



Department  
for Transport

Better Bus Areas Programme

**Evaluation Plan**

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## 1 INTRODUCTION

*“Evaluation can offer robust quantitative and qualitative data on the outcomes and impacts of a policy, programme, package or scheme: providing evidence not only for what changes it produced but also why and how these changes came about. Sound evidence has, in turn, a crucial role to play to improve the evidence base for future policy making”<sup>1</sup>*

- 1.1 The Better Bus Areas (BBA) fund is an innovative programme whereby Bus Service Operators Grant (BSOG) payable in defined geographic locations is progressively devolved from bus operators to local authorities. Over a four year period, the aim is for them to work in partnership with local bus operators to use that funding to implement schemes that will generate better value for money than BSOG itself does.
- 1.2 In the summer of 2013, the DfT offered local authorities the opportunity to become a Better Bus Area. Authorities were asked to prepare a bid to become a BBA in conjunction with local bus operators and propose a series of schemes which they felt would offer better value for money than BSOG. Five local authority areas were successful in becoming Better Bus Areas:
  - ❑ Sheffield
  - ❑ Nottingham
  - ❑ Liverpool City Region
  - ❑ West of England
  - ❑ York
- 1.3 Each of the five successful authorities looked to implement different schemes and each set up different partnership arrangements with their local bus operators.
- 1.4 This evaluation plan is the first deliverable in the process of evaluating the BBA programme. It details the key research questions, the schemes for each authority area that can be evaluated, and the datasets required to carry out the evaluation of each scheme.
- 1.5 The first draft of this report was submitted to the DfT to enable the client team to consider the evaluability of all BBA funded schemes. Following consideration by the DfT and through discussion with the evaluation team, decisions were taken relating to:
  - ❑ Agreeing and finalising the research questions
  - ❑ The schemes that the DfT would like to see included within the impact evaluation
- 1.6 This evaluation plan has therefore been supplemented with an additional chapter which presents the data collection plan for the schemes that will be evaluated in line with DfT’s priorities. The structure of this evaluation plan is therefore presented below.

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<sup>1</sup> Tavistock (2010). Guidance for transport impact evaluations: Choosing an evaluation approach to achieve better attribution. Report to DfT, March 2010. Accessed online at: <http://webarchive.nationalarchives.gov.uk/20111020223908/http://www.dft.gov.uk/pgr/evaluation/evaluationguidance/transportimpact/>

## Report Structure

1.7 The remainder of this report is structured as follows:

- ❑ Chapter 2 presents the evaluation approach and the key research questions that the evaluation should answer.
- ❑ Chapter 3 presents the impact evaluation design, together with a review of which BBA schemes could be evaluated and the indicators and data sources that could be used to for the impact evaluation.
- ❑ Chapter 4 presents the data collection plan for impact evaluation, taking account of the outcome of discussions with DfT on their priorities.
- ❑ Chapter 5 presents the process evaluation plan for assessing the different partnership arrangements in place in each of the five BBAs.
- ❑ Chapter 6 sets out the next steps for the evaluation process.

## 2 EVALUATION APPROACH

2.1 This chapter starts off by setting out the purpose of the evaluation of the Better Bus Area programme, considering both the impact evaluation and process evaluation work strands. This leads in to the development of the key research questions that the evaluation will aim to answer.

### Evaluation Purpose

2.2 In March 2014, the DfT published the 'Better Bus Area Monitoring and Evaluation Framework'. This document set out clearly the objectives of the BBA programme and the reasons for monitoring and evaluating it.

2.3 There are three key policy objectives of the BBA programme. These are:

- To support the local economy and facilitate economic development through the improvement of local bus infrastructure, patronage numbers and services;
- Reduce carbon emissions or at the least be carbon neutral; and
- Improve the working relationship between local authorities and operators.

2.4 This set of objectives then led to the development of the monitoring and evaluation framework which included the following aims:

- Investigate the contribution of the fund in delivering economic growth and carbon neutrality or reduction. (i.e. report against the policy objectives);
- Provide accountability to tax payers and Parliament;
- Fill evidence gaps to inform the case for future local, national or third party funding for bus market; and
- Provide an effective method for benchmarking and comparison for current and future bus projects.

2.5 There are two strands to the monitoring and evaluation plan as set out in this document. Firstly, in order to meet the above objectives it is necessary to evaluate the impact of the schemes being implemented across the BBAs, to the greatest extent possible. The impact evaluation will therefore look to provide quantitative evidence of the outcomes and impacts of BBA funded schemes.

2.6 Secondly, the devolution of BSOG from bus operators to local authorities is based on partnership working between the various parties. In order to assess whether the third BBA programme policy objective is being met it is necessary to evaluate the success or otherwise of partnership working between authorities and operators - process evaluation - to examine different arrangements and highlight areas of good practice.

2.7 The process evaluation is particularly important as the BBA programme is a new initiative by the DfT to look at alternative ways to subsidise or support the bus industry through methods other than BSOG. This programme therefore changes the relationship and dynamic between the bus industry and local authorities and each BBA has/will put in place its own arrangements to handle these changing dynamics.

2.8 The process evaluation will help determine whether there are any specific circumstances which may influence the performance of the scheme in delivering outputs and impacts in any of the BBAs.

### **Research Questions**

2.9 Based on the three core objectives of the BBA programme and in accordance with the monitoring and evaluation framework set out by DfT, a number of research questions were developed following meetings and discussions with all five of the BBA authorities and some key bus operators. These meetings enabled the study team to obtain a better understanding of the various interventions, the potential data sources available, the partnership arrangements that have been put in place by each BBA authority, and the rationale for each authority adopting its particular schemes and methods.

2.10 It should be noted that each BBA has its own needs and objectives and as such several of the BBAs have their own research questions that they have developed themselves for their own monitoring and evaluation purposes. Given the nature of this cross-BBA evaluation, the study team felt that the research questions should remain simple and focus on the objectives of the BBA programme, as set by DfT.

2.11 Seven research questions were developed:

1. What are the measurable changes in bus journey times, bus journey time reliability and bus patronage from the schemes evaluated in each BBA area?
2. How much of the observed change(s) can be attributed to the BBA schemes?
3. How do BBA funded schemes, individually or collectively, affect bus operating costs?
4. What are the effects of the BBA schemes on non-bus users?
5. What measurable changes in carbon emissions can be attributed to the BBA schemes?
6. Are the BBA programme schemes good value for money compared to the previous funding arrangements i.e. BSOG?
7. What lessons can be learned from the partnership arrangements put in place in each BBA?

2.12 Most of these research questions stem from the core objectives of the BBA programme. Improving bus services, making them more attractive and encouraging growth in bus patronage covers the first research question, while the second research question attempts to understand to what extent the measured changes are attributable to the BBA programme. These questions stem from the first objective presented in paragraph 2.3 above.

2.13 The third research question does not stem from any of the DfT's core BBA objectives, but is highly relevant to the process of devolution of BSOG from bus operators to local authorities. Some bus operators view the BBA process as an opportunity to implement schemes that will not only improve bus services and encourage patronage growth, but may also reduce the costs of operating those services. In Sheffield and Nottingham in particular, operators and the authorities have expressed a desire to reduce operating costs while maintaining service levels. It is therefore necessary for the evaluation of the BBA programme to assess (to the extent possible) whether any schemes lead or contribute to a reduction in bus operating costs and how this came about.

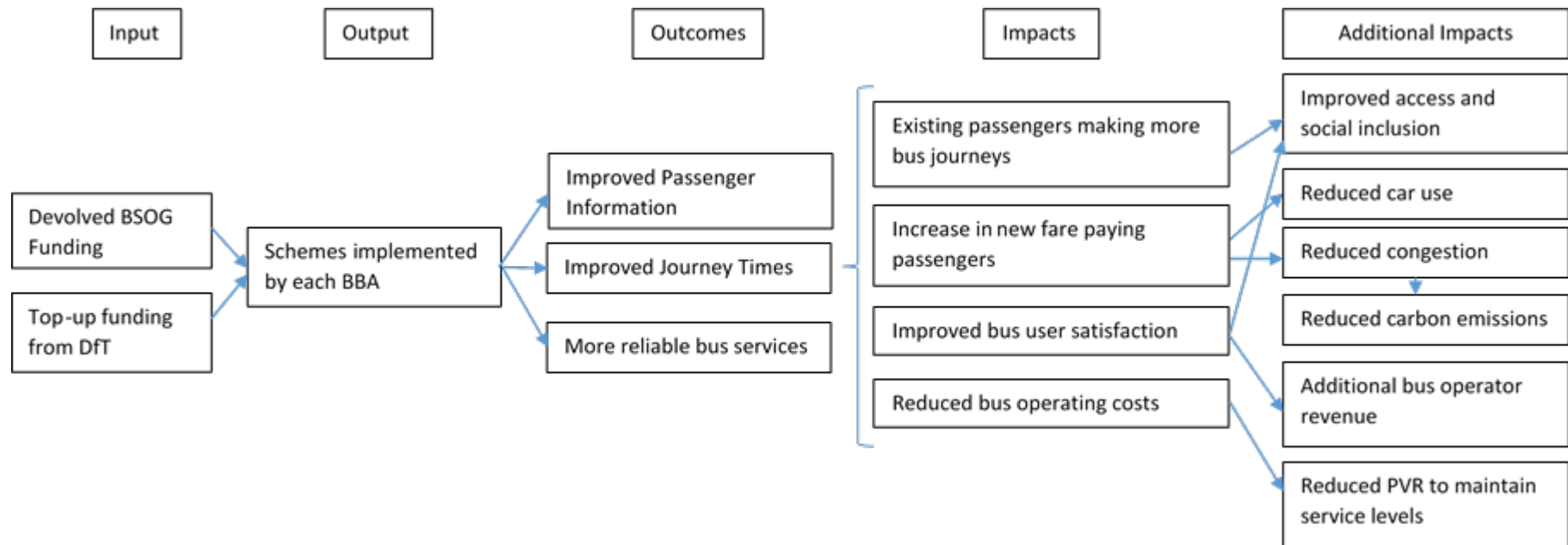
- 2.14 The effects of the BBA programme on non-bus users is an important element of the evaluation, as providing improved bus services may have consequences for other road users such as car users, cyclists, pedestrians etc. Where possible, this should be highlighted within the evaluation and measured using any available tools.
- 2.15 The second of the DfT's core objectives is for the BBA programme to reduce carbon emissions or at least be carbon neutral. It therefore appears highly desirable that one of the research questions considers the effects of BBA funded schemes on carbon emissions. Through discussion with the DfT, the impacts on carbon emissions are considered to be a secondary impact and will be included in the final evaluation where appropriate underlying data is available.
- 2.16 In the view of the research team, for a reasonable assessment to be made of whether the BBA programme is good value for money for tax payers, it is necessary to understand how the impacts brought about by BBA compare to subsidising operators through BSOG. The DfT has, in the past, suggested that BSOG has a benefit / cost ratio (BCR) of 2, a value that was derived from the DfT's national bus model. Therefore, for the BBA programme to be judged a success in economic terms, the interventions should be able to reach a BCR of greater than 2.
- 2.17 The BBA evaluation will therefore include an economic analysis of those schemes which are part of the impact evaluation. This will use the indicator data collected to develop updated BCRs, using the same process used by the local authorities when bidding to become a BBA. It is recognised that insufficient data will be able to be obtained to carry out a fully locally evidenced ex-post economic evaluation within the monitoring remit agreed with the authorities. However, in the absence of local evidence for particular parameters, reasonable estimates (eg. from Webtag guidance) will be used alongside quantified evidence gained from the impact evaluation.
- 2.18 Finally, the devolution of BSOG is a major step-change in the subsidy of local bus services in England. In the partnership-working that is an inherent part of the BBA programme, both parties will have their own views of what measures will most benefit local bus services. The BBAs will each address this working in different ways and different circumstances. The final research question therefore relates to the third of the DfT's objectives – 'to improve working relationships between operators and local authorities'.

### **Logic Map**

- 2.19 Figure 2.1 presents the intervention logic for the entire BBA programme. The mapping of the intervention logic was carried out based on the BBA bids, taking account of discussions and meetings with programme managers in each BBA and with some bus operators. The logic map is a visual representation of how the interventions carried out are expected to achieve the programme objectives. The logic map is at a strategic level and is deliberately generic in order to encompass the variety of schemes that each BBA will implement.
- 2.20 Further scheme-specific and more detailed logic maps are presented in Chapter 3, as part of the development of the data collection plan for the impact evaluation.



Figure 2.1 Logic Map for BBA Programme



### 3 IMPACT EVALUATION DESIGN, POTENTIAL INDICATORS AND DATA SOURCES

- 3.1 This chapter sets out the impact evaluation design, together with identification of potential indicators and available data sources. Within this chapter, the **full range** of practical possibilities is explored. Chapter 4 then presents the **finalised** data collection plan, following discussion with DfT on its priorities for the evaluation.
- 3.2 Within the original brief for this evaluation study, influenced by the Frontier Economics scoping report, it was specified that the impact evaluation should focus upon assessing the impact of:
- Real time information and audio-visual interventions
  - Bus priority
  - Bus signalling
- 3.3 In addition, it was specified that only certain interventions carried out in the Liverpool City Region, Nottingham and Sheffield should be evaluated.
- 3.4 The following sections examine each of the BBAs in turn and the schemes that they intend to implement. For each scheme, a logic map is presented that details the outcomes and impacts that could be measured as part of this evaluation. Each scheme-specific logic map is followed by some discussion relating to the evaluability of each scheme and how a counter-factual can be determined – if necessary.
- 3.5 The impact evaluation will use a **quasi-experimental design**<sup>2</sup> because the BBA intervention areas have not been chosen at random and control areas with the same characteristics, and subject to the same external factors as the intervention areas, do not exist. It will therefore be necessary to consider other areas, routes, or corridors within the BBA areas that will not be subject to the measures implemented through BBA, but are otherwise as similar as possible, and use these as comparator areas to estimate the counter-factual. These are discussed for each scheme.
- 3.6 At the end of each section, a review of the data required and each potential data source to meet those requirements is presented in order to summarise the preceding discussion. This is set out in tabular form for each BBA, including reference to the research question(s) that would be answered by evaluating each scheme.
- 3.7 It is important to note that while this chapter considers how each scheme could be evaluated, the ability to isolate the effects of schemes or even specific elements within schemes is not always possible. While bus journey time impacts can often be isolated due to the nature of the AVL/RTI data available – where buses can be timed between one bus stop and another – assessing the effects of any changes in journey time on bus patronage is less straightforward as there are other external variables and factors that can influence bus patronage. In some cases, there are several schemes that a BBA implements that could collectively affect bus patronage. In these cases trying to disaggregate the effects of each scheme is simply not

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<sup>2</sup> Quasi-experimental design uses a comparator group or area which is as similar as possible to the intervention group or area to determine the counter-factual, as opposed to a randomised or controlled group or area.

possible without extensive surveys identifying new bus passengers and asking them to state (and weight) the reasons why they started using bus services.

3.8 As discussed in the previous chapter, carrying out an economic appraisal of BBA schemes is essential in order to assess the value for money of the BBA programme to help inform policy makers of the benefits (or otherwise) of devolving BSOG. As a result, an economic evaluation of the schemes implemented under the BBA programme will be carried out to the extent possible. Where data is collected as part of the impact evaluation process that can be used to update inputs used in the ex-ante appraisal BCR calculations, this will be used. If other datasets become available through the impact or process evaluation process that could assist in the development of more robust BCR calculations, then this data will be recorded and reported within the baseline data report. However, there will be various BCR calculation inputs that will not be able to be quantified - for example values of time, mode switch from car. In these cases, the best available evidence and reasonable assumptions will be used – as were typically adopted by BBAs when bidding – to determine a BCR for specific schemes.

**Liverpool**

3.9 There are six main areas of work on which the Liverpool City Region will focus:

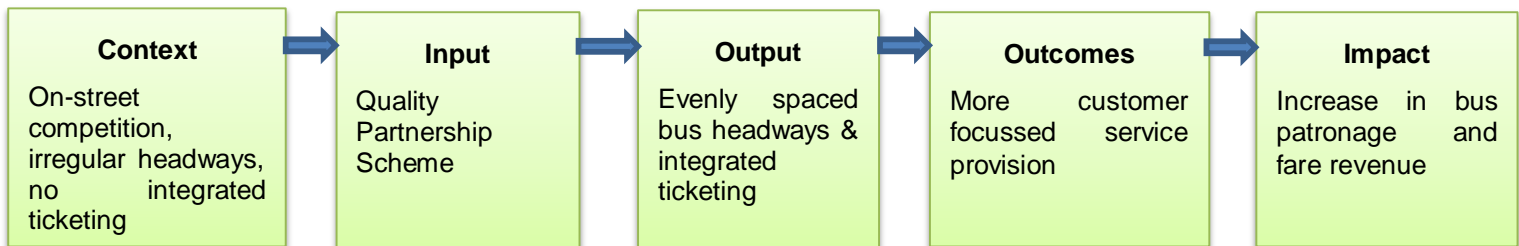
- ❑ Quality partnership schemes (QPS);
- ❑ Active traffic management infrastructure;
- ❑ Housing estate bus stop improvements;
- ❑ Highway infrastructure schemes;
- ❑ Bus station / stop enhancements; and
- ❑ Traffic management and highway infrastructure.

3.10 Each of these is considered in turn below.

Quality partnership schemes

3.11 There are five key corridors where bus quality partnership schemes have been set up. These arrangements include providing joint ticketing for passengers and co-ordinating timetables for the benefit of passengers. Of these five routes, three are within the Merseytravel area (routes 10 and 10A, 17 and 33, 61), one within Halton (14 and 79C) and one within St Helens (89 and 89A). Figure 3.1 presents the logic map for the quality partnership schemes.

**Figure 3.1 Logic map for quality partnership schemes**



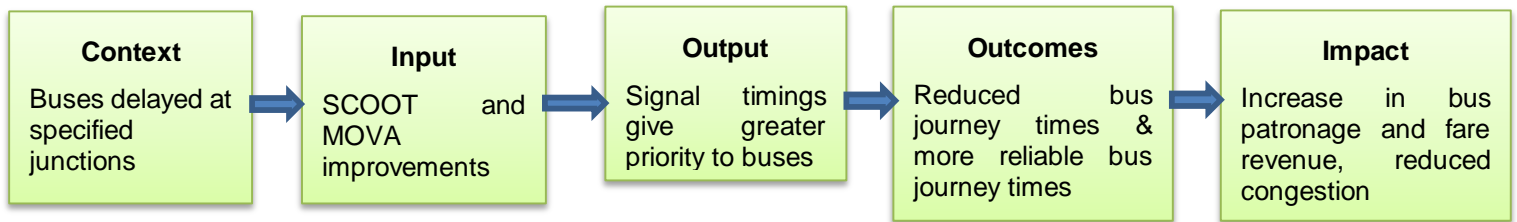
3.12 The quality partnership schemes will be introduced on corridors that will see other major improvements, so monitoring their impact in isolation will not be possible. This was recognised in the scoping study carried out by Frontier Economics, and impact evaluation of the quality partnership schemes was not included in the brief for this evaluation study. That said, on

corridors where there are to be interventions and where there is a QPS, any changes in patronage are likely to be, in part, attributable to the QPS along with the other interventions. Therefore the QPS will effectively be evaluated, albeit in aggregation with other measures.

Active traffic management infrastructure

- 3.13 This involves SCOOT and MOVA being deployed to control traffic signals. SCOOT bus priority capability will be utilised to optimise signal timings and maximise efficiency on the bus network. There are plans to upgrade SCOOT:
  - ❑ At St Helens town centre;
  - ❑ Along Prescott Road;
  - ❑ In the Thatto Heath area;
  - ❑ In the Rainhill area;
  - ❑ Along the Marshalls Cross corridor; and
  - ❑ Along Jubits Lane.
- 3.14 In addition, MOVA will be upgraded at the Cronton Road / Smithy Lane junction, work will be carried out on the traffic signals under SCOOT control on the Warrington Road and Higher Road corridors, and at the Cronton Road / Whitfield Lane junction.
- 3.15 A logic map for this scheme is presented in Figure 3.2. This illustrates the key benefits of the scheme and where the evaluation could focus its efforts in order to assess the impacts of the scheme.

**Figure 3.2 Logic Map for Active Traffic Management Infrastructure**



- 3.16 The primary objective of these improvements is to reduce bus delays and improve bus journey time reliability. To measure how these change between the pre- and post-implementation conditions, automatic vehicle location (AVL) data from the bus real time information (RTI) system could be obtained at each of the locations listed above. Depending on the depth of the AVL data available, journey times would be measured between the same two bus timing points or the same two bus stops that straddle the relevant modified junction/s. For either method, the point at which a bus departs from the earlier stop and arrives at the following stop or timing point would be used. In the pre-implementation data collection wave data would be collected for a period of one month (the month of October 2014) and would be disaggregated by time period (AM peak, Interpeak and PM peak) and direction of travel.
- 3.17 The intended long term impact of improving bus journey times and reliability is to increase bus patronage. While obtaining bus patronage data is straightforward – bus operators have expressed a willingness to share patronage data as required – isolating the effects of just these signal timing priority measures is complex. The journey time savings at the specified

junctions are likely to be modest (although this evaluation process would determine what they would be) and any patronage changes would also be affected by other unknown external factors in the study corridors. Nevertheless, looking at patronage on bus routes across the Liverpool City Region that are not in the BBA would provide a reasonable proxy for the counterfactual, allowing the proportion of any change attributable to the intervention to be estimated.

- 3.18 In terms of measuring patronage, data would be collected monthly on an aggregated basis. The evaluation team would work with each operator in order to collect patronage data for all non-BBA affected routes within the Liverpool City Region and would present this data in an aggregated manner across all participating operators. Specifically, Arriva, Stagecoach and Halton Borough Transport would be asked to provide this data.
- 3.19 If possible, car journey time data should also be obtained along with bus journey time data and bus passenger numbers as a further input to estimating the overall benefits and costs of the measures implemented. Pre-implementation data should be collected during part of the same time period as for the bus AVL data collection. Depending on routine local data collection efforts that may be taking place anyway, this could be done using GPS units in survey cars, conventional journey time surveys or possibly buying data from commercial services providers such as INRIX or Trafficmaster. The viability of purchasing this data, however, is unknown at present but can be explored further during the baseline data collection period.
- 3.20 There are two key variables that impact on an operator's ability to make a profit from operating bus services. One variable is revenue (from fares, subsidy or through other government-led funding such as the English National Concessionary Travel Scheme), the other is operating costs. The active traffic management schemes may improve journey times and journey time reliability to an extent that headways can be maintained while the number of vehicles required reduces. Assessing changes to operating costs such as the cost per vehicle mile or per vehicle hour is theoretically possible, but this is subject to changes in bus fleet that the operator may choose to make commercially (and not as a result of BBA). A broader, but altogether more reliable method of assessing changes in operating costs is to monitor the peak vehicle requirement for a given route and any changes in it compared to the headway. For each affected route therefore, the peak vehicle requirement (PVR) would be monitored (in liaison with bus operators) before and after implementation, alongside the headways at different times of the day.
- 3.21 To assess the effects of the interventions on carbon emissions, without detailed surveys to determine how many passengers have shifted from other modes to buses as a result of the interventions then assumptions would be necessary. A broad assumption that 30% of any change in bus patronage is the result of modal shift from cars would allow carbon emissions to be estimated. This is consistent with the assumptions within the DfT's National Bus Model.

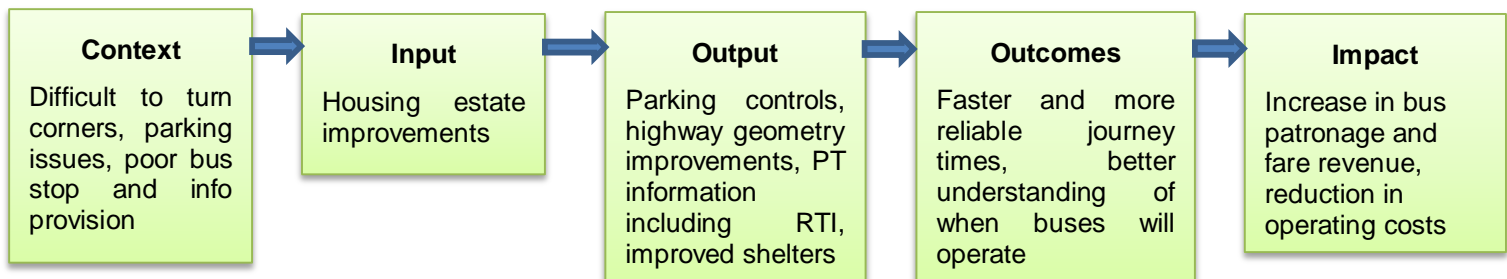
#### Housing estate bus stop improvements

- 3.22 Four estates within St Helens will see bus stop improvements - Australia Estate, Portico, Four Acre Estate and Sutton Manor Estate.
- 3.23 According to the Liverpool City Region BBA bid document 'At present buses have difficulty negotiating tight corners. Inappropriately parked cars worsen the situation and also mean that buses cannot avoid speed humps. Both of these issues cause delays to bus services. In addition, bus stops are in poor condition with little or no travel information, deterring people

from using the services provided. The proposed schemes will include minor highway geometry revisions to widen problem corners and the introduction of enforcement measures to minimise the disruption caused by current parking habits. Bus stop improvements will be made and up-to-date travel information will be made available, making the bus services more appealing and easier to use'.

3.24 A logic map for these bus stop improvements is presented in Figure 3.3 below.

**Figure 3.3 Logic Map for Housing Estate Bus Stop Improvements**



3.25 Although evaluation of the impacts of the localised bus stop improvements is not included in the scope of work specified by DfT for the evaluation, our view is that they are as evaluable as the specified bus signalling (active traffic management) schemes and that the evaluation results would be just as useful. The following paragraphs set out how the evaluation could be done.

3.26 The primary objectives of the improvements are to reduce bus delays and improve bus journey time reliability, and also attract new passengers through an improved bus stop environment and passenger information. Therefore AVL data could be obtained for all services operating within the estates between two locations at either end of the estate (or just outside). Data would be collected at each of these estates pre and post implementation to understand whether and how average journey times are impacted by the interventions. Journey time data for a period of one month would be collected for each route in both directions and reported within the baseline data report.

3.27 It would be useful to understand public perceptions of the interventions and the Liverpool City Region intends to carry out on-street interviews with bus users pre and post implementation. The outputs from these surveys could also be monitored to understand public perceptions.

3.28 In terms of measuring bus patronage, data could be collected monthly on an aggregated basis. The evaluation team would work with each operator in order to collect patronage data for all non-BBA affected routes within the Liverpool City Region and present this data in an aggregated manner across all participating operators. Specifically, Arriva, Stagecoach and Halton Borough Transport would be asked to provide this data.

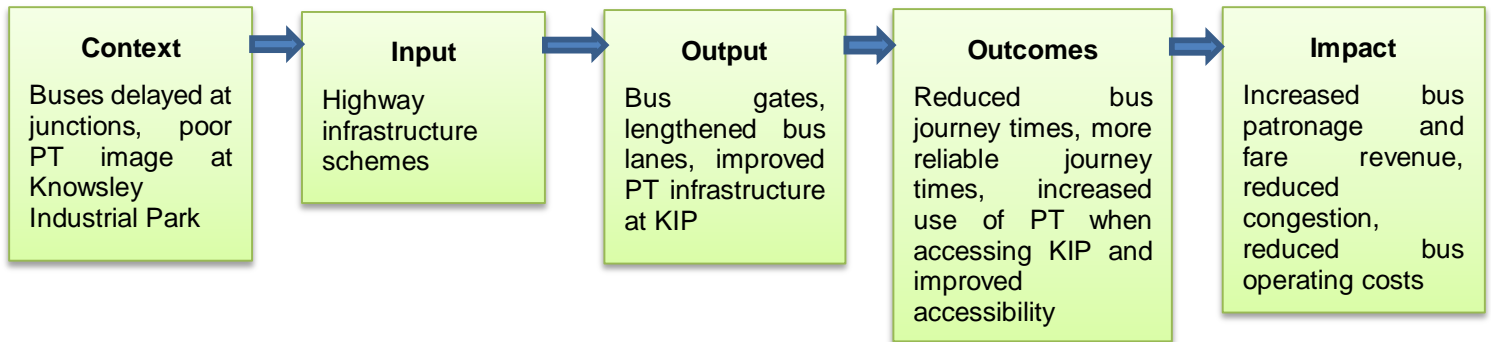
3.29 Finally, to understand whether any improvement in journey times from the housing estate improvements leads to reduced bus operating costs, it would be necessary to monitor PVR requirements and headways of affected routes over the period of the BBA programme.

#### Highway infrastructure schemes

3.30 These schemes are focussed on St Helens and Knowsley and include two bus gates, roundabout improvements and bus lane improvements. The aim of these is to aid the smooth

running of bus services and consequently reduce journey times. In addition, a transport hub at Knowsley Industrial Park will be developed to improve access and permeability of the park and encourage greater numbers of people to access the park using public transport. The logic map for these schemes is shown in Figure 3.4.

**Figure 3.4 Logic Map for Highway Infrastructure Schemes**

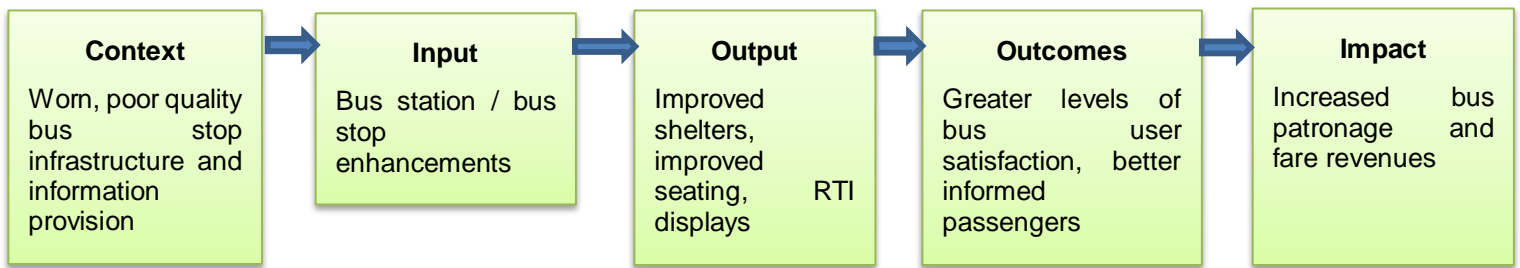


- 3.31 Like the housing estate bus stop interventions, the impact of these measures appears evaluable although not included in the original scope for the evaluation study.
- 3.32 As with the preceding measures, it would be possible to measure bus journey times pre- and post-implementation using AVL data relative to bus timetables, analyse bus patronage data and measure impacts on car journey times. Impacts on PVR could also be monitored as previously outlined.
- 3.33 Bus patronage data would be obtained from all routes, with a particular focus on those routes that serve the Knowsley Industrial Park. Where possible, a disaggregation of patronage data between concessionary pass holders and fare payers would be useful.

Bus station / stop enhancements

- 3.34 The Liverpool City Region identified bus stop infrastructure in certain areas of the BBA as being in need of improvement. In some locations, bus stops (and some bus stations) are ‘worn, lacking shelter or seating, in need of replacement and lacking travel information’. This poor infrastructure is cited by local residents as a barrier to using public transport.
- 3.35 The enhancements will therefore consist of improved seating and shelters and build-outs to assist passengers when boarding and alighting at 30 bus stops across the BBA. The proposals also include the installation of real time information at the majority of these bus stops and throughout the four major bus stations within the BBA. The logic map for these measures is shown in Figure 3.5.
- 3.36 These station and bus stop enhancements will occur on many of the same corridors as other interventions, making it extremely difficult to isolate the effects of any particular intervention. Our view is that it would therefore be possible only to assess the aggregate impact of all of the interventions on bus patronage on the corridors where the interventions take place, as previously described. User satisfaction surveys carried out by Passenger Focus could also be used to assess the levels of satisfaction of the services pre and post implementation.

**Figure 3.5 Logic Map for Bus Stop / Station Enhancements**

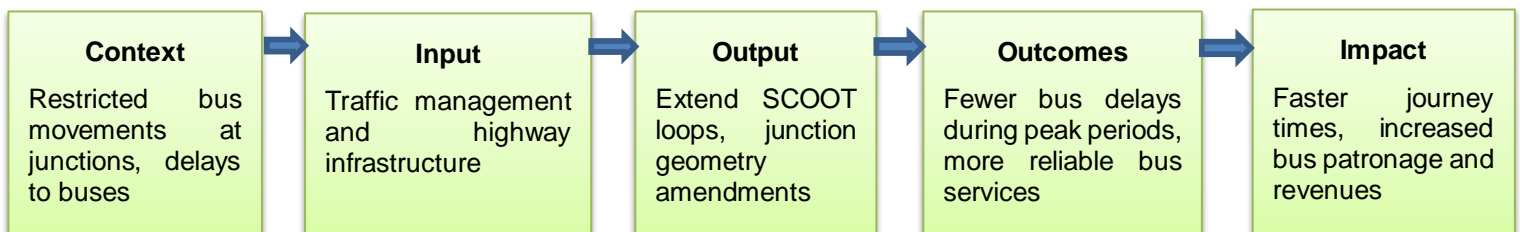


Traffic management and highway infrastructure

3.37 At certain junctions within the BBA, the current road geometry hinders bus movement, particularly at peak times. In addition, traffic signals provide little priority to bus services due to traffic queues extending beyond the length of the SCOOT loops. The combination of these two factors leads to long delays for bus services at peak times. There will therefore be some small-scale infrastructure measures to address this, as well as the traffic signal and other measures. Figure 3.6 shows the logic map for these measures.

3.38 Because of the close proximity of these measures to others, their impacts could largely be picked up in the measurement of indicators previously described. They would therefore be measured but only in the context of a package of measures in each location. Customer satisfaction levels could be monitored through the Passenger Focus surveys, where additional samples will be carried out in the affected areas.

**Figure 3.6 Logic map for traffic management and highway infrastructure**



Potential overall data collection plan

3.39 Table 3.1 summarises the potential overall data collection plan for the Liverpool City Region resulting from the preceding sections. This was put forward on the assumption that DfT may wish to extend the scope of the evaluation to take in other BBA elements as well as the traffic signalling (active traffic management) schemes included in the evaluation study specification.

3.40 As noted above, in practice the impact evaluation in Liverpool will need to focus on the impacts of packages of rather than individual measures, since they are packaged together in most locations to address local objectives. This is a common issue in most transport evaluations. However, we do not believe that this in any way diminishes the value of the evaluation.



**Table 3.1 Liverpool City Region Potential Data Collection Plan**

| Scheme                                   | Objectives / Outcomes  | Research Question | Indicators   | Pre-Implementation Data Required   |
|--|--|-------------------|--|--|
| Quality Partnership Schemes              | Impact of QPS included in measured impacts of other schemes below as it cannot be isolated from other interventions.   |                   |  |  |
| Active traffic management infrastructure | Reduce bus journey times<br>Improve bus journey time reliability<br>Increase bus patronage<br>Improve bus user satisfaction<br>Reduction in carbon emissions | 1, 2, 3, 4, 5, 6  | Absolute and % change in average bus journey times in defined corridors / areas<br><br>Absolute and % change in bus journey time difference from timetabled journey times<br><br>Changes in bus patronage (% and number of passengers)<br><br>Absolute and % changes in car journey times<br><br>Changes to PVR requirements related to headway on affected routes<br><br>Change in level of user satisfaction (% of users satisfied or very satisfied with different aspects of service)<br><br>Calculated change in carbon emissions | AVL data for the length of those routes affected by the interventions. Dataset should be for a period of 1 month (October), but disaggregated by AM peak (7am – 9.30am), Inter Peak (9.30am – 3.30pm) and PM Peak (3.30pm – 6pm)<br><br>The variance of differences from timetabled journey times would be assessed<br><br>Bus patronage, disaggregated by route and passenger type (if available), on affected routes and non-affected routes (comparator) within the Liverpool City Region<br><br>Car journey times along each affected corridor for the same time period (if available)<br><br>PVR, peak and off-peak headway of each affected route<br><br>User satisfaction as measured through Passenger Focus surveys |
| Housing estate bus stop improvements     | As above   | 1, 2, 3, 6,       | As above   | As above   |
| Highway infrastructure schemes           | As above, plus<br><br>Reduction in congestion  | 1, 2, 3, 4, 5, 6  | As above   | As above   |
| Bus station/stop enhancements            | Increase bus patronage<br>Improve bus user satisfaction  | 1, 2, 5           | Changes in bus patronage (% and number of passengers)<br><br>Change in level of user satisfaction (% of users satisfied or very satisfied with different aspects of service)   | Bus patronage, disaggregated by route and passenger type (if available), on affected routes and non-affected routes (comparator) within the Liverpool City Region<br><br>User satisfaction as measured through Passenger Focus surveys   |

| Scheme  | Objectives / Outcomes   | Research Question | Indicators   | Pre-Implementation Data Required |
|---|---|-------------------|--|----------------------------------|
| Traffic management and highway infrastructure | Reduce bus journey times<br>Improve bus journey time reliability<br>Increase bus patronage<br>Improve bus user satisfaction | 1, 2, 3, 4, 5, 6  | As for active traffic management.<br><br>NB Impacts of these measures would only be picked up in the impacts of packages of measures in different locations. | As for active traffic management |

### Nottingham

3.41 In Nottingham there are five key schemes that will be delivered as part of BBA:

- ❑ Southside bus priority scheme
- ❑ AVL signal priority
- ❑ Real time information (RTI)
- ❑ Smartcard retail network
- ❑ CCTV feed direct to operator depots

3.42 Each of these five schemes is reviewed below and its evaluability considered.

#### Southside bus priority scheme

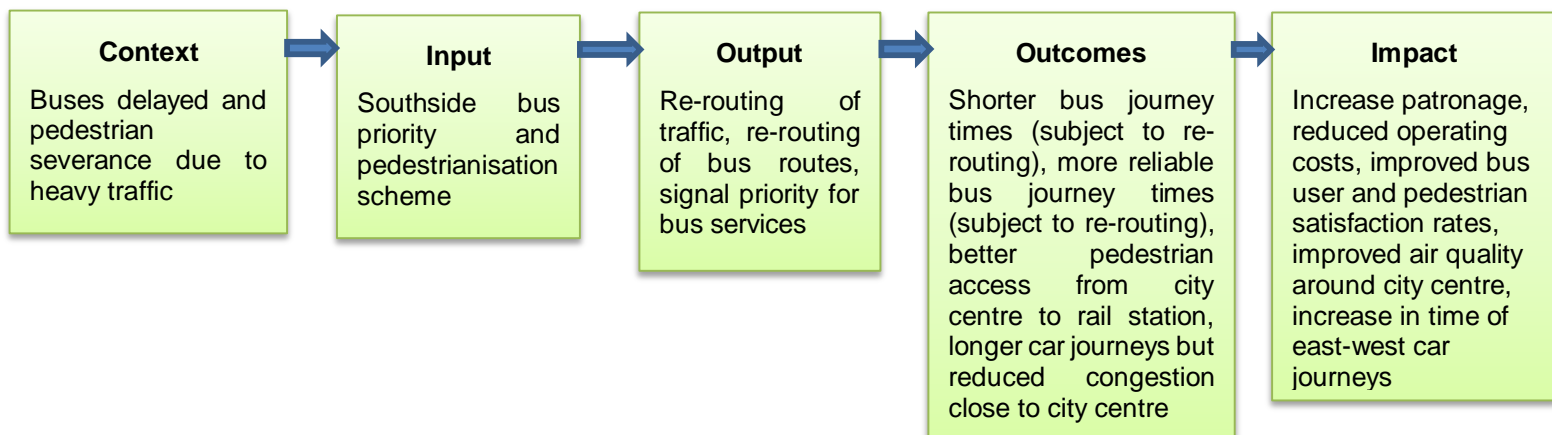
3.43 This scheme involves a major re-routing of vehicular traffic from Canal Street in order to give buses greater levels of priority as they reach the city centre. There are also wider benefits of the scheme to pedestrians when walking between the rail station and Nottingham city centre.

3.44 This scheme is being delivered alongside other major schemes in the local area, including the extension of the tram network, the potential re-routing of bus services to remove buses from central areas, the regeneration of the Broadmarsh shopping centre, and the construction of Central College on Canal Street.

3.45 In terms of evaluating the scheme, it is necessary to consider the value of the information that would emanate from an evaluation. The Southside bus priority scheme is unlikely to be a scheme that could be replicated elsewhere due to the specific nature of the scheme to Nottingham and the significant changes taking place not only as a result of the scheme, but also due to general land use changes and developments. However, returning to the research questions, the scheme will require a significant proportion of the total BBA funding received by Nottingham City Council (approximately £4m) and therefore assessment of whether the programme is good value for money would be helped by some evidence of the impacts.

3.46 The logic map shown in Figure 3.7 helps illustrate areas in which the scheme could be evaluated.

Figure 3.7 Logic map for the Southside bus priority scheme



3.47 In terms of how it could be evaluated, there are a variety of influences that could impact upon the evaluation process. In terms of journey times, there will be a variety of bus routes that will be affected, although many of these may be re-routed to different parts of the city centre as a result of local transport policies. Through discussion with Nottingham City Council and local bus operators, we understand that the following routes are unlikely to be changed significantly other than through the changes brought about by this scheme:

- Indigo (Trent Barton (TB))
- I4 (TB)
- Skylink (TB)
- 2 (Nottingham City Transport (NCT))
- 3 (NCT)
- 48 (NCT)
- Rushcliffe Greens (TB)
- Cotgrave Connection (TB)
- Keyworth Connection (TB)
- Ruddington Connection (TB)

3.48 For all of these routes, journey times and journey time reliability could be monitored using AVL data that is currently available to operators through the Nottingham real-time information (RTI) system. AVL data would need to be collected during October 2014 for the entire month and disaggregated by AM peak, interpeak and PM peak periods. Most of the above routes will differ in the route which they take to approach the Southside scheme area and therefore AVL data would be collected from the bus stop or timing point before the scheme area until the terminus or bus stop after exiting the scheme area, in both directions.

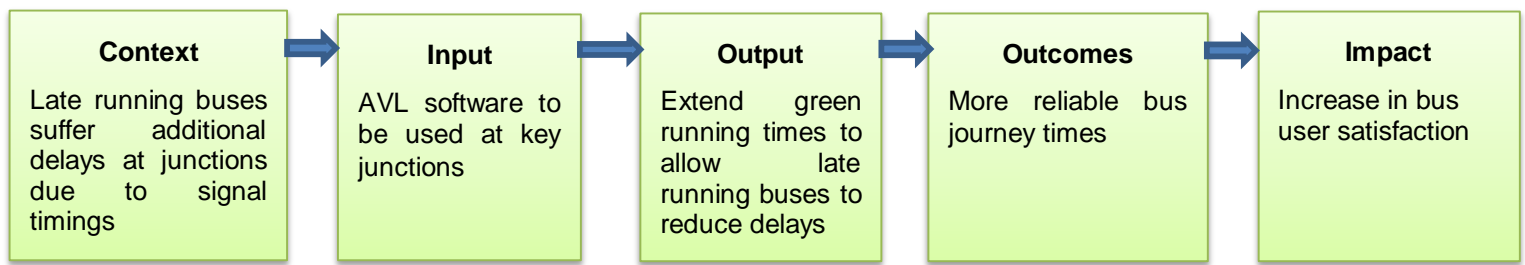
3.49 Bus patronage could also be monitored, although this will be impacted by various other schemes that are being implemented but are un-related to BBA. For example, services 2, 3 and 48 are likely to be significantly impacted by the new tram services between Clifton and Nottingham. Patronage on Indigo, i4 and Skylink is also likely to be impacted by tram services between Beeston and Nottingham. All services serving the Southside scheme area are likely to be affected by developments at Broadmarsh shopping mall and Central College. Therefore, there is little prospect of being able to carry out a comparable before and after data analysis that isolates the impact of the scheme. It is therefore recommended that any patronage impacts from this intervention are not measurable and are excluded from this evaluation plan.

- 3.50 In terms of impact on operating costs, discussions with bus operators suggest that they feel that there will not be any significant changes to peak vehicle requirement as a result of the Southside bus priority scheme. Therefore it is unlikely that there will be any measurable reduction in operating costs as a result of the Southside scheme. That said, the PVR of all of the potentially affected routes could be recorded pre and post scheme implementation, alongside bus headways at different times of day, to assess whether there are any unexpected impacts in this area. Due to the potential impact of the opening of Nottingham's new tram lines (scheduled for late 2014 / early 2015) on bus services, this data would need to be collected in the autumn of 2015 rather than 2014, once the effects of the tram on bus services should have settled down.
- 3.51 The impact of the Southside scheme on non-bus users would need to be monitored. Pedestrian flows and pedestrian journey times between the rail station and the city centre are not something that will be measured by Nottingham City Council but may be worth considering in order to assess the impact of the scheme on pedestrians. In addition, the views of pedestrians would be worth obtaining to assess their levels of satisfaction with the changes. Again, this is not something that the City Council has stated that it will carry out.
- 3.52 As the Southside bus priority scheme will result in major re-routing of car and vehicular traffic along Canal Street, the impact of the scheme on car journey times should be measured. In particular, car journey times would need to be measured through car journey time surveys and vehicle counts along the key roads impacted by the scheme. These roads are Canal Street (eastbound and westbound) Wilford Street (northbound and southbound) and Queens Road (eastbound and westbound). Despite requests for this information, it is currently not clear whether this data will be collected by Nottingham City Council. This data could be collated and analysed as part of the BBA evaluation, subject to the data being collected by the City Council.

#### AVL signal priority

- 3.53 Automatic vehicle location hardware on board buses allows for a smarter way of adjusting signal timings to provide late running buses with greater levels of priority when travelling through signalised junctions. Nottingham City Council intends to implement signal priority for buses drawing on the AVL information at the following junctions:
- ❑ A60 Mansfield Road / Haydn Road, Sherwood
  - ❑ A60 Mansfield Road / Winchester Street
  - ❑ A60 Mansfield Road / Magnus Road
  - ❑ A611 Hucknall Road / Arnold Road
  - ❑ Derby Road / Lenton Boulevard (possible)
  - ❑ A611 Hucknall Road / Perry Road (possible)
- 3.54 The logic map presented in Figure 3.8 illustrates the outcomes and impacts anticipated from the AVL signal priority intervention.

Figure 3.8 Logic Map for AVL Signal Priority



- 3.55 AVL journey time data could be obtained from operators for all routes that operate through the affected junctions before and after signal priority is implemented. ‘Before’ data would focus on the average time it takes for a bus to travel from departure from the bus stop before the junction to arrival at the bus stop after the junction. In addition, in the case of the A60, the average time it takes for buses to travel through all three affected junctions would also be monitored.
- 3.56 The average journey times through the affected junctions would be drawn from a dataset from October 2014, disaggregated by AM peak, interpeak and PM peak period. It may also be possible to calculate journey times for buses flagged as ‘late running’.
- 3.57 Bus user satisfaction surveys would be helpful to understand whether there is any impact on satisfaction rates as a result of AVL signal priority measures. The user satisfaction survey that Nottingham City Council carries out asks questions around the routes on which passengers travel and their views of aspects such as journey time reliability. This attitudinal data would be gathered and disaggregated by routes affected by the AVL signal priority measure to measure any possible changes in satisfaction rates. It is important to recognise that there are other external factors that could influence responses such as road works. However, these will be considered in more detail once there is a clearer picture of precisely what data can be obtained following the agreement of this Evaluation Plan.
- 3.58 It is also necessary to consider the effects of the AVL bus priority technology on cars. If possible, car journey time data should also be obtained as a further input to estimating the overall benefits and costs of the measures implemented. Pre-implementation data should be collected during part of the same time period as for the bus AVL data collection. Depending on routine local data collection efforts that may be taking place anyway, this could be done using GPS units in survey cars, conventional journey time surveys or possibly buying data from commercial services providers such as INRIX or Trafficmaster.

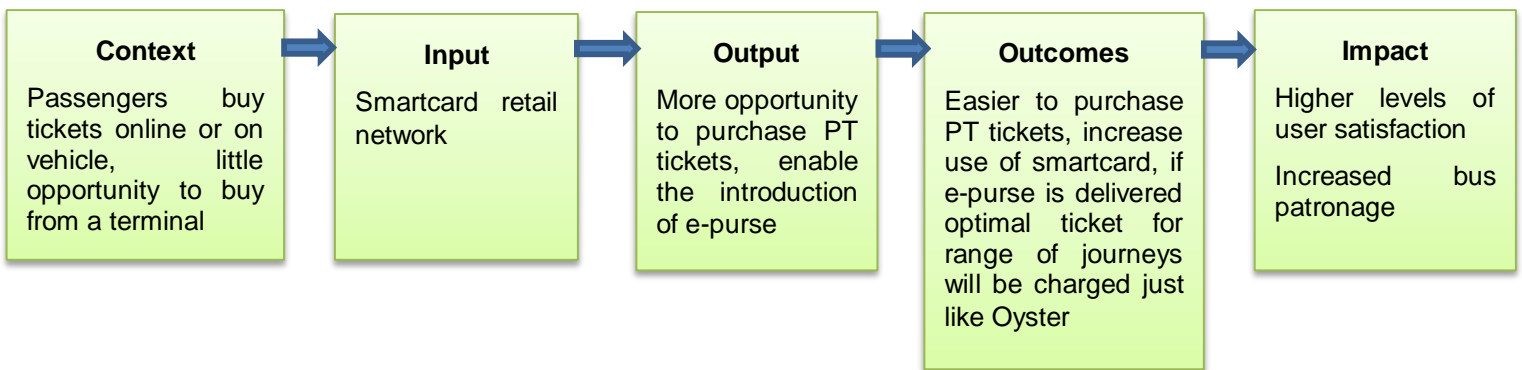
#### Real time information

- 3.59 Nottingham City Council has spent a number of years rolling out real time information across the city area and has over 1,000 RTI displays across the city. The funding from BBA will help to further this process but in reality, the additional displays funded by BBA will only account for a very small proportion of the total displays already in place.
- 3.60 In terms of measuring and isolating the impact of the new RTI displays in Nottingham, our view is that this is not feasible as displays are widely operational throughout the city. We therefore recommend that this evaluation does not consider the impact of RTI displays in Nottingham.

Smartcard retail network

- 3.61 The smartcard retail network consists of kiosks, outlets and an online portal in order to make the purchase of smart public transport tickets faster, more convenient and more cost effective. This network is only part-funded by BBA as LSTF and other funding sources have also been used for this purpose. The network will consist of 38 kiosks around the city centre and a further 50 locations at district centres across the Greater Nottingham area. The logic map for this measure is shown in Figure 3.9.
- 3.62 The city council views this retail network as an additional ‘nudge’ to encourage residents and visitors to use public transport to travel around the local area. It is also the precursor to the development of an e-purse ticketing scheme to enable people to use one smartcard and obtain the best available fare product for the journeys that they make.

**Figure 3.9 Logic map for Smartcard retail network**

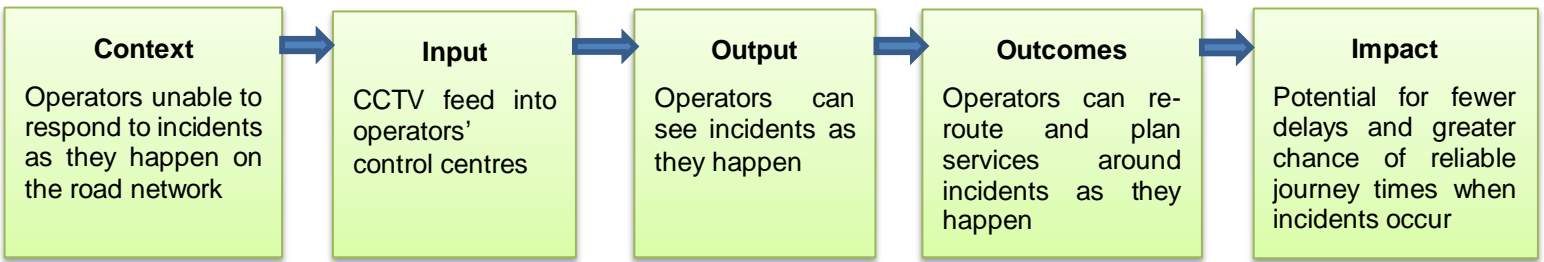


- 3.63 In terms of evaluating the smartcard retail network, it is extremely complex to disaggregate and isolate the effects of the network from any other public transport improvement schemes that are being carried out across the city, particularly when considering the effects on bus patronage. While outcomes could be monitored by the City Council in terms of the number of people using smart card tickets before and after roll-out of the network, any measured changes in bus patronage across the city would include influences of many initiatives and external factors. Without specific additional targeted surveys (that could be carried out by NCC or ITP), and which would help determine the extent to which the smartcard retail network led to a change in bus use, it would not be possible to determine any change in the number of bus users as a result of the smartcard retail network.
- 3.64 Bus user satisfaction could be monitored, however. This would be dependent upon the bus user surveys that the city council carries out each year. The study team would work with Nottingham City Council to better understand whether any specific questions relating to ticketing and the smartcard retail network could be added to the existing questionnaire in order to assess changes in user satisfaction rates.

CCTV feed to operator depots

- 3.65 While not in the original BBA funding bid, Nottingham City Council has re-directed some funding from other schemes towards installing a CCTV feed into the control centres of both Trent Barton and NCT (the dominant bus operators within the city) so that they can better react to incidents as they happen on the network, and more efficiently than at present. The associated logic map is shown in Figure 3.10.

**Figure 3.10 Logic Map for CCTV Feed to Operator Depots**



3.66 In order to quantify any impacts of the CCTV feed, it would be necessary to monitor the impact on bus services of incidents (most likely road traffic accidents) that occur on the road network before and after the CCTV feed is fed to operator control centres. In order for there to be a fair comparison, incidents would need to be in the same locations before and after and be of a similar scale. The likelihood of this is very small, and therefore the ability of the study team to access data that can be compared in a fair manner is inhibited. We therefore recommend that there should be no quantitative evaluation of the impacts of the CCTV feeds.

3.67 However, it would be possible to carry out a qualitative analysis through obtaining feedback from the operators and the city council. The process evaluation phase would therefore be used to obtain feedback from the operators on specific schemes such as the CCTV feed as well as on partnership aspects.

Potential overall data collection plan

3.68 Table 3.2 summarises the resulting potential overall data collection plan for Nottingham.

**Table 3.2 Nottingham BBA Potential Data Collection Plan**

| Scheme                        | Objectives / Outcomes  | Research Question | Indicators   | Pre-Implementation Data Required   |
|-------------------------------|--|-------------------|--|--|
| Southside bus priority scheme | Move traffic away from city centre<br>Greater priority for buses<br>Increase bus patronage<br>Reduced severance for pedestrians between city centre and rail station | 1, 2, 3, 4, 5     | Absolute and % change in average bus journey times through scheme area<br>Absolute and % change in bus journey time difference from timetabled journey times<br>Absolute and % changes in car journey times<br>Changes to PVR requirements related to headway on affected routes<br>Change in level of bus user and pedestrian satisfaction (% of users satisfied or very satisfied) | AVL journey time data for specified services during AM, IP and PM peak in October from last stop/timing point before Southside scheme area to terminus / first stop after scheme area in both directions.<br>Car journey time data on affected movements<br>PVR for affected routes (collected in October 2015)<br>User satisfaction surveys |

|                          |   |   |  |  |
|--------------------------|---|---|--|--|
|                          |   |   | <p>with different aspects of service)</p> <p>Absolute and % change in pedestrian flows between rail station and city centre</p> <p>Absolute and % change in pedestrian journey times between rail station and city centre</p>                              | <p>Pedestrian counts per direction between city centre and rail station</p> <p>Pedestrian journey times between city centre and rail station</p>   |
| AVL signal priority      | Improve journey times for late running buses  | 1, 2, 6   | <p>Absolute and % change in average bus journey times on affected routes</p> <p>Change in level of bus user satisfaction (% of users satisfied or very satisfied with different aspects of service)</p> <p>Absolute and % changes in car journey times</p> | <p>AVL data collected for all routes affected by AVL signal priority junctions. Data collected per direction, per peak period during October 2014.</p> <p>Bus user satisfaction rates on routes affected by AVL signal priority junctions.</p> <p>Car journey times along each affected corridor for the same time period (if available)</p> |
| Real time information    | Complete roll out of RTI displays across Greater Nottingham   | Given that there is already extensive distribution of RTI displays across the Greater Nottingham area, the effects of the additional displays introduced from BBA funding cannot be isolated. This will therefore not be evaluated. |  |  |
| Smartcard retail network | <p>Improve passenger's ability to purchase PT tickets</p> <p>Increase use of smartcards</p> <p>Increase bus patronage</p> | 1, 2  | <p>Change in level of bus user satisfaction (% of users satisfied or very satisfied with different aspects of service)</p> <p>Absolute and % change in smartcard ticket transactions</p>   | <p>Bus user satisfaction survey data on ease of ticket purchase</p> <p>Proportion of all commercial (non-concession) transactions being carried out using smart cards, aggregated across all services operating in Greater Nottingham</p> <p>Bus patronage impacts not measured, for reasons indicated above.</p>                            |
| CCTV feed to operators   | Improve operators ability to react to incidents on the road network   | 1, 2  | Views of key stakeholders on effectiveness of intervention   | Qualitative feedback from operators and council officers through process evaluation interviews.  |



**Sheffield**

3.69 In Sheffield there are various schemes that will be implemented using BBA funding. These are:

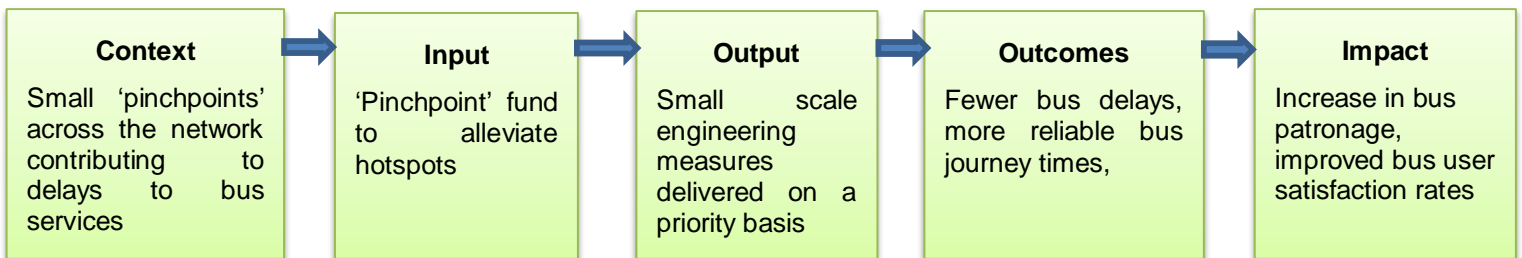
- ❑ Hotspot improvements;
- ❑ Improvements in the use of the urban traffic control centre;
- ❑ Audio-visual equipment installation;
- ❑ Real time information displays; and
- ❑ Key route improvements

3.70 Each of these schemes is examined below and their evaluability considered.

Hotspot improvements

3.71 Hotspots are where small interventions could overcome minor ‘pinchpoints’ or problems on the network. A list of hotspots has been maintained by operators, SYPTE and Sheffield City Council for a number of years and this list is an evolving one which any party can add to as problems arise. The current list contains around 70 hotspots and the BBA funding will be used to alleviate some of these hotspots, with the most effective being given priority. The associated logic map is shown in Figure 3.11.

**Figure 3.11 Logic Map for Hotspot Improvements**



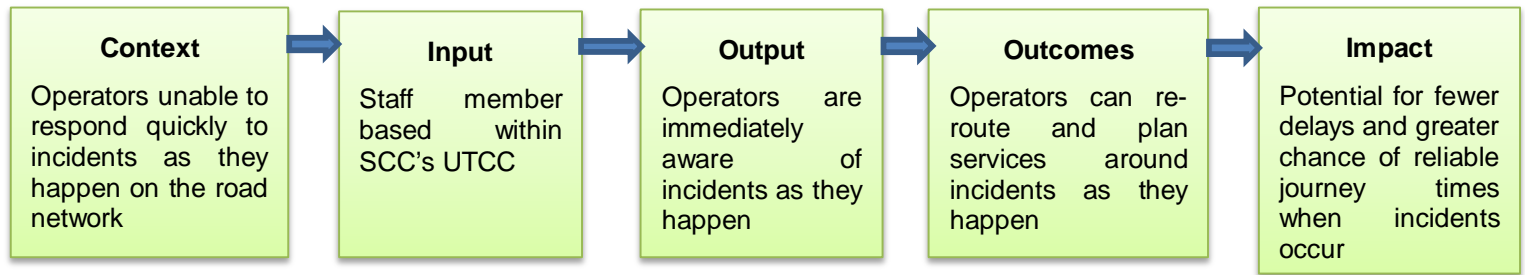
3.72 Some of the impacts of these hotspots may be able to be monitored in terms of journey time savings and journey time reliability compared to the timetable. Where hotspots have been identified that could have a material impact on journey times and journey time reliability, AVL data from the bus RTI system could be collected pre and post implementation – disaggregated by direction and peak period. Specifically, the time it takes to depart from the bus stop before the intervention to arrive at the bus stop after the intervention could be measured before and after implementation. An average of bus journey times would be calculated over a period of one month in each case.

3.73 Due to the nature of these hot spots, it is not possible at this stage to determine precisely which hotspots would be monitored. However, the study team could work with SYPTE to identify up to three hotspots to monitor their impact.

Improvements in the use of the urban traffic control centre

3.74 BBA funding is being used to fund one member of staff from each of the two largest operators (First Group and Stagecoach) to be located at the UTC centre in order to contribute to overall network efficiency by reacting to on-street issues immediately. The associated logic map is shown in Figure 3.12.

**Figure 3.12 Logic Map for Improvements in the Use of the Urban Traffic Control Centre**



3.75 In order to monitor the effects of this initiative, qualitative evidence could be collected from operators during the process evaluation data collection phase. This would provide the operators' view of the benefits of having a staff member within the UTC centre.

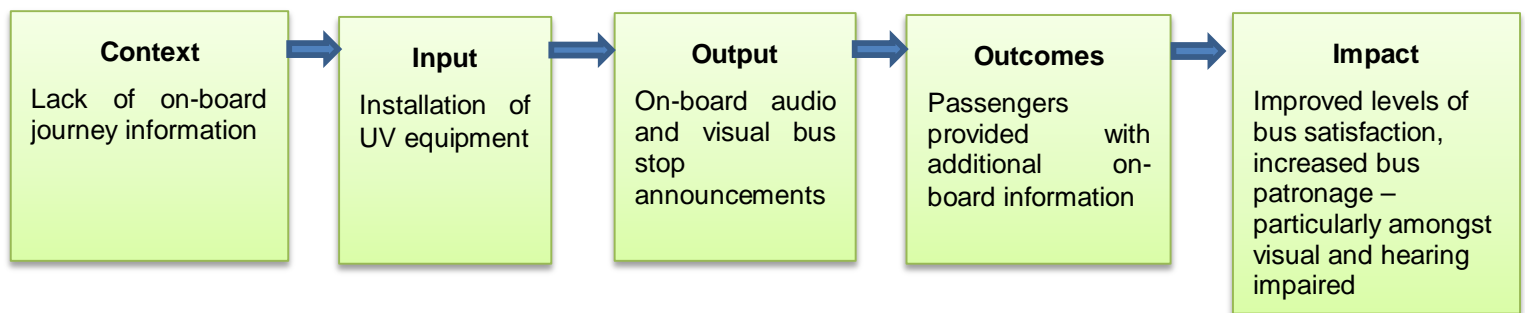
3.76 In addition, staff within the UTC centre would need to keep a daily log of interventions and responses to incidents on the network. This log would be reviewed to understand in more detail the sorts of incidents that occur and how they are dealt with.

Audio-visual equipment

3.77 Part of the BBA funding will be spent on the installation of audio-visual (AV) equipment on board 40 buses operating along Route 120 between Halfway and Fulwood. This route is part operated by both First and Stagecoach and serves the Royal Hallamshire Hospital and Sheffield city centre. It is currently planned that the AV equipment will be installed following the retendering of the RTI framework which will take place in the autumn of 2015.

3.78 The DfT is particularly keen, as is illustrated within the monitoring and evaluation framework, to develop an evidence base on the impacts of some of the schemes, and AV equipment on board buses is one area that the DfT has identified a lack of evidence base at present. Evaluating the effects of AV could therefore be carried out in Sheffield on route 120. The logic map in Figure 3.13 drives how this could be carried out.

**Figure 3.13 Logic Map for Audio-Visual Equipment**



3.79 Firstly, as SYPTE highlighted within its BBA bid, AV equipment is most likely to lead to improved levels of user satisfaction. Therefore, monitoring user satisfaction would be valuable. SYPTE intends to carry out user satisfaction surveys, and as part of the impact evaluation plan these could be monitored pre and post implementation to understand whether satisfaction rates change as a result of AV equipment being installed.

3.80 Secondly, bus patronage could be monitored pre and post implementation to understand whether AV equipment encourages patronage growth. Both First Group and Stagecoach have

stated that they would be willing to share patronage data provided that when it is published, it is done so in an aggregated and/or commercially sensitive manner. The number of bus passengers could be monitored on service 120 across both operators pre and post implementation over a number of years. ETM ticket sales and passenger boarding records would be collected on a regular basis by operators as a matter of course and made available to the evaluation team as required. Pre and post implementation patronage data could then be assessed to remove any potential seasonal bias.

- 3.81 It would be necessary to use other bus routes in Sheffield as a comparator (proxy counter-factual) to determine whether the AV equipment has made a material difference in bus passenger numbers. As patronage data is available for all routes across the BBA area from the two main bus operators, it is not necessary at this stage to determine which these control corridors should be to determine the counter-factual, but this would be done during the baseline data collection phase in conjunction with SYPTTE and the two main operators.
- 3.82 Finally, the composition of passengers could be monitored and recorded. It is unknown which passengers may benefit most from AV equipment, although concessionary passengers or people with hearing or sight impairments are thought to be likely groups that may benefit. Therefore by considering the impact on fare payers and concessionary pass holders, the effects of the AV equipment may be better understood.

#### Real Time Information Displays

- 3.83 SYPTTE has spent a number of years rolling out real time information across the city area and has many displays across the city. The funding from BBA will help to further this process but in reality, the additional displays funded by BBA will only account for a very small proportion of the total displays already in place. In terms of assessing the impact of the new RTI displays in Sheffield it is unlikely that any impact will be measurable because RTI displays are already widely operational. We therefore recommend that this evaluation does not consider the impact of RTI displays in Sheffield.

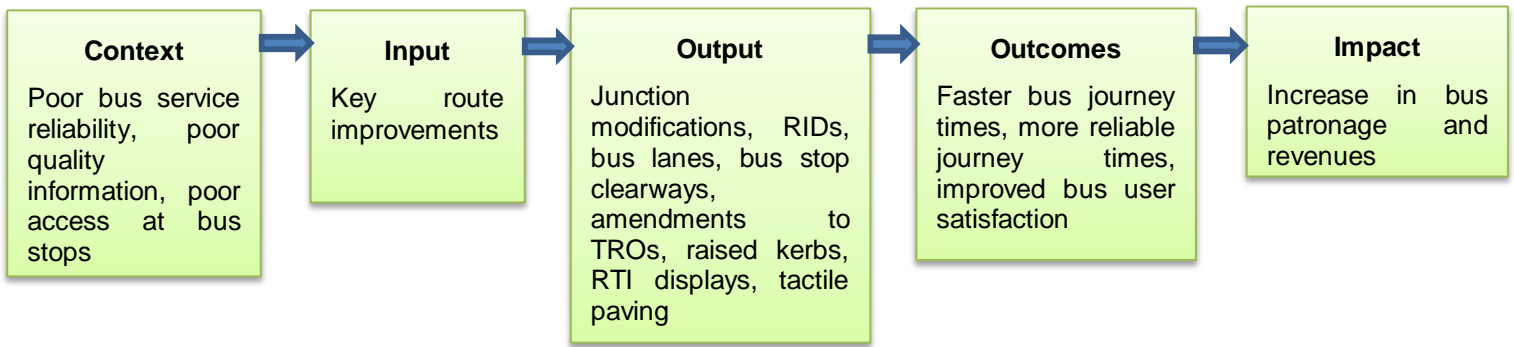
#### Key Route Improvements

- 3.84 SYPTTE identified six key routes/corridors that will be subject to a series of interventions. These are considered in turn below.

#### *Sheffield – Gleadless*

- 3.85 The interventions due to be implemented on this corridor 'will provide a range of bus priority and network management measures on a key bus route in Sheffield. Measures will include junction modifications, Real Time Intelligent Detection (RIDs), bus lanes, bus stop clearways, amendments to TROs, raised kerbs at stops, Real Time Information displays, tactile paving and measures to make enforcement easier'. The primary aim of these measures is to improve journey times and journey time reliability to such an extent that it will translate into reduced operating costs for operators. The logic map for these interventions is shown in Figure 3.14.

**Figure 3.14 Logic Map for Key Route Improvements on Sheffield-Gleadless Corridor**

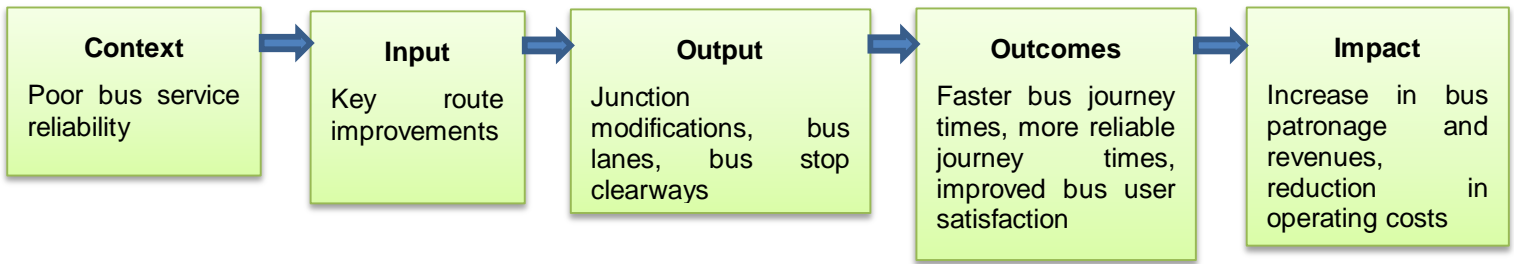


- 3.86 Given the variety of measures that will be implemented and the relatively small scale nature of each one, it would not be possible to isolate the impact of each individual measure, but it would be possible to quantify the effect of the collection of measures along each corridor.
- 3.87 There are two predominant bus routes affected by these interventions, 47 and 252, although operators would be able to guide the evaluation team if there are other affected routes. Bus patronage on these routes would be monitored pre and post implementation along with the make-up of passengers i.e. adult fare payers, child fare payers and concessionary pass holders. Pre-intervention data would be collected and disaggregated by month in order to assess seasonal variations in pre and post implementation data analysis.
- 3.88 It is very difficult to identify a robust comparator area for the corridors to act as a proxy counterfactual which can be used to assess changes in bus patronage attributable to the interventions. From discussion with SYPTE, it is apparent that there will not be any corridors in Sheffield that will be untouched by BBA or BBA1 funded interventions or LSTF funded interventions. In addition, selecting another town or city as a comparator area is also fraught with difficulties and would be imperfect. Therefore, our view is that the best available comparator would involve using a combination of all routes across Sheffield – excluding those impacted directly from the six key route improvement projects. Comparison with data trends from these other routes would at least give some indication of the likelihood of the impacts being the result of the key route interventions.
- 3.89 Journey times and journey time reliability could also be monitored using AVL data from the Sheffield RTI system that is available for both routes. During the baseline data collection phase, average journey times along the length of the routes over a period of one month would be obtained from AVL data held by SYPTE. How these journey times relate to the timetabled journey times would also be recorded to assess journey time reliability, while the timetables themselves would be collected to monitor whether time is saved and reflected within an amended timetable.
- 3.90 Finally, bus operating costs would be monitored in terms of changes to PVR for each identified bus route, as described for the Liverpool City Region earlier in this chapter.

*Chesterfield Road*

- 3.91 Chesterfield Road (A61) is one of the main corridors into Sheffield from Chesterfield, Dronfield and Woodseats. The scheme consists of ‘two main interventions, at Heeley Bottom and Meadowhead, and a range of smaller items along the route’.

**Figure 3.15 Logic Map for Key Route Improvements on Chesterfield Road**



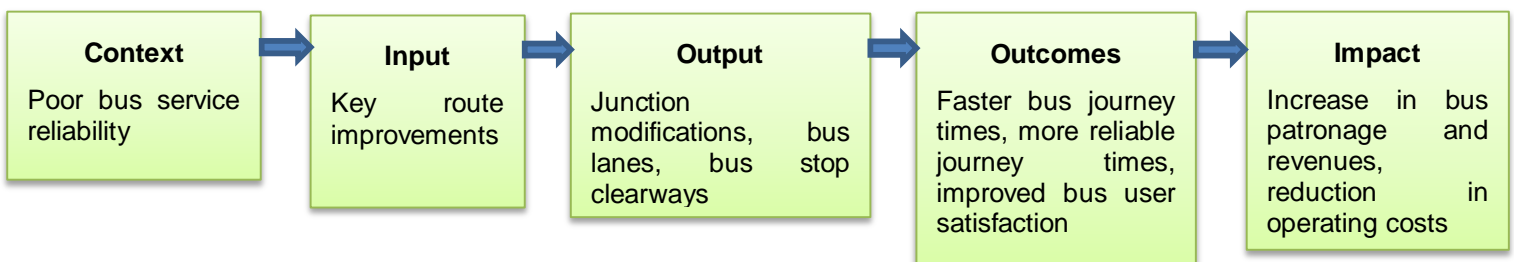
3.92 As with the Sheffield-Gleadless corridor, it would not be possible to isolate the impact of each individual intervention, but it would be possible to quantify the effect of the collection of measures along the corridor. There are approximately 48 buses per hour per direction and nine different services operating along the corridor that will be impacted by these interventions. Again, the counter-factual for determining the effects on bus patronage would be all remaining bus routes in Sheffield not influenced by the six key route improvements.

3.93 In line with the Sheffield-Gleadless corridor, bus patronage data would be collected across the nine routes, journey times and journey time reliability would be monitored and PVR costs would be recorded pre and post implementation.

*Penistone Road*

3.94 This corridor serves the north of the city and can be particularly congested during peak periods. With 20 buses per hour per direction, the proposed interventions are expected to make journey time savings of up to 6 minutes per bus.

**Figure 3.16 Logic Map for Key Route Improvements Penistone Road**



3.95 The logic map above is the same as that for Chesterfield Road, highlighting the same outcomes and impacts that would be recorded through this evaluation.

3.96 The key indicators that would be adopted to measure the effects of these interventions include changes in bus patronage, changes in journey times, changes in journey time reliability, and changes in operating costs for operators. As a result the same datasets detailed in the Chesterfield Road and Sheffield-Gleadless sections above would be collected.

*North Sheffield II*

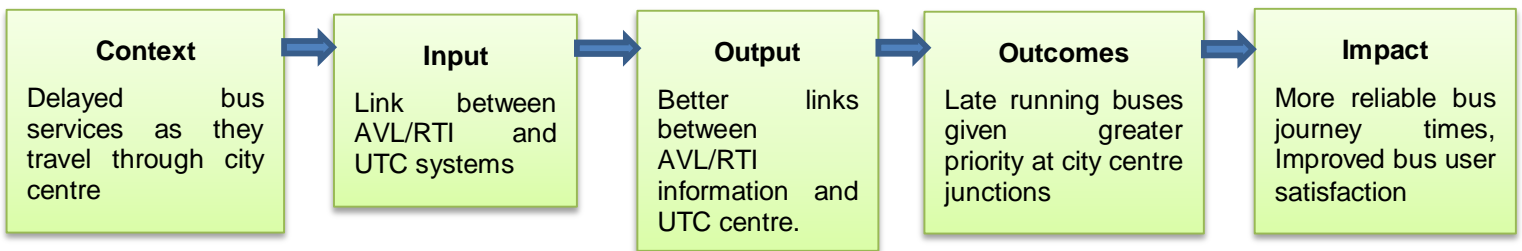
3.97 This scheme is made up by a mixture of bus priority measures, highway modifications and signalling improvements, including the use of real-time detection for buses. Again, the impacts of these measures cannot be quantified in a disaggregated form but can be measured across the whole corridor. The logic map for this corridor is the same as in Figure 3.16 above.

3.98 As with the key routes discussed above, the key datasets that would be required to measure the impacts of these interventions include bus patronage data, AVL data, AVL data in comparison to timetabled journey times, and PVR for each affected route.

*Sheffield City Centre*

3.99 The city centre is the key focal point of the vast majority of bus routes across Sheffield. However the city centre is also well developed with few opportunities to make significant changes to the road network to improve bus services. The proposal within the BBA programme is therefore to ‘improve the links between the central RTI system and the central UTC. This would enable the traffic control strategy to give preference to particular areas at specific times, for example, based on the density of late running buses’.

**Figure 3.17 Logic Map for Sheffield City Centre Key Route Improvements**



3.100 This scheme differs from those discussed above as it does not rely on any form of engineering along the road network. The key objective of the scheme is to reduce bus journey times as they travel through the city centre. Therefore a key indicator to assess the impact is to examine bus journey times and journey time reliability. AVL journey time data would therefore be examined with bus stops determined for each route before it enters the city centre area and bus stops immediately after the bus departs the city centre. It is important to be consistent between which stops are selected and at which points. The time from when a bus departs a bus stop to the time that it arrives at a bus stop the other side of the city centre would be measured across a period of one month with an average journey time for each route obtained. Data would also be disaggregated by time period i.e. AM peak, interpeak and PM peak.

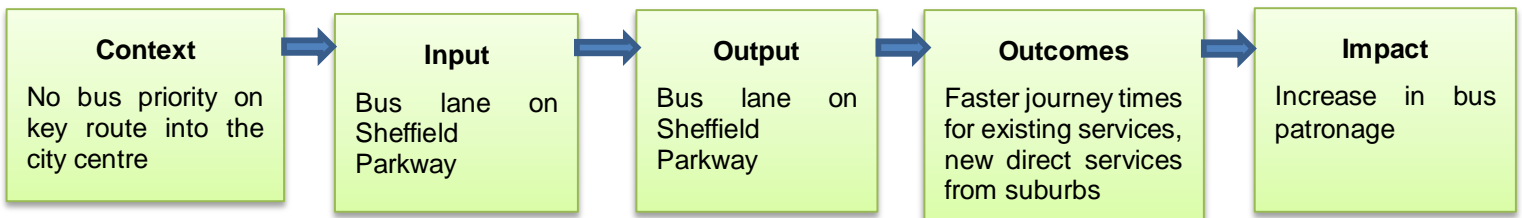
3.101 Given that over 85% of bus services will benefit from these measures within the city centre, attempting to assess the effects on patronage as a result of simply these interventions would be a futile exercise as there is no realistic comparator area. It is therefore proposed that only journey time and journey time reliability are monitored to measure the effects of the intervention.

3.102 It would also be desirable to measure the effects of the intervention on car journey times. If possible, car journey time data should also be obtained as a further input to estimating the overall benefits and costs of the measures implemented. Pre-implementation data should be collected during part of the same time period as for the bus AVL data collection. Depending on routine local data collection efforts that may be taking place anyway, this could be done using GPS units in survey cars, conventional journey time surveys or possibly buying data from commercial services providers such as INRIX or Trafficmaster.

*Parkway*

3.103 'This scheme envisages the introduction of a bus lane on Sheffield Parkway, one of the main routes into Sheffield for car users from the M1. The Parkway is not used by many buses at present due to the levels of congestion experienced at peak times and the lack of stops. However, operators have stated that improved journey times on this route would open the market for car-competitor bus services for large areas of eastern Sheffield, such as Handsworth and further out to Brinsworth and Aston. It will also be able to serve the important development sites around Waverley and the old Airport, including the Advanced Manufacturing Park (AMP) further along the Parkway in Rotherham'.

**Figure 3.18 Logic Map for Parkway Key Route Improvements**



3.104 Bus journey times can be measured along the parkway for existing services such as the X7 between Sheffield and Rotherham pre and post implementation. In addition, journey times for services accessing the city centre from Handsworth and Brinsworth can be measured to assess the impact on journey times for those passengers should there be significant route changes once the Parkway bus lane has been implemented.

3.105 Unfortunately it is difficult to measure the effects of the intervention on bus patronage due to the brand new nature of the bus lane. In reality, the bus lane along the Parkway will be implemented in the hope that bus operators introduce new services. However, service X7 between Rotherham and Sheffield will benefit significantly from the bus lane, and patronage on that service should be monitored pre and post implementation. Datasets would be monthly passenger numbers on the X7, preferably disaggregated by passenger type. As the focus of this would be on one service, it is important to highlight again the commercially sensitive nature of this data and therefore any data presented for this one route within the baseline data collection report would be redacted but made available to whoever carries out the post implementation evaluation study.

3.106 It would also be desirable to measure the effects of the intervention on car journey times. Therefore, car journey times inbound along the Parkway would be recorded pre and post implementation at directly comparable times of day (AM peak would be preferable) and times of the year. Any in-bound AM peak vehicle counts that are carried out along the parkway pre-implementation would also be collected.

Potential overall data collection plan

3.107 Table 3.3 summarises the potential overall data collection plan for Sheffield.

**Table 3.3 Sheffield BBA Potential Data Collection Plan**

| Scheme                                    | Objectives / Outcomes  | Research Question | Indicators   | Pre-Implementation Data Required   |
|---|--|-------------------|--|--|
| Hotspot Improvements                      | <p>Reduce bus journey times</p> <p>Improve bus journey time reliability</p> <p>Increase bus patronage</p> <p>Improve bus user satisfaction</p>                                   | 1, 2, 6           | <p>Absolute and % change in average bus journey times in up to 3 areas</p> <p>Absolute and % change in bus journey time difference from timetabled journey times</p> <p>Changes in bus patronage (% and number of passengers)</p> <p>Change in level of user satisfaction (% of users satisfied or very satisfied with different aspects of service)</p> | <p>AVL data for the length of those routes affected by the interventions. Dataset should be for a period of 1 month (October), but disaggregated by AM peak (7am – 9.30am), Inter Peak (9.30am – 3.30pm) and PM Peak (3.30pm – 6pm)</p> <p>The variance of differences from timetabled journey times would be assessed</p> <p>Bus patronage, disaggregated by route and passenger type (if available), on affected routes and non-affected routes (comparator) within Sheffield</p> <p>User satisfaction surveys</p> |
| Improvements to the use of the UTC centre | <p>Improve bus journey time reliability</p>  | 1, 2              | <p>Absolute and % change in bus journey time difference from timetabled journey times</p>  | <p>AVL data for the length of those routes affected by the interventions. Dataset should be for a period of 1 month (October), but disaggregated by AM peak (7am – 9.30am), Inter Peak (9.30am – 3.30pm) and PM Peak (3.30pm – 6pm)</p> <p>The variance of differences from timetabled journey times would be assessed</p>   |
| Audio-visual Equipment                    | <p>Improve bus user satisfaction</p>   | 1, 2              | <p>Change in level of user satisfaction (% of users satisfied or very satisfied with different aspects of service).</p> <p>Changes in make-up of bus passengers (% and number of passengers)</p>   | <p>Bus patronage, disaggregated by passenger type (if available), on route 120 and non-affected routes (comparator) across Sheffield</p> <p>User satisfaction surveys</p>  |
| RTI                                       | N/A  |                   |  |  |
| KRI – Sheffield-Gleadless                 | <p>Reduce bus journey times</p> <p>Improve bus journey time reliability</p> <p>Increase bus patronage</p> <p>Improve bus user satisfaction</p> <p>Reduce bus operating costs</p> | 1, 2, 3, 6,       | <p>Same as ‘Hotspot Improvements’ above</p>  | <p>Same as ‘Hotspot Improvements’ above, plus PVR, peak and off-peak headway of each affected route</p>  |



| Scheme                                   | Objectives / Outcomes   | Research Question | Indicators   | Pre-Implementation Data Required   |
|--|---|-------------------|--|--|
| KRI – Chesterfield Road                  | As above  | As above          | As above   | As above   |
| KRI – Penistone Road                     | As above  | As above          | As above   | As above   |
| KRI – Sheffield City Centre Improvements | Improve bus journey time reliability  | 1, 2, 6           | Absolute and % change in bus journey time difference from timetabled journey times<br><br>Absolute and % changes in car journey times  | AVL data for the length of those routes affected by the interventions. Dataset should be for a period of 1 month (October), but disaggregated by AM peak (7am – 9.30am), Inter Peak (9.30am – 3.30pm) and PM Peak (3.30pm – 6pm)<br><br>The variance of differences from timetabled journey times would be assessed<br><br>Car journey times around the city centre for the same time period (if available)  |
| KRI - Parkway                            | Reduce bus journey times<br><br>Improve bus journey time reliability<br><br>Introduce new direct services from some suburbs<br><br>Increase bus patronage | 1, 2, 3, 4, 5, 6  | Absolute and % change in average bus journey times for affected routes<br><br>Absolute and % change in bus journey time difference from timetabled journey times<br><br>Changes in bus patronage (% and number of passengers)<br><br>Change in level of user satisfaction (% of users satisfied or very satisfied with different aspects of service)<br><br>Change in scope of services from Brinsworth and Handsworth | AVL data for the length of those routes affected by the interventions. Dataset should be for a period of 1 month (October), but disaggregated by AM peak (7am – 9.30am), Inter Peak (9.30am – 3.30pm) and PM Peak (3.30pm – 6pm)<br><br>The variance of differences from timetabled journey times would be assessed for affected routes<br><br>Bus patronage, disaggregated by route and passenger type (if available), on affected routes and non-affected routes (comparator) within Sheffield<br><br>User satisfaction surveys<br><br>List/review of services operating in areas close to the Parkway<br><br>In-bound car journey times on Parkway during AM peak<br><br>Vehicle counts on Parkway during AM peak |

**West of England**

3.108 The West of England BBA programme entails a variety of interventions focussed on eight corridors, five of which radiate out from Bristol and three from Bath. Around Bath, interventions will focus on CCTV and bus lane enforcement. Around Bristol, interventions will focus upon upgrading bus stop infrastructure and providing CCTV images of traffic and incidents – where there is no provision at present. On most of these corridors, these improvements will be on the section of the corridor that sits outside of the Bristol City Council area as these sections have already received upgrades funded by alternative funding sources such as LSTF.

3.109 The Frontier Economics scoping note concluded that the impact evaluation of the West of England BBA scheme would be complex and therefore the focus of the impact evaluation

should be on Nottingham, Sheffield and Liverpool. The study team concurs with this conclusion and proposes that the West of England BBA be monitored in terms of process evaluation only.

### York

3.110 The York BBA programme will involve the following schemes:

- Congestion busting pot
- Bus wardens
- Rail station information point
- Improvements to traffic signals and small changes to kerblines

3.111 The Frontier Economics scoping note concluded that the impact evaluation of the York BBA scheme would be complex and therefore the focus of the impact evaluation should be on Nottingham, Sheffield and Liverpool. The study team concurs with this conclusion and proposes that the York BBA be monitored in terms of process evaluation only.

3.112 However, as discussed in the following chapter, the DfT has shown a desire to consider a qualitative evaluation of operators being provided with CCTV feeds to enable operators to respond more quickly to incidents on the network. As part of the process evaluation interviews, operators and council officers could be asked additional questions relating to their perceptions of the effects of having access to CCTV information. This would add to the qualitative evidence and build a more robust case study of evidence of these types of schemes. A sample of proposed questions is contained in Table 5.1 in Chapter 5.

### Additional Consideration

3.113 While the information above has set out the quantitative data that may be collected, there are qualitative data that will also be collected. In particular, there are schemes that will be implemented that cannot be quantitatively assessed, but where the views of operators would be valuable, to understand their perception of the value of those schemes.

3.114 The qualitative research will be carried out during the process evaluation phase and specific question themes and specific questions are included within Table 5.1 in Chapter 5.

3.115 During the development of the impact evaluation plan it became apparent that the DfT would specifically like to examine the evidence of impacts audio-visual equipment installed on-board buses on bus patronage. As noted above, Sheffield is likely to install AV equipment on board buses on one route (service 120) at some point following the autumn of 2015.

3.116 However, during discussions with Nottingham City Transport (NCT), the operator pointed out that it has taken the commercial decision to install AV equipment on board buses on specific routes, and plans to roll out this equipment on board all bus services over coming years. NCT has stated that it would be willing to share current, historic and future patronage data if the DfT wanted to explore the evidence of the impact of AV equipment – on the proviso that no commercially sensitive data is published or shared with a third party.

## 4 REFINED IMPACT EVALUATION BASELINE DATA COLLECTION PLAN

- 4.1 The study specification provided by DfT stated that it wished the evaluation team to '*scope out how this final evaluation study could be done and specifically how the baseline data collection will ensure a robust impact evaluation is carried out in 2019*'. The previous chapter set out whether and how the impact evaluation could be carried out for each BBA-funded scheme and this enabled the DfT to consider what it wants to achieve from the impact evaluation. The client and evaluation teams met to discuss this in September 2014 and decisions were taken by the DfT on which schemes in each BBA will be evaluated.
- 4.2 This chapter sets out the refined data collection plans for the BBA funded schemes that the DfT wishes to evaluate following full consideration of the discussion in Chapter 3. While it provides further detail of the datasets that will be collected pre- and post-implementation in order to evaluate each scheme, the precise details will be developed during September/October when the evaluation team will meet with each BBA again. This process will involve examining each dataset and defining exactly what data samples should be extracted for the baseline position. This approach is possible as most of the datasets are being collected and stored by either the authorities or bus operators on a continuous basis.
- 4.3 As noted in Chapter 2, the BBA evaluation will assess the impacts of the targeted schemes on carbon emissions and will also provide data to update the ex-ante economic evaluations prepared at the bid stage. These requirements have been taken into account in the following sections.

### Liverpool City Region

- 4.4 There are two BBA funded schemes that DfT would like to focus on within the Liverpool City Region:
- Housing estate bus stop improvements
  - Active traffic management infrastructure
- Housing estate bus stop improvements
- 4.5 This scheme lends itself well to this evaluation due to the defined geographic nature of the housing estates and the potential for the schemes to be replicated elsewhere in the UK if successful. The key indicators are:
- Absolute and % change in average bus journey times on the relevant routes
  - Absolute and % change in bus journey time difference from timetabled journey times
  - Changes in bus patronage (% and number of passengers)
  - Changes to PVR requirements related to headway on affected routes
  - Change in level of user satisfaction (% of users satisfied or very satisfied with different aspects of service)
  - Changes to carbon emissions
- 4.6 The following datasets are therefore required (baseline and post-implementation):

- ❑ AVL-based bus journey time data for a period of one month, for buses travelling in both directions from the last stop before each housing estate to the first stop after the housing estate (source: Merseytravel), together with appropriate comparator routes.
- ❑ Bus patronage on routes operating through each of the four housing estates (and appropriate comparator routes), with boardings at the bus stops within the housing estates disaggregated by passenger type (fare payer / concessionary pass holder). Where possible, data will be collected directly from bus operators for up to three years to show medium-long term patronage trends (source: bus operators). Operators have expressed a willingness to share this data with the evaluation team, although no specific requests have yet been made.
- ❑ User satisfaction survey outputs (source: Merseytravel using booster samples from the annual bus Passenger Focus survey). Booster survey samples will be carried out on routes that operate through the four housing estates (e.g. routes 17, 17a, 33, 89, 89a), but will not specifically be carried out with passengers boarding at the housing estates. Surveys will also ask specific questions relating to some of the schemes implemented, such as RTI, bus stop infrastructure etc.
- ❑ PVR and headway information (source: operators) for routes operating through the four housing estates.

4.7 It should be noted that by collecting the above datasets, it is anticipated that this evaluation will examine the effects of the package of measures implemented within the four housing estates on bus patronage. While the patronage effects of individual measures cannot be isolated, it is the view of the evaluation team that bus patronage can be monitored on an aggregated basis, and in particular, bus boardings within each of the estates.

4.8 While AVL and bus patronage data is available and will be reported in baseline data report (to be published in December 2014), it is likely that the Passenger Focus surveys will not be reported upon within that report as the 2014 data will not be available at that time. Merseytravel will therefore need to provide an addendum to the baseline data report once the survey outputs become available in the spring of 2015. It should be noted that two further booster samples will be obtained in spring 2016 (for an interim evaluation) and in spring 2019 (for the final evaluation).

4.9 Collecting data on the effects of the scheme on non-bus users is not appropriate for this scheme as the intervention will have little perceived impact on non-bus users.

#### Active traffic management infrastructure

4.10 This scheme involves introducing and upgrading SCOOT and MOVA technology to provide traffic signal priority at 26 junctions across the BBA area. From discussions with Merseytravel, this particular scheme takes a greater proportion of the BBA budget (approximately £1.7m) than the traffic management / highway infrastructure improvements scheme (approximately £0.6m). Therefore there is a preference for this particular scheme to be evaluated.

4.11 The key indicators for this scheme are:

- ❑ Absolute and % change in average bus journey times in defined corridors / areas
- ❑ Absolute and % change in bus journey time difference from timetabled journey times
- ❑ Changes in bus patronage (% and number of passengers)

- ❑ Absolute and % changes in car journey times
- ❑ Changes to PVR requirements related to headway on affected routes
- ❑ Change in level of user satisfaction (% of users satisfied or very satisfied with different aspects of service)
- ❑ Changes to carbon emissions

4.12 The following datasets will therefore be obtained:

- ❑ AVL-based bus journey time data for the length of those routes affected by the interventions with more than one junction on a given corridor, and either side of a junction where there is just one intervention per corridor. Datasets should be for a period of 1 month, disaggregated by AM peak (7am – 9.30am), Inter Peak (9.30am – 3.30pm) and PM Peak (3.30pm – 6pm) (source: Merseytravel).
- ❑ Bus patronage, disaggregated by route and passenger type (if available), on affected routes and non-affected routes (comparator) within the Liverpool City Region. Where available, patronage data will be collated for up to 3 years before implementation to provide historic patronage trends (source: bus operators).
- ❑ PVR, peak and off-peak headway of each affected route (source: bus operators).
- ❑ User satisfaction as measured through Passenger Focus surveys (source: Merseytravel).
- ❑ Car journey times along each affected corridor for the same time period (Merseytravel via Trafficmaster data). This data may only be available for certain corridors (dependent on the location of Trafficmaster cameras); the exact extent of the available data will be established during the baseline data collection period.

4.13 The exact data that will feed into the baseline position will be further defined and collected in October 2014 once the evaluation team have met again with Merseytravel and the participating bus operators. This includes defining those non-affected comparator routes that should provide the counter-factual. Finally, where possible and practical, datasets will be collected for a period of 2-3 years before implementation in order to set out the historic trends to inform the pre and post implementation evaluation.

### **Nottingham**

4.14 There are three BBA funded schemes that DfT would like to focus on in Nottingham:

- ❑ AVL signal priority
- ❑ Smartcard retail network
- ❑ CCTV feed to operator's control centres

4.15 In addition, DfT would like to take up the option of carrying out an evaluation of Nottingham City Transport's own commercial initiative to introduce audio-visual (AV) displays and announcements on selected bus services in Nottingham in recent years.

#### AVL signal priority

4.16 Nottingham City Council intends to implement signal priority for buses using AVL data at six junctions across Nottingham to give late running buses greater levels of priority.

4.17 The key indicators for evaluating this scheme are:

- ❑ Absolute and % change in average bus journey times through the affected junctions (with late running buses identified where possible)
- ❑ Absolute and % change in bus journey time difference from timetabled journey times (with late running buses identified where possible)
- ❑ Change in level of user satisfaction (% of users satisfied or very satisfied with different aspects of service)
- ❑ Absolute and % changes in car journey times

4.18 The following datasets will therefore be obtained:

- ❑ AVL-based bus journey time data through the targeted junctions (with late running buses identified where possible). Datasets should be for a period of 1 month, disaggregated by AM peak (7am – 9.30am), Inter Peak (9.30am – 3.30pm) and PM Peak (3.30pm – 6pm) (source: bus operators).
- ❑ Change in level of bus user satisfaction - % of users satisfied or very satisfied with different aspects of service (source: Nottingham City Council survey).
- ❑ Car journey times along each affected corridor for the same time period as for AVL journey time. The exact extent of the available data will be established during the baseline data collection period (source: Nottingham City Council).

4.19 The precise bus stops and locations between which AVL data will be collected to assess the effects of the scheme on bus journey times will be discussed further with the relevant bus operators who hold the AVL data. Bus operators have expressed a willingness to share these datasets. Impacts on patronage and on car journey times through the affected junctions will not be measured as they are likely to be small and not readily measurable through any monitoring work currently planned in Nottingham.

#### Smartcard retail network

4.20 As discussed in the previous chapter, the smartcard retail network can be evaluated with scheme outputs monitored and changes in bus user satisfaction rates evaluated. The DfT is particularly keen to understand whether there is an added value of introducing a smart card retail network across an urban area and would like to consider how the benefits of the network can be recorded in a qualitative way.

4.21 The evaluation team will therefore work with Nottingham City Council officers to not only ensure that existing bus user surveys ask questions relating to the purchasing of smart tickets but also obtain, where available, qualitative feedback from passengers as to the value obtained.

4.22 In addition, discussions will also be held with council officers and operators on the perceived value of the smartcard retail network as part of the process evaluation phase (some sample questions are included towards the end of Table 5.1) and will contribute to the qualitative assessment of the scheme. This information will all be collated and a qualitative case study developed that sets out the likely effects of the scheme on passengers, bus operators and the council. This case study can then be completed through further qualitative research in the post-implementation evaluation phase.

### CCTV feed to operators' control centres

- 4.23 Providing operators with access to CCTV information is a scheme that several of the BBAs are looking to implement. In Nottingham the CCTV feed is being delivered directly to operator control rooms and the DfT is keen to understand, in a qualitative sense, the benefits that operators get from CCTV feeds.
- 4.24 As part of the process evaluation interviews, operators benefitting from this CCTV feed (NCT and Trent Barton) will be asked a series of questions relating to their views and perceptions of the benefits they see from access to live CCTV images. A sample of such questions are included within Table 5.1, although the discussion will not be limited to these questions and the interviewers will use their knowledge to obtain sufficient information upon which to assess the effects of the CCTV feed. Where possible, quantitative evidence will be obtained. However, this will be on a case by case basis and entirely dependent upon guidance from the operators.
- 4.25 The key output from this process will be qualitative case studies, developed in consultation with the operators, that set out the different benefits (or otherwise) of having access to live CCTV feeds.

### AV equipment on NCT routes

- 4.26 Nottingham City Transport (NCT) has introduced AV equipment on board buses on selected routes as part of a rolling programme of vehicle upgrades. Discussions with NCT suggest that AV equipment is installed on vehicles as the operator upgrades vehicles on a route by route basis. Therefore the evaluation of AV equipment will be aggregated with any possible effects of new vehicles on a route.
- 4.27 The key indicator will be:
- Changes in bus patronage (% and number of passengers) – overall and disaggregated by type of bus passenger (fare-paying / concessionary pass holder)
- 4.28 The evaluation team will work with NCT during September / October to determine which routes have AV equipment installed and from what date, and then obtain patronage data for those routes disaggregated by passenger type (adult fare payer, child fare payer, concessionary pass holder). Patronage data will then be obtained from the remaining bus network (excluding those routes which have suffered from major tram and road works), also disaggregated by passenger type. Datasets will be obtained for up to 3 years before AV equipment was introduced (subject to availability) and for the post-implementation period up to October 2014.
- 4.29 Since AV has already been implemented on a number of routes, an evaluation of impacts (rather than just establishment of a baseline position) can be produced during the baseline data collection period. It is anticipated that the Nottingham AV impact evaluation results will be reported in a separate standalone note that would form an appendix to the baseline data report in December 2014.

### **Sheffield**

- 4.30 There are two BBA funded schemes that DfT would like to focus on in Sheffield:
- Key route improvement - Sheffield City Centre improvements
  - On-bus audio-visual equipment

### Sheffield City Centre improvements

- 4.31 This scheme aims to use existing infrastructure more intelligently and efficiently by improving the links between the central RTI system and the central UTC centre to enable late running buses to travel through the city centre with fewer delays.
- 4.32 The key indicators are:
- ❑ Absolute and % change in average bus journey times through the city centre
  - ❑ Absolute and % change in bus journey time difference from timetabled journey times
  - ❑ Absolute and % changes in car journey times
- 4.33 The following datasets will therefore be obtained:
- ❑ AVL-based bus journey time data for the length of those bus routes affected by the interventions, disaggregated by section of route within city centre. Dataset should be for a period of 1 month but disaggregated by AM peak, Inter Peak, and PM Peak
  - ❑ Car journey times between locations within the city centre, disaggregated by peak period, subject to locations of Trafficmaster ANPR cameras (source: Trafficmaster data held by SYPTE or their consultants)
- 4.34 In order to disaggregate AVL journey time data by the section of route within the city centre, relevant bus stops for each route before it enters the city centre area and bus stops immediately after the bus departs the city centre will be determined through discussions with SYPTE. The time from when a bus departs a bus stop to the time that it arrives at a bus stop the other side of the city centre will be measured across a period of one month with an average journey time for each route obtained.
- 4.35 Following further discussions with SYPTE, it transpires that there will be two 'hot spot' improvements carried out close to the city centre. One of these is to be located on Lady's Bridge at the northern edge of the centre and is likely to impact on a number of bus routes. Therefore, the precise locations of bus stops from which buses are timed using the AVL equipment will need to be carefully defined in order to isolate the effects of the scheme from the hot spot improvements.
- 4.36 The required baseline data is already available and is held by SYPTE. The evaluation team will work with SYPTE officers to define the precise locations of bus stops at the earliest opportunity following the approval of this plan.

### On-bus audio-visual equipment

- 4.37 The evaluation of AV equipment has been selected in order to complement the ex-post evaluation of AV equipment that will be carried out in Nottingham during the autumn of 2014. The primary aim of this evaluation is to understand the effects of AV equipment on bus patronage and to provide evidence of the benefits of on-bus AV equipment.
- 4.38 The key indicators are:
- ❑ Absolute and % change in bus patronage on service 120
  - ❑ Absolute and % change in types of passengers using service 120
  - ❑ % change in users satisfied or very satisfied with different aspects of service 120



- 4.39 The following datasets will therefore be obtained:
- ❑ Bus patronage on service 120 for up to 3 years pre-implementation (disaggregated by month, and by passenger type) on both First and Stagecoach services
  - ❑ Bus patronage on all other services across Sheffield as the counter-factual
  - ❑ Bus passenger user satisfaction survey outputs
- 4.40 Attempts will be made to evaluate the effects of the AV equipment on bus patronage removing the influence of external factors that could affect patronage. As a result, all services operating in Sheffield will act as the counter-factual.
- 4.41 Overall, the data required to evaluate the two main schemes in Sheffield will be available and the baseline data will be collected during October and November 2014.

## 5 PROCESS EVALUATION DESIGN AND DATA COLLECTION PLAN

5.1 One of the key objectives of the evaluation of the BBA is to “improve the working relationship between local authorities and operators”. It is therefore necessary to monitor and examine the processes that local authorities and bus operators put in place in order to understand areas of successful and less-successful partnership and lessons learned. This knowledge can then be used to highlight areas of good practice that other local authorities could adopt if there were to be further devolution of BSOG in future.

### Process Evaluation Methodology

5.2 The proposed process evaluation methodology is based on semi-structured interviews with authorities and operators to understand their views of what has worked well and areas for improvement. These will be undertaken in the Autumn of 2014, and will then need to be repeated at least once (and preferably twice) more during the course of the four year BBA programme and once at the end of the programme. This will give a good picture of how issues evolve and are resolved within each of the partnership structures.

5.3 Between September and November 2014, face to face interviews and telephone interviews will be carried out by the study with local authority officers in all five BBAs and a senior member of staff from the key bus operators in each BBA. Within the process evaluation, it is important to not only consider the views of the largest bus operators (in terms of BSOG devolved within the BBA), but also smaller operators as the devolution of BSOG may have a disproportionate effect on their businesses (which typically operate at lower profit margins). In each BBA, every operator will be contacted and invited to be interviewed. If operators decline to be interviewed (our experience of speaking to operators thus far is that they have been very happy to talk openly about the BBA programme and are happy to take part in the process evaluation) – then we would ask why they do not wish to take part and report as appropriate.

5.4 Face to face interviews may be more likely to elicit more in depth and robust responses whereas telephone interviews may be more limited in scope to obtain sufficient evidence and information from operators. As a consequence, face to face interviews will be used wherever possible. However, where it is impractical to meet with an operator or where they have very limited involvement and engagement with the BBA, then telephone interviews will be used to obtain their views and perceptions.

5.5 Each interview will be carried out using a semi-structured series of questions that are targeted at obtaining maximum information relating to previous partnership arrangements, how the current arrangements came about, how the current arrangements work (or otherwise) in practice and how stakeholders envisage partnership arrangements developing in future, both through the BBA programme and in other areas of work. The study team has developed a semi-structured series of questions to guide stakeholder interviews and these are presented in the following section.

5.6 When interpreting the responses from operators, some weighting will be given to those operators who have contributed the most to the BBA fund through the devolution of BSOG.

### Semi-Structured Questionnaire

5.7 Following meetings with BBA authorities and bus operators across all five BBAs, the study team has developed a generic semi-structured topic guide in order to guide each interview

and extract sufficient information in order to assess how the BBA programme has affected the relationships and the level of partnership working between local authorities and bus operators.

5.8 There are six question themes that have been developed, and for each of these themes a series of questions that should be asked of local authorities or bus operators or both. This series of questions is a generic topic guide that covers the need to speak to local authorities and bus operators in all five BBAs. In advance of each interview, it will be the role of the interviewer to tailor each interview to the needs of each BBA to ensure that appropriate questions are asked. The generic questions are presented in Table 5.1.

**Table 5.1 Stakeholder Interview Themes and Questions**

| Question Themes                                      | Questions   |
|--|---|
| Partnership arrangements before BBA                  | <p>Were there any formal or informal LA/operator partnership arrangements in place before BBA? If so, what did they entail?</p> <p>How do you think the arrangements were performing before BBA?</p> <p>If you were not part of a partnership before, were there any reasons why not? How did things operate within your area without any arrangements?</p>   |
| Establishing the BBA and agreeing on the BBA schemes | <p><b>To Local Authorities</b></p> <p>What were your reasons for bidding for BBA funding?</p> <p>How did you approach operators to take part?</p> <p>Were operators willing to take part? Did any operators require any encouragement? If so, how? Where there any issues that had to be addressed?</p> <p>Were operators involved in the development of the schemes? If yes, how? If no, why not?</p> <p><b>To Operators</b></p> <p>Were you involved in the development of the BBA bid in your local area? How?</p> <p>Were you involved in the formation of proposed schemes to be funded through BBA? If yes, how were you involved? Please provide details. If no, was there a reason behind this?</p> <p>Why did you want to take part in the BBA programme?</p> <p>What did you want to gain from being involved in BBA?</p> <p>Are there any risks to your involvement in BBA? If so, what are these risks and how do you intend/hope to manage them?</p> |

| Question Themes   | Questions   |
|---|---|
|   | <p>How did the partnership agree on the schemes that would be implemented under BBA?</p>  |
| <p>The new BBA arrangements</p>                             | <p>Please give an overview of the type of BBA governance arrangements adopted.</p> <p>What contact is there between BBA partners?</p> <p>How often does the BBA partnership meet?</p> <p>How are decisions made within the partnership?</p> <p>Do you feel your interests are met through the partnership? If yes, how? If no, why not?</p> <p>Are you aware of what schemes will be implemented and the timetables for implementation? If no, why not?</p> <p>Are any changes from the BBA bid managed appropriately within the partnership arrangements?</p> <p>How are expectations around delivery and implementation of schemes managed?</p> <p>As a partner do you feel your opinion is listened to, can you hold other partners to account? Why / why not? How are partners held to account?</p> |
| <p>Implementation</p>                                       | <p>Have the governance arrangements of the BBA so far met your expectations? How? Why? Why not?</p> <p>Were any specific targets or success factors defined which would measure how the partnership is working – are they being met?</p> <p>Are there any elements of the partnership arrangements that have been better or worse than you expected? Why?</p> <p>Has partnership working improved or got worse compared to (formal or informal) arrangements in place before BBA? Why?</p> <p>Are there any unforeseen issues that have arisen through BBA? How were they dealt with?</p> <p>Has this BBA affected your working relationships with other partners? If yes, how? If no, why not?</p>   |
| <p>Problem resolution/flexibility/adaptability/feedback</p> | <p>Have there been any disputes in the development and/or delivery of the BBA programme? What? How were they dealt with?</p> <p>What arrangements are there in place to deal with resolving disputes?</p>   |

| Question Themes               | Questions  |
|-------------------------------|--|
|                               | <p>Are there any monitoring or feedback structures in place so that lessons can be learned, or opportunities taken advantage of?</p>   |
| <p>The future</p>             | <p>Based on your experience so far, how do you see the partnership arrangements continuing over the course of the five years of the BBA programme? Why?</p> <p>Is there anything that you think could be done in future to ensure partnership arrangements are maintained or improved?</p> <p>Is there anything that you foresee that could jeopardise the BBA partnership arrangements over the coming years?</p> <p>Do you feel that the proposed BBA schemes might be able to offer better or less value for money than BSOG did? Why?</p>  |
| <p>BBA specific questions</p> | <p><u>York, Nottingham, Sheffield, WoE:</u></p> <p>What impacts have there been following the introduction of the CCTV feed / staff member within the CCTV control centre?</p> <p>How has this affected your operations?</p> <p>In your opinion, do you think this initiative is good or poor value for money? Why?</p> <p><u>WoE:</u></p> <p>What are your views of the extension of bus corridor improvement measures?</p> <p>Have these benefitted your operations? How?</p> <p>Do you feel the schemes delivered through BBA would have been delivered either by the operator or by the LA in the absence of the BBA partnership?</p> <p><u>Nottingham and York</u></p> <p>How will the smartcard retail network affect how passengers purchase PT tickets?</p> <p>What benefits do you think will be obtained from the delivery of the smartcard retail network?</p> <p>Are there any issues that you foresee with the delivery and ultimate functioning of the retail network?</p> |

## 6 SUMMARY AND NEXT STEPS

- 6.1 This report has set out the proposed Evaluation Plan for conducting an impact evaluation and process evaluation of the BBA programme. This includes the proposed methodology for collecting and collating all available data sources, taking account of the nature of the schemes in each BBA and data availability. Further detail on the precise locations and periods of data collection will be resolved through cooperative working with the BBA authorities and bus operators as the baseline data collection period progresses.
- 6.2 We would request that DfT and the wider steering group consider and approve this plan in order for the study team to progress to the next stage of collating, collecting and analysing data and information. Following agreement of the Evaluation Plan the next steps are as follows:
- ❑ September to November 2014 – collect and collate baseline data for impact evaluation and carry out interviews for process evaluation.
  - ❑ December 2014 – produce baseline data report and circulate amongst steering group members.
  - ❑ February 2015 – produce overarching evaluation report setting out future data collection activities and how the data can be analysed to answer the key research questions and objectives of the BBA programme.