the project delivery and identify aspects of good practice which contributed to the scheme success, as well as lessons learnt which could be transferred to other schemes.

The analysis in these case studies is based on existing monitoring data and related information, and as a result it focuses on transport outputs and outcomes of the schemes. The analysis will be supplemented in Phase 2 of the study which will involve primary data collection to enable analysis of the wider economic and social impacts of bus investments.

The case studies covered in this report are:

- Fastway in West Sussex.
- Mansfield Public Transport Interchange.
- South East Hampshire Bus Rapid Transit (Eclipse).

The case study methodology seeks to be compliant with relevant government guidance on evaluation, including HM Treasury's 'Green Book' and 'Magenta Book', as well as Department for Transport (DfT) evaluation guidance, to the extent allowed by the available data and constraints of the study.

Each case study is split into a performance evaluation and a process evaluation.

Firstly, the performance evaluation analyses key performance metrics against project targets. These mainly include: demand/patronage, car traffic, footfall, customer satisfaction and journey times. Where possible these have also been compared with similar metrics in neighbouring areas, or a wider region, to help to identify the impact of external factors.

Secondly, the process evaluation is a qualitative assessment of the project delivery taking account of delivery arrangements such as partnership agreements, timescales, costs and post-opening improvements. Lessons learnt from the project performance and delivery are summarised at the end of the evaluations.

Each evaluation also includes an analysis of the original business case and a comparison with actual scheme performance to estimate the ex post value for money of the project. Comparing ex ante and ex post value for money assessments also allows us to check the accuracy of the initial project forecasts and the forecasting methodology, and establish whether the investment delivered the expected benefits.

Here we present the main findings from the case studies. The full analysis and approach are set out in the appendix to this report.

Case study 1: Fastway in West Sussex

Fastway was delivered in phases between 2003 and 2006 with a total cost of £38 million. The scheme involved the implementation of a series of bus priority measures along two core routes linking Horley, Gatwick airport and Crawley. The main elements of the scheme consisted of the construction of a new bus only link and widening existing highways to provide a dedicated bus lane including sections of segregated bus way with kerb guidance.

The main issues identified by West Sussex County Council relating to the previous bus system, which Fastway aimed to address, were:

- Availability: Although the area had a reasonably dense network of services, many services had low frequencies and through journeys often required interchange. A fully integrated system was needed to provide a comprehensive series across the area.
- Speed: Bus speeds were relatively low and unreliable due to congestion and the lack of priority for buses. For those with access to a private vehicle there was little incentive to use buses for journeys in the area on a regular basis. There was a need for a faster, more frequent and reliable service to compete with the car.
- Poor vehicle design: New, modern air conditioned vehicles with easy access were required in place of the traditional buses used on most local services.
- Fares: Fare levels in West Sussex were perceived as being high compared with other Shire Counties. A balance needed to be struck between the fare level and the quality of service.

There had been a long-term decline in patronage across Crawley prior to 2001. This started to reverse when Metrobus started serving the Crawley area, but West Sussex CC identified that a significant investment in service quality was needed to accelerate growth in patronage.

Performance evaluation

The table below shows the performance of Fastway against its key performance indicators (KPIs), based on the available monitoring data which has been collected.

Table 1: Fastway key performance indicators

KPI	Fastway project appraisal	Target (Quality Partnership Agreement)	Actual data
Patronage growth	Increase in patronage to 8,500 per day by 2008.	10% in ten years more than 1% in bus mode share.	160% over ten years.
Traffic levels	Reductions in traffic (less than 10% reduction expected).	Reduce traffic growth by 2.5% by 2006.	19% reduction in traffic levels between 2006 and 2013.
Reliability	-	95% of buses to operate within five minutes of timetable.	Reliability between 90-95%.
Journey times	Improved journey times (20% reduction on long distance journey times).	Average reduction of one minute.	Average reduction of 9.5 minute (incl. waiting).
Customer satisfaction	-	-	Overall satisfaction up from 91% in 2004 to 96% in 2008.

The performance evaluation of Fastway shows that the scheme has consistently succeeded in attracting increasing numbers of passengers over the last ten years, exceeding targets. As a result of the scheme, journey times have been reduced significantly, reliability is over 90% and satisfaction with the service is very high. Based on the latest data, there is evidence to suggest that the scheme has also resulted in a decline in road traffic, achieving modal shift from car.

Process evaluation

Fastway was delivered in three phases with the first services originally intended to be operational in 2002. The scheme was ultimately delivered behind the original schedule, with the first services commencing in September 2003. The delays were largely attributed to difficulties in obtaining cooperation from utility companies to re-route pipes and cables which ran beneath the busway route.

In terms of finances, the final cost of Fastway did exceed the budget. In the original business case produced in July 2000, total capital costs of Fastway were estimated at £23.9 million. This figure was updated prior to work commencing in 2002 to £32 million, and the final costs of delivery were around £38 million. The costs overruns were due to both the delays experienced as well as unexpectedly complex groundworks being required. Some costs were recouped by adjusting the specification of the scheme in subsequent phases.

Despite a large number of partners involved in the scheme, agreements were achieved without preventing progress of the project. The partners shared a common vision and a strong Steering Group was established supported by sub-groups such as Infrastructure and Communications. In addition, the public was consulted and informed of the progress of the scheme. An informal partnership agreement between the Partners was put in place to monitor overall quality and specific targets.

Fastway was one of the first BRT schemes in the UK, and this led to it delivering some unexpected benefits. For example the flexibility of the BRT system to adapt routes to demand allowed Route 20 to change as a result of residents' feedback. This would have not been possible with a tram or light rail system. The scheme has also had a positive impact on property prices and the attractiveness of housing in the area.

However, there were also lessons learnt from the scheme stemming from the fact that the technology was relatively novel at the time. Some elements of the bus priority technology have not been as effective as expected. It was also felt that in the initial design stage, the scheme was primarily treated as an engineering project. Metrobus' close involvement from the later design and throughout the implementation stage led to a more issues-led approach. This enabled subsequent cost savings to be made whilst retaining the majority of the planned benefits.

In hindsight the design should have been issues led, with a focus on addressing specific problem areas, where there was evidence of buses being delayed. It was felt that this may have been given greater consideration if Metrobus had been involved at an earlier stage to provide greater insight from an operators' perspective.

Ex post BCR analysis

A scheme appraisal report for Fastway was produced by West Sussex County Council in 2000. According to this business case appraisal, the Fastway scheme was expected to deliver a BCR of 1.94. This was based on a present value of benefits of £73 million and present value of costs of £38 million, thus leading to a net present value of £36 million.

Since this appraisal was undertaken, the DfT methodology for estimating BCRs has changed and benefits and costs have been reclassified⁶. Based on the current guidance, the net present value would stay the same but the ratio of benefits and costs would change, due to lower estimated costs, leading to a BCR of 4.67. This indicates high value for money.

Using the updated data on demand and costs, the benefits and costs have been updated based on the assumptions set out in Table 2 below:

⁶ The treatment of private sector impacts has changed: in the new methodology the net impact of private operator revenues and costs are included in the scheme benefits, whereas the old methodology included operator revenues in the scheme benefits and private operator costs in the scheme costs. In addition, the surplus revenue obtained by the private operator, which is assumed to be transferred to the local authority as a grant to fund the scheme, is accounted as a benefit in the business case instead of a reduction in costs.

Table 2: Ex post benefits and costs – Fastway

Present value (2000 prices)	Ex ante (6% discount rate)	Ex post (3.5%* ⁷ discount rate)	Assumptions/data
Travel time – Bus users	£22.6 million	£37 million	Actual demand data and time savings. This assumes that 20% of bus users are new.
Quality benefits	n/a	£11 million	Actual demand data and WebTAG values for bus service quality (M3.2.1).
Wider social and economic benefits	n/a	£29 million	Actual demand and journey time data, and methodology based on latest Greener Journey's Research on the value of local bus services to society. (These benefits have not been checked against actual socio-economic indicators)
Private sector revenue	£28 million	£41 million	Ex ante revenue uplifted by actual demand growth.
Grant/subsidy	£1.4 million	£5.9 million	Surplus revenue (updated revenue and ex ante operating costs).
Capital costs	£24 million	£38 million	Actual capital costs. It is assumed that the local authority absorbed the difference but it is compensated by the surplus revenue generated.

Those benefits and costs which have not been updated based on actual data have been adjusted to reflect the latest WebTAG methodology, including the revised Government discount rate. The results show a BCR of up to 6.0 including wider and social benefits (4.6 without wider benefits), indicating high value for money, and higher than the BCR estimated in the ex-ante business case (4.7).

Summary

Despite some cost overruns and delivery delays, the available evidence indicates that Fastway has delivered high value for money, achieving sustained demand growth and consistently improving frequency and service quality. Partnership working is considered to have been a key driver of this success, with collaboration across a large number of stakeholders. There has also been an ongoing focus on the need to keep the brand and service fresh, and this is considered to have been an important factor in maintaining customer satisfaction and patronage growth over time, delivering long term benefits from the initial capital outlay.

Case study 2: Mansfield Public Transport Interchange

The project, in Mansfield town centre, consisted of building an £8.5 million new, fully enclosed bus station building with 80 metre connecting footbridge to the railway station. The station opened in March 2013.

Key features of the project include:

- A new signalised junction.
- A bus to train interchange.
- Pedestrian bridge linking bus and rail.
- Taxi provision at bus station.

⁷ In 2003 the Treasury Green Book revised its recommended approach to discounting. The risk component of the discount rate was "unbundled" from the social time preference rate (STPR). As a result the recommended discount rate was reduced to 3.5%

- Cycle parking.
- Improved walk routes to town centre.

The new bus station was designed to address a number of specific issues with the old bus station, including: its limited weather protection; the safety and security of passengers, particularly at night; operational safety; its accessibility; and links with the town centre.

As part of this the project aimed to enhance the public realm, improve the ease, image and attraction of using public transport, and thus encourage modal shift from car use.

Performance evaluation

The performance evaluation involved analysis of the performance of the bus station against key performance indicators (KPIs), using the available monitoring data and publicly available statistics. The project KPIs are shown in Table 3 below:

Table 3: Mansfield key performance indicators

KPI	Target	Actual data
Patronage growth	5% growth in first year	7% growth in the first year.
Customer satisfaction	Customer satisfaction rating over 90%	Satisfaction has increased significantly since 2005. However, only five categories have scored 90% or above, while the rest of the categories have slightly lower satisfaction scores (70-88%).
New bus and rail users	None	Data indicates potential reverse of rail station usage decline.
Bus to rail interchange passengers	2% increase in bus to rail interchange	Significant increase in rating of the walk route to the train – No data confirming increase in interchange passengers.
Bus accidents	Reduce bus accidents to 25% of 2005 levels	Reduction in accidents to 29% of 2005 levels in 2014. However, this cannot be robustly attributed to the new interchange.
Journey time	No specific target	Improvement in reliability (5% increase in buses that were on time).

The comparison of the actual data to the targets shows that the Mansfield Public Transport Interchange succeeded in meeting most targets and objectives. The observed demand increase has exceeded expectations while passenger satisfaction has improved significantly. Whilst previously high, the reliability of the bus service has improved further since the opening of the new bus station. Accident rates have also fallen in line with the targets set, although based on previous trends, this cannot be attributed fully to the bus station investment. Other aspects of the service such safety and ease of interchange to rail have also improved.

Process evaluation

Overall the delivery of the project went to schedule with no major complications or delays.

The success of the project delivery was attributed in part to the design team employed. The internal team provided expertise in landscaping, highway design, and architecture. Being located together in one building enabled the team to work through any issues which arose during either the design or delivery phase more quickly and efficiently and eased the task of project management. The expertise and experience of the project team also enabled them to learn lessons from other bus stations in the local area, including Retford bus station which opened in 2007 and Newark bus station which opened in 2011.

The delivery of the Mansfield Public Transport Interchange also demonstrated strong and effective partnership working, in particular between Nottinghamshire County Council, Mansfield District Council and the bus operators. The partnership was formalised through the Statutory Quality Bus Partnership (SQBP) which came into force on 5 May 2013. This included commitments from all parties to invest in improved bus services.

In addition, both the general public and relevant organisations such as taxi companies and a local car park were engaged in the process to maximise the consensus on the project delivery.

The effective collaboration and communication through the delivery phase meant that the final delivered station met the majority of the requirements. There have been some minor amendments required following opening, in order to optimise the station's functionality and operation.

These include:

- Adjusting the digital signage on the bays to allow it to be turned off (which had not initially been possible), to save on energy costs at night.
- Adjusting the cleaning schedule to an early morning and late night rota to reduce the impact when the station is at its busiest.
- Increasing hours of opening from 10.00 p.m. to 11.00 p.m. to allow for additional services to run.

Overall, however, there has been little change needed and the interchange has faced few significant issues since opening.

Although the project is considered to have been a success, the expected re-development of the old bus station and Stockwell Gate has not yet materialised. This is expected to have had a negative impact on the extent of the expected regeneration impacts of the new bus station on the town as a whole. Linked to this, the new bus station has also had a negative impact on retail sales in Stockwell Gate, as footfall has been redirected from this route to the new interchange site, though this has been partly mitigated by investment in street signage and maps.

The economic downturn and the increase in unemployment are also likely to have led to lower patronage levels and lower retail sales than might have otherwise been expected.

Nonetheless, the metrics clearly show the positive outputs and outcomes delivered by the project.

Ex post BCR analysis

Based on the data available we have updated the BCR analysis using the latest WebTAG methodologies. We have also added wider social and economic benefits identified in Greener Journeys' latest research on the benefits of local bus services to society. The estimated values of benefits are shown in

Table 4 below.

Table 4: Updated benefits – Mansfield Interchange

Updated benefits (annual, 2002 prices)	Ex ante	Ex post	Assumption
Pedestrian time savings (excl. bus to rail interchange)	£1,052,400	£1,186,000	Uplifted based on actual pedestrian counts.
Quality benefits	£610,000	£854,000-£2,278,000	Uplifted based on actual demand growth and WebTAG values.
Wider social and economic benefits	n/a	£5,904,000	Estimated based on outturn demand and time savings data and Greener Journey's research on wider benefits of buses.
Revenue	£333,300	£511,980	Uplifted based on actual demand growth.
New bus user benefits	£32,100	£44,940	Uplifted based on actual demand growth.
Time savings	(£45,000)	(£63,000)	Uplifted based on actual demand growth.

Other benefits or costs not included in

Table 4 have been assumed to be equal to the forecasts in the ex ante business case. This assumption is made either due to lack of data or because it was difficult to establish a counterfactual scenario. Those values which have not been updated include non-user benefits such as benefits from a reduction in accidents or cost savings for operators.

The updated annual benefits and costs have been discounted to 2002 values over a 60-year appraisal period, in line with the ex ante business case.

The results of the ex post business case analysis show that the actual BCR of the scheme, based on outturn data, is likely to be in the range of 4.3 to 6.8. This compares to an ex ante BCR estimate of 4.06. The exact BCR will depend on actual quantity of time savings and exactly how much users value the quality of the new station and the additional facilities and services offered. However, the estimated BCR based on the revised analysis indicates that the scheme was good value for money and exceeded the value for money that was initially expected to achieve.

Summary

In summary, the interchange has been delivered successfully in line with the original project specification and with its expected benefits and costs. Key reasons identified for its success include the high quality design and finish of the station, the service provided by the staff, a partnership agreement established at an early stage and early involvement of the site manager in the design and delivery.

Case study 3: South East Hampshire Bus Rapid Transit (Eclipse)

The South East Hampshire Bus Rapid Transit (BRT) is a high specification, sub regional public transport network designed to provide a viable alternative to the car and remove the transport barriers to economic growth and development of key sites. Phase 1 of the project cost £25 million and opened in April 2012. It included an off-road busway in a disused railway line, new bus shelters with CCTV and real time passenger information and cycle parking, amongst other infrastructure measures.

In addition to infrastructure investments, the private bus operator committed to providing a new high quality fleet. The service operated on this route was branded as the Eclipse service.

The objectives⁸ of the project were to:

- Improve access to future and existing employment sites by public transport.
- Improve access to public health services at both local and sub-regional levels by public transport.
- Improve public transport access to tertiary education by public transport.
- Improve public transport access to and from the North Fareham SDA to local employment, education and health services.
- Improve the overall quality of public transport provision.
- Assist in meeting the requirements of the Air Quality Management Areas (AQMAs) Plans.

Performance evaluation

As part of the case study we undertook analysis of the performance of the project against key performance indicators using available monitoring data and publicly available statistics.

⁸ South East Hampshire Bus Rapid Transit – Phase 1 Fareham Gosport, Community Infrastructure Fund 2: Full Business Case Submission – Volume 1, October 2008.

Table 5: Eclipse key performance indicators

KPI	Target	Actual data
Patronage growth	10% after one year and 15% after two years	48% growth over the first two years, although this has been partly at the expense of other services experiencing lower demand.
Journey time reliability	85%-95% of all BRT services to operate within one minute early and five minutes late	Reduction in journey time variation from 27-30 min to 11.5-15.5 min. Monthly reliability between 85%-99%.
Passenger satisfaction	No target	7 out of 11 categories achieved over 80% satisfaction (2012 survey). Overall, satisfaction has increased by more than 20% across all categories.
Reduction in traffic	No target	Reduction in traffic of 1.3%.

The performance data shows that South East Hampshire BRT scheme has been successful at achieving levels of demand and revenues which exceeded forecasts within a short timescale following opening. The available monitoring data indicates that the scheme has resulted in an increase in demand and improvements to the reliability and frequency of the service. Passenger satisfaction ratings have gone up more than 20% on average, with satisfaction levels now above 80% in 7 out of 11 categories.

No other external factors, such as other transport investments, were identified that would be expected to have significantly impacted the measured outcomes of the Eclipse.

Process evaluation

The project was successfully delivered to the original budget of £25 million with funding coming from the intended sources. Hampshire County Council identified the involvement of the contractor at an early stage of the design and specification of the project as a key contributing factor to the successful delivery of the project to budget. Early involvement resulted in feasibility issues regarding the specification being addressed at an early stage and the project was then delivered to specification without unexpected adjustments or costs.

The construction phase of the project did however face some delays, due to a number of judicial reviews brought forward. It was intended to be completed by April 2011, but was delayed by a year and was officially opened by the then Transport Minister Norman Baker in April 2012.

From an operational perspective, the project revenues have exceeded forecasts. Furthermore, the risk sharing agreement agreed between Hampshire CC and operators has meant that Hampshire CC has benefitted financially from the increase in patronage and commercial success of the project, which has allowed further investment in the BRT.

There have been various elements identified as contributing to the success of the scheme:

- The focus on the customer and public transport objectives, achieved partly thanks to the creation of a steering group of public transport representatives to maintain the right focus.
- The early engagement of the contractor and their involvement at the design and specification stage.
- The unique opportunity for the Fareham-Gosport route in the form of a disused rail corridor – This allowed the construction of a dedicated busway which runs parallel to a highly congested route, the A32, bypassing the majority of the congested area, with limited negative impact on local road users and residents.

Whilst the majority of the expected benefits have materialised, there have been some unexpected outcomes from the project; both positive and negative:

- Displacement from other bus services: passengers were willing to walk further to travel on the Eclipse service.
- Journey times: the extension of the bus route to include Fareham train station and facilitate public transport integration has resulted in longer journey time for some passengers, although journey times at peak times have been shortened.
- Emissions: overall emissions have gone down despite increased bus service frequency than originally planned as a result of fuel efficient buses.

Overall, the design of the scheme and the good relationship maintained between the operated and Hampshire County Council helped to ensure the success of the scheme. A key factor in the success of the scheme was considered to be the focus on the end customer experience rather than on the project itself.

Ex post BCR analysis

A full business case for the South East Hampshire BRT was submitted in 2008. This presented a BCR of 1.5, with a present value of benefits of £228 million and costs of £153 million (2002 prices) over a 60-year period. This BCR represents low to medium value for money. However this is based on an assumed loss of revenues from local authority controlled car parks over a 60 year period, which may overstate the true costs. Excluding these from the calculation increases the BCR to 5.51 based on the demand and time saving assumptions in the original business case.

Based on the data available we have updated the BCR analysis using the latest WebTAG methodologies. This inputs to this and relevant assumptions are shown in Table 6.

Table 6: Actual data⁹ – SE Hampshire BRT

Business case inputs	Source/assumption
Demand 2012/13	Actual demand data.
Demand 2013/14	Actual demand data.
Demand 2014/15	Actual demand data.
Percentage of trips switching mode to bus	Actual demand data.
Average journey time saving	No changed assumed (actual data shows a shorter route in one direction and a longer route in the other direction).
Average waiting time saving (due to frequency changes)	12 minute saving assumed - current frequencies are 7/8 min, while old frequencies were 20-30 min.

Service quality benefits have also been included based on values set out in WebTAG M3.2.1. Revenue has not been updated, despite actual data on fares and demand, due to lack of information about the do minimum scenario (situation without the scheme).

In this updated version of the report we have added wider social and economic benefits identified in Greener Journeys' latest research on the benefits of local bus services to society.

Ex post annual benefits have been discounted over the appraisal period, in line with the ex ante business case. A comparison of ex ante and ex post benefits is shown below. Benefits from a

⁹ It has not been possible to compare actual data with forecasts from the ex ante business case, as the assumptions and data used in the ex ante business case have not been reported or clearly explained.

reduction in greenhouse gases, accidents and operating costs have not been updated and are therefore not shown.

Table 7: Ex post Present value of benefits – SE Hampshire BRT

Ex post business case	PV benefits (ex-ante)	PV benefits (ex post)
Time savings (2014/15)	£28 million	£72 million
Quality benefits (2014/15)	n/a	£15.5 million
Wider social and economic benefits (2014/15)	n/a	£49 million

Assuming revenue and costs have not varied from the figures reported in the ex ante business case, the ex post business case evaluation shows a BCR of 1.9 indicating medium value for money – A slightly higher BCR than the ex ante business case BCR of 1.5.

Removing the loss of parking revenues from the analysis uplifts the ex post BCR to 6.94, and we would consider this to represent the top end of potential value for money. Whilst we would expect that the loss of parking revenues may create a short term cost relative to the counterfactual, over the longer term it would be reasonable to expect that revenues for the finite supply of parking spaces would be driven by other sources of demand, or else land for parking would be reallocated and achieve an alternative source of revenue, and would not represent a cost over the full 60 year appraisal period.

Finally, adding wider social and economic benefits to the analysis estimated based on actual demand and journey time data pushes the BCR up to 8.1. These benefits have not been checked against actual social and economic indicators and therefore should be interpreted with caution.

We would therefore expect the true BCR to fall between 1.9 and 8.1.

Summary

In summary, the success of the project is reflected in the significant increase in demand both as a result of new passengers and displaced passengers from other services, partly thanks to the strong customer focus adopted in the delivery of the project. The good relationship maintained between the operator and Hampshire County Council was an important factor in the delivery of the project. The ex post BCR analysis, based on transport outcomes, indicates that the scheme achieved medium to very high value for money.

Summary of case study findings

The ex post evaluations show that each of the three case study schemes met most of the objectives they were designed to achieve, including improvements to transport accessibility, journey times, economic performance, safety and environmental impacts. In most cases, the projects also sought to improve the image of public transport and increase demand for public transport services.

Performance across key metrics and against set targets varies across projects, with some schemes achieving targets in line with expectations and some significantly exceeding them. It is evident that external factors outside the decision-makers' control related to the economic performance and employment in the area can play an important role in influencing demand and further scheme development. For instance, the economic downturn is likely to have limited both demand and supply growth in some cases.

A process evaluation of project delivery shows that overall the project implementation was effective, in part thanks to partnership agreements between the local authority, operators and local stakeholders. Having the right design and delivery experts in charge also positively influenced the success of the scheme. More innovative schemes such as Fastway in West Sussex, involving the implementation one of the first guided busways in the UK, may have been delivered or designed

slightly differently if best practice regarding this type of schemes had been available. However, no significant issues that could have been avoided have been found in the delivery of these projects. Finally, approaching the project with strong customer focus as opposed to an engineering focus was found to be an important factor contributing to a successful project delivery. This customer focus sometimes translated in successful marketing campaigns.

An ex post business case analysis of each scheme shows that in general the schemes assessed are likely to have delivered value for money, slightly higher than initially forecasted. However, this analysis has been constrained by data availability and the quality of the original business cases, which varies across projects.

4 Wider economic impacts

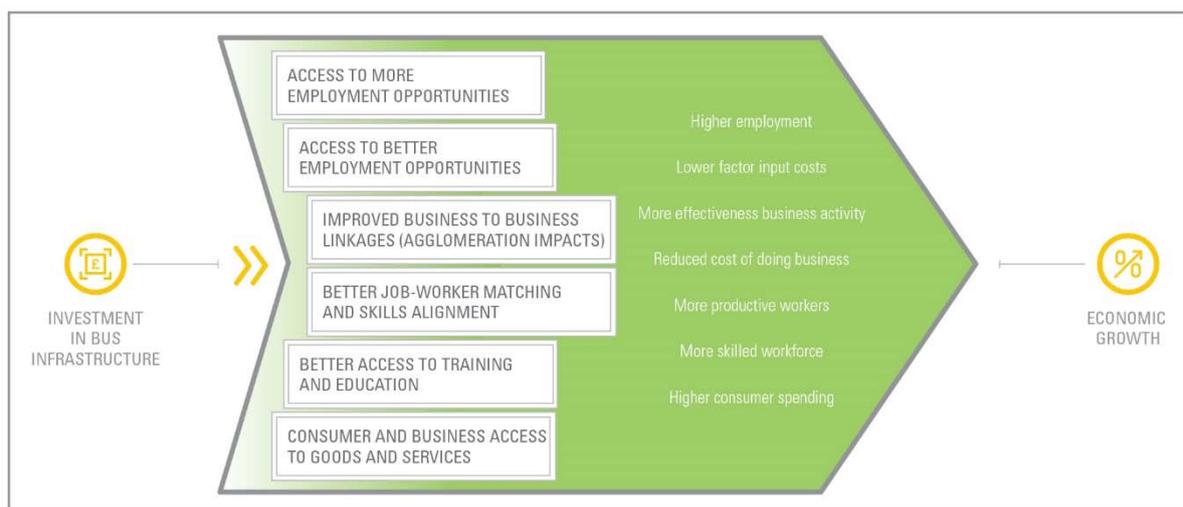
As we identify in Section 2, bus infrastructure schemes can generate wider economic impacts in addition to standard user and non-user benefits. The existing evaluation frameworks and guidance, whilst acknowledging the presence and importance of wider impacts, tend to focus on the standard user and non-user benefits. Similarly, due to their reliance on existing monitoring data and information, the case studies included in this report also focus on standard user and non-user benefits.

However the economic impacts of bus project go much wider and include impacts on productivity, output, levels of employment and unlocked development, among others. Other wider impacts with a more social dimension include impacts on health and social inclusion. However these impacts are much harder to identify and quantify and tend to require primary data collection.

For this reason, wider impacts are often excluded from bus scheme business cases and tend not to be covered in detail, if at all, in ex-post evaluations of transport projects. In its report published in July 2015 about impact evaluations, the 'What works centre', a policy research centre, has found a lack of evidence regarding this type of benefits. In particular, it states that it is 'worrying that so few evaluations can demonstrate that these effects occur in practice', referring to scheme evaluations across all transport modes.

Despite the lack of evidence at a project level, there are studies documenting wider economic benefits at larger scale. An example of this is the work undertaken by the Institute of Transport Studies in Leeds on the relationship between buses and economic growth. They estimate for instance that 400,000 people are in employment or in a more productive job as a result of the bus network, based on survey results. The potential value of these wider impacts on economic growth mean that it is important to take steps to include these in bus appraisals, particularly given the greater emphasis given to economic growth objectives at the local level.

Figure 5: Examples of the wider impacts resulting from bus infrastructure investment



How can wider economic impacts be incorporated into ex-post evaluations?

Researching wider impacts is a challenging exercise. It requires establishing a counterfactual scenario and disentangling the impacts of transport from other economic policies that may have been implemented at the same time. Determining which benefits are additional, and are not the consequence of displacement effects, also constitutes an important challenge in the estimation of wider impacts.

We have found some examples of evaluation reports where these impacts have been considered.

Table 8: Example of evaluations including wider impacts

Evaluation	Method
POPE evaluations.	Qualitative analysis of wider economic impacts.
Ex Post Appraisal, what lessons can be learnt from EU Cohesion funded transport projects (Frontier Economics, University of Leeds, Atkins, etc. 2012).	Qualitative interviews with stakeholders.
Nottingham Tram evaluation (Mott Macdonald, 2014).	Publicly available data on employment by sector, development, unemployment rate, property values was used to estimate the economic impact of the tram. A housing price model was also developed to isolate the effects of the tram on property prices in the tram corridor.
Ex post evaluation of investment projects co-financed by the ERDF and Cohesion Fund (1994-99) (2011).	Qualitative analysis of wider economic impacts.
Ex-post assessment of transport investments and policy interventions (International Transport Forum, 2015).	Use of the US TPICS (Transport Projects Impact Case Studies) database for wider economic impacts. This provides information on the range of outcomes delivered by a sample of projects and can be used to benchmark expected outcomes of similar projects.

Researching wider impacts of buses through primary data collection

Theory

Based on WebTAG, three types of wider economic impacts, in addition to standard user and non-user benefits, result from transport investments that improve accessibility:

- Agglomeration benefits.
- Labour impacts: move to more productive jobs and increase in employment.
- Imperfect competition.

These relate changes in productivity as well as changes in employment or output.

Employment impacts can also be estimated based on additional retail expenditure, tourism activities, regeneration and other consequences of the scheme. There are a range of approaches which can be used to arrive at these estimates.

Available methodologies

- User surveys to identify changes in levels and type of employment (aspects not generally covered in passenger satisfaction surveys).
- Stakeholder interviews with businesses to identify impacts of new or improved bus services.
- Modelling of the elasticity of bus travel time to employment, for example based on 'Buses and Economic growth II: econometric analysis', ITS Leeds 2014.

An economic evaluation of local bus infrastructure schemes – Phase 2

We will draw upon these methods in the second phase of our work, in order to supplement the analysis to date and to provide evidence on the wider benefits of investing in local bus infrastructure.

The work will involve primary data collection through surveys of passengers.

The research will examine how the investment has:

- Enhanced access to employment, commercial activities, essential services and other activities.
- Influenced travel behaviour.
- Changed perceptions of service quality.
- Changed levels of passenger satisfaction.
- Changed perceptions of bus travel amongst prospective passengers.

5 Evaluation programmes

Robust evaluation can be a resource intensive exercise – in terms of time, funding and expertise. Though it is a valuable tool in ensuring the effective use of public funding and improving the value for money of bus infrastructure investments, the current funding landscape for local government means that the availability of funding for evaluation is limited. This puts a greater emphasis on the need for a targeted and co-ordinated approach to evaluation to ensure that resources are employed effectively and that findings are shared.

There are a number of existing evaluation programmes which could be drawn upon in order to establish a similar programme for bus infrastructure projects. Examples of these are summarised below:

Highways England Post Opening Project Evaluation (POPE)

The Post Opening Project Evaluation (POPE) of Major Schemes is a programme run by Highways England, an executive agency of the Department for Transport, which produces ex post evaluation studies of major road schemes over £10 million. The key objective of POPE is to identify the extent to which the expected impacts of highway schemes have materialised and to inform thinking on current and future national scheme appraisal methods. POPE studies are undertaken for each major scheme one year and five years after opening.

The results for all the schemes are reported in a summary evaluation table containing both the predictions and the actual data in terms of traffic, carbon emissions and accidents.

In addition to these, an independent meta-analysis of all project evaluations is produced every two years which reports on the average impact of schemes against their objectives to identify if projects are delivering value for money, are improving journey times and safety, and are stimulating economic growth. The Government has specific economic objectives that major schemes need to meet. These are:

- Provide good value for money in relation to impact on public accounts.
- Improve transport economic efficiency for business users and transport providers.
- Improve transport economic efficiency for consumer users.
- Improve reliability.
- Provide beneficial wider economic impacts.

The accuracy of appraisal methodologies and forecasting is also investigated in the meta-analysis.

In addition to POPE for major schemes, a POPE programme for local network management schemes (LNMS) is also carried out for projects over £25,000 and less than £10 million, where a meaningful evaluation is possible. Longer and more detailed evaluation reports are produced for schemes over £1 million. In the case of POPE for LNMS, evaluation takes place one year after scheme opening and a meta-analysis is produced on an annual basis.

The POPE programme provides taxpayers with evidence on the benefits delivered for each pound invested on major road schemes. It also allows Highways England (HE) to check forecasting accuracy in ex ante project appraisals enabling them to refine and improve forecasting accuracy going forward. Finally, it provides useful information that can be used to improve HE's business performance.

The latest POPE Meta report (2013) states that there is evidence to suggest that the accuracy of traffic forecasting has been improving over time. It also reports that 94% of scheme objectives are

met and that on average, projects deliver high value for money with an average BCR of 4. On the other hand, accuracy of accident predictions is reported as being poor.

Local Authority Major Schemes (LAMS) monitoring and evaluation framework

In 2012 the DfT published a monitoring and evaluation framework for LAMS¹⁰. This framework was developed partly in response to a National Audit Office (NAO) report concluding that the coverage, quality and resourcing of the evaluation of major schemes could be improved. The framework aimed to provide a consistent evaluation approach to facilitate programme analysis that is complementary to current devolution processes. It also aimed to meet the DfT's requirement to demonstrate value for money of its investments at a local level.

This framework establishes three types of monitoring depending on the scale of the investment:

- Standard monitoring: Minimum requirements for monitoring for all schemes.
- Enhanced monitoring: Requirements for schemes over £50 million or which are anticipated to have a significant impact on particular indicators.
- Fuller evaluation: Selected schemes based on the scale of investment, the nature of the scheme and the benefits to be gained from the evaluation evidence generated.

The standard monitoring requirements include:

- Scheme build.
- Delivered scheme.
- Costs.
- Scheme objectives.
- Travel demand.
- Travel times and reliability of travel times.
- Impacts on the economy.
- Carbon.

Enhanced monitoring requires additional consideration of noise, local air quality and accidents; and fuller evaluation is required to generate evidence on:

- Whether the scheme was delivered effectively and efficiently.
- The causal effect of the scheme on the anticipated outcomes and whether these have contributed to the intended impacts.
- Whether it had any unintended adverse or positive impacts.

The LAMS framework is similar to POPE, although it places a slightly larger emphasis on economic benefits such as employment and rental values.

The Department for Transport periodically produces a meta-analysis of selected local major schemes, however the most recent report concluded that the evaluation standard was highly varied with the consequence that this has limited the opportunity to identify constructive lessons for promoters of future schemes.

¹⁰ Department for Transport (2012) Monitoring and evaluation framework for Local Authority Major Schemes, https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/9154/la-major-schemes-monitoring-evaluation.pdf

Establishing a dedicated programme

The What Works Centre for Local Economic Growth notes that the current LAMS guidance provides an appropriate framework for undertaking scheme evaluation for individual local authorities and Local Enterprise Partnerships (LEPs)¹¹. They nevertheless recommended that the DfT supports the development of further guidelines on how evaluations should be carried out and improved, including:

- Using of appropriate 'control groups' to refine evaluations.
- Extending the analysis to include wider economic impacts.
- Considering displacement impacts on neighbouring markets.
- Providing better alignment between ex ante appraisal and ex post evaluations.

The What Works Centre also recommended that the DfT should provide a coordinating role in this process and that it performs ex post analysis on schemes involving multiple interventions.

With major scheme funding now included in local Growth Deals, responsibilities for monitoring and evaluation of government interventions sit with the local decision-makers who are required to develop robust and rigorous plans for monitoring and evaluation.

It is not yet clear how monitoring and evaluation of local transport schemes will work in practice under devolution but there is scope for the DfT to:

- Provide enhanced and consistent guidance to local decision-makers on the evaluation of transport schemes, including methods to capture wider economic and social impacts.
- Sponsor evaluations of particularly large and complex schemes.
- Undertake, periodically, a meta-analysis of local evaluations of local bus schemes so the lessons learnt can be shared amongst scheme promoters.

¹¹ What works centre for local economic growth (2015) Transport review, July 2015.

<http://www.whatworksgrowth.org/policies/transport/>

6 Conclusions

Respondents to Greener Journey's consultation on local bus infrastructure confirmed strong support for monitoring and evaluation of the impacts of new local bus infrastructure schemes. This was not only seen as an effective way to help realise the benefits of infrastructure schemes once operational but it also allows lessons to be learnt on the planning, design, delivery and operation of schemes, ultimately leading to better decision-making.

Building on recent work on 'Buses, Devolution and the Growth Agenda'¹², this project has:

- Considered the development of a framework for the evaluation of local bus infrastructure schemes following scheme opening, aligning with the requirements of HM Treasury and the Department for Transport.
- Established an evidence base on the impacts of local bus infrastructure schemes based on a selection of three case studies covering selective priority measures, stops and interchanges and the application of new technologies.
- Reviewed the merits of establishing an on-going programme of scheme evaluation with reference to the Highways Agency's Post Opening Project Evaluation (POPE) process.

The ex-post evaluations show that each of the three case study schemes met the objectives they were designed to achieve which included improvements to transport accessibility, economic performance, safety and environmental impacts. The schemes have also improved the image of public transport and increase the demand for public transport services.

Performance across key metrics and against set targets varies across schemes, with some schemes meeting targets in line with expectations and some significantly exceeding them. A process evaluation of project delivery shows that project implementation worked well, in part thanks to partnership agreements between the local authority, operators and other local stakeholders.

By finding out and documenting whether the intervention has achieved its goals, the benefits of ex post monitoring and evaluation include delivering better outcomes from existing schemes and improving the planning, design and implementation of new schemes. In this regard, lessons can be learnt from the Highways Agency's Post Opening Evaluation (POPE) programme. There is scope for the DfT to provide enhanced guidance on the evaluation of transport schemes, sponsor evaluations of large and complex schemes, and periodically undertake a meta-analysis of local evaluations so that best practice can be shared amongst scheme promoters.

¹² Op cit

7 Appendices – Full case studies

7.1 Case study methodology

Selection of case studies

The case studies were selected in consultation with Greener Journeys' stakeholders. They aimed to cover a range of different local bus infrastructure schemes, including:

- Selective priority.
- Transport hubs, interchanges and bus stops.
- New technology.

The case studies were selected based on a range of criteria including: level of capital investment, availability of base-line data, stakeholder engagement and support, timing of the delivery (established schemes but not so long after scheme opening for 'institutional memory loss' to take hold) and type of scheme.

The selected schemes comprise:

- Fastway in West Sussex.
- Mansfield Public Transport Interchange.
- South East Hampshire Bus Rapid Transit (Eclipse).

Approach

The case study methodology sought to be compliant with relevant government guidance on evaluation, including HM Treasury's 'Green Book' and 'Magenta Book', as well as Department for Transport (DfT) evaluation guidance.

Based on the available data and information, for each case study, we aimed to establish:

- The extent to which the scheme achieved its objectives.
- The extent to which the schemes provided value for money.
- The contributing factors to the realisation of outcomes.
- Aspects of good practice and lessons learnt which can be transferred to other schemes.

The evaluation is split into a performance and a process evaluation. Firstly, the performance evaluation analyses key performance metrics against project targets. These mainly include: demand/patronage, car traffic, footfall, customer satisfaction and journey times. These have also been compared with similar metrics in neighbouring areas or a bigger region to determine the impact of external factors. Secondly, the process evaluation is a qualitative assessment of the project delivery taking account of delivery arrangements such as partnership agreements, timescales, costs and post-opening improvements. Lessons learnt from the project performance and delivery are summarised at the end of the evaluations.

Each evaluation includes an analysis of the original business case and a comparison with actual scheme performance to estimate the ex post value for money of the project. Comparing ex ante and ex post value for money assessments also allows us to check the accuracy of the initial project forecasts and forecasting methodology, and establish whether the investment delivered the expected benefits.

Research methodology

The methodological approach consisted of four stages:

i) Review of documentation produced in the decision making process, including business plans

For each case study we sourced the original business plan and ex ante appraisal from the scheme, and any other relevant background documentation such as quality partnership agreements. We used this documentation to identify the rationale for the investment, its objectives, key performance indicators, and the assumptions underlying the ex ante appraisal.

This allowed us to establish the data requirements for the scheme evaluation.

ii) Analysis of data collected prior to, and following, the scheme opening

Based on our review of the business plans and ex ante appraisal, we formulated a data request specifying the data and information needed to assess the performance of the scheme against its objectives. This included metrics collected prior to the scheme opening, relating to the previous infrastructure, as well as monitoring data collected following the scheme opening. We worked primarily with the relevant Council and primary operator to identify and obtain as comprehensive a dataset as possible to inform the analysis.

Where possible we sourced data from publicly available government databases.

We carried out analysis of the data to identify changes and trends in the data, in order to review the performance of the schemes. Where possible we identified comparison or control areas, by looking at the performance against similar metrics of neighbouring areas or at the wider city or county level. This allowed us to go some way to identify local trends in the data, and take account of external factors influencing the performance of the scheme against its objectives.

iii) Interviews with stakeholders

In addition to the data analysis which informed the performance evaluation, we also spoke directly to representatives involved with the schemes to obtain information relating to their planning, implementation and operation of the scheme in order to carry out a high level process evaluation. As part of this we explored the challenges faced in implementation, key success factors and lessons learnt. We sought to speak to representatives involved in all stages of the schemes and from different perspectives, including from the primary operator and the Council.

iv) Comparison to ex ante business case

In order to assess the value for money of the schemes, an ex post BCR analysis was undertaken based on a combination of actual outturn data, standard transport appraisal assumptions and information from the ex ante business case. Where possible we identified the economic benefits and costs forecast in the ex ante appraisal and ascertained how they were calculated. We then used the latest available data to update benefits and costs to obtain an ex post Benefit-Cost Ratio (BCR). The extent to which this was possible varied across the schemes, and across metrics. In some cases the ex ante assumptions could not be updated due to the unavailability of outturn data.

While the performance evaluation and ex post BCR analysis mainly consists of analysis of quantitative data, the process evaluation was largely based on qualitative information collected in interviews with stakeholders.

Evaluation challenges

Data: The evaluation case studies were commissioned to be undertaken following implementation of the schemes. This means the evaluation could not be designed into the delivery and implementation of the schemes. Furthermore, due to time constraints the case studies rely primarily on existing information monitoring data.

The availability and coverage of the monitoring data varies across the schemes. We have however, as far as possible, sought to achieve consistency in our analysis and approach across the schemes.

Impacts: The scope of these case studies does not extend to the ultimate economic and social impacts resulting from the scheme outputs and outcomes. These will be covered in more detail using primary research as part of phase 2 of the project.

Causal relationship: The limitations of the evaluation design restrict the extent to which a causal relationship can be identified between delivery of the bus infrastructure and the outputs and outcomes of the schemes.

As identified above, the case studies therefore focus on assessing performance of the schemes in term of outputs and outcomes, with the addition of contextual information regarding external factors which may have influenced the performance of the schemes.

Institutional memory: The timing of the evaluation case studies requires consultants to provide information based on events up to 12 years ago. For all case studies, a key criteria for selection was that the institutional knowledge was maintained and we were able to speak to at least one person who had been involved in the scheme throughout its lifetime.

7.2 Case study 1: Fastway

The Fastway scheme involved the implementation of a series of bus priority measures along two core routes linking Horley, Gatwick airport and Crawley. The main elements of the scheme consisted of the construction of a new bus only link and widening existing highways to provide a dedicated bus lane including sections of segregated bus way with kerb guidance.

Figure 6: Fastway guided busway



Source: West Sussex CC

7.2.1 Project overview

Problem being addressed

The Crawley and Horley urban area is a major transport hub, with Gatwick airport lying between the two town centres. The area is also a centre of economic activity with a number of industrial estates in the area.

Public transport in the area consisted of trains and buses, with buses used for the majority of public transport journeys in the area, and rail predominantly used for longer distance journeys.

The main issues identified by West Sussex County Council relating to the previous bus system were:

- **Availability:** Although the area had a reasonably dense network of services, many services had low frequencies and through journeys often required interchange. A fully integrated system was needed to provide a comprehensive series across the area.
- **Speed:** Bus speeds were relatively low and unreliable due to congestion and the lack of priority for buses. For those with access to a private vehicle there was little incentive to use buses for journeys in the area on a regular basis. There was a need for a faster, more frequent and reliable service to compete with the car.
- **Poor vehicle design:** New, modern air conditioned vehicles with easy access were required in place of the traditional buses used on most local services.
- **Fares:** Fare levels in West Sussex were perceived as being high compared with other Shire Counties. A balance needed to be struck between the fare level and the quality of service.

There had been a long-term decline in patronage across Crawley prior to 2001. This started to reverse when Metrobus started serving the Crawley area, but West Sussex CC identified that a significant investment in service quality was needed to accelerate growth in patronage.

Description of the scheme

It was considered that the Fastway scheme would provide the 'step change' that was needed to change perceptions of public transport and achieve a modal shift from car to bus.

The objectives of the scheme were linked to West Sussex Local Transport Plan (LTP) objectives and Surrey LTP objectives. They are summarised as follows:

- **Choice:** Obtain a high standard of service in bus passenger transport and increase patronage through enhanced services.
- **Safety:** improve safety and security, and reduce the fear of crime, for all travellers and in all aspects of transport.
- **Integration:** Improve the integration and co-ordination within and between all transport types and improve public transport interchanges and information.
- **Economic performance:** Promote an efficient transport system which supports a sustainable economy.
- **Environmental:** Reduce the adverse effects of motorised transport and reduce the growth in unsustainable travel.
- **Accessibility:** ensure proper provision for the mobility impaired, ensure those without use of a car have access to local services or appropriate public or community transport, and make it easier for everyone to travel to everyday facilities.

To achieve the improvement in service quality needed West Sussex CC felt that either a much better quality of bus service or a new light rail service.

The advantages of light rail transit (LRT) were recognised: It would provide a modern, attractive image and a high quality of service. However, an LRT system would be relatively expensive and inflexible, and the cost would necessitate high levels of patronage to make it a viable option. For these reasons it was considered to be unsuitable for the local context.

Fastway was designed to provide a much higher quality, all round, image compared to the previous service. In order to improve service performance in terms of speeds and reliability, a number of measures were put in place to provide priority to buses, comprising:

- Bus lanes.
- Kerb-guided bus ways.
- Bus priority at signal controlled junctions.
- Barrier controlled bus only gates.

In addition to bus infrastructure, a number of improvements were made to the buses themselves.

Figure 7: Fastway route map



Source: West Sussex CC

The service itself also experienced an overhaul, some of which were facilitated by the infrastructure investment:

- Frequent services operating for extended hours (5.00 a.m. to midnight, seven days a week) to cater for shift patterns at Gatwick, Manor Royal Industrial Estate and elsewhere.
- Integrated ticketing.
- Improved environment at bus stops.
- Integration with other modes of transport including other bus services.
- Good information systems for passengers.
- Reduced and more reliable journey times to reduce the differential between bus journey times and corresponding car journey times.

The two routes for Fastway feature 2.8 km of guided busway, 7.8 km of bus lane and 28 junctions where buses are given some form of priority, 19 of which have vehicle actuated signals.

The service was planned to operate at ten minute intervals in peak periods and every 20 minutes off-peak, giving five minute and ten minute intervals respectively on the common sections of the route.

Key performance indicators

The following performance targets were set out in the original project appraisal and subsequently as part of the Quality Partnership Agreement:

Table 9: Fastway KPIs

KPI	Fastway project appraisal	Quality partnership agreement
Patronage growth	Increase in patronage to 8,500 per day by 2008.	10% in ten years with an aim of increasing the proportion of passengers travelling by bus in the area by 1% a year.
Traffic levels	Reductions in traffic (less than 10% reduction expected).	Reduce the otherwise prevailing traffic growth by 2.5% by 2006.
Reliability	–	19 out of 20 buses must operate within five minutes of the stated timetable, unless traffic congestion or other circumstances beyond the control of the partners prevail.
Passenger satisfaction	–	To determine the proportion of customers satisfied by services and strive toward a steady and verifiable growth in this level of satisfaction.
Journey times	Improved journey times (20% reduction on long distance journey times).	Average single journey times to reduce by one minute and average bus speeds to improve by 1mph in association with phased implementation of new infrastructure.
Speed of service	Average speeds of 25-40 km/h in the off-peak and 20-30 km/h in the peak periods.	–
Cleanliness	–	Nine out of ten buses inspected are clean to agreed standards.
Accidents	Reduction in accidents.	–
Pedestrian impacts	More people walking to bus stops (additional 5,000 per day by 2008).	–

Source: West Sussex CC Fastway Scheme Appraisal Report 2000; Fastway Quality Partnership Agreement.

Decision-making process

Plans for Fastway were developed over the three years running up to 2000 involving assessment of the engineering and economic viability of the scheme.

In 1999 an initial proposal was submitted as part of the Provisional Local Transport Plan (LTP), and this was worked up in greater detail to develop a full project appraisal submitted as part of the Local Transport Plan for West Sussex in 2000.

Sources of funding

In the 2000 project appraisal the estimated capital costs of the project were £23.9 million¹³. This covered the infrastructure costs, with an additional cost of £3 million for the purchase of the new vehicles themselves, funded by the bus operator¹⁴.

At this stage it was intended that £14.1 million of total infrastructure costs would be funded by the private sector, plus £3 million for the new vehicles. This resulted in a public sector funding requirement of £9.8 million which was sought from the DfT.

By 2002 the total cost estimate had been revised to £32 million, comprising £29 million of infrastructure costs and £3 million for the purchase of new buses. The public funding requirement had increased to £18 million.

7.2.2 Performance evaluation

The 2000 appraisal of Fastway sets out objectives for the scheme and key performance indicators. These were updated and expanded upon in the Quality Partnership Agreement between the local councils, Metrobus Ltd and Gatwick Airport.

This case study evaluation focuses on the measures of patronage, traffic levels, reliability, passenger satisfaction and journey times.

Bus patronage

Target: 10% in ten years with an aim of increasing the proportion of passengers travelling by bus in the area by 1% a year

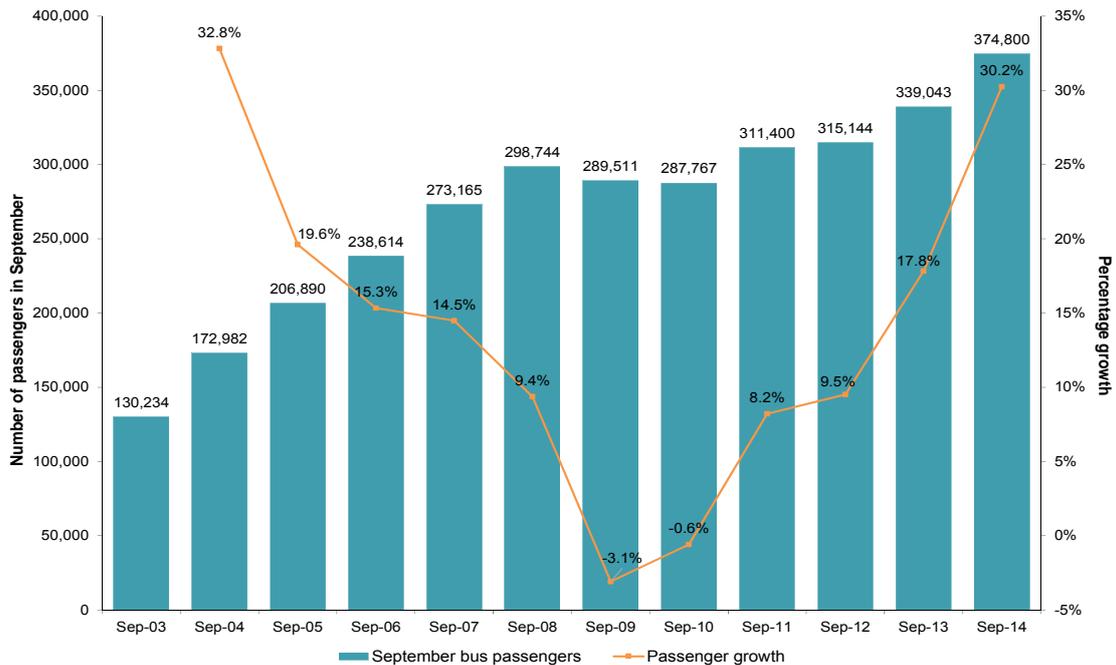
Overall bus usage increased by 160% over the ten year period between September 2003 and September 2013. This significantly exceeds the target of 10% growth over ten years.

Year-on-year patronage growth ranges from 32.8% to 30.2% in the years from September 2003 and September 2014. Figure 8 shows the total number of passengers and percentage change for each September from 2003 to 2014.

¹³ Local Transport Plan for West Sussex Supporting Submission, Fastway Scheme Appraisal Report. West Sussex County Council, July 2000.

¹⁴ http://www.Fastway.info/about_Fastway/cost.html.

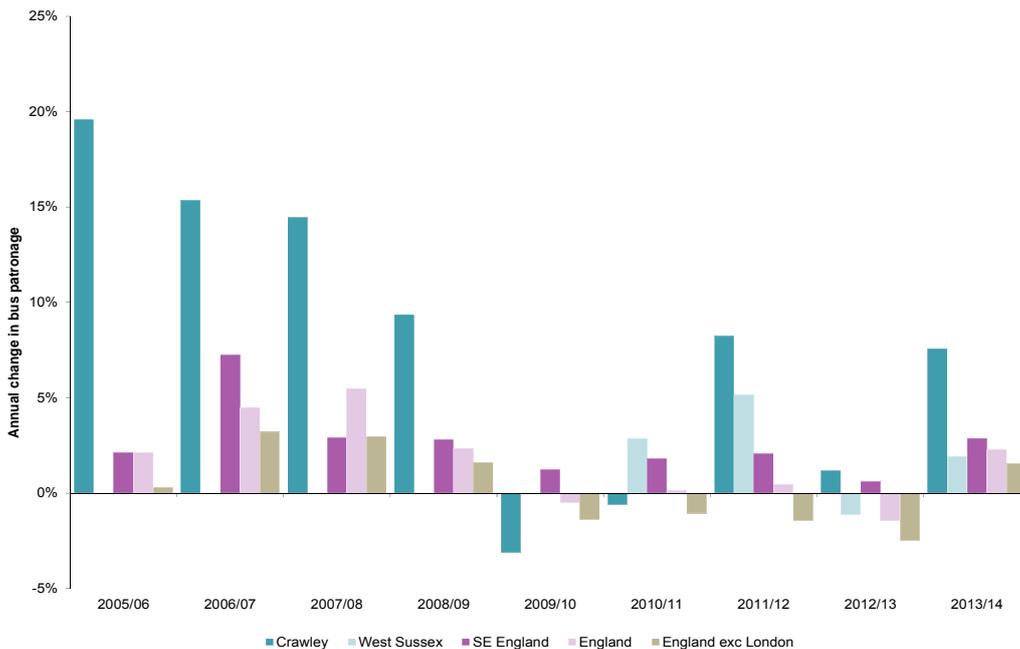
Figure 8: Fastway bus patronage 2003-2014



Source: Metrobus data

There are only two years, since Fastway was launched, in which the 1% per annum patronage growth target was not met. In these two years (2009/10 and 2010/11) patronage declined by 3.1% and 0.6% respectively. This coincided with the economic downturn and comparing the performance of Fastway with local and national level data shows that bus patronage levels across the country were negatively impacted over this period. However, as Figure 10 illustrates, while growth in bus patronage in Crawley had been stronger, patronage in Crawley declined at a greater rate than across the county and region as a whole at the time of the recession. One reason for this could be the focus on use of Fastway for access to employment sites, meaning that the economic downturn and increase in unemployment, hit Fastway patronage more than other bus services.

Figure 9: Growth in bus patronage



Source: Metrobus data; DfT.

As shown in Figure 9, bus patronage in Crawley tends to grow at a greater rate than the rest of the country. Additionally, in the two years when patronage in Crawley fell (2008/09 and 2009/10), patronage also fell in the rest of the country. This suggests that bus patronage was nationally affected by an external factor such as a slowdown in the economy.

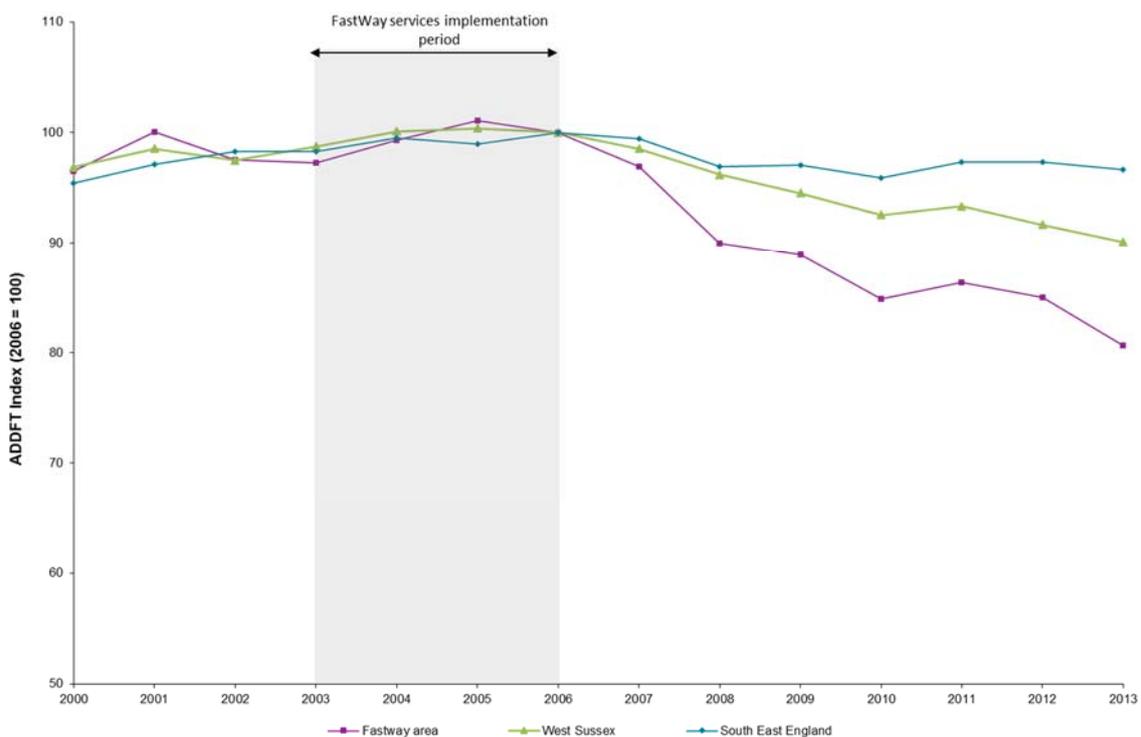
Traffic levels

Target: Reduce the otherwise prevailing traffic growth by 2.5% by 2006

Traffic flow data allows us to analyse changes in traffic levels along the Fastway route. We have used Annual Average Daily Flow (AADF) data from the Department of Transport to measure traffic levels for the Fastway area and the surrounding areas, before and after the introduction of Fastway services. AADF data gives the number of vehicles that will drive on a stretch of road on an average day of the year¹⁵.

We have converted the AADF data to an index to track the growth and decline of the traffic levels since 2000 for the Fastway areas (Crawley, Gatwick Airport and Horley, Three Bridges and Broadfield)¹⁶. We have also included comparison data for West Sussex and the South East of England.

Figure 10: Traffic counts index 2000-2013



Source: DfT AADF Traffic counts.

Figure 10 above shows traffic levels increasing slightly between 2000 and 2006 for the Fastway area, and for West Sussex and South East England as a whole. Between 2000 and 2006, traffic levels in the Fastway area grew by an annual equivalent of 0.6%, while West Sussex and South East England saw average annual growth of 0.5% and 0.8% respectively. In the Fastway area, traffic levels peaked in 2005 and have seen a steady decline since. This trend was reflected in West Sussex as a whole, though the subsequent decline in traffic levels across West Sussex has been less marked.

¹⁵ <http://www.dft.gov.uk/traffic-counts/about.php>.

¹⁶ Data was not available for Redhill.

Between 2006, when Fastway was completed, and 2013 traffic levels in the Fastway area have fallen by 19%, while West Sussex has seen a decline of 10% and South East England has seen fall of 3% over this period.

This indicates that part of the decline in the Fastway area may be attributed to external factors which have led to a general downward trend in the area since 2005/06. However the data shows that the Fastway area has seen a far greater decline in traffic levels than the area as a whole which suggests the decline may be, at least in part, attributable to the implementation of the Fastway scheme.

Reliability

Target: 19 out of 20 buses must operate within five minutes of the stated timetable, unless traffic congestion or other circumstances beyond the control of the partners prevail.

Table 10 below shows the percentage of buses running on time for Fastway and comparators for 2014.

Table 10: Bus punctuality data

Route	2014 ¹⁷
Fastway Route 10	94.9%
Fastway Route 20	90.4%
Crawley non-Fastway frequent bus services	89.7%
West Sussex	86.0%
South East England	85.4%

Source: Metrobus data, DfT bus statistics.

The Fastway Quality Partnership set a target to have 19 out of 20 buses, equivalent to 95% of buses, operating within five minutes of the stated timetable. We do not have data specifically for this window of tolerance, therefore we have used data on the Traffic Commissioner's definition of on time is between one minute early and five minutes 59 seconds late¹⁸ as a proxy for the target.

Table 10 shows that Route 10 of Fastway, achieves this reliability target. However Route 20 is almost five percentage points short of achieving the target, and is only slightly more punctual than the non-Fastway services in the Crawley area. It is worth noting however that this route operates into Horley in Surrey, where there are no bus lanes or guideways, which may contribute to the less punctual performance.

However, our assessment of the reliability of the services against the target does not take into account those instances where traffic congestion or other circumstances beyond the control of the partners may have influenced the service. The actual performance against the specific target would, therefore, be expected to be higher. The data also shows that, in terms of the Traffic Commissioner's definition, Fastway services are more punctual than the averages for West Sussex and the South East of England.

¹⁷ Figures for West Sussex and South East England are for 2013/14.

¹⁸ This definition is based on the Traffic Commissioner's guidelines.

Passenger satisfaction

Target: To determine the proportion of customers satisfied by services and strive toward a steady and verifiable growth in this level of satisfaction.

Following initial introduction of Fastway services, customer surveys were carried out for Fastway passengers in 2004, 2006 and 2008 following the launch in 2003. The 2004 survey involved 217 face to face interviews, and the same survey was used in 2006, involving 465 face to face surveys. The 2008 survey involved 874 face to face surveys. There have not been any satisfaction surveys undertaken since 2008.

The 2004 and 2006 surveys allow for direct comparison of results, however the 2008 survey used a different format and methodology, bringing it in line with measures of bus user satisfaction outlined by the DfT and the Scottish Executive¹⁹. This aimed to improve the robustness of the results, but reduces the direct comparability with previous results. However, a number of the questions asked in the 2008 survey followed a similar theme to those asked in the 2004 and 2006 surveys meaning that some level of comparison is maintained.

Table 11: Fastway performance indicators – Percentage satisfaction

	2004	2006	2008
Frequency	83%	95%	92%
Clean	99%	90%	86%
Comfortable	97%	92%	-
Sufficient storage for luggage	60%	60%	-
Sufficient storage for pushchairs	81%	70%	-

Source: West Sussex CC.

Customer satisfaction was high in 2004 following initial launch of the scheme, particularly in relation to the cleanliness of the buses and the level of comfort, with 99% and 97% satisfaction in these areas respectively. Satisfaction relating to cleanliness and comfort fell slightly over the following two years, as might be expected through the general wear of the buses, however satisfaction remained high on the whole. The satisfaction with the frequency of the service rose between 2004 and 2006 from 83% to 95%, but dropped slightly in 2008 to 92%.

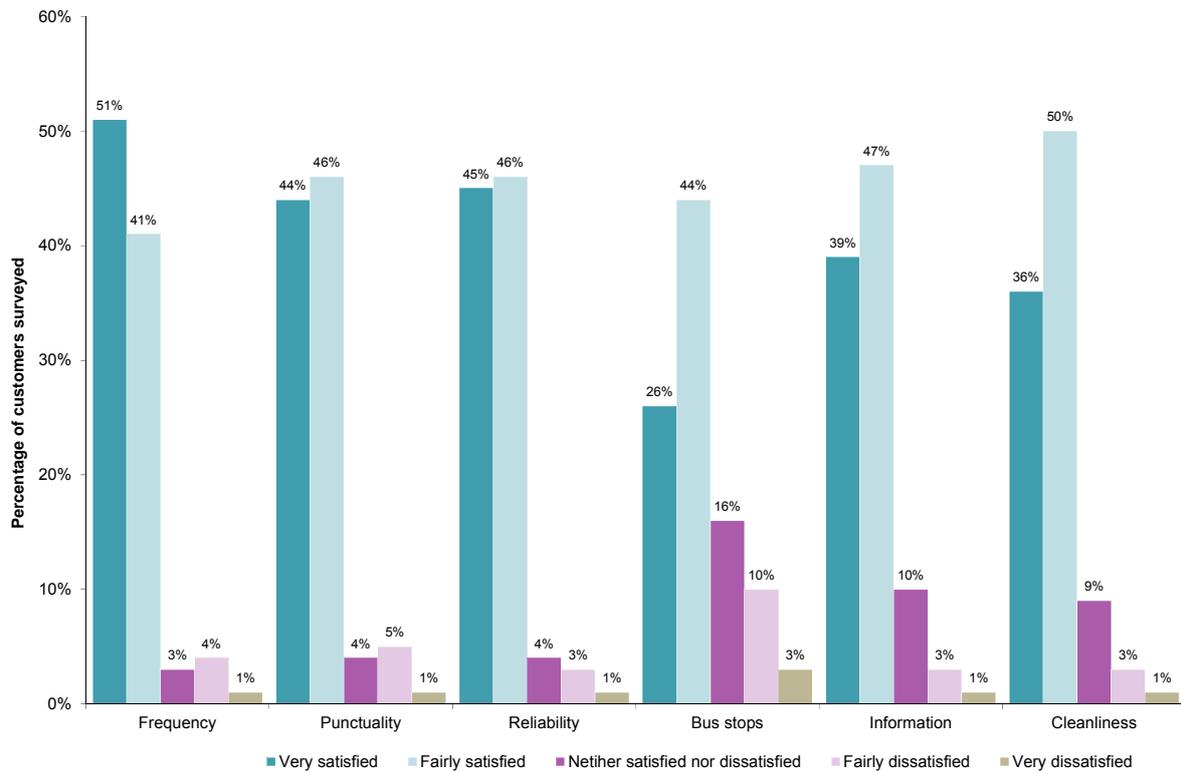
The 2008 survey was split into five levels of satisfaction.

In 2008, 95.5% of bus passengers surveyed said that they were either 'Very satisfied' or 'Fairly satisfied' with the overall bus service. However, satisfaction with different aspects of the bus service varied.

¹⁹ Bus and light rail statistics Great Britain: July-September 2008; Scottish Executive Bus Satisfaction Surveys.

The results of the 2008 customer survey is shown in Figure 11 below:

Figure 11: Fastway passenger satisfaction



Source: West Sussex CC.

Satisfaction across the themes was high, with satisfaction ranging between 70% and 92%. The lowest satisfaction was with the bus stops, with 70% satisfaction, and only 26% very satisfied. However the bus service itself scored very highly in terms of frequency, punctuality and reliability.

Journey times

Target: Average single journey times to reduce by one minute and average bus speeds to improve by 1mph in association with phased implementation of new infrastructure.

On average journey times have improved by 9.5 minutes, taking into account reduced waiting times. This represents an average 28% reduction in journey time since the introduction of Fastway. This falls within a range of journey time changes of a three minute increase to a 28 minute reduction, depending on route.

A breakdown of journey times before and after the introduction of Fastway is shown in Table 12 below.

Table 12: Journey times data

Origin/Destination	Crawley Bus Station			Gatwick South			Three Bridges		
	Journey time before Fastway	Journey time after Fastway	Change	Journey time before Fastway	Journey time after Fastway	Change	Journey time before Fastway	Journey time after Fastway	Change
Bewbush Dorsten Square	24.5	19	5.5	31.5	34.5	(3)	-	-	-
Broadfield Barton	19	14	5	36.5	30	6.5	29	24	5
Gatwick Road North	25.5	17	8.5	5	5	0	34.5	14	20.5
Horley Town Centre	48	36	12	30	22	8	59	31	28
Manor Royal Faraday Road	25	12.5	12.5	15.5	11.5	4	-	-	-
Gatwick South	29.5	22	7.5	-	-	-	39.5	19	20.5

Source: West Sussex CC.

With the exception of Bewbush Dorsten Square to Gatwick South, journey times on all routes have reduced by more than the one minute target set for the project.

7.2.3 Process evaluation

Project delivery

Fastway was delivered in three phases²⁰ with the first services originally intended to be operational in 2002. Fastway was ultimately delivered behind the original schedule, with the first services commencing in September 2003.

The delays were largely attributed to difficulties in obtaining cooperation from utility companies to re-route pipes and cables which ran beneath the busway route. Pressure from the then cabinet minister for West Sussex County Council, Tex Pemberton, helped an agreement to be met with the utility companies so that progress could continue to be made on the busway, and the extent of the delays were curtailed. These issues would be less likely to arise going forward due to the street works licence scheme, which is being implemented by West Sussex. This licence scheme facilitates the co-ordination of street works by the Street Authority and aims to address the issues faced in the construction of the Fastway bus route.

Other slight delays came from the required inspections of the busways. Fastway was one of the first projects to include guided busway and at the time there was a lack of clarity as to how it should be treated. During the first phase of construction it was decided that it should be classified as a railway (along with tramways) and required a full inspection by HM Railway Inspectorate. The scope was adjusted in 2006 to exclude guided busways from the remit of HMRI.

The delays to Phase 1 had a knock on effect on subsequent phases, but there were no other significant delays to the project.

In terms of finances, the final cost of Fastway did exceed the budget. In the original business case produced in July 2000, the cost of the total capital costs of Fastway were estimated at £23.9

²⁰ <http://web.archive.org/web/20021209002321/www.Fastway.info/creating/phasing.htm>.

million²¹. This figure was updated prior to work commencing in 2002 to £32 million, and the final costs of delivery were estimated at around £38 million.

The main cost overruns were experienced in Phase 1 of the project. The increased costs were in part attributed to the delays in work by the utility companies and unexpectedly complex groundworks being required.

Some costs were recouped through value engineering allowing the majority of the intended benefits to be accrued at a lower cost.

Stakeholders and partnership working

The Fastway project involved a large number of partners to varying degrees, comprising West Sussex County Council, Surrey County Council, Crawley Borough Council, Reigate and Banstead Borough Council, Gatwick Airport, British Airways, the Go Ahead Group and Metrobus²². Arriva were involved in the initial stages of development, before making the decision to discontinue its operations in Crawley.

Despite a large number of partners involved in the scheme, agreements were achieved without preventing progress of the project. The partners shared a common vision and a strong Steering Group was established supported by sub-groups such as Infrastructure and Communications. In addition, the public was consulted and informed of the progress of the scheme.

An informal partnership agreement between the Partners was put in place to monitor overall quality and specific targets.

A programme of public communications was undertaken during the construction phase to keep the public and local businesses informed of progress. Events were also held to obtain views from the public. This allowed concerns to be identified and, where possible, to be addressed.

Fastway faced some negative press, but based on the public consultation through events, the press coverage did not appear to reflect public perceptions as a whole.

Adverse or unexpected outcomes

The original appraisal of Fastway set out a number of anticipated benefits, however there were some impacts from the scheme which were not initially anticipated.

One benefit of the implementation of a BRT over and above light rail or a tram system which was realised is its flexibility. Route 10 and Route 20 were planned to take the same route through the Broadfield residential estate. However, following the launch of Route 10, residents fed back that for those at the south of the estate it was a long walk to reach the route. Therefore, when Route 20 was implemented it followed a slightly different route through the estate, better serving more parts of the estate. This flexibility and responsiveness to demand would not have been possible with a tram or light rail system.

A further unanticipated impact resulting from Fastway was the impact on house prices. Fastway became a key selling point for marketing of properties in the area. A study undertaken by research organisation ETP²³ on behalf of Kent County Council and Transport for London found that terrace houses within 300m of the Fastway corridor had an average house price premium of 3.5% compared

²¹ Local Transport Plan for West Sussex Supporting Submission, Fastway Scheme Appraisal Report. West Sussex County Council, July 2000.

²² <http://www.Fastway.info/about-Fastway/>.

²³ British Busways and their Impact on Property Sales, 2008.

to those in the outside-600m area, while semi-detached houses within 300m of the Fastway corridor had an average house price premium of 8.9%.

As well as benefits on the Fastway route, the introduction of Fastway has facilitated greater investment in improvements to bus infrastructure more widely across Crawley. The success of Fastway has led Metrobus to invest in real time information and other services at bus stops, including beyond the Fastway route. Furthermore, as Metrobus is making these investments themselves, it has been possible for Crawley Borough Council and West Sussex County Council to invest S106 revenues in infrastructure.

Other positive impacts from the success of Fastway have been to focus the minds of local bus partners on the value of marketing and brand in the successful delivery of a high quality service. In the early stages of planning Fastway, Metrobus were hesitant to agree to using new livery and branding for Fastway – this was one area where views among the delivery partners diverged. However, in hindsight, Metrobus recognises the value of a new brand for Fastway, which gives it its own identity as a unique and high quality service.

External factors

A number of factors are considered to have impacted the overall success of the scheme.

One factor which is identified by project partners to have boosted success of the Fastway service is the growth of Gatwick airport, and the growth of the local economy more generally. This is believed to have contributed to the growth in patronage figures.

Conversely, delivery partners reported that all services were impacted by the economic downturn in 2008/09. The economic downturn would be expected to have had a negative effect on patronage figures both due to fewer people being in work, and lower spending on activities and shopping. This led to a planned increase in the frequency of the Fastway service being postponed. However, this increase was subsequently introduced at a later stage once patronage figures had recovered.

Scheme evolution and improvements

Over the lifetime of Fastway, the frequency of the main Fastway route – Route 10 – has steadily increased in response to the growth in patronage. Route 10 started in 2003 with a service frequency of every ten minutes at most times²⁴, and this has now reduced to every six minutes. In addition, in May 2004 a 24 hour service was introduced with a service frequency of every 30 minutes.

As per the partnership agreement, the Fastway fleet has been replaced every five years. In addition to this, the Fastway branding was redesigned and refreshed by Metrobus in 2014. The whole Fastway fleet now has next stop audio announcements, wifi and infotainment screens providing information about the local area, including Live Rail Departure Boards showing on approach to the rail stations.

²⁴ Metrobus 'Operational perspective' presentation, 2014.

Figure 12: A recent addition to the Fastway fleet



Source: West Sussex CC

Some amendments were made to other aspects of the service in response to demand. The section of the route which runs into Surrey is subsidised by Surrey County Council. This part of the route was initially included as part of the infrastructure investment on the expectation of 2000 homes being built on the route. However the economic downturn as resulted in the housing development being postponed, and therefore to support this part of the route running, Surrey CC contributed revenue funding to this service. Budget cuts resulted in these contributions being reduced, therefore adjustment had to be made to the service and route to make it viable. However construction of the housing development is now well underway and the level of evening and Sunday services that have been restored.

Another amendment to the service and route was at Gatwick airport – the Fastway route through a service tunnel under Gatwick airport had to be moved due to tunnel being blocked off for safety and security reasons following the 2007 terrorist attack at Glasgow International Airport. The route was changed to run along the A23, around the airport, where a bus lane was introduced. However, although this created disruption at the time, the new route along the A23, with the introduction of the bus lane, now allows for a quicker journey time for passengers.

Key reason for success

Partnership

The partnership working between West Sussex CC, Metrobus and other partners, were considered to have been very successful.

West Sussex CC have taken the approach of leaving bus operators to promote their own services. Once the infrastructure was constructed, Metrobus was given the freedom to manage its own services, within an informal partnership arrangement.

This was enabled in part by co-operation between Metrobus and smaller operators, working together to maintain and promote the positive image of the bus. An example of this is Metrobus' role in maintaining and updating their own, and other operators' information at the bus stops along the Fastway route, ensuring the information remains up to date. This approach, while giving Metrobus the freedom to manage the information in the way they want, also saved West Sussex CC time and money.

The political will behind Fastway was also identified as a key part of the success in getting Fastway delivered initially, and in standing up to opposition.

Business market

One strategic factor which has been identified as a key contributor its success and growth is the focus on white collar workers as a target market. The Fastway route goes via two main business areas, where many employers had previously provided their own employee bus service to encourage car-free travel to work. However, the services were limited and costly.

Metrobus approached a number of employers to establish a partnership whereby they could purchase bus passes for their employees at a discounted rate. This created savings for the businesses, and a more frequent service for employees. Similarly, Metrobus offered discounted single journey passes to businesses as an alternative to calling a taxi for visitors – The frequency and speed of the service, as well as the quality of the buses, are reported to have contributed to the service being considered a suitable alternative to a taxi or employer specific bus service.

Lessons learnt

Fastway was one of the earliest BRT schemes implemented. As a result, there was not the opportunity to learn from other similar schemes in order to help identify the most effective measures to include.

There are a number of elements of the scheme which, in hindsight, have not been as effective as expected. Overall, while the scheme is considered to have been a success, it is felt that the bus priority measures have not delivered all the anticipated benefits. This is in part felt to be due to the fact that when implemented, intelligent bus priority measures were in their infancy and the extent of their technological ability was overestimated. The increase in the frequency of the bus service has also had an impact on the effectiveness of the intelligent bus priority measures – if a series of buses are running late and need to be given priority, it is not possible to give all priority while managing other traffic. In hindsight it was felt that more roundabouts, with part time signals, may have been more effective.

It was also felt that in the initial design stage, the scheme was primarily treated as an engineering project, and followed the trend at the time for replacing roundabouts with traffic signals. It is also considered that the engineering focus of the project led to more guideway being included than strictly necessary, and on some stretches it is not felt to have added value to the operation of the bus service. Metrobus' close involvement from the later design and throughout the implementation stage led to a more issues-led approach. This enabled subsequent cost savings to be made whilst retaining the majority of the planned benefits.

In hindsight the design should have been issues led, with a focus on addressing specific problem areas, where there was evidence of buses being delayed. It was felt that this may have been given greater consideration if Metrobus had been involved at an earlier stage to provide greater insight from an operators' perspective.

7.2.4 Ex post business case evaluation

Summary of previous business case

A scheme appraisal report for Fastway was produced by West Sussex County Council in 2000. According to this business case appraisal, the Fastway scheme was expected to deliver a BCR of 1.94. This was based on a present value of benefits of £73 million and present value of costs of £38 million, thus leading to a net present value of £36 million.

Since this appraisal was undertaken, the DfT methodology for estimating BCRs has changed and benefits and costs have been reclassified²⁵. Based on the current guidance, the net present value

²⁵ The treatment of private sector impacts has changed: in the new methodology the net impact of private operator revenues and costs are included in the scheme benefits, whereas the old methodology included operator revenues in the scheme

would stay the same but the ratio of benefits and costs would change, due to lower estimated costs, leading to a BCR of 4.67. This indicates high value for money.

Ex ante business case analysis

Details of the ex ante business case are shown in Table 13. It shows that a large proportion of benefits correspond to benefits for car and bus users. These reflect time savings resulting from the scheme implementation. The exact assumptions behind these calculations are not explicitly described in the business case.

Table 13: Business case – Fastway

Business case	Present value (2000 prices, £ million)	
Bus and Car user benefits	46.1	a
Freight benefits	4.1	b
Private sector revenue	28.0	c
Private sector operating costs	(26.6)	d
Private sector grant (paid to local authority)	(1.4)	e
Public sector cost	(11.1)	f
Indirect tax revenues	(5)	g
Benefits (old methodology)	73.2	(a+b+c+g)
Costs (old methodology)	37.7	(-d-f)
BCR (old methodology)	1.94	
Benefits (new methodology)	45.2	(a+b+c+d+e+g)
Costs (new methodology)	9.7	(-f-e)
BCR (new methodology)	4.67	

The business case assumes that surplus private sector revenue will be transferred as a grant to the public sector to fund the scheme.

It is worth noting that the present value of benefits has been calculated over a 30-year appraisal period using a 6% discount rate. The guidance relating to the appropriate discount rate to apply has been updated in the latest WebTAG methodology, which recommends using a discount rate of 3.5%.

The ex ante appraisal did not include any quantification of journey ambience or quality benefits, although these are described as a beneficial impact in the appraisal summary table of the business case.

Ex post business case

Actual data shows that demand has exceeded forecasts and that capital costs were also higher than initially estimated. Table 14 shows the data used to update the business case.

benefits and private operator costs in the scheme costs. In addition, the surplus revenue obtained by the private operator, which is assumed to be transferred to the local authority as a grant to fund the scheme, is accounted as a benefit in the business case instead of a reduction in costs.

Table 14: Actual Data – Fastway

Business case	Forecasts	Actual data	Source/assumption
Actual daily demand (2003)	3,550	4,341	Actual demand data (Metrobus data).
Actual daily demand (2004)	4,070	5,766	
Actual daily demand (2005)	7,550	6,896	
Actual daily demand (2006)	8,000	7,954	
Actual daily demand (2007)	8,450	9,106	
Actual daily demand (2008)	8,950	9,958	
Actual daily demand (2014)	10,079	12,493	Assumes 2% demand growth for business case forecasts. Actual demand data (Metrobus data).
Actual time savings (min)	n/a	9.5	Actual time savings (Information from West Sussex CC).
Actual capital costs (£ million)	£24	£38	Actual capital costs (Information from West Sussex CC).

Using this data, the benefits and costs have been updated based on the assumptions set out in

Table 15 below.

Table 15: Ex post benefits and costs – Fastway

Present value (2,000 prices)	Ex ante forecasts (6% discount rate)	Ex post estimation (3.5% discount rate)	Assumptions/data
Travel time – Bus users	£22.6 million	£37 million	Actual demand data and time savings. This assumes that 20% of bus users are new annualisation factor of 300.
Quality benefits	n/a	£11 million	Actual demand data and WebTAG values for bus service quality (M3.2.1).
Wider social and economic benefits	n/a	£29.4 million	Actual demand and journey time data, and Greener Journeys research on the wider benefits of buses.
Private sector revenue	£28 million	£41 million	Ex ante revenue uplifted by actual demand growth.
Grant/subsidy	£1.4 million	£5.9 million	Surplus revenue (updated revenue and ex ante operating costs).
Capital costs	£24 million	£38 million	Actual capital costs. It is assumed that the local authority absorbed the difference but it is compensated by the surplus revenue generated.

Quality benefits were not been monetised in the ex post BCR calculation. These have been calculated in the ex ante BCR analysis based on the assumptions from WebTAG unit M3.2.1 relating to the value of the new bus shelters and RTI. Any benefits and costs not included in

Table 15 have not been updated.

Wider social and economic benefits have been added to the analysis. These have been estimated based on outturn demand and journey time data and the Greener Journeys' latest research on the

benefits of local bus services to society. The methodology to estimate these benefits is available in the appendix.

Using a 3.5% discount rate, benefits and costs have been discounted over a 30 year appraisal period. Those benefits and costs which have not been updated based on actual data have been adjusted to reflect this discount rate. The results show a BCR of up to 6.0 (4.6 excluding wider benefits), indicating very high value for money, and higher than the BCR estimated in the ex ante business case (4.7).

Although the BCR estimates in the ex ante and ex post analysis are similar if we exclude wider impacts, the drivers of the value of the estimates have changed. While the costs have been higher than forecast, there were also a wide range of additional benefits not included in the ex ante business case.

These results rely on the assumption that the surplus revenue estimated (based on updated revenue and forecast operating costs from the ex ante business case) was used to fund the scheme.

This analysis may underestimate the BCR as traffic has decreased more than forecast, which would result in greater benefits than estimated in the ex ante business case. However there was insufficient data available to update benefits to take account of this. In addition, since opening, the scheme has continued to improve. For example a 24-hour services and a new fleet have been introduced. Neither the costs nor the benefits of these additional improvements have been included in this analysis.

7.2.5 Concluding comments

In summary, the performance evaluation of Fastway shows that the scheme has consistently succeeded in attracting increasing numbers of passengers over the last ten years, exceeding targets. As a result of the scheme, journey times have been reduced significantly, reliability is over 90% and satisfaction with the service is very high. Based on the latest data, there is evidence to suggest that the scheme has also resulted in a decline in traffic, achieving modal shift from car.

Despite some cost overruns and delivery delays, Fastway has delivered high value for money, achieving sustained demand growth and consistently improving frequency and service quality. Partnership working is considered to have been a key driver of this success, with collaboration across a large number of stakeholders. There has also been an ongoing focus on the need to keep the brand and service fresh, and this is considered to have been an important factor in maintaining customer satisfaction and patronage growth over time, delivering long term benefits from the initial capital outlay.

An ex post BCR analysis indicates that the ex post BCR estimate is likely to be higher than the ex-ante BCR set out in the original scheme appraisal. While capital costs were higher than initially forecast, benefits have also been higher than expected.

7.3 Case study 2: Mansfield public transport interchange

The Mansfield case study involved the building of a new, fully enclosed bus station building with 80 metre connecting footbridge to the railway station and improved access to the city centre.

Figure 13: Mansfield Public Transport Interchange, 2014



Source: Mansfield District Council

7.3.1 Project overview

Problem being addressed

Prior to the planned bus station development, Mansfield had an Index of Multiple Deprivation average super output area score of 31.80 compared to 24.38 for Nottinghamshire and 21.58 for England, and was ranked 34th in the national Index of Multiple Deprivation out of 354²⁶.

Mansfield District Council identified a number of ways in which public transport was acting as a barrier to growth:

- Reduced mobility and accessibility for people without access to a private car.
- Access to existing employment and potential regenerations sites.
- The environmental impact of traffic in the town centre.

Plans for the Mansfield Public Transport Interchange were initially put forward in the 2006/7 – 2010/11 Local Transport Plan. The previous facility was reported as being sub-standard with significant signs of wear and tear. Further to this, the station provided limited protection for waiting passengers and was difficult to access. Local consultation at the time provided strong support for a new bus station.

Nottinghamshire County Council summarise the problems with the previous bus station as:

- Aging structure with limited weather protection.
- Safety issues for bus passengers and operators.
- Steps, ramps and subways to gain access, leading to accessibility issues.

²⁶ Mansfield Public Transport Interchange Scheme Business Case 2010.

- Isolated at night meaning people were reluctant to use it.
- Walk routes between bus and rail and town centre were indirect and lengthy.

Figure 14: Old bus station, Mansfield



Source: Mansfield District Council

Description of the scheme

In order to address the issues identified by Nottinghamshire County Council, proposals were put forward for a new bus station, located closer to the train station, to provide an integrated public transport interchange.

The project had the following objectives:

- To improve the ease, image and attraction of using public transport and encourage a modal shift away from the private car.
- To improve the interchange between modes of public transport.
- To provide a quality public transport interchange building that is easy, safe and convenient to use.
- To improve the operational safety of the bus station.
- To improve the ease and safety of pedestrian access between the bus and rail station and on the routes between the bus station, rail station and town centre.
- To support the sustainable development of the Mansfield sub-regional centre and enhance the public realm within Mansfield.

Specific measures implemented to deliver on these objectives include:

- New bus station with passenger facilities.
- Pedestrian bridge linking bus and rail.
- New signalled junction.
- Taxi provision at the bus station.
- Cycle parking.
- Improved walk routes to the town centre.
- CCTV and emergency alarms.

Key performance indicators

Alongside the general objectives, Nottinghamshire County Council set out key performance indicators by which to measure the success of the scheme. These are set out in Table 8 below.

Table 16: Mansfield performance indicators

KPI	Target
Patronage growth	5% growth in first year
Passenger satisfaction	Customer satisfaction rating over 90%
New bus and rail users	None
Bus to rail interchange passengers	2% increase in bus to rail interchange
Bus accidents	Reduce bus accidents to 25% of 2005 levels
Growth in local economy	None

Source: Mansfield Public Transport Interchange Scheme Major Scheme Business Case.

Decision-making process

A Major Scheme Business case (MSBC) for the Interchange Scheme was submitted for approval by the DfT in July 2005. Following review as part of the Regional Prioritisation process the Scheme received approval in August 2006.

During December 2006 and January 2007, a public consultation was held in the town centre to canvas public opinion on the proposed bus station and to ensure the specification of the bus station and accompanying investments met the needs of the potential users. Additionally a series of stakeholder meetings were held during this period.

Planning approval was first granted on 5 February 2008. However, the adjacent landowner, Aldergate Projects Limited (APL) sought judicial review which went to High Court and planning permission was revoked.

The revised application for planning permission was approved on 23 September 2009.

Sources of funding

Eligible scheme costs excluding pre-construction works totalled £8.5 million. Of this the DfT contributed £7.16 million and £1.34 million was funded locally by Nottinghamshire County Council and Mansfield District Council.

Mansfield District Council also contributed the land which had been used as a car park, with a land value of £1.1 million.

7.3.2 Performance evaluation

In their original business case, Nottinghamshire County Council set out target key performance indicators (KPIs). As part of this case study we assess the performance of the schemes against these metrics, where data allows, as well as against other key indicators linked directly to the scheme objectives.

We therefore assess the scheme's performance against 6 measures: bus patronage growth, customer satisfaction, rail users, bus to rail interchange passengers, accidents, and journey time and reliability.

Bus patronage

Target: 5% patronage growth in the first year.

Since the opening of the new interchange figures suggest that the number of bus passengers has increased by 7%, exceeding the 5% target for the first year.

Passenger figures have increased by approximately 334,000 over the year, equivalent to 1,000 additional passengers per week.

Table 17: Mansfield patronage data

		March 2013 (old bus station)	March 2014 (new interchange)	Growth
Number of passengers	Weekly	14,830	15,838	7%
	Annually	4,607,009	4,941,142	7%

Source: Nottinghamshire County Council data.

As shown below in Table 18, the passenger growth of the new Mansfield bus interchange is considerably higher than local and national comparisons. In the absence of other identifiable contributing factors, the local and national benchmarks provide some evidence that the additional increase in passenger growth could be attributed to the new bus interchange.

Table 18: Bus patronage growth

Location	Passenger journeys percentage increase or decrease 2012/13 – 2013/14
Mansfield Public Transport Interchange	7%
Nottinghamshire (County)	(1.80)%
England (outside London)	1.50%

Source: DfT – Statistical Release 2014 and Table BUS0109a.

Passenger satisfaction

Target: Customer satisfaction rating over 90%

Customer satisfaction across a range of features has seen a marked improvement since the opening of the new interchange, with most meeting, or being very close to meeting the 90% satisfaction rating target.

In June 2014, Nottinghamshire County Council undertook bus passenger surveys to monitor customer satisfaction of the new interchange. A range of features of the services and physical bus station were rated on from very good to very poor.

For the purposes of comparing the results of the survey against the 90% customer satisfaction target, we have considered passengers who specified a 'very good' or 'good' rating as being satisfied.

Figure 15: Mansfield passenger satisfaction 2014



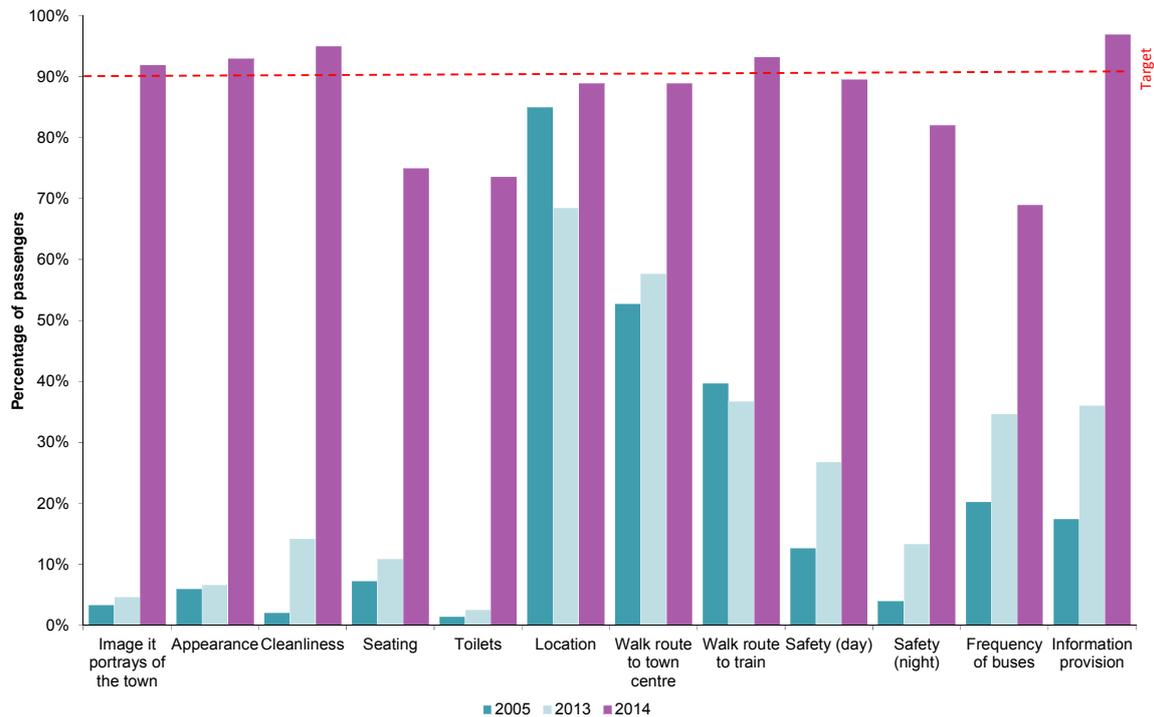
Source: Nottinghamshire County Council data.

Using this assumption, only five areas can be considered to have achieved the 90% customer satisfaction target in 2014.

However, all but three of the features achieved a satisfaction of over 80%, indicating high satisfaction. Furthermore, when comparing the results of customer satisfaction survey in 2014 versus the equivalent surveys undertaken in 2005 and 2013, we can see that customer satisfaction has increased since the introduction of the new bus station. This is shown in Figure 16 below. In some areas customer satisfaction has increased by more than 90% points. The rating for shelter from wind/rain in particular, has increased by 92% points, from 7% satisfaction to 99% satisfaction.

Safety at night should be especially noted for increasing from 4% in 2005 to 82% in 2014 as this was one of the main issues identified with the old bus station.

Figure 16: Mansfield customer satisfaction progress for 2005, 2013 and 2014



Source: Nottinghamshire County Council data.

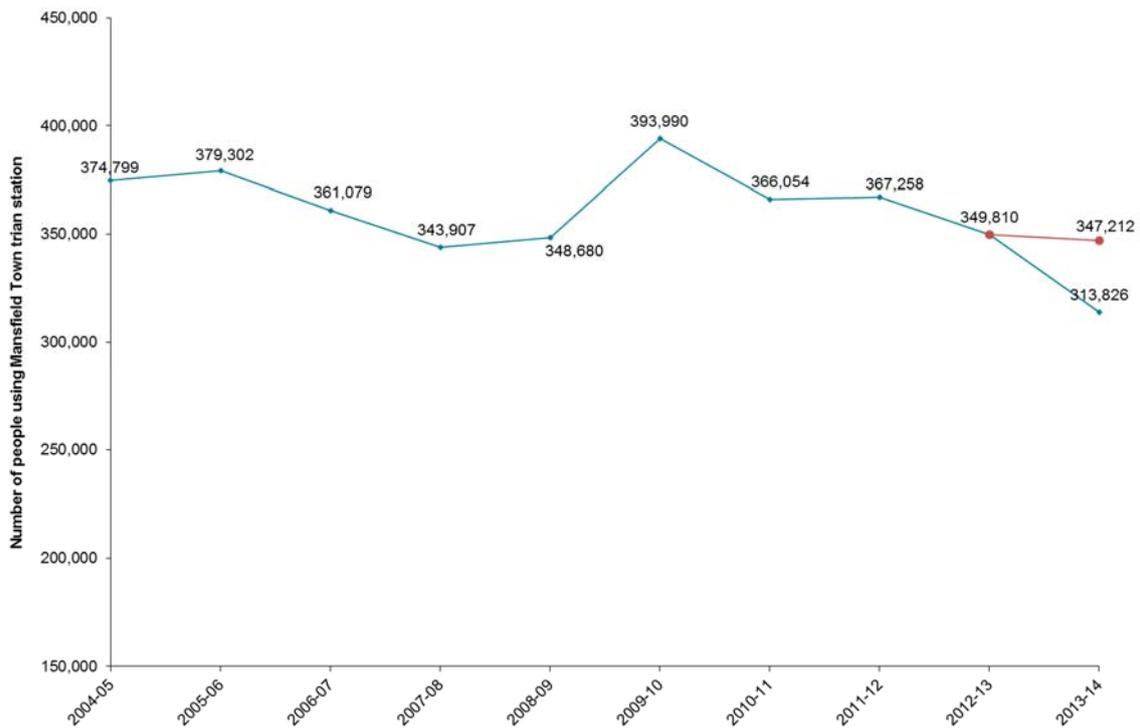
Rail passengers

Target: No specific target

Station usage data for Mansfield Town rail station shows that since 2009/10 station usage has generally declined year-on-year. Station usage refers to the total numbers of people entering, exiting and changing at each station in Great Britain²⁷. The graph below shows the station usage for Mansfield Town rail station over the last ten years, from 2004/05 to 2013/14. The new Mansfield bus station opened on 31 March 2013, so the fiscal year 2013/14 would be expected to fully capture any changes in bus-to-rail interchange passengers brought about by the new interchange.

²⁷ Office of Rail and Road (2014) Estimates of station usage. [Accessible at: <http://orr.gov.uk/statistics/published-stats/station-usage-estimates>].

Figure 17: Mansfield Town rail station usage



Source: Office of Rail and Road (2014), Estimates of station usage.

Between 2012/13 and 2013/14 station usage at Mansfield Town rail station decreased by 10% from 349,810 users to 313,826 users. This implies that there was a decline in rail users over this period. However this figure is likely to have been influenced by the closure of Nottingham rail station for five weeks during the summer of 2013. Nottingham is a main destination for passengers boarding at Mansfield Town station, therefore the closure of Nottingham station at this time would be expected to have had a significant negative impact on usage of Mansfield Town station.

In an attempt to take account of this influencing factor we have adjusted the usage figure pro rata on the assumption that the usage figure only accounts for 47 weeks of usage over the year²⁸. The adjusted figure estimates the pro-rated usage could be as high as 347,212 users. This would represent a reduction of less than 1% on 2012/13 compared to a 5% fall in users in the previous year, potentially indicating a slowing of the downward trend seen since 2009/10.

However, given the fluctuations year on year in station usage, and the potential impact of the closure of Nottingham station, the data available does not allow us to make a robust assessment of the impact of the new interchange on rail users.

Bus to rail interchange passengers

Target: 2% increase in bus to rail interchange

There is no specific data available to us on the number of passengers interchanging between bus and rail to allow direct comparison between the old and new bus stations. However, results from customer feedback surveys provide some indication of the change in ease of interchange between bus and rail.

²⁸ There is a risk that this may overstate the adjusted usage figure as even with the closure of Nottingham Station there would remain some users of Mansfield Town station over this five week period. However the majority of services from Mansfield require a change at Nottingham, therefore this assumption is not considered to be unreasonable.

In 2013 and 2014, 11% and 12% of respondents respectively said they used trains more than they did prior to the opening of the new interchange.

However, these findings are contradicted by survey responses relating to the number of trips made between the bus and rail station. In 2005, 3% of those surveyed said they made a trip between the bus and rail station daily, whilst 1% made the trip several times a week and 11% made the trip around once a month. This leaves 84% who made the trip very occasionally or never. These figures had fallen to 1%, 1% and 6% respectively in 2014, with 92% who made the trip very occasionally or never.

Whilst trends in bus and rail usage will have influenced these figures, there does not seem to be any evidence that the location of the new interchange has had a positive impact on the number of passengers interchanging between bus and rail.

Nonetheless, the perception of the interchange has improved. Of those surveyed in 2014, 93% rated the walk route to train as very good or good, compared to 40% in 2005 and 37% in 2013.

Table 19: Percentage of customers who rated the 'Walk route to train' as 'very good' or 'good'

2005	2013	2014
40%	37%	93%

Source: Nottinghamshire County Council data.

Therefore, although we do not have direct evidence as to whether the 2% growth target has been achieved, and survey responses regarding usage are mixed, there is evidence that customers are more satisfied with the interchange than they were prior to the new bus station and interchange opening.

Accidents

Target: Reduce bus accidents to 25% of 2005 levels

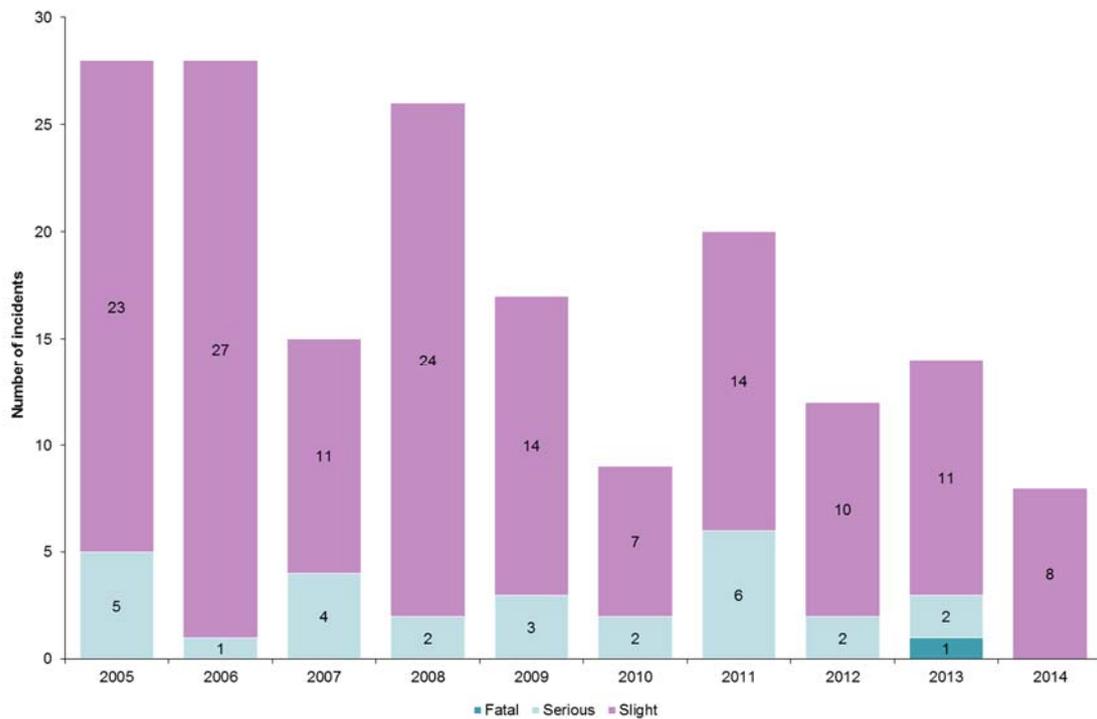
There has been a significant reduction in accidents since 2005, however we do not have evidence to suggest that this can be attributed to the opening of the bus interchange.

In 2005 there were a total of 28 traffic accidents reported in Mansfield Town Centre, including 23 accidents categorised as 'slight' and five categorised as 'serious'. There were no fatal accidents in this year.

Figure 18 shows the annual number of accidents over the last ten years. Although there have been fluctuations year on year, accident rates appear to have seen an overall downwards trend over this period.

In 2014 the number of reported accidents had fallen to a total of eight, all categorised as 'slight'. This represents a fall to 29% of 2005 levels, close to the target of 25% of 2005 levels.

Figure 18: Mansfield accident performance



Source: Nottinghamshire County Council, Road Injury Accidents, Mansfield Town Centre.

This is a positive result. However, the downward trend appeared to have emerged prior to the opening of the bus station in 2013, therefore it is not possible to attribute the decline in the number of accidents wholly to the new interchange.

Journey times and reliability

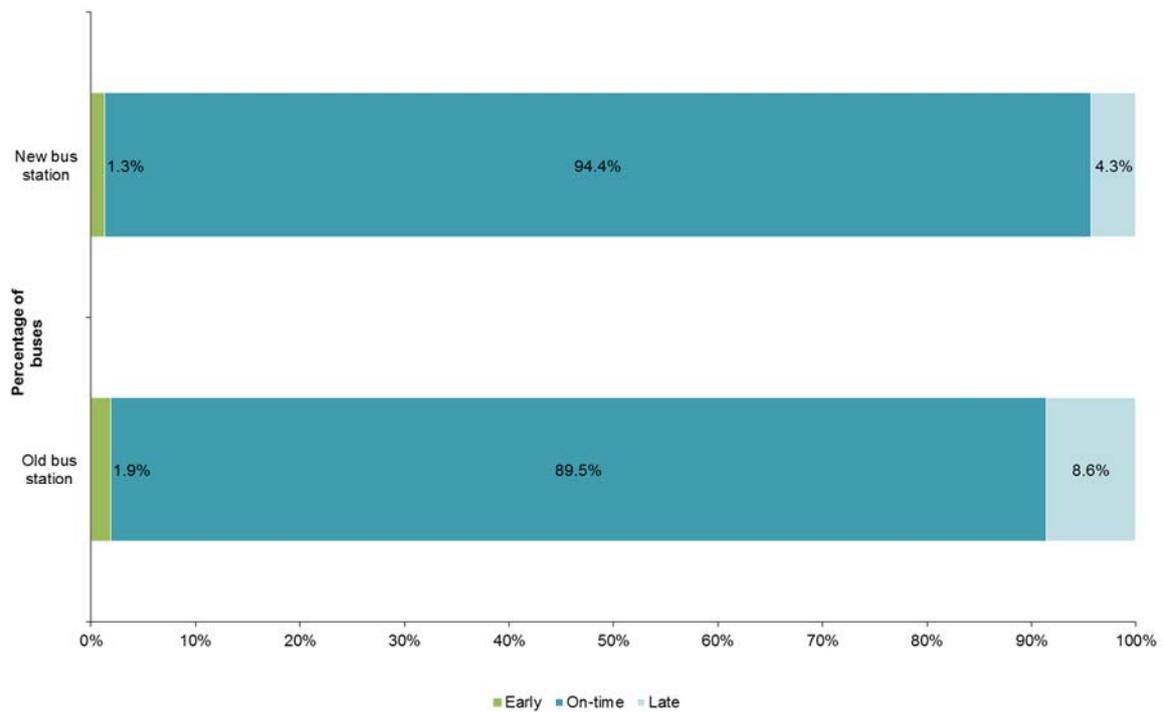
Target: No specific target

Bus reliability has increased since the opening of the new bus station.

Nottinghamshire County Council undertook bus punctuality surveys at the old and new bus stations in March 2013, October 2013 and March 2014. Comparing the results from March 2014 at the new bus station, with those from March 2013 at the old bus station, the number of buses that were on-time²⁹ has increased by almost 5% points. At the same time the number of late buses has decreased by 4.3% points.

²⁹ We have determined a bus as on time using the DfT definition as between one minute early and five minutes and 59 seconds late.

Figure 19: Mansfield punctuality performance



Source: Nottinghamshire County Council data.

Comparing this performance to local averages, we can see that services running from the new Mansfield bus station now perform to a higher rate of reliability than other local and national bus services. This strong relative performance cannot be wholly attributed to the new bus station however, as performance at the old bus station was relatively good compared to the region as a whole. Nonetheless, there has been a clear improvement since the introduction of the new interchange.

Table 20: Punctuality performance of Mansfield comparators

Location	Bus services on time (2013/14)
Mansfield Public Transport Interchange	94.40%
Nottinghamshire (County)	84%
Nottingham (City)	91%
East midlands	82.40%
England (outside London)	83.10%

Source: Nottinghamshire County Council data.

7.3.3 Process evaluation

As part of the process evaluation, we spoke to three individuals associated with the bus project, covering project management, site management and project delivery.

Project delivery

Planning and implementation

Overall the delivery of the project went to schedule with no major complications or delays. The official opening of the interchange by the then Secretary of State for Transport the Rt Hon Patrick McLoughlin, was planned for the 18 March 2012. Though there had been slower than expected progress in the early stages of the project, the high profile and political nature of the opening is considered to have provided the necessary impetus to accelerate delivery in the last few weeks to ensure the interchange was completed in time. This required more intensive resource input from the contractors and from the project management team in the closing stages, but resulted in the bus station being delivered successfully on time and to the planned budget.

The final product was delivered as per the original specification. All major elements of the interchange were delivered as planned, though there have been a few minor defects which have come to light since opening, and which are in the process of being addressed by the contractors. The development as a whole has been delivered as expected and is of high quality, which is reflected in the customer satisfaction metrics and the increase in bus patronage.

The success of the project delivery was attributed in part to the design team employed. Nottinghamshire County Council have expertise in landscaping, highway design and architecture. This enabled the team, all based in one building, to work through any issues which arose during either the design or delivery phase more quickly and efficiently, easing the task of project management. The expertise and experience of the project team also enabled them to learn lessons from other bus stations in the local area, including Retford bus station which opened in 2007 and Newark bus station which opened in 2011. In addition, the project team visited a number of other bus stations across the country to learn from others' experiences. Examples of learning points from other projects included understanding of:

- The space needed for bus drive in and out.
- The optimal number of bus bays.
- The number of toilets required for the anticipated footfall.

In terms of lessons learnt from implementation, quantity surveying was one area of external expertise which, in hindsight, was identified as being worth investing in. The project team felt this was supported by experience from delivery of other bus stations. It was felt that in projects which are not standard and see significant variation from project to project, the expertise of a quantity surveyor would prove valuable in making savings through the purchase of the most appropriate and best value materials at the right price. This would be expected to reduce costs, and reduce the time required in dealing with these issues.

Operation

Following opening, the required revenue commitment from Nottinghamshire County Council has been higher than initially forecast, but not by a significant margin. The annual costs faced by Nottinghamshire County Council and Mansfield District Council are £270,000, £20,000 higher than the £250,000 forecast. This additional cost is covered by Nottinghamshire County Council due to the funding arrangements in place.

The additional costs are largely the result of higher than expected costs of repairs and additional staff costs. Repair costs are higher than expected in part due to the higher than expected footfall using the facility. Staff costs have increased compared to forecasts, due both to more cleaning staff

being employed, and to the implementation of the living wage which has impacted cleaning staff costs. Other unexpected costs include the cost of snow clearance which hadn't been factored into forecasts.

Stakeholders and partnership working

The Mansfield Public Transport Interchange demonstrated strong and effective partnership working, in particular between Nottinghamshire County Council and Mansfield District Council and the bus operators.

The partnership was formalised through the Statutory Quality Bus Partnership (SQBP) which came into force on 5 May 2013. This obligated all parties to contribute to the improvement of bus services in the area by meeting commitments to provide specified infrastructure, measures, and standard of services. The partnership agreement was implemented alongside the establishment of the interchange, and ensured that both the Councils and the bus operators invested in improved bus travel. This achieved an overall improvement to bus services and is considered to have strengthened the aggregate impact of the investment in the interchange.

Mansfield District Council also took steps to secure the support of other key stakeholders, in order to minimise any negative impacts of the development on the town.

During the planning and construction phases of the project there was opposition from the owner of the adjacent car park who filed a legal challenge to the planning application. This was overturned by the high court, but Mansfield District Council subsequently worked closely with the owner regarding shared boundaries to minimise the impact on the car park site.

Mansfield District Council also engaged with local taxi companies through a series of meetings. There was discontent among the local taxi trade relating to the location of bays, but a compromise was reached with a number of bays being allocated a short walk from the bus station.

The most significant stakeholder engagement was with the general public, and Mansfield District Council and Nottinghamshire County Council took a number of steps to ensure there was strong engagement and communication with the public with regard to the new bus station. In the planning stage of the project a consultation was held in the town centre to canvas the views of the public in relation to the bus station, and to understand the priorities and needs of the local population.

The focus on local engagement was considered to contribute to the broadly positive response to the interchange when it opened.

A final significant partnership which has influenced the success of the interchange since opening has been the partnership with the Mansfield Business Improvement District (BID). The BID is itself a partnership between the District and County Councils and the local business community to support the long-term sustainability of the town. It promotes a number of business led events in Mansfield, and markets Mansfield as a whole to the surrounding area. Through this partnership they have promoted a number of community and business led initiatives which is thought to have contributed to the increase in use and perception of the new interchange.

Adverse or unexpected outcomes

The original business plan included an expectation that the site of the old bus station (Stockwell Gate) would be redeveloped and that this would, along with the new interchange, lead to increased economic activity in Mansfield town centre.

This redevelopment of the old bus station has not yet materialised. We would expect this to have had a dampening effect on the growth in bus patronage compared to if the investment had gone ahead, and to have reduced the economic impact of the bus station compared to that anticipated in the business case.

The lack of development of Stockwell Gate may be in part attributed to the economic downturn which hit over the course of the planning and construction phase of the project. Mansfield was badly affected following the economic downturn. Unemployment in Mansfield increased from 6.4% in 2008 to 11.0% 2011/2012, at the time of the opening of the new interchange.

Unemployment in Mansfield has now dropped to 6.4%, back in line with the national average of 6.2% for the period January 2014 – December 2014. It is hoped that as the economic climate improves, the development of the old bus station will materialise and bring further benefits to Mansfield.

However, in the absence of the anticipated retail development, the relocation of the bus interchange has had a detrimental effect on the retail sites at Stockwell Gate, as footfall has been redirected from this route to the new interchange site. Mansfield District Council has taken steps to mitigate this impact through a £40,000 investment in street signage to direct consumers to the retail areas at Stockwell Gate, including maps or streets and all retailers and businesses, in conjunction with Mansfield BID, however this is not expected to have reversed the full impact of the relocation of the bus station on these retailers.

External factors

As well as its perceived impact on the development of the Stockwell Gate site, the economic downturn is likely to have also had an effect on the outcomes from the bus interchange in terms of bus patronage.

The growth in unemployment would be expected to have reduced the number of workers needing to use the bus to access employment, and will also have reduced the amount of disposable household income which would be expected to lead to lower consumer spending and less use of the bus for shopping trips.

Other than the economic downturn there were no other external factors identified that would have been expected to significantly impact the project KPIs.

Scheme evolution and improvements

Following opening of the interchange Nottinghamshire County Council invited Senior Officers from South Yorkshire Passenger Executive (SYPT) and from West Yorkshire Metro to visit the bus station and provided a peer review of the scheme. Overall the feedback on the scheme was very positive from both parties, but also provided some points for improvement which Nottinghamshire Council was able to act upon to optimise the positive impact of the scheme. These mainly related to signage, including safety and emergency warning signs.

As well as this feedback, there have been a number of elements of the bus station which have seen minor amendments following opening, to improve functionality and operation. These include:

- Adjusting the digital signage on the bays to allow it to be turned off (which had not initially been possible), to save on energy costs at night.
- Adjusting the cleaning schedule to an early morning and late night rota to reduce the impact when the station is at its busiest.
- Increasing hours of opening from 10.00 p.m. to 11.00 p.m. to allow for additional services to run.

Overall, however, there has been little change needed and the interchange has faced few significant issues since opening.

Lessons learnt

The bus station has been well received and has had positive feedback in terms of design and operation. There are however a couple of minor aesthetic aspects which in hindsight the project team identified that could have been done differently.

The first of these relates to the 'hardicrete' surface applied to the bus bays. A light grey colour was used for this, however this has been found to make the black oil stains left by buses very visible. In hindsight a darker colour would have been used to hide the marks.

Secondly the Peakmoor stone used for the exterior of the bus station is both aesthetically pleasing and durable, however its light colour has been found to show up footmarks from people standing outside the bus station and placing a foot on the wall. In hindsight an alternative stone, or a covering, may have been used around the base of the building to prevent these marks being as obvious.

As indicated earlier, these are relatively minor issues, but will over the course of time, impact the image of the bus station.

In terms of delivery the only key learning point identified from the delivery of the Mansfield bus interchange is the value of procuring the services of a professional quantity surveyor. Whilst on the Mansfield project, keeping this role in house did not disrupt delivery of the project, it was felt that by utilising external expertise in this area, and assigning a dedicated role to this function, cost savings could be made in the procurement of materials.

Key reason for success

There were a range of factors which were considered to have contributed to the success of the bus station:

- **The high quality of the design, lighting and finish of the station:** It was felt that this contributed to the feeling of safety and cleanliness of the station and made using it a more pleasant experience.
- **The service provided by the staff:** The staff are helpful and approachable and provide a public interface. Their presence and actions are felt to have limited any anti-social behaviour and have helped to ensure that friendly and safe environment is maintained at the bus station.
- **Securing partnership and buy in at an early stage:** This includes the formal partnership agreement with the bus operators which brought about a wholemeal approach to investment in improved bus services, the engagement and communications with the public, and the buy in and support of councillors who were fully committed to the scheme.
- **Early involvement of site manager:** Mansfield involved the intended bus station manager on site early in the process which enabled him to be consulted in issues associated with the layout and operation of the bus station. It was felt that this helped to ensure that decisions made were practical, and would enable efficient and effective operation on the ground.

7.3.4 Ex post business case evaluation

Summary of previous business case

An initial business case was submitted in 2005. This was updated in 2010 after the original proposal was amended. The updated business case showed a Benefit-Cost Ratio (BCR) of 4.06 for the base case and 4.99 for an optimistic scenario over a 60-year period, indicating high value for money. The present value of benefits was in the range of £61 million to £75 million while the present value of costs was £15 million.

Ex ante business case analysis

The base case was based on a target of 5% increase in demand in the first year while the optimistic scenario estimated benefits based on a 10% increase in demand over the same period. A summary of the outputs is shown in Table 13, including the forecasts for the optimistic case, where available:

Table 21: Mansfield Business Case Summary

Economic benefits – Annual impacts (2002 prices)	Base case	Optimistic case
Revenue from patronage increase from interchange improvement	£333,300	£699,000
Quality benefit (based on 10% of standard fare and 3,050,000 annual boarders)	£610,100	£610,100
Pedestrian benefits (including bus to rail interchange)	£1,064,700	£1,064,700
New bus user benefits (based on additional 152,500 trips) (includes quality and pedestrian benefits)	£32,100	£64,300
In vehicle journey time impact for existing users	(£45,000)	n/a
Accidents at signals (1.35 accidents saved)	£140,000	n/a
Bus operator accidents (75% reduction)	£14,250	n/a
Non-user vehicle time savings	107,400	n/a
Revenue and costs		
Capital costs (including cost of land and pre-scheme costs)	approximately £11 million	approximately £11 million
Operating and maintenance costs (annual)	£420,000	£440,000
Departure charges (annual)	£180,000	£180,000
Other income to bus station (annual)	£67,500	£67,500
BCR	4.06	4.99

Thus, according to the ex ante business case, the scheme was expected to generate benefits for pedestrians, quality benefits for station users from station improvements and additional revenue for operators. Small dis-benefits were estimated for bus users due to route changes, partly offset by new bus user benefits. The results also show that the new interchange would require an operating subsidy from the local authority, corresponding to the difference between operating costs and income (departure charges plus other income).

Ex post business case

We have updated the ex ante business case with the latest available data. This data includes the actual growth in demand for services originating from the bus station, actual pedestrian counts, and financial data. This shows that demand, income and costs have all been higher than expected.

Table 22: Forecasts and actual data – Mansfield Interchange

Business case inputs ^(a)	Forecast	Actual	Source
Additional station demand (for trips originating at the station)	152,500	213,500	Based on 7% actual demand growth
Pedestrians	4,326,200	4,941,142	Actual pedestrian counts
Operating costs (£, per annum)	420,000	562,000	Financial data from NCC
Departure charges income (£, per annum)	180,000	193,220	
Other income (£, per annum)	67,500	92,110	

(a) Some discrepancies in costs may be due to prices being in different price base years. This was not possible to verify with the available information.

Using the data presented in Table 22 we have updated the estimated benefits. These are presented in Table 23. The revised estimates of the benefits of the bus station have been made, where possible, based on outturn data for the station and standard WebTAG assumptions.

Table 23: Updated benefits – Mansfield Interchange

Updated benefits (annual, 2002 prices)	Ex ante	Ex post	Assumption
Pedestrian time savings (excluding bus to rail interchange)	£1,052,400	£1,186,000	Uplifted based on actual pedestrian counts.
Quality benefits	£610,000	£854,000-£2,278,000	Uplifted by actual demand growth and WebTAG values for quality improvements.
Wider social and economic benefits	n/a	£5,904,000	Estimated based on outturn demand and journey time data and Greener Journey's research on the benefits from local bus services.
Revenue	£333,300	£511,980	Uplifted based on actual demand growth.
New bus user benefits	£32,100	£44,940	Uplifted based on actual demand growth.
Time savings	(£45,000)	(£63,000)	Uplifted based on actual demand growth.

Actual quality benefits have been estimated to be in the range of £0.8 million to £2.3 million per annum, based on assumed quality benefits per trip of between £0.20 and £0.53. While the ex ante business case assumed a value of £0.20 per trip, our own analysis estimates that these benefits would be approximately £0.53³⁰ based on the DfT's WebTAG values of bus quality improvements for CCTV provision, on-screen displays and new interchange facilities (WebTAG M3.2.1).

Wider social and economic benefits have been estimated based on outturn data on demand and journey times, and applying the evidence contained in the latest research commissioned by Greener Journeys on the value of the local bus services to society. In total, these benefits amount up to £5.9 million, with benefits from health improvements and access to employment opportunities accounting

³⁰ £0.53 has been obtained by adding the benefits for a new interchange (1.27 min), half the benefits for CCTV provision at bus stops (the new station will have additional CCTV cameras) (1.85 min) and benefits for on-screen displays (1.9 min). Adding these benefits in minutes results in a five min journey time saving, which translates in £0.53 savings, applying the average value of time for bus users (weighted by journey purpose).

for 60% of these benefits. These impacts have not been checked against actual social and economic indicators.

Other benefits or costs have been assumed to be equal to the forecasts in the ex ante business case. This is either due to lack of data or because it was difficult to establish what a scenario without the scheme would have looked like. These include non-user benefits such as benefits from a reduction in accidents or cost savings for operators.

The updated annual benefits and costs have been discounted to 2002 values over a 60-year appraisal period, in line with the ex ante business case.

The results of the ex post business case analysis show that the actual BCR of the scheme is likely to be in the range of 4.3 to 6.8, compared to an ex ante BCR estimate of 4.06. The exact BCR will depend on actual time savings and exactly how much users value the quality of the new station and the additional facilities and services offered. However, estimated BCR based on the revised analysis indicates that the scheme was good value for money and exceeded the value for money that was initially expected to achieve.

7.3.5 Concluding comments

The Mansfield Public Interchange scheme was delivered without major complications and has succeeded in meeting most targets and objectives. The observed demand increase has exceeded expectations while passenger satisfaction has improved significantly. Whilst previously high, the reliability of the bus service has improved further since the opening of the new bus station. Accident rates have also fallen in line with the targets set, although this cannot be attributed fully to the bus station investment. Other aspects of the service such safety and ease of interchange to rail have also improved.

Key reasons identified for the success of the project include accurate initial project specification due to collaboration among internal experts leading to a high quality final deliverable. Successful partnership working and early engagement with key delivery and operational partners was identified as an important factor in the ultimate success of the project as operational requirements were identified early on. These factors contributed to an attractive customer offer, evidenced by the increase in customer satisfaction and levels of demand.

An ex post evaluation of the economic appraisal indicates that the initial forecasts were realistic and that it is likely that the expected benefits have been delivered. The scheme therefore provides an example of effective project delivery, from the decision-making phase to the delivery stages, and has demonstrated good value for money.

7.4 Case study 3: South East Hampshire BRT

The South East Hampshire Bus Rapid Transit (BRT) is a high specification, sub regional public transport network designed to provide a viable alternative to the car and remove the transport barriers to economic growth and development of key sites.

Phase 1 of the project opened in April 2012 and provides 3.4 kilometre of busway for the sole use of buses and cycles, along a disused railway, and completely segregated from the main highway.

Figure 20: Map showing route of segregated busway along disused railway line



Source: Hampshire CC

7.4.1 Project overview

Problem being addressed

The most significant challenges faced by South East Hampshire were set out in the Hampshire Local Transport Plan 2006-2011. The primary issues relating to public transport are economic underperformance, accessibility to services and employment, transport integration, public transport image, past and future development and environmental impacts of transport.

Economic underperformance: The South Hampshire area was identified in the South Hampshire Sub Regional Strategy³¹ as under-performing economically compared to the rest of the region.

Accessibility: A decline in defence related employment in Gosport has led the area to be characterised by high levels of out-commuting, in particular to Portsmouth and Southampton. In 2001 Gosport had 7,610 in-commuters and 18,140 out-commuters giving a net loss of 10,530. Access is along a mostly single carriageway road, the A32, on and off the peninsula. This results in high levels of congestion at peak times. It was forecast that by 2011 66% of the route of the A32 would be over capacity.

Integration: It was identified that development of a comprehensive public transport network in South East Hampshire was hindered in part by the lack of easily practicable interchange between modes and the geography of the area, including the Fareham Gosport peninsula. These difficulties of interchange and geography create problems of connectivity between people and activities.

³¹ South Hampshire Sub-regional Strategy, November 2004, Partnership for Urban South Hampshire (PUSH).

Public transport image: Infrastructure and vehicles were perceived as poor quality, and bus services were often affected by congestion at peak periods making bus travel unreliable.

Future strategic housing and employment site developments: There was a need identified for housing and employment site development decisions to be integrated with the transport strategy. Designing the sites so that bus services play a strong role was considered a key factor in this.

Air Quality: Two Air Quality Management Areas (AQMAs) were designated in Fareham Borough. Following the declaration of these AQMAs, an Air Quality Action Plan (AQAP) was developed to improve air quality in the AQMAs with an associated timescale. The AQAP included improvement actions such as, to provide a bus/rail interchange facility at Fareham railway station; to provide real time bus information at bus stops; and, the promotion of public transport.

Description of the scheme

In order to address these issues, Transport for South Hampshire (TfSH)³² developed an integrated public transport system for South East Hampshire. A key component of this was the dedicated busway to improve access in the Fareham-Gosport peninsula.

The scheme involved delivery of an off road busway along a section of disused railway line between Redlands Land in Fareham and Tichborne Way in Gosport. The dedicated busway was designed to allow buses to avoid queues and delays on the northern section on the A32 and the B3385 and to provide a more direct link to Fareham railway station. By bypassing the main areas of congestion, it was intended that journey times would be more reliable and faster during peak times.

In addition to the busway, which formed the key part of the scheme, the services operated on this route introduced a new high quality fleet with on-board services such as free WIFI, news and updates. An improvement of the fleet was a commitment by the operator as part of the project. This service was branded as the Eclipse service.

The specific objectives of the scheme, set out in the business case³³ are:

- To improve access to future and existing employment sites by public transport.
- To improve access to public health services at both local and sub-regional levels by public transport.
- To improve public transport access to tertiary education by public transport.
- To improve public transport access to and from the North Fareham SDA to local employment, education and health services.
- To improve the overall quality of public transport provision.
- To assist in meeting the requirements of the Air Quality Management Areas (AQMAs) Plans.

Key performance indicators

The business case for the busway set out metrics by which performance against the objectives would be measured. These are set out below:

³² Now rebranded as Solent Transport.

³³ South East Hampshire Bus Rapid Transit – Phase 1 Fareham Gosport. Community Infrastructure Fund 2: Full Business Case Submission – Volume 1. October 2008.

Table 24: Eclipse KPIs

Objective	Measure of performance	Metric
To improve access to future and existing employment sites by public transport	Changes in journey time for public transport users and increases in population experiencing the changes in journey time.	Bus journey times Bus patronage
To improve access to public health services at both local and sub-regional levels by public transport	Changes in journey time for public transport users and increases in population experiencing the changes in journey time.	Bus journey times Bus patronage
To improve public transport access to tertiary education by public transport	Students can arrive at tertiary education establishments before start times, usually 9.00 a.m.	Bus timetable data
To improve public transport access to and from the North Fareham SDA to local employment, education and health services	Journey times to and from the SDA location.	Bus journey times on this route
To improve the overall quality of public transport provision	Improvement in perception of quality of service (both public transport and non-public transport users) and patronage data from the key bus operator.	Bus survey data on quality Patronage data
To assist in meeting the requirements of the Air Quality Management Areas (AQMA) Plans	Reduction of NO2 levels in accordance with thresholds and timescales defined in the AQMA plans.	NO2 data

Source: Hampshire County Council³⁴.

Sources of funding

Eligible scheme costs for the busway totalled £25 million. Of this, £20 million was funded through the Community Infrastructure Fund (CIF) with monies provided by the DfT and DCLG. The remaining £5 million was funded locally from Local Transport Plan (LTP) allocations. In addition to the capital costs of the scheme, FirstGroup injected over £2.8m into new vehicles and marketing

7.4.2 Performance evaluation

The business case for CIF funding put forward by Hampshire County Council and partners in 2008 set out metrics by which performance against the objectives would be measured.

In addition to this, the partnership agreement between Hampshire County Council and the bus operators sets out key targets which must be met by each side. These include maximum journey times, reliability of the bus service, and bus patronage growth for individual operators.

This evaluation is based on the scheme performance against targets within the partnership agreement, and where the available data allows, against the scheme KPIs.

We have not included assessment of the impact on air quality due to the unavailability of data at a sufficiently granular level to make a robust assessment possible. We do however consider the impact on traffic levels in the area which could be used as a proxy for the impact on air quality.

³⁴ South East Hampshire Bus Rapid Transit – Phase 1 Fareham Gosport, Community Infrastructure Fund 2: Full Business Case Submission – Volume 1, October 2008.

Therefore, based on the objectives and the availability of data, we have assessed the scheme's performance against four metrics: bus patronage growth; journey times and reliability; passenger satisfaction and traffic levels.

Bus patronage

Target: All operators seek to increase their individual annual patronage on BRT services operating between Gosport bus station and Fareham bus station by 10% after one year and an aggregate 15% after two years

The graph below shows the change in patronage of Eclipse and non-Eclipse services between Fareham and Gosport, as well as the total across all services in this area, since the introduction of the Eclipse services in April 2012³⁵.

Patronage for Eclipse has grown significantly over the three years it has been in operation. Between the end of April 2012 and the end of April 2013, weekly bus patronage on the Eclipse services had grown by 18% while over the first two years of service, patronage had grown by 48%. This performance clearly exceeds the target set.

However, some of this growth in patronage has been at the expense of use of other services, and anecdotal evidence from Hampshire CC indicates that passengers may have been willing to walk further to access the more regular Eclipse services rather than wait for one of the alternative services. This has led to lower demand for other bus routes, some of which have subsequently had services reduced.

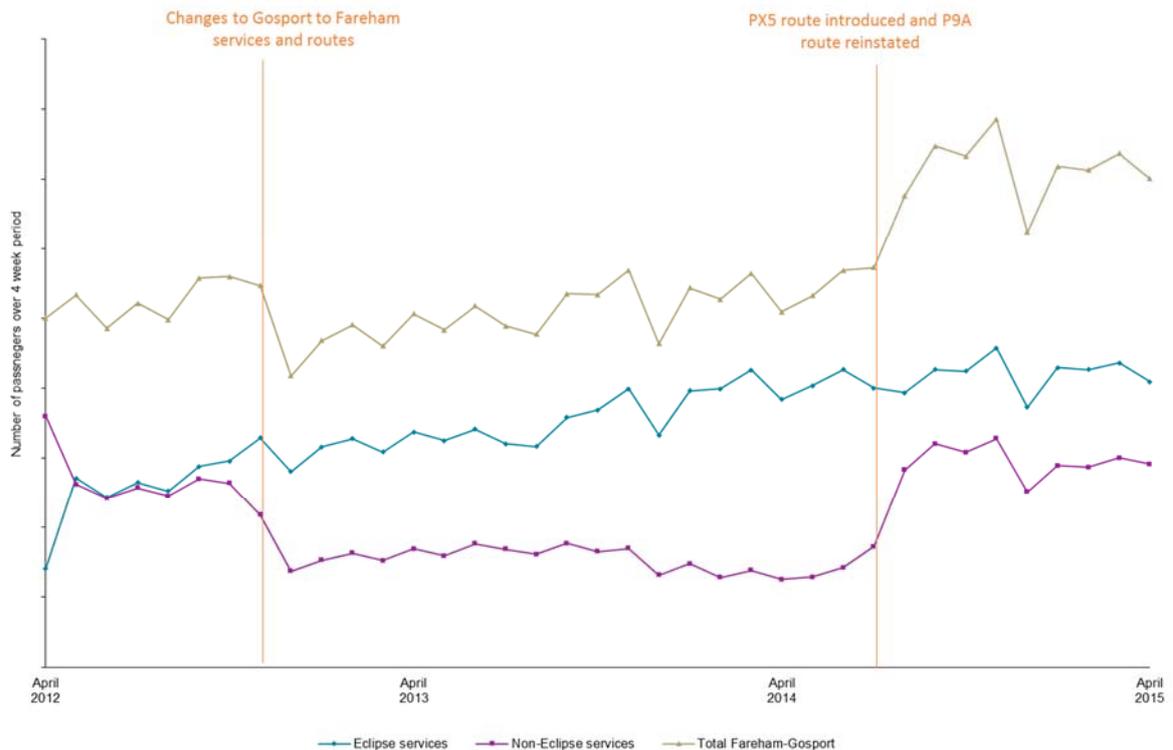
Nonetheless, overall patronage growth in the area over the past two years has been strong. Total annual bus patronage between Fareham and Gosport grew by 2% between 2012/13 and 2013/14³⁶. This compares to 2% growth in bus passenger journeys in Hampshire and 3% growth across South East England³⁷. However, the data provided by FirstGroup and shown in Figure 21 suggests that patronage growth was held back by the change to services. Since the introduction of the PX5 in July 2014 patronage figures have recovered. This is reflected in the annual bus patronage figures, which grew by 30% between 2013/14 and 2014/15 for the Fareham-Gosport area, and reflect annual average growth of 17% between 2012/13 and 2014/15.

³⁵ These services included the 86 and 82 which were replaced by the E1 and E2 from week commencing 22 April 2012, and services 34, 83, 85, 87, 87A and 88 and 9, which ran until week commencing 18 November 2012, and subsequently includes the revised services, PE1, PE2, P10, P11, P21, P9 and P9A. The P9A was suspended from week commencing 26 January 2014 to week commencing 27 July 2014, when the PX5 was also introduced. The Eclipse services comprise the E1 and E2, replaced by the PE1 and PE2. The non-Eclipse services comprise the 34, 82, 83, 85, 86, 87, 87A, 88 and 9, replaced by the P10, P11, P21, P9 and P9A and PX5.

³⁶ This compares total bus patronage from w/c 1 April 2012 to w/c 24 March 2013, with total bus patronage from w/c 31 March 2013 to w/c 23 March 2014.

³⁷ ONS Local Bus Passenger Journeys BUS01 Table BUS0109.

Figure 21: Hampshire bus patronage



Source: FirstGroup data.

Passenger data for Hampshire and for the South East region for 2014/15 was not available when this analysis was undertaken, therefore we are unable to make a comparison with performance across the wider area. However, the available data shows that growth in passenger journeys at the wider area levels has not exceeded 3% per annum since 2008, and therefore we would expect the growth in patronage between Gosport and Fareham to compare favourably to growth in bus use in the wider area.

The issue of displacement of other services by the Eclipse services is explored in a passenger survey carried out in September 2012. When asked about their use of the Eclipse service, 23% of survey participants said that they had started using the bus since the opening of BRT. In response to the question 'How did you previously make your journey', 72% of participants responded that they previously used the bus, indicating that 28% were new bus users.

Similarly, 21% of respondents reported that they have been using the bus service for six months or less, and a further 12% had been using it for less than a year.

These survey responses indicate that in the first year, around 21-33% of Eclipse users were new bus users while around 67-79% of Eclipse users represented displacement from other services.

Reliability

Target:

- **95% of all BRT Service departures are to operate within a window of one minute early and five minutes late at all registered timing points between (and including) Redlands Lane, Fareham and Tichborne Way, Gosport.**
- **85% of all BRT Service departures are to operate within a window of one minute early and five minutes late at all registered timing points beyond Redlands Lane, Fareham and beyond Tichborne Way, Gosport.**

From November 2014 to April 2015, 96% of E2 services and 92% of E1 services on the full route between Fareham bus station and Gosport ferry operated on time (within a window of one minute early and five minutes late).

This data shows that the E2 service has clearly met the upper target. While it is not clear how the E1 service has performed based on the splits in the route specified in the target, its achievement of 92% of services on time across the whole route is in line with these section targets.

It is also worth noting that the bus priority on the Eclipse corridor does not extend fully to the Gosport terminus and as a result the southern section of the corridor still experiences traffic delays during peak periods which would impact the reliability metrics for the bus priority sections of the route when considered as a whole.

These figures also compare favourably with local and national averages, based on the latest available figures set out in Table 25 below. Hampshire as a whole performs slightly better than the national average in terms of the percentage of bus services running on time, but remained at 86% in 2013/14. The performance of the Eclipse services, particularly the E2 service is at the upper end of performance across all local authorities.

Table 25: Proportion of bus services running on time

Location	Percentage on time
E1 service (November 14 – April 15)	91.6
E2 service (November 14 – April 15)	95.9
Hampshire (2013/14)	86.0
South East (2013/14)	85.4
England (2013/14)	83.4

Source: DfT Bus Statistics 2014.

This data does not allow us to compare with performance of the services between Fareham and Gosport before the BRT was opened, therefore we cannot directly attribute this strong performance to the opening of the BRT. However, the reduction in the variation in journey times, set out in the section below, indicates that fewer services would have run on time prior to the BRT being opened.

Journey times

Target: Maximum journey times between Gosport Bus Station and Fareham Bus Station of 43 minutes Monday to Saturday 0700-1900 and 33 minutes at any other time.

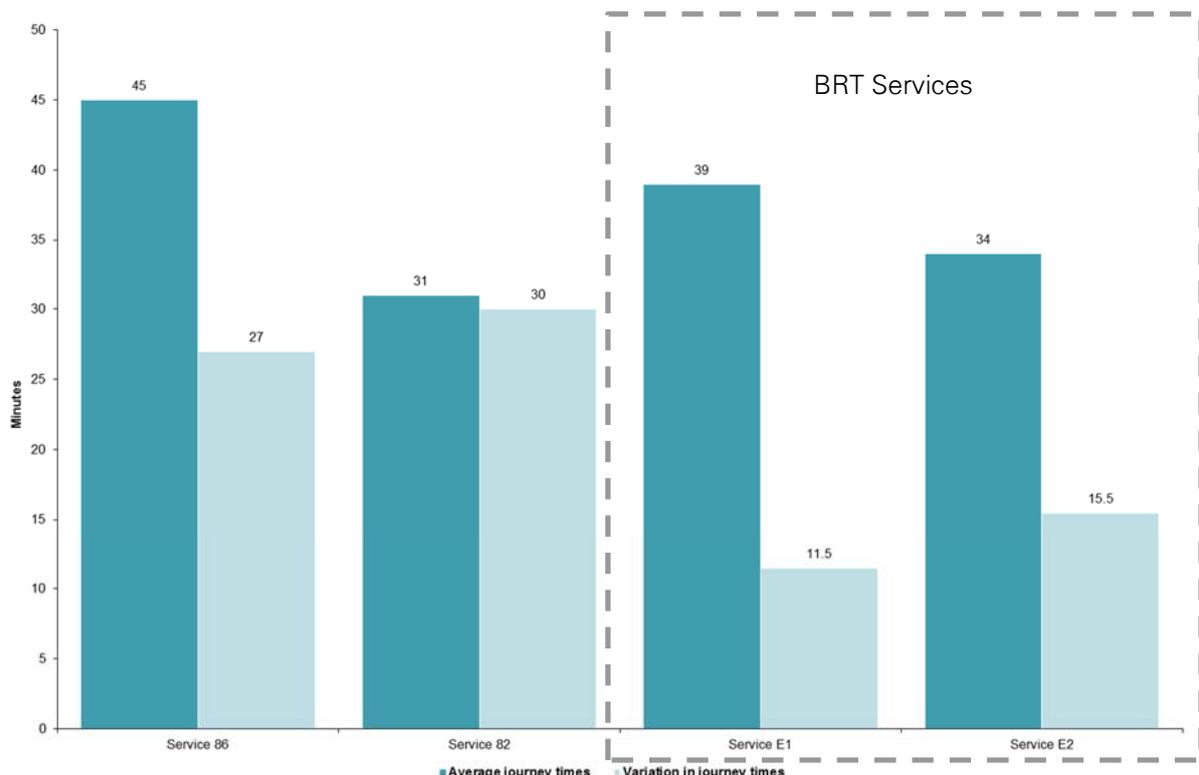
The operator was only able to provide data on actual run times on a monthly average basis. This did not enable us to identify the actual maximum journey times in order to specifically assess performance against the targets.

However, registered journey times and indicates that the maximum journey times between 0700-1900 Monday to Saturday is 40 minutes and 33 minutes at other times. This doesn't take account of individual late running services. However the high reliability of performance of the services indicates that longer journey times would be infrequent. Data from Hampshire CC based on timetabled services³⁸ is shown in Figure 22. This shows the average scheduled journey times and variations in journey times, on services prior to and since the BRT was implemented.

The impact on journey time, shown in Figure 22, is mixed. The data shows that the E1 service which replaces the 86 service has reduced the average journey time between Fareham and Gosport by six minutes, from 45 minutes to 39 minutes. However, the E2 service, which replaces the 82 service, has, on average, lengthened the journey time from an average of 31 minutes for the journey to an average of 34 minutes. The reason for the longer journey time is that the route has also been lengthened, to include Fareham train station, with the aim of improving the connectivity of the public transport service across modes, and to allow a link between Fareham train station and Gosport, without the need to change buses.

The most significant impact on journey times that the busway has had is on the variation in journey times. The journey time data shows that for both services the variation in journey time has reduced as following the introduction of the new busway. The E1 service now has a maximum variation in journey time of 11.5 minutes, compared to 27 minutes on the previous 86 service. The variation on the E2 service is slightly higher at 15.5 minutes, but has seen the variation in journey time almost half since introduction of the busway. This reduction in variation will be most impactful at peak times, when congestion on the A32 is at its highest. It is at this time that the ability of the Eclipse service to bypass the congestion is most advantageous.

Figure 22: Fareham to Gosport timed bus runs



Source: Hampshire CC data.

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http://www.firstgroup.com/ukbus/hampshire/journey_planning/timetables/timetable.php?day=1&source_id=2&service=E1/E2&routeid=12964781&operator=13&source=sp

Passenger satisfaction

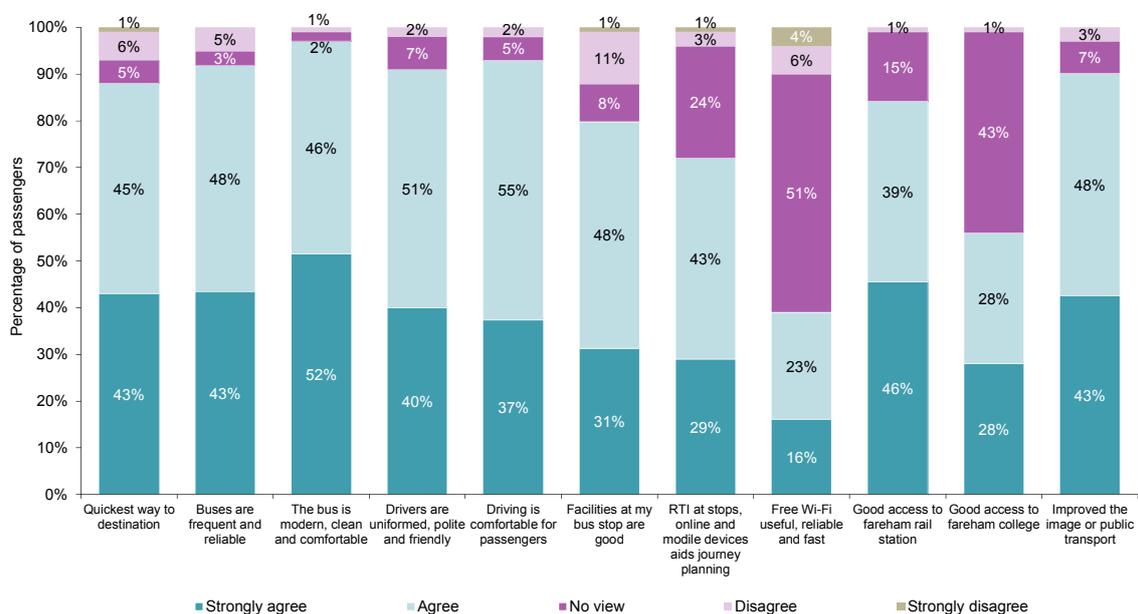
Target: No specific target

In general customer satisfaction with the BRT services is high and has increased since the introduction of the Eclipse buses.

Customer satisfaction surveys were carried out over the first quarter of 2011 (constituting the 'before' metrics) and in October and November 2012, followed up with some additional surveys in early 2013 (constituting the 'after' metrics).

Figure 23 shows the satisfaction levels of passengers surveyed in October 2012, six months after the introduction of the Eclipse bus services.

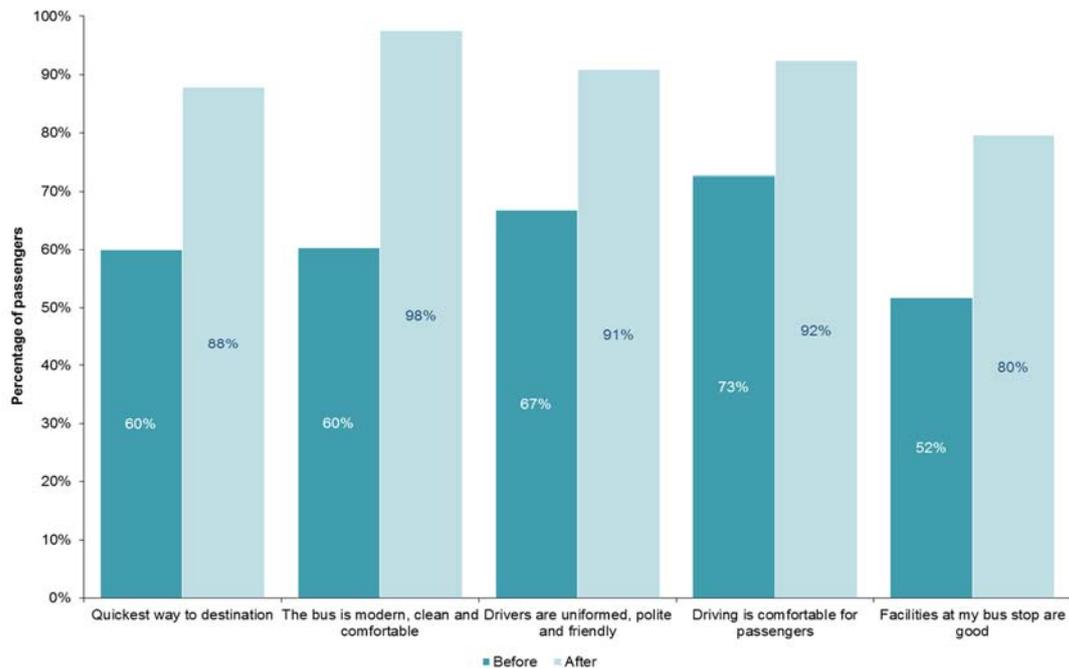
Figure 23: Eclipse passenger satisfaction October 2012



Source: Hampshire CC.

In general, satisfaction levels are high, with seven out of 11 areas achieving over 80% customer satisfaction. Issues including 'Free Wi-Fi', 'Real Time Information' (RTI) and 'Good access to Fareham College' scored lower on satisfaction levels, but had a high percentage of passengers saying that they had 'No view' on the area which if you removed from the figures would result in greater satisfaction among those with a view.

Figure 24: Eclipse passenger survey responses before and after Eclipse



Source: Hampshire CC.

Satisfaction has increased since the introduction of the Eclipse services. Figure 24 shows the percentage of customers who stated that they ‘strongly agree’ or ‘agree’ with a particular statement.

In all areas where passengers were surveyed before and after the introduction of the Eclipse service, satisfaction has increased by more than 20%.

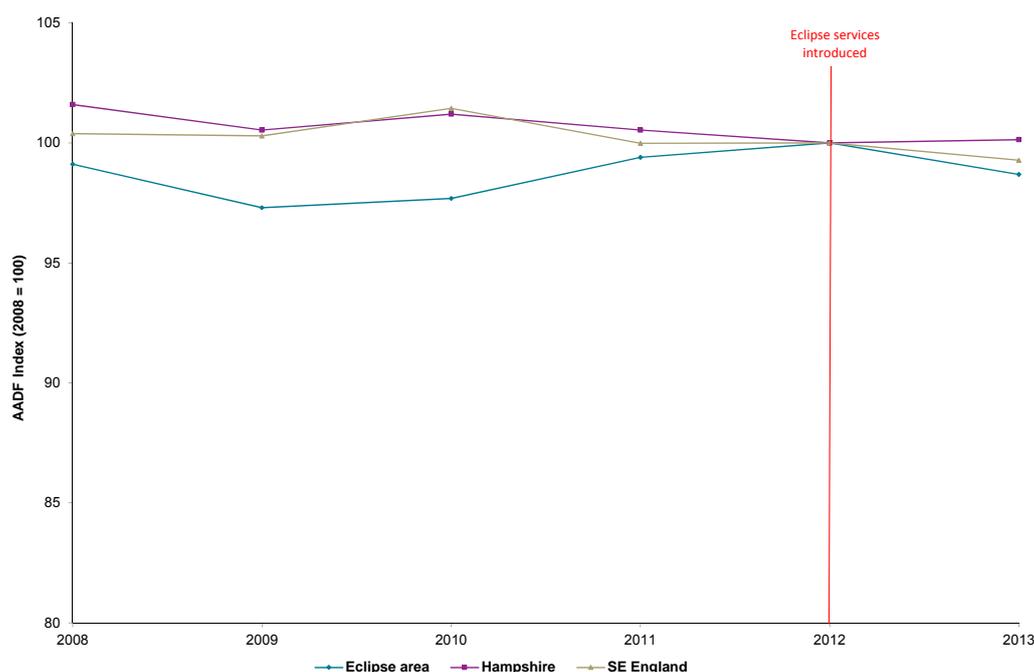
Traffic levels

We have used Annual Average Daily Flow (AADF) data from the Department of Transport to measure traffic levels for the Eclipse area of Fareham and Gosport, before and after the introduction of Fastway services. AADF data gives the number of vehicles that will drive on a stretch of road on an average day of the year³⁹.

We have used index of AADF data to track the growth and decline of the traffic levels before and after the introduction of the Eclipse service for the Eclipse area itself, Hampshire and the South East of England. This is shown in Figure 25.

³⁹ <http://www.dft.gov.uk/traffic-counts/about.php>.

Figure 25: Traffic counts index 2008-2013



Source: DfT AADF Traffic Counts.

Since the base year, traffic between Gosport and Fareham, and across Hampshire has decreased below that of South East England. Comparing traffic levels between Gosport and Fareham in 2012, before the Eclipse service was implemented, with traffic levels in the same area in 2013, we can see there has been a small decline in traffic levels, of 1.3%.

The decline in traffic between Gosport and Fareham was greater than the decline seen across South East England, and greater than the wider Hampshire area, which remained relatively constant.

However, there appeared to have been an upward trend in traffic levels in the Eclipse area between Fareham and Gosport since 2009, which has been halted since 2012.

2014 data, which is expected shortly, may provide a better indication of the marginal impacts.

7.4.3 Process evaluation

Project delivery

The project was successfully delivered to the original budget of £25 million with funding coming from the intended sources.

Hampshire County Council identified the involvement of the contractor at an early stage of the design and specification of the project as a key contributing factor to the successful delivery of the project to budget. Early involvement resulted in feasibility issues regarding the specification being addressed at an early stage and the project was then delivered to specification without unexpected adjustments or costs.

There were however some delays to the delivery of the project, which were not foreseen. Construction of the busway was intended to be completed by April 2011, but was delayed by a year and was officially opened by the then Transport Minister Norman Baker in April 2012.

The delays were attributed to a series of legal challenges against the construction of the bus corridor. The proactivity of the legal team and the support from the executive member were considered to have led to delays being minimised and progress continuing as fast as possible.

From an operational perspective, the project revenues have exceeded forecasts. The arrangement between Hampshire CC and operators is such that rather than a flat usage fee, which operators were reluctant to agree to due to the uncertainty around the success of the scheme, a risk sharing agreement was set up whereby operator contributions are linked to the financial performance of the operator along the BRT route.

The agreement has meant that Hampshire has financially benefitted from the increase in patronage and commercial success of the project.

This has allowed further investment in the BRT – The contributions must be invested back into the development of future BRT infrastructure schemes as part of the Fareham-Gosport project, marketing and promotional campaigns associated with the project, or other initiatives pertaining to the project, but may not be used for other purposes.

Stakeholders and partnership working

Hampshire CC were unable to identify any significant issues faced during delivery of the project in relation to delivery partners.

Hampshire CC consider that they have a productive relationship with the bus operators. This is aided by managing the relationship such that any frictions relating to general bus delivery, for example relating to contributions for concessionary fares, are separated from the relationship relating to delivery of the Eclipse service.

The productive relationship was fostered by including operators on the BRT board from an early stage and through collaborative working Hampshire CC have built the trust of the operators. This was exemplified by the fact that FirstGroup allowed Hampshire CC to take the lead on the marketing of the project and the creation of a new brand, distinct from the national First brand.

Figure 26: Eclipse branded bus



Source: Hampshire CC

In terms of other delivery relationships, the relationship with the contractor was considered to have worked well with few issues of any significance arising through the delivery phase. This was in part attributed to the early engagement of the contractor and their involvement at the design and specification stage.

There have been some minor issues which have arisen since the completion of the construction phase, relating to work carried out by sub-contractors. One such issue concerns the quality of the bus shelters, which though delivered to the specification, have seen their condition degrade over time. This issue is still being resolved, but could not realistically have been foreseen or avoided through prior action by Hampshire CC.

Adverse or unexpected outcomes

There have been both positive and negative unexpected outcomes from the scheme:

Displacement

While the BRT has seen significant growth in patronage along the route, this has been in part to the detriment of other services in the area. This would be expected on any new route, however the extent of the transfer of patronage exceeded expectations.

Anecdotal evidence suggests that some passengers are willing to walk further in order to access a more frequent and more reliable Eclipse service, leading to increased patronage on the Eclipse service. However the corollary of this is a decrease in demand for other less frequent service. Some of the alternative services are relied upon by customers who are not able to access the Eclipse service due to the additional distance to a bus stop, but the fall in demand has in some cases made service provision commercially unviable. In some cases services have been halted or reduced and additional subsidisation has been required from Hampshire CC in some cases in order to maintain the running of services.

Hampshire CC are working with operators to achieve a reasonable level of service provision across all services.

Journey times

The extension of the previous bus route to include Fareham train station has resulted in a longer route and therefore a longer journey time for some passengers. However, for passengers travelling at peak times, particularly in the morning period, journey times have been shortened and been made more reliable as a result of the busway bypassing the worst of the congestion.

Furthermore, although journey times are longer for some passengers, the new bus route improves access to Fareham train station and facilitates increased integration of the public transport network.

Emissions

The increased frequency of the bus service has resulted in an increase in the number of buses using the busway. All other things being equal this would be expected to increase emissions by more than was originally intended. However internal analysis commissioned by Hampshire CC has shown that emissions from the Eclipse service are lower than compared to the previous bus service. This is due both to the greater fuel efficiency of the new buses compared to the previous bus fleet and the fact they are able to operate at more constant, and therefore more efficient, speeds than they would in normal traffic.

Furthermore, this assessment does not take into account the additional reduction in CO2 which would be expected as a result of the lower levels of traffic on the A32. In addition, some of the additional buses using the busway will have displaced services on other routes, which are likely to have used less fuel efficient vehicles.

External factors

There were no other public transport initiatives or other significant changes in the local area which were identified as potentially having an impact on the outcomes of the Eclipse service.

In the performance analysis we take account of local trends where possible, but based on the information available we would not expect other external factors to have significantly impacted the scheme metrics.

Scheme evolution and improvements

Using income from the operators contributions to the scheme there are ongoing investments being made to reduce journey times and improve the reliability of the data.

Where congestion pinch points have been identified, works have or are planned to be carried out. An example of this is in Fareham town centre where buses were being held up, and where sections of bus lane and bus priority measures have now been implemented. Additional extensions to the route have been considered but are currently hindered by a lack of funding.

Lessons learnt/key reason for success

The unique opportunity for the Fareham-Gosport route was the disused rail corridor. This allowed the construction of a dedicated busway which runs parallel to a highly congested route, the A32, bypassing the majority of the congested area, with limited negative impact on local road users and residents.

Figure 27: Disused rail corridor



Source: Hampshire CC

Although the project received opposition on environmental grounds, there were in general few objections from the public. This is thought to be due largely to the fact there was little disruption to the everyday activity of local residents and road users.

The use of the disused rail corridor also allowed a through route, without the need for compulsory purchase orders or the appropriation of road space from the highway.

This meant that the use of the main road was not disrupted during the construction phase, and the busway did not reduce road space for cars and other vehicles.

However the nature of the corridor meant that access was limited making construction less straight forward, and similar to working in a tunnel. The difficulties and costs associated with this were considered to be minor in comparison with those which would have been faced if there was no existing route for the busway.

As well as being able to take advantage of this opportunity there were additional factors which have been identified as contributing to the success of the scheme.

One of these was the focus on the customer. Hampshire CC had previously been involved in the A3 bus priority corridor which opened in 2008 running along the A3 into Portsmouth. The key lesson learnt from this scheme was the need to treat the project, first and foremost, as a public transport project and not as a vanity engineering project. This means letting the public transport objectives drive decisions relating to design and project expenditure and activities.

The Fareham-Gosport project achieved this by putting in place a steering group of public transport stakeholders to maintain the right focus – On elements which will deliver the desired outcomes. They ensured that engineering decisions were focused on delivering the required public transport outcomes and that budget was allocated to customer focused activities such as branding and communications.

7.4.4 Ex post business case evaluation

Summary of previous business case

A full business case for the South East Hampshire BRT was submitted in 2008. This presented a BCR of 1.5, with a present value of benefits of £228 million and costs of £153 million (2002 prices) over a 60-year period. This BCR represents low to medium value for money.

Ex ante business case analysis

Of the £228 million of benefits, 25% corresponded to user benefits, including both time savings and reductions in vehicle operating costs. A further 69% of benefits corresponded to additional revenue generated by the scheme for private sector providers. Non-user benefits included environmental benefits and a reduction in accidents (approximately 7% of total benefits).

Scheme costs consisted of investments costs, operating costs and revenue funding, with revenue funding accounting for 73% of costs.

The present value of benefits and costs is shown in Table 26 below.

Table 26: Benefits and Costs – SE Hampshire BRT

Benefits and costs	Present value (2002 prices) (million)
User benefits	
■ Time savings	£28.0
■ Vehicle operating costs savings	£28.9
Non user benefits	
■ Greenhouse gases	£2.3
■ Accidents	£13.2
Private sector providers	
■ Revenue impacts	£156.9
■ Operating costs	(£0.6)
Public accounts costs	
■ Investment costs (local government)	£6.0
■ Investment costs (central government)	£15.5
■ Operating costs	£4.7
■ Revenue funding	£111.5
■ Indirect tax revenues	£15.3
Present value of benefits	£228.8
Present value of costs	£153.0
Benefit-Cost Ratio	1.50

The breakdown of costs and benefits shows that the scale of the costs are driven by revenue funding while the benefits are driven by revenue generation. Based on the limited information available in the original business case, the revenue costs appear to be driven by the expected reduction in demand for car parking, due to increased bus use, and the loss of revenues associated with this. However, the inclusion of the costs associated with a reduction in parking revenues for the full 60 year appraisal period risks overestimating the present value of costs - while revenues may reduce in the short term, it would be reasonable to expect that over the longer term any excess supply would be filled by demand growth from other sources, or else the available parking space would be sold off or put to an alternative use, thus achieving alternative revenues. By altering the treatment of this reduction in revenues could increase the BCR to up to 5.51, indicating high value for money.

Ex post business case

We have updated the ex ante business case based on a combination of actual outturn data from the schemes and informed assumptions where needed.

Table 27 sets out the assumptions used in the updated BCR calculations.

Table 27: Actual data – SE Hampshire BRT

Business case inputs	Source/assumption
Demand 2012/13	Actual demand data.
Demand 2013/14	Actual demand data.
Demand 2014/15	Actual demand data.
Percentage of trips switching mode to bus	Actual demand data.
Average journey time saving	No changed assumed (actual data shows a shorter route in one direction and a longer route in the other direction).
Average waiting time saving (due to frequency changes)	12 minute saving assumed - current frequencies are 7/8 min, while old frequencies were 20-30 min.

(a) It has not been possible to compare actual data with forecasts from the ex ante business case, as the assumptions and data used in the ex ante business case have not been reported or clearly explained.

We have also included service quality benefits in the ex post business case evaluation, since the scheme specification included the provision of new high quality infrastructure such as new bus stops with RTI and CCTV. Quality benefits have been calculated based on the following assumptions:

Table 28: Quality benefits assumptions – SE Hampshire BRT

Quality improvement	Value	Source
Quality benefits – RTI	1.47 (min/trip)	WebTAG M3.2.1
Quality benefits – CCTV at bus stops	3.7 (min/trip)	WebTAG M3.2.1

It is likely that the scheme resulted in further quality benefits, as a new high-quality fleet was introduced as part of the scheme, replacing old buses. However, since the costs of the fleet were not included in the ex ante business case, as these were covered by the operator, both benefits and costs of the fleet have been excluded from the ex post business case evaluation.

Revenue has not been updated despite actual data on fares and demand due to lack of information about the do minimum scenario (situation without the scheme). In the absence of available data to suggest otherwise, all other costs and benefits are assumed to be the same as in the ex ante business case.

Wider social and economic benefits have also been added to the analysis to reflect the value that this high quality local bus service provides to the local population and the local economy. These benefits have been estimated based on outturn data on demand and journey time, and the evidence reported in the latest research commissioned by Greener Journeys on the value of local bus services to society. More details on the benefits included and the methodology employed are reported on Appendix X. Ex post annual benefits have been discounted over the appraisal period, in line with the ex ante business case. For those benefits which have been updated in the ex ante business case, a comparison of ex ante and ex post benefits is shown below.

Table 29: Ex post present value of benefits – SE Hampshire BRT

Benefits and costs (2002 prices)	PV benefits (ex-ante) (million)	PV benefits (ex post) (million)
Time savings	£28.2	£72.0
Quality benefits (2014/15)	n/a	£15.5
Wider social and economic benefits	n/a	£49

Assuming revenues and costs have not varied from the figures reported in the ex ante business case, the ex post business case evaluation shows a BCR of 1.9, indicating medium value for money – A slightly higher BCR than the ex ante business case BCR of 1.5.

Excluding the reduction in parking revenues and adding wider social and economic benefits to the appraisal results in a BCR of up to 8.1, compared to a BCR 5.51 for the ex ante appraisal. These figures may overstate the true value for money of the scheme, due to the fact they fully exclude the lost parking revenues, however they do demonstrate the impact of including the reductions in parking revenues for the full appraisal period and represent the upside potential to the BCR estimates.

7.4.5 Concluding comments

In conclusion, the South East Hampshire BRT scheme is an example of successful project planning and implementation, with levels of demand and revenues exceeding forecasts within a short timescale following opening. The available monitoring data indicates that the scheme has resulted in an increase in demand and improvements to the reliability and frequency of the service. Passenger satisfaction ratings have gone up more than 20% on average.

The key opportunity presented by this project was the availability of the disused railway line, which allowed the construction of an off road busway with minimum disruption to traffic both during the construction phase and during operation. This enabled a bus only route which bypassed the main area of heavy congestion, offering improved reliability. The focus on the customer in the planning and implementation stages of the project, leading to a high quality service offer, is considered to be a relevant factor behind the project's success.

Based on the available data and assumptions, an ex post BCR analysis suggests that the value for money of the scheme may be higher than originally forecasted in the business case, and adjustment of the assumptions regarding parking revenues indicates that the true BCR may be even higher.

7.5 Wider social and economic impacts methodology

7.5.1 This report

The present report corresponds to an updated version of the report published in September 2015. The purpose of this update has been to incorporate additional wider social and economic impacts into the ex-post evaluation of the schemes previously assessed. Motivated by the publication of new research on the value of local bus services to society – commissioned by Greener Journeys and undertaken by KPMG in collaboration with the Institute of Transport Studies at the University of Leeds⁴⁰ – the updated analysis aims to better capture the potential wider benefits these schemes might have generated by significantly improving local bus services in their local area.

7.5.2 The evidence on wider social and economic impacts

There is increasing evidence on the wider social and economic impacts of transport connectivity. Over the last years this has concentrated especially on the wider economic impacts such as labour markets effects and changes to business productivity and investment. This is now incorporated into the Department for Transport's guidance, which places increasing value on this type of impacts.

In addition to wider economic impacts, bus services in particular have a strong social dimension as they tend to be heavily used by the most disadvantaged groups in society (e.g. people with mobility impairments). They can therefore be associated with a wide range of social impacts, which have been less researched in the wider impacts literature. Nevertheless, recognition of these impacts is increasing and insightful research has been published recently on the topic, which underpins the update of this report.

⁴⁰ KPMG (2016), "A study on the value of local bus services to society"

7.5.3 Methodology to estimate wider social and economic impacts

A wide range of social and economic benefits has been captured in this updated ex-post evaluation of three bus infrastructure schemes, leading in some cases to benefits of significant scale. As previously stated, these benefits were identified in recent research on the benefits of local bus services. Specifically, we have included the following benefits:

- Access to employment opportunities
- Fiscal savings from improved health due to increased employment
- Fiscal benefits from improved education
- Benefits to the wider community from increased participation in volunteering activities
- Health impacts from increased physical activity
- Benefits from improved psychological wellbeing as a result of improved commuting
- Option values from increased provision of bus services.

The methodology to estimate these benefits has been derived from the evidence collected in KPMG's report for Greener Journeys on the value of bus services to society⁴¹. This includes a mix of academic studies and guidance on economic appraisal, which provide values on how to monetise these impacts.

However, with gaps remaining on how we can quantify some of these impacts and more understanding needed regarding the extent to which these benefits are additional to benefits traditionally included in standard appraisals, the list of wider social and economic impacts included here is subject to higher uncertainty compared to time savings, fare savings and quality benefits. The results should therefore be interpreted with this in mind.

The list below shows the methodology employed to estimate each benefit and an indication of the level of uncertainty associated with each of them.

⁴¹ KPMG (2016), "A study of the value of local bus services to society"

Policy / investment	Level of uncertainty (DfT perspective)	Sources	Methodology
Economic impacts			
Employment benefits (additional tax revenue or tax savings)	Medium	Buses and the Economy II, ITS report for Greener Journeys (2014), ONS, DfT WebTAG	An elasticity of journey time to employment (ITS 2014) is applied to changes in generalised journey time and the employment affected by the scheme (ONS) to obtain the number of potential new jobs. New jobs are then multiplied by the median wage (ONS) and the tax take on those jobs (WebTAG).
Health fiscal savings from increased employment	Medium	New Economy Tool (NET) (2016)	New jobs estimated as part of employment impacts are multiplied by the health fiscal saving of new jobs (NET).
Fiscal savings from increased education	Medium	New Economy Tool (2016) and National Travel Survey (2014)	The number of new people in education – estimated based on forecast additional bus demand that was not displaced from other modes, the average proportion of education trips out of total bus trips, and education trips per person – is multiplied by the NET fiscal savings of new people in education.
Social impacts			
Option and non-use values	Low	ONS, UK Bus statistics, DfT WebTAG	The change in households with good access to bus services – estimated based on existing households with poor access to buses and changes in bus services (measured as vehicle km) - is multiplied by an option value from WebTAG.
Health and wellbeing	Low	New Zealand Transport Agency (NZTA)	The change in walked km as a result of trips shifting from car to bus and generated bus demand (not displaced from other modes) is multiplied by the NZTA health benefit per walked km.

Volunteering	Medium	Royal Voluntary Service (RVS) (2011)	Using shadow prices, average number of hours devoted to volunteering activities per person from the RVS, the proportion of how many of these activities may be accessed by bus, as well as generated bus travel demand by the scheme (not displaced from other modes), the value of the change in voluntary activity is estimated.
Psychological wellbeing	High	ONS research on commuting and wellbeing (2014), New Economy Tool (2016)	Using the improvement in wellbeing researched by the ONS as a result of increased commuting by public transport and reduced commuting time, as well as the value of emotional wellbeing from the NET, the value of changes to psychological wellbeing are estimated.

7.5.4 Limitations and future steps

Due to the constantly evolving literature on the wider impacts of transport, it is likely that the appraisal of these benefits will be further developed in the near future. This could include additional benefits that have not been quantified in our wider impacts methodology.

More ex-post evaluation of wider social and economic benefit is needed for appraisal to improve and comprehensively capture the impacts of infrastructure investments. This is a challenging exercise as social benefits from transport may be linked to other non-transport policies, making it difficult for the researcher to disentangle the benefits attributable to transport investments. However, with more data and the use of rigorous methodologies, social and economic evaluations of transport schemes can add significant value to future appraisals and transport decision-makers.

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