
Technical Report

Greater Bristol Bus Network Monitoring Report

Prepared for
The West of England

18 June 2014



Bath & North East Somerset, Bristol, North Somerset and South Gloucestershire
Councils working together to improve your local transport

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Document history

This document has been issued and amended as follows:

Version	Date	Description	Created by	Checked by	Approved by
0.1	06 May 2014	Working draft for UA comment	G Dean / S Guy 06 May 2014	D Carey 06 May 2014	G Dean 06 May 2014
0.2 and 0.3		<i>CH2M Internal versions only</i>			
0.4	14 May 2014	Revised draft for UA comment	G Dean / S Guy 14 May 2014	<i>Not checked</i>	G Dean 14 May 2014
0.5	15 May 2014	2 nd Revised draft for WoE Comms	G Dean / S Guy 15 May 2014	<i>Not checked</i>	G Dean 15 May 2014
0.6	16 May 2014	3 rd Revised draft for UA comment	G Dean / S Guy 16 May 2014	G Dean 16 May 2014	G Dean 16 May 2014
0.7	21 May 2014	4 th Draft for HoTs comment	G Dean / S Guy 20 May 2014	D Carey 20 May 2014	G Dean 21 May 2014
0.8	05 June 2014	Final Draft	G Dean / S Guy 05 June 2014	D Carey 05 June 2014	G Dean 06 June 2014
0.9	10 June 2014	Revised Final Draft (<i>minor changes only</i>)	G Dean 10 June 2014	n/a	G Dean 10 June 2014
1.0	18 June 2014	Issued Report	G Dean 18 June 2014	n/a	G Dean 18 June 2014

Acronyms and Abbreviations

AAWT	Annual Average Weekday Traffic
ANPR	Automatic Number Plate Recognition
APS	Active Person Survey
AQMA	Air Quality Management Area
ATC	Automatic Traffic Count
B&NES	Bath and North East Somerset (council)
BBAF	Better Bus Area Fund
BCC	Bristol City Council
BVPI	Best Value Performance Indicator
DfT	Department for Transport
ETM	Electronic Ticket Machine
GBBN	Greater Bristol Bus Network
GPS	Global Positioning Satellites
HOV	High Occupancy vehicle (2+)
ITN	Integrated Transport Network
JLTP	Joint Local Transport Plan
JTEC	Joint Transport Executive Committee
KSI	Killed or Seriously Injured (for accidents)
LSTF	Local Sustainable Transport Fund
MSBC	Major Scheme Business Case
MOVA	Microprocessor Optimised Vehicle Actuation (traffic signals)
NSC	North Somerset Council
QPS	Quality Partnership Scheme
RTI	Real Time Information
SGC	South Gloucestershire Council
SVD	Selective Vehicle Detection (<i>priority for late running buses</i>)
WEST	West of England Sustainable Travel

Introduction

1.1 Background to the GBBN

The Greater Bristol Bus Network (GBBN) is a network of 10 'showcase' bus routes across the four West of England authorities. These four authorities are Bath & North East Somerset (B&NES), Bristol City Council (BCC), North Somerset Council (NSC) and South Gloucestershire Council (SGC). The GBBN grew out of discussions between the authorities as they developed their first Joint Local Transport Plan (JLTP) in 2006 and recognised the cross-authority nature of travel including bus routes in the four West of England authorities. The activities across the four authorities are coordinated through the Joint Transport Executive Committee (JTEC) made up of elected members of all four councils.

The GBBN was developed at a time of a low level of satisfaction in local bus services in the West of England. Overall punctuality was poor, and the main bus operator First was called to Traffic Commissioner's public inquiry on a number of occasions to explain poor time-keeping. Negative local media reports were common, and there were few new entrants to the local bus market.

The GBBN Major Scheme Business Case (MSBC) was developed to cover 10 strategic bus corridors with the key outcomes to improve and upgrade the bus network infrastructure, and enhance the bus passenger experience with better buses and improved information and reliability; reducing congestion and reducing emissions. The GBBN was also developed to deliver substantial improvements to the speed, quality, reliability and attractiveness of bus services.



The total £80 million investment in the GBBN comprised of £42.3 million of grant funding from the Department for Transport (DfT), a contribution of £22.5 million from First and a local and developer contribution of £15.2 million. This was within 0.5% variance of the budget.

Over the course of the project, the funds invested in GBBN have increased by £11.4 million (£2.5 million from First and £8.9 million in additional local contributions and developer contributions). This funding has been for measures above and beyond those in the GBBN.

The GBBN built upon the success of two previous 'Showcase' bus routes in the West of England, which were the A38 (Showcase 1) and A420/A431 (Showcase 2) corridors, which saw investment in new buses, bus priority measures, and bus stop infrastructure. These 10 corridors were chosen as the main bus corridors in the west of England that had not already been improved under the Showcase 1 and 2 projects.

There was a holistic approach to the corridor reviews, including reviews of waiting and loading restrictions, traffic signal operation, banned turns and street furniture. As well as giving local people the

chance to comment on the proposals, the consultations also demonstrated support for many measures including new crossing points and improving access to local shops and facilities.

The 10 GBBN corridors are shown in **Appendix A**, and these, along with the local councils responsible are:

- Corridor 1 - M32 to Bristol City Centre (BCC and SGC);
- Corridor 2 - A4018 Cribbs Causeway to Bristol City Centre (BCC and SGC);
- Corridor 3 - A4 Bath to Bristol City Centre (B&NES and BCC);
- Corridor 4 – Cribbs Causeway to Bristol City Centre via Bradley Stoke and Filton Avenue (BCC and SGC);
- Corridor 5 – A432 Chipping Sodbury / Yate to Bristol City Centre via Fishponds Road (BCC and SGC);
- Corridor 6 – Midsomer Norton / Paulton to Bristol City Centre via A37 Wells Road (B&NES and BCC);
- Corridor 7 – A4174 Cribbs Causeway to Emersons Green via the Ring Road (SGC);
- Corridor 8 – A370 Weston-super-Mare to Bristol City Centre (BCC and NSC);
- Corridor 9 – A369 Portishead to Bristol City Centre (BCC and NSC); and
- Corridor 10 – A367 Midsomer Norton to Bath City Centre (B&NES).

The scheme was delivered in partnership with the four local authorities and the local bus operator, First. All five partners worked together on the bid to ensure key congestion hot spots were identified for bus and road improvements.

The councils, working in partnership with First, have brought the 10 key corridors up to Showcase standard with:

- Over 120 new buses;
- Nearly 1,000 improved bus stops - new shelters, new information panels, level access;
- More than 300 new real time information (RTI) displays;
- New bus priority signals at junctions that turn green when buses approach helping them stay on time;
- Bus priority lanes allowing buses to bypass general traffic;
- Improvements to pedestrian and cycle access and safety;
- Road widening in key traffic hot spots;
- Tree planting and public realm / environmental improvements in local areas; and
- Marketing and promotion initiatives.

During the course of the GBBN, a new operator Wessex (part of the Rotala Group) started to operate commercial bus services in many parts of the West of England area. These are largely based around serving the University of the West of England, the University of Bristol, the University of Bath, and Bath Spa University, but are not exclusively for students, so there was an overall improvement in the range of travel options and bus frequencies. Services on the GBBN routes are also operated by other bus operators such as Abus and Somerbus.

1.2 Examples of improvements

Through the GBBN, there has been considerable investment in the local highway to improve the reliability of buses. General road widening, and cycling and pedestrian improvements were also delivered to maximise benefits to all road users. Reducing congestion and journey times by encouraging sustainable transport not only improves health and contributes to climate change mitigation, but it also helps to strengthen the economy through, for example, attracting new investment from businesses and by reducing the amount of time employees spend in traffic congestion. Examples of projects include:

- In Stoke Gifford, near key employers such as Ministry of Defence and the University of the West of England, there have been a number of improvements including widening the Abbey Wood roundabout for a new bus lane for buses, taxis and motorcycles. There have been improved cycling and pedestrian facilities, and priority vehicle lanes on the A4174 Ring Road and Coldharbour Lane for buses, car sharers, taxis, motorcyclists and heavy goods vehicles.
- On the A4 approach to Bristol, adjacent to the Brislington park and ride there has been an additional traffic lane which has also benefited buses and improved traffic flow. The road on the westbound approach to M5 junction 21 was widened to include a peak hour bus lane.
- As well as a northbound bus lane on the A4018 Whiteladies Road, there have been other environmental improvements to the street-scene including parking improvements and traffic calming measures.
- On the A432 Fishponds Road there has been an extension of the existing bus lane to speed up buses, and the remodelling of the junction with Muller Road has increased capacity for all road users.
- The highway widening and improvements to the traffic signals on the A369 with M5 junction 19 has provided priority for buses and also improved capacity for all road users.

These are just a few of the many improvements across the region which together improve journeys for all road users.

As part of the programme Quality Partnership Schemes (QPSs) were 'made' under the Transport Act 2000 as amended by the Local Transport Act 2008. These schemes, which are some of the first to have been made in the UK, set out the ongoing partnership arrangements between the authorities and bus operators. There are six live QPSs that were made for the GBBN. B&NES made three - for corridors 3, 6 and 10. NSC made two for corridors 8 and 9. SGC made one for corridors 4 & 7 combined.

1.3 Timescales

The GBBN MSBC was given final approval from the DfT in May 2008. New buses were phased in by First over the duration of the project and measures were constructed in the period 2008 to 2012. The first corridor to be launched following completion was corridor 8 (A370) in March 2011, and the whole GBBN network was given a formal launch by the then transport minister, Norman Baker MP in March 2012.

Case Study: Corridor 2 - A4018 Whiteladies Road - Environmental Improvements

The GBBN measures for the Whiteladies Road part of corridor 2 include:

- bus stop, shelter, kerb, and information improvements (seen on all 10 GBBN corridors);
- new northbound bus lanes;
- clearly defined parking and loading bays;
- planters and better pedestrian crossing facilities; and
- new traffic signals at the Blackboy Hill gyratory and the St Pauls Road junction, with selective vehicle detection (SVD) for late running buses.

As part of the improvements for Whiteladies Road, the parking in the inter-peak outside the hours of bus lane operation was made limited time only, which again encouraged turnover of occupancy of the spaces, making it easier to park for access to shops and businesses.

Before:



After:



In 2013, the Whiteladies Road bus corridor received a Civic Society environmental award 2013.

Figure 1.1: The launch of the GBBN in March 2012



1.4 Other initiatives

Other transport projects and initiatives have also taken place in the areas of the four West of England local authorities during the period of the GBBN and the post GBBN evaluation period. These are complementary to the GBBN and include:

- Transport improvements for the Weston Package (Phase 1) MSBC which included improvements to the eastbound approach to the M5 junction 21 and improvements to Worle railway station;
- The Bath Package MSBC which has included complementary bus improvements in the Bath urban area to complement the GBBN measures,
- The Local Sustainable Transport Fund (LSTF). This is a £42m interconnected set of 10 projects under the West of England Sustainable Travel (WEST) banner. These are designed to stimulate growth and tackle carbon under the three themes of:
 - Stimulating Growth in Priority Areas - Tackling congestion to get business and our economy moving;
 - Connected and Thriving Centres - Completing end-to-end journeys; and
 - Transitions to a Low-Carbon Lifestyle – Training, skills and securing long term benefits.
- The Better Bus Area Fund (BBAF) Round 1 saw funding of £6.8m for improvements to the A38 and A420/A431 corridors which were older Showcase corridors, which pre-dated the GBBN. These improvements saw infrastructure and bus stop facilities improved to reflect GBBN standards, with new shelters, additional real time information, junction upgrades and environmental improvements. Buses are also having passenger Wi-Fi and next-stop displays, improvements to bus lane enforcement, and driver training. The BBAF also helped enable the introduction of the 'AvonRider' multi-operator ticket scheme;
- There was also £1.3m of funding under the BBAF Round 2 for improvements to eight corridors in the Bath and Bristol urban areas and link to Thornbury. These schemes include new and extended bus lanes, bus gates, CCTV monitoring and enforcement cameras, parking controls, improved signage, bus stop upgrades and extended active operational control of the road network to evenings, Saturdays and for events; and
- The joint Bristol and South Gloucestershire Cycling City project – a £23m project to double the number of cyclists over a three year period, with new on-street infrastructure and cycle-ways, and more cycle training.

Case Study: Corridor 9 - A369 Portishead to Bristol - Bus Service Enhancements

The GBBN improvements on corridor 9 include:

- *lane widening and new traffic signals at the A369 / M5 junction 19 approaches in both directions;*
- *a new westbound HOV lane at Martcombe Road;*
- *new signals at the St Georges Hill junction to enable buses to leave Pill and access the A369;*
- *the traffic signals were also refurbished at both the Abbots Leigh Road and Bridge Valley Road junctions; and*
- *all traffic signals have SVD for late running buses.*

Helped by the GBBN improvements to speed up buses along this corridor and also as part of LSTF 'kick-start' funding, First simplified three routes into two services X2 and X3, and doubled the previous joint frequency from 2 buses/r to 4 buses/hr along many parts of the routes. Buses were rebranded into the 'Express Yourself' livery, and buses with leather seats and free wi-fi were provided.

1.5 This report

The GBBN MSBC included an Evaluation Plan, setting out a range of strategic performance indicators through which the effectiveness of the GBBN project will be assessed towards achieving its objectives. These were:

- Bus patronage;
- Park and ride patronage;
- Bus user satisfaction;
- Bus punctuality;
- Rail patronage;
- Congestion;
- Area wide traffic levels;
- Proportion of high occupancy vehicles (HOV) on corridors;
- Air quality;
- Number of cycling trips; and
- Road safety (number of KSI and no. of slight injuries).

This report follows the structure of the indicators set out above, with various case studies highlighted throughout the report. The final chapter sets out some conclusions and makes some recommendations for monitoring of the GBBN going forward. The chapters of this report therefore are:

- Chapter 2 - Bus patronage
- Chapter 3 - Park and ride patronage
- Chapter 4 - Bus user satisfaction
- Chapter 5 - Bus punctuality
- Chapter 6 - Rail patronage
- Chapter 7 - Area-wide traffic levels and congestion
- Chapter 8 - Proportion of HOVs on corridor
- Chapter 9 - Air quality
- Chapter 10 - Number of cycling trips
- Chapter 11 - Road safety
- Chapter 12 - Conclusions and recommendations

Data for this report has been supplied by the four West of England authorities and the bus operators. No new data has been collected directly by CH2M HILL for this report.

Case Study: Corridor 3 - A4 Bath Road - Service enhancements

The GBBN improvements on corridor 3 include:

- *new traffic signals at Hicks Gate, Twerton Fork, Newbridge Road and Upper Bristol Road- all with SVD for late running buses;*
- *new eastbound and westbound bus lanes in sections between Callington Road to Stockwood Road;*
- *junction improvements at the Sandy Park Road junction to increase capacity and coordination of traffic signals and pedestrian crossings; and*
- *a new westbound bus lane between Paintworks and the 'Three Lamps' junction.*

The GBBN measures gave the opportunity for a range of service enhancements on the GBBN corridor 3. These included:

- *a co-ordinated timetable and ticket inter-availability between First and Abus between Bristol and Keynsham through a "Qualifying Agreement" with a net increase from 3 to 4 buses/hr on Mondays to Fridays;*
- *First merging their services 337 and 349 to create 338 (now 38) which has improved links from east Keynsham to Bristol and south Keynsham to Bath;*
- *New late night buses on 339 (now 39) on Mondays to Saturdays until 0100 from Bath and 0200 from Bristol;*
- *New daily hourly service A4 operated by RATP Bath Bus Co from Bath to Bristol Airport; and*
- *New vehicles on First X39.*

1.6 Summary of bus service enhancements along GBBN corridors

As noted earlier, many service enhancements are not solely down to the GBBN, but the GBBN measures have helped enable them. Other initiatives such as the LSTF, BBAF, and commercial decisions by the bus operators have also influenced these service enhancements. These service enhancements are summarised in Table 1.1 overleaf.

Table 1.1. Summary of bus service enhancements on the GBBN corridors

Corridor	Services	Service enhancements <i>(frequencies quoted are Mon to Fri daytime unless otherwise noted)</i>
1	X27 / X46 X49	A new commercial service X46 operates between Bristol and Yate by First. This is in addition to the previously supported X27 which Wessex now operates commercially and which no longer requires local authority support. The 689 is now re-numbered X49 and operated on a commercial basis therefore no longer requiring local authority support.
2	1 54 / 2	Increased from every 15 mins to every 12 mins in 2011, and now every 10 mins. Service 54 (now service 2) in Sept 2011 was increased from every 15 mins to every 12 mins, then to every 10 mins in Sept 2013.
3	1 X39	As noted above under corridor 2, service 1 increased from every 15 mins to every 12 mins in 2011, and now every 10 mins. In June 2011 - service X39 increased from every 15 mins to every 12 mins. <i>Other service enhancements are noted in the case study on the previous page.</i>
4	73	In Sept 2011 Service 73 Increased from every 15 mins to every 12 mins and to every 10 mins in Sept 2013.
5	48 / 49 13 X27, X46 X49 47, X47	In Apr 2012 some running times reduced. Also daytime frequency improved from every 20 mins to every 15 mins each, so creating a combined frequency of every 7/8 minutes. Wessex introduced this new service in September 2012 which uses a section of this corridor between Fishponds and Old Market. This has a current frequency of every 12 minutes. A new commercial service X46 operates between Bristol and Yate by First. This is in addition to the previously supported X27 which Wessex now runs commercially and so no longer needs local authority support. The 689 is now re-numbered X49 and operates on a commercial basis, and therefore no longer requires local authority support. These services (formerly the 342 & X42) also benefit from the measures installed in the Fishponds area and along the A4174 Ring Road
6	54 / 2 376 379	As noted above under corridor 2, service 54 (now service 2) increased from every 15 mins to every 12 mins, then to every 10 mins in Sept 2013. Commercial operation of Sunday & Public Holiday journeys on service 376 by First, giving a saving in financial support by B&NES. LSTF 'kick-start' revenue support enabled expansion of First service 379 to an all-day hourly direct service linking Midsomer Norton with Bristol.
7	X18	New service X18 introduced in January 2013.
8	X1	Various service enhancements as part of GBBN. In Apr 2012, service X1 increased from every 30 mins to every 20 mins.
9	X2 / X3	These services were every 30 mins as services 357 / 358 / 359, but now every 15 mins along many parts of the route as services X2 and X3.
10	175 178 379	Introduction of Somerbus service 175 with "kick-start" support from developers contributions to link the Orchard Way area of Peasedown St John and 'CircleBath' Hospital with Bath Commercial operation of Sunday & Public Holiday journeys on service 178 by First, and so no longer needs local authority support. Extension of First service 379 to Bath, thus increasing the combined frequency of First services between Midsomer Norton, Radstock and Bath from 3 to 4 buses/hr.

Case Study: Corridor 4 - Service 73 Service Enhancements

The GBBN improvements on corridor 4 include:

- *new bus lanes on the A38 towards Aztec West;*
- *new bus lanes southbound on Great Stoke Way;*
- *new bus gate to bypass traffic on New Road;*
- *new bus lanes and upgraded traffic signals at Abbey Wood roundabout;*
- *new northbound bus lane and upgraded traffic signals on Filton Avenue to Station Road; and*
- *upgraded traffic signals at Toronto Road, Wessex Avenue and Muller Road including SVD.*

The 73 is the main GBBN bus route for corridor 4 and runs between The Mall at Cribbs Causeway through to Bristol City Centre. The service has really benefitted from the GBBN improvements and as a result the service has gone from strength to strength. The service uses five separate bus priority measures that were installed as part of GBBN. After completion of GBBN the frequency was improved from every 15 minutes - initially to every 12 minutes and subsequently further improved to every 10 minutes. For a while this was run as a split service 73/74 before combining again as the 73.

To a degree the frequency improvements were enabled by the cumulative savings in journey time gained as a result of the bus priorities. It also enabled the operator, First, to run a more reliable service by redistributing intermediate running times on the service and allowing more time on the sections nearer Bristol City Centre. Increases in passenger demand have also spurred improved frequencies in the shoulders of peak periods and extra journeys in the late evenings and early mornings.

Patronage figures in 2013 show a 30.5% increase compared to a 2009 baseline. Against a national decline in passenger numbers, the 73 service is a true testament to the success of the GBBN improvements.

Bus patronage

2.1 Summary

 This target has been met.

2.2 Introduction

The GBBN Evaluation Plan defined the target as:

- Bus passengers to increase by 10% in the Greater Bristol area by 2010/11 (**to 60.749M**) from a baseline of **55.226M (2003/04)**. The JLTP target without the GBBN was a 3% increase to 56.883M.

2.3 Results

2.3.1 Area-wide patronage

The JLTP3 bus patronage target is based on predicted growth arising from GBBN, the Bath Transportation Package, the Weston Package and the Ashton Vale to Bristol City Centre Rapid Transit scheme. This represents an overall target of over 11% growth between 2008/09 and 2015/16. In 2009/10 the number of bus users unfortunately fell, a reflection of continuing national economic difficulties but 2010/11 saw a welcome recovery. This positive trend continued in 2011/12 with patronage slightly above the target figure for that year. Provisional figures for 2012/13 suggest however that patronage has fallen, reflecting the national picture where even bus usage in London fell.

2.3.2 First's patronage by GBBN corridor

First's data for the main GBBN bus services along the GBBN corridors show many significant increases in patronage. Table 2.1 below shows the changes in patronage between the periods of April 2008 / March 2009 to April 2013 / March 2014 for each GBBN corridor excluding corridor 10 which is reported separately below. Corridors 1 and 5 are combined as bus services from the Yate area either use the M32 (corridor 1) or Fishponds Road (corridor 5). Similarly corridors 4 and 7 are combined due to common sections of route.

The First services analysed for each corridor are:

- Corridor 1/5 - services 48, 49, 329, 342 and X42;
- Corridor 2 - services 1, 8, 9, 54 / 2 (part);
- Corridor 3 - services 1, 178, 337, 339, 649, X39 and 338;
- Corridor 4/7 - services 70, 73, 73B, X73 and 74;
- Corridor 6 - services 51, 54/2 (part), 379, and 376;
- Corridor 8 - service X1;
- Corridor 9 - services 357, 358, 359, 23, X2 and X3; and
- Corridor 10 - services 173, 178 and 184.

Table 2.1: Change in patronage 2008/09 - 2013/14 by GBBN corridors 1 to 9 (First's main GBBN services)

Corridor	% change
Corridor 1&5	24.2%
Corridor 2	40.9%
Corridor 3	-1.9%
Corridor 4&7	14.6%
Corridor 6	26.0%
Corridor 8	17.3%
Corridor 9	52.2%

Table 2.1 shows that for First's services corridor 9 has the biggest percentage increase in patronage between 2008/09 and 2013/14 at 52.2%. This reflects the improvements to this bus corridor as part of the GBBN, and also the service enhancements as part of the LSTF.

Corridor 2 saw the second biggest percentage increase for First's services in the same period, as 40.9%. Corridors 1 and 5 together show an increase of 24.2%.

Case Study: Corridor 8 - Bristol to Weston-super-Mare - Patronage growth

The GBBN improvements on corridor 8 include:

- *Junction improvements at Locking Road / New Bristol Road;*
- *New bus lane at M5 J21 westbound approach;*
- *New bus lane and junction improvements at Congresbury including traffic signals with SVD; and*
- *Improvements at Cumberland Basin including SVD.*

The enhanced X1 service provided in Phase 1 of the LSTF WEST saw an increase in patronage of 14.2% between the financial years 2011/12 and 2012/13. These enhancements also saw newer, higher quality and re-branded vehicles on the route. This service saw an increase in patronage of 27.7% between 2011/12 and 2013/14.



However, as shown in Table 2.1, corridor 3 saw a decrease over this period with a reduction of 1.9%. It should be noted that on corridor 3 there is competition from another operator (Abus), and it has not been possible to obtain comparable patronage data in a form that allows an overall comparison to be made.

There are two main reasons that may explain the patronage decreases on corridor 3. Towards the end of 2012, a £34m Keynsham town centre redevelopment project commenced. As may be expected, this has caused major disruption to all traffic, including buses. Additionally the High Street was significantly disrupted in early 2014 during major utilities works.

Case Study: Corridor 10 - A367 Midsomer Norton to Bath - Patronage growth - Somerbus

The GBBN improvements on corridor 10 include:

- a northbound bus lane at Odd Down;
- a southbound bus lane between Midford Road and the Red Lion;
- a northbound bus lane and bus gate at Wellsway Lower; and
- a northbound bus lane at Bear Flat.

For the Somerbus service 175 patronage grew 9% in 2012 from 2011, and grew by a further 16.5% in 2013, making a total increase in 2013 from 2011 of 27.0%. The first quarter of 2014 has also seen a 19.6% increase in passengers over the same period in 2013. Somerbus have not raised their fares in the last 4 years, and instead say they have relied on patronage growth for improved revenues. From April 2014 Somerbus have also added an additional early morning peak time journey to provide additional capacity.

Table 2.2 shows the percentage change in bus patronage on a year by year basis for the periods April 2008 / March 2009 to April 2013 / March 2014, for First's main GBBN services taking all of the GBBN corridors together.

Table 2.2: Change in patronage 2008/09 - 2013/14 all GBBN corridors (First's main GBBN services)

Year	% change /yr.	% change total
2008/09	<i>baseline</i>	<i>n/a</i>
2009/10	3.5%	<i>n/a</i>
2010/11	5.9%	<i>n/a</i>
2011/12	4.6%	<i>n/a</i>
2012/13	-4.7%	<i>n/a</i>
2013/14	7.7%	17.6%

For First, for all GBBN corridors, between 2008/09 and 2013/14 patronage increased overall **by 17.6%**.

2.3.3 Wessex's patronage by GBBN corridor

Patronage data for Wessex's is available for boarding passengers in SGC's area for whole financial years for 2009/10 through to 2013/14. As with First's services described above, only Wessex's main services along GBBN corridors have been considered. Initially these services were branded as 'Ulink' services as they largely served the University of the West of England, and had a 'U' suffix in the range of U1 to U5. They were however available as local bus services to all passengers.

In September 2012 these 'U' services were renumbered into 'conventional' numbering sequences as shown below. Broadly speaking these also serve single GBBN corridors. However there are some services that serve more than one GBBN corridor, and so to avoid duplicate reporting, they have been allocated as follows:

- Service U1/11 is allocated to corridor 4.
- Service U2/12 is allocated to corridor 4.
- Service U3/13 serves corridors 5 and 7. It has been allocated to corridor 1/5.
- Service U4/14 serves corridor 1 and a small part of corridor 7. It has been allocated to corridor 1/5.
- Service U5/15 serves corridors 2 and 4. It has been allocated to corridor 2.
- Service 16 is allocated to corridor 2.
- Service 19 is allocated to corridor 4.
- Service X27 is allocated to corridor 1/5.

Due to the very different formats in which available Wessex passenger data has been reported, data is in one format up to and including March 2012 and in a different format from April 2012. The two formats are very similar but not directly comparable and therefore the data is reported separately between the financial years of 2009/10 and 2011/12 (table 2.3 below), and 2012/13 and 2013/14 (table 2.4).

Table 2.3: Change in patronage 2009/10 - 2011/12 by GBBN corridor (Wessex's main GBBN services, passengers boarding in SGC's area only).

Corridor	% change
Corridor 1&5	82.3%
Corridor 2	101.5%
Corridor 4&7	38.5%
All corridors	69.4%

Table 2.4: Change in patronage 2012/13 - 2013/14 by GBBN corridor (Wessex's main GBBN services, passengers boarding in SGC's area only).

Corridor	% change
Corridor 1&5	44.1%
Corridor 2	14.0%
Corridor 4&7	68.9%
All corridors	47.4%

At the time of writing, some patronage data has been provided for Wessex services for boarding passengers in BCC's area, but this does not include all months and therefore has not been included in the analysis above for Wessex patronage which is boarding passengers in SGC's area only.

Wessex also operate the service 178 evening and Sunday services on corridor 10, but this is reported separately below.

2.3.4 Patronage by GBBN corridor 10

Corridor 10 is served by three different bus operators - First, Somerbus and Wessex. As data has been provided for all three operators, patronage for this corridor can be reported as a whole. This shows that for the period of the financial years between 2008/09 and 2013/14, patronage on this corridor grew by **0.45%**.

2.4 Conclusion

Taken as average for the GBBN corridors as a total, **the target to increase the number of passengers has been met and exceeded.**

Case Study: Corridor 9 - Bristol to Portishead - Patronage growth

The X2 / X3 services provided in Phase 2 of LSTF WEST have seen a patronage increase of 27% in the first year of operation compared to the three services that previously operated on the route. Newer, higher quality and re-branded buses were provided on the routes. The evening and weekend services were enhanced in November 2013 at a time when other similar services were being cut. The service is showing signs that it will be commercially viable in the longer term.



Park and ride patronage

3.1 Summary

 This target has been met.

3.2 Introduction

The GBBN Evaluation Plan defined the target as:

- To increase park and ride patronage by 20% by 2010/11 to **2.437M**.
- Baseline of 2.031M (assumed to be 2003/04).
- JLTP Target without Major Scheme: 2.355M.

The 20% increase in park and ride patronage with the GBBN compares with a JLTP target of a 16% increase. However it was not defined as to which sites in B&NES should be included or excluded, as B&NES operate three park and ride sites:

- Newbridge (GBBN corridor 3);
- Odd Down (GBBN corridor 10); and
- Lansdown (not on a GBBN corridor).

Therefore for the purpose of this analysis, Lansdown has been excluded as it is not on a GBBN corridor.

BCC has three park and ride sites and these are:

- Portway (GBBN corridor 8/9 - part);
- Long Ashton (GBBN corridor 8/9); and
- Bath Road (GBBN corridor 3).

It should be noted there is no bus based park and ride operated by either NSC or SGC.

Case Study: Corridor 3 - A4 Bath Road - Journey-time savings

Due to the improvements along the A4 Bath Road at Arnos Vale, it has been reported that First were able to take four minutes out of the timetables of certain buses. As noted in the earlier corridor 3 case study, these improvements included a new inbound (to Bristol city centre) bus lane between Paintworks and the 'Three Lamps' junction, new traffic signals with SVD for late running buses, and alterations to the Sandy park Road junction and coordination of traffic signals to increase capacity.

3.3 Results and conclusion

In recent years, the number of passengers using the park and ride services has in some cases risen, and in some cases fallen. This reflects changes in the pricing policies of some park and ride services in order to cover more of their operating costs. There has also been some shift in users to conventional bus services, to walking and cycling, and also to car-share. There have also been some changes in the way concessionary pass holders are counted to eliminate double-counting.

The total number of passengers using the B&NES and BCC park and ride services in 2012/13 was **2.597M** which is **6.58%** above the GBBN target of **2.437M**. **It is therefore considered that the target for park and ride patronage has been met and exceeded.**

Bus user satisfaction

4.1 Summary



This target has been met.

4.2 Introduction

The GBBN Evaluation Plan defined the target for bus user satisfaction as:

- GBBN target = 60%.
- Baseline = 38% (2003/04).
- JLTP2 target = 44%.

The GBBN Evaluation Plan notes that GBBN specific corridor targets were to be more stretching than area wide specific targets, but does not quantify them.

Detailed bus user satisfaction surveys have been undertaken on all 10 GBBN corridors in 2007. Surveys were also carried out in either 2011 or 2012, and for some corridors in both 2011 and 2012. For the corridors where surveys were undertaken in 2011 and 2012 the results have been averaged to simplify reporting.

These surveys covered a range of criteria and were:

- The overall quality of the bus service;
- Whether buses arrive on time;
- The frequency of the buses;
- The journey time to your destination;
- How easy buses are to get on and off;
- The quality of the bus stops and shelters; and
- The availability of timetable and route information.

Additional questions were added in 2011/12 and these were:

- The value for money of the journey (excluding pass-holders);
- The route the bus takes;
- The way the bus is driven; and
- The comfort and cleanliness of the bus.

All were scored on a scale of 1 to 5, with the marking being:

- Very Satisfied 5
- Satisfied 4
- Adequate 3
- Dissatisfied 2
- Very dissatisfied 1

‘Satisfaction’ is taken as ‘satisfied’ or ‘very satisfied’.

Due to the common sections, GBBN corridors 1 and 5 were reported together, as were corridors 4 and 7.

Case Study: Corridor 5 - A432 Fishponds Road - Consultation changes and support

The GBBN improvements on corridor 5 include:

- bus lanes, junction layout and traffic signal improvements - Straits Parade to Lodge Causeway;
- new and extended bus lanes, junction layout and traffic signal improvements - Muller Road junction; and
- bus lanes, junction layout and traffic signal improvements - Coombe Road to Robertson Road; and
- SVD on traffic signals.

Extensive consultation was carried out as part of the GBBN. BCC set up consultation 'drop in' shops at key points along certain corridors for informal consultation. Plans were on display at these and officers and engineers were available to explain the proposals in detail and to enable people to have their say. This was undertaken before the formal consultation processes.

As part of the consultations, 382 people commented on the proposals for the GBBN corridor on Fishponds Road and Stapleton Road. Based on these responses, officers from BCC amended plans to ban the right turn into Straits Parade and Hockey's Lane in Fishponds, and the left turn from Easton Way into Stapleton Road. However other junction changes and banned turns were supported, such as the right turn at the top of Muller Road, and this enabled one stage of traffic movement to be removed, increasing capacity to the other two main flows - benefitting all road users including buses.

As an example, these measures have enabled First to take 2 minutes out of their timetables for the services 48/49 between Fishponds (Channon's Hill) and Eastville (Robertson Road) in the morning peak for their services towards Bristol City Centre.

4.3 Results

The overall quality of the bus service

This is considered to be the key indicator of bus user satisfaction.

The percentage of passengers satisfied with the overall quality of the bus service as an average over all 8 surveys in 2007 was **46%**. This rose to **73%** 2011/12, showing a very significant improvement, and well above the GBBN target of 60% satisfaction.

Corridor 3 had the highest level of satisfaction in 2011/12 at 89%. Both combined corridors 4 & 7 and corridor 10 were next with 83% and corridor 2 with 81%. Corridor 2 also saw the biggest improvement from 28% satisfaction in 2007 to 81% in 2011/12.

Case Study: Area-wide - First vehicle fleet improvements

In 2013/14, First has invested a further £7.4m in buses for the west of England, taking delivery of 48 brand new buses. In addition the company has completed a refurbishment of the rest of its Bristol fleet (costing around £1.4 million), which saw by the end of March 2014, a further 140 double deck buses in the city given leather seats and LED lighting, alongside a new external paint job. The latest developments bring £8.8 million total investment in buses made by First in the financial year 2013/14.

Whether buses arrive on time

For satisfaction with whether buses arrive on time, the average over all 8 surveys in 2007 was **41%**. This rose to **66%** 2011/12, again showing a significant improvement, and above the GBBN target.

Again, corridor 3 had the highest satisfaction levels in 2011/12 at 82%, with corridor 10 close behind with 80%. Corridor 2 was also the biggest improver for whether buses arrive on time. Corridors 4 & 7 also saw an improvement of more than double in satisfaction, with an increase from 37% in 2007 to 75% in 2011/12.

The frequency of the buses

For satisfaction with frequency of the buses, the average over all 8 surveys in 2007 was **44%**. This rose to **70%** in 2011/12, again showing a significant improvement, and above the GBBN target.

All corridors saw an increase in satisfaction with frequency of the buses, with corridor 3 again having the highest level of satisfaction with the frequency of the buses at 88%, closely followed by corridor 2 at 86%.

The journey time to your destination

For satisfaction with the journey time to your destination, the average percentage satisfaction over all 8 surveys in 2007 was **52%**. This rose to **81%** in 2011/12, again showing a significant improvement, and above the GBBN target.

All corridors saw an increase in satisfaction with the journey time to your destination. Corridor 2 saw the highest level of satisfaction at 98%. Corridor 3 followed with 95% and corridor 10 with 93%.

How easy buses are to get on and off

For satisfaction with how easy buses are to get on and off, the average over all 8 surveys in 2007 was **62%**. This rose to **89%** in 2011/12, again showing a significant improvement, and above the GBBN target.

All corridors saw an increase in satisfaction with how easy buses are to get on and off. Four corridors or sets of corridors saw very high levels of satisfaction at 97%. These were corridors 2, 3, 4 & 7, and 6. Corridor 10 also scored highly at 96%. Corridor 2 again had the highest increase from 54% to 97%. This reflects the almost universal use of low-floor, easy-access buses on the GBBN network.

The quality of the bus stops and shelters

For satisfaction with the quality of the bus stops and shelters, the average over all 8 surveys in 2007 was **46%**. This rose to **78%** in 2011/12, again showing a significant improvement, and above the GBBN target.

Again, all corridors saw an improvement in the scores for the quality of the bus stops and shelters, with corridor 2 having the largest increase from 35% in 2007 to 92% in 2011/12.

Case Study: Corridor 2 - Example of Improvement in bus user satisfaction

The GBBN improvements on corridor 2 in on Whiteladies Road were detailed in an earlier case study. Other GBBN improvements on corridor 2 include:

- Lysander Road roundabouts - bus lanes and priority measures;
- Westbury Road - southbound bus lane and junction improvements; and
- SVD on traffic signals.

Corridor 2 saw very significant increases in bus user satisfaction from 2007 (pre-GBBN) to 2012 (post-GBBN) for all criteria in the survey. This was based on 613 responses on bus services 1 and 54 in October 2007 and 372 responses on bus service 1 in February 2012. The table below gives more detail:

Criteria	2007	2012
The overall quality of the bus service	28%	81%
Whether buses arrive on time	24%	78%
The frequency of the buses	28%	86%
The journey time to your destination	37%	98%
How easy buses are to get on and off	54%	97%
The quality of bus stops and shelters	35%	92%
The availability of timetable and route information	34%	88%

The availability of timetable and route information

For satisfaction with the availability of timetable and route information, the average over all 8 surveys in 2007 was **44%**. This rose to **75%** in 2011/12, again showing a significant improvement, and above the GBBN target.

Corridors 2 and 3 scored the highest for satisfaction with the availability of timetable and route information at 88% and 87% respectively.

4.4 Conclusion

The GBBN Evaluation Plan set out a target of increasing the percentage of bus user satisfaction from a baseline of 38%, to a target of 60%. With satisfaction levels in 2011/12 of **73%** for the overall quality of the bus service, **the target for bus user satisfaction has been met and exceeded.**

Case Study: Corridor 6 - A37 Wells Road - Corridor improvements

GBBN improvements on corridor 6 include:

- Improvements to the Staunton Lane traffic signals;
- Bus lanes and junction improvements - Haverstock Road to Three Lamps; and
- SVD on traffic signals.

Bus stops were improved along the GBBN corridors, including new raised kerbs for easier access to the buses, new paving with contrasting colours, and many bus stops had new shelters, real-time information, and lighting. Bus stops were also reviewed for waiting / loading restrictions, and *where* required, coloured surfacing was used to indicate the bus 'box'.

Before:



After:



Bus punctuality

5.1 Summary

● This target has been met.

5.2 Introduction

The GBBN Evaluation Plan defined the targets for bus punctuality as:

- 74.5% of buses starting route on time.
- 64.6% of buses on time at intermediate timing points.
- 57.1% of buses on time at non-timing points.

The baseline figures are:

- 66.5% of buses starting route on time
- 51.5% of buses on time at intermediate timing points
- 40.1% of buses on time at non-timing points

Trajectories to be achieved by 2012/13. JLTP target without Major Scheme: trajectories to be achieved by 2014/15.

Case Study: Corridors 8 and 9 - Bus stop infrastructure enhancements

The Anchor Road southbound bus stop (to Portishead, Long Ashton, Clevedon and Weston-super-Mare) is one of the busiest bus stops in central Bristol in terms of number of passengers boarding. It is also one of the more high profile stops, being close to 'At Bristol', the Harbourside, and the Cathedral. As part of the GBBN, the two small existing bus shelters were replaced with one very long 'super shelter', complete with a 12-line RTI display, giving passengers much more space to wait and much better weather protection. The use of a single stop also enables buses to arrive in turn for boarding, rather than previously having to cut in front of the bus at the other bus stop, which caused delays and frustration to all road users.

Before:



After:



5.3 Results

The data has been taken from the RTI system as this offers the most comprehensive source of comparative data.

The bus routes used for the analysis are the ones that cover the corridors to the greatest extent, and are:

- Service 1 – corridors 2 and 3 (part);
- Service 2 – corridors 2 and 6 (part);
- Service 73 – corridor 4; and
- Services 48 and 49 – corridor 5.

There is no 'before GBBN' punctuality data for bus services from the RTI systems on corridor 1, the B&NES end of corridor 3, the southern part of corridor 6, corridor 7, corridor 8, corridor 9, and corridor 10. This is because the buses on these routes operate out of the First depots in Bath, Weston-super-Mare, and Wells, which were not equipped with tracking equipment until 2011 - 2012 when many of the physical priority measures were either under construction or completed.

The results detailed below are from all journeys of these selected services where they were tracked by the RTI system. Journeys that were not tracked by the RTI system due to factors such as hardware faults, data errors, driver error, journeys not operated are not included in the below.

Buses starting route on time:

The average percentage of buses starting the route on time for all 5 services listed above in 2013 is **83.4%**. This is well above the GBBN target of 74.5% and the baseline of 66.5%. This compares to an average in 2008 of **73.3%**.

Buses on time at intermediate timing points:

The average percentage of buses on time at intermediate timing points for all 5 services listed above in 2013 is **73.2%**. This is well above the GBBN target of 64.6% and the baseline of 51.5%. This compares to an average in 2008 of **67.7%**.

Buses on time at non-timing points:

The average percentage of buses on time at non-timing points for all 5 services listed above in 2013 is **72.6%**. This is well above the GBBN target of 57.1% and the baseline of 40.1%. This compares to an average in 2008 of **67.6%**. However the validity of analysis of buses on time at non-timing points is debatable, as bus drivers have no requirement to be on time at non-timing points, and often have no data on times expected at non-timing points to monitor their progress against. It should also be noted that there is now no requirement for local authorities to collect this data for non-timing points.

5.4 Conclusion

For the GBBN corridors where comparative before and after data is available, **the three targets for punctuality have been met and exceeded.**

Case Study: Area-wide - First's Fares Review in Bristol

Following improvements to bus punctuality and patronage across the 10 GBBN corridors, First were able to respond to public demand and following an extensive public consultation, undertake a fares review in Bristol. This resulted in the introduction of a simpler, more equitable and understandable fare structure offering substantially cheaper fares for many and discounts for younger people. The outcome of the review was met with positive feedback, thereby improving the reputation of First and public transport generally, whilst encouraging even greater passenger growth. A fares review covering the rest of the West of England is due to be introduced, after another public consultation in July 2014.

Rail patronage

6.1 Summary

● This target has been met.

6.2 Introduction

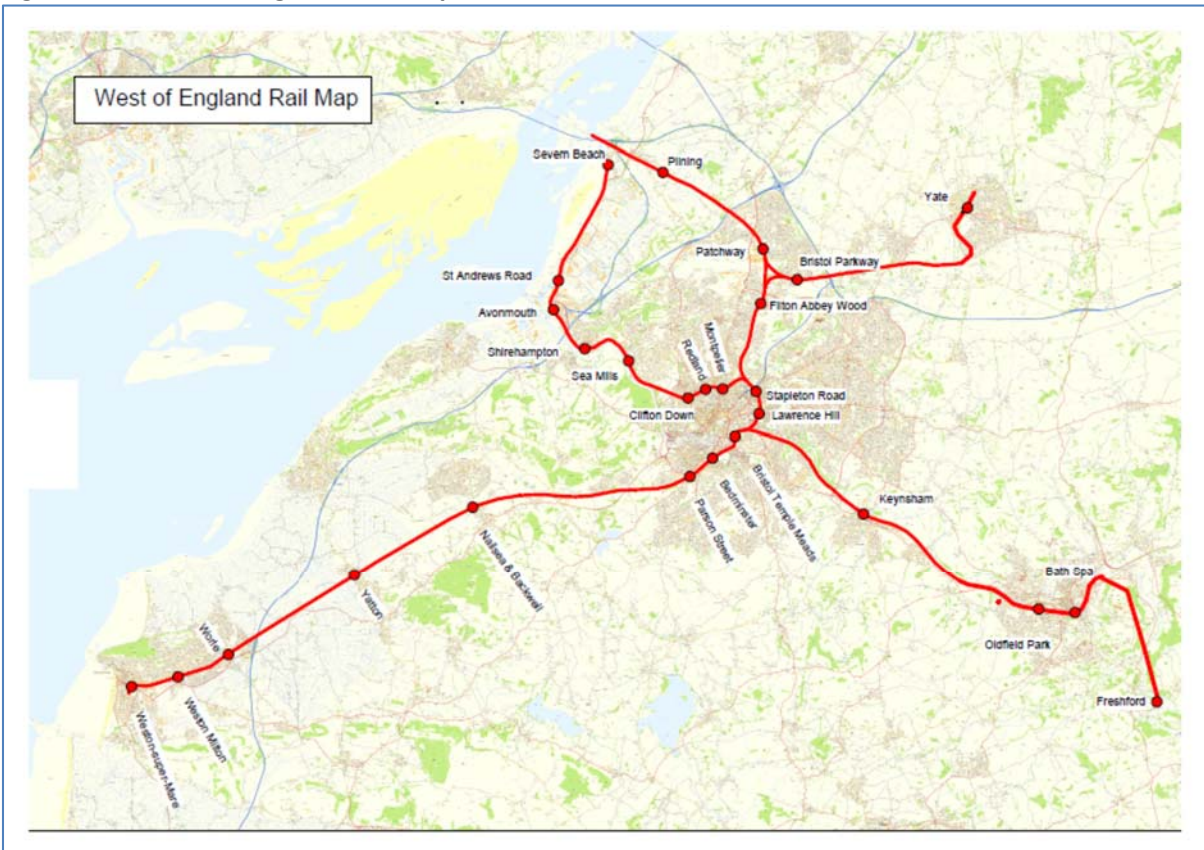
The rail patronage target is a West of England-wide indicator. It was hoped that the GBBN would contribute to achieving the target by improving modal interchange opportunities between bus and rail.

The GBBN Evaluation Plan set the rail patronage target index at 117 based on the impact of the GBBN package (i.e. 17% increase in baseline rail trips).

6.3 Rail network

The core rail network in the West of England area is shown in the Figure 6.1 below. No significant infrastructure has been added to the rail network since the implementation of the GBBN schemes.

Figure 6.1 - West of England Rail Map



6.4 Rail Patronage GBBN target

Table 6.2 below summarises the average daily passenger volumes from rail stations across the West of England authorities. *Note - The majority of Bristol Temple Meads movements were not covered by the survey.*

Table 6.2 - One-day 'snap-shot' survey of daily passengers - West of England area

	2007	2008	2009	2010	2011	2012	2013
Patronage	35280	40590	43972	46517	48512	51661	57164
Indexed	100	115	125	132	137	146	162

Source: Annual West of England Rail Survey

The growth of rail patronage is especially noteworthy on the Severn Beach Line, which the DfT has formally designated as a Community Rail Route. Through the work of the Severnside Community Rail Partnership, measures have been undertaken to provide an improved and safer environment on the line's unstaffed stations (and others across the partnership area. BCC and SGC have funded additional train services, while First Great Western has improved station information systems. These measures have contributed to overall passenger growth of 236% on the Severn Beach Line over the period 2007 to 2013 (approximately 6,700 additional daily trips).

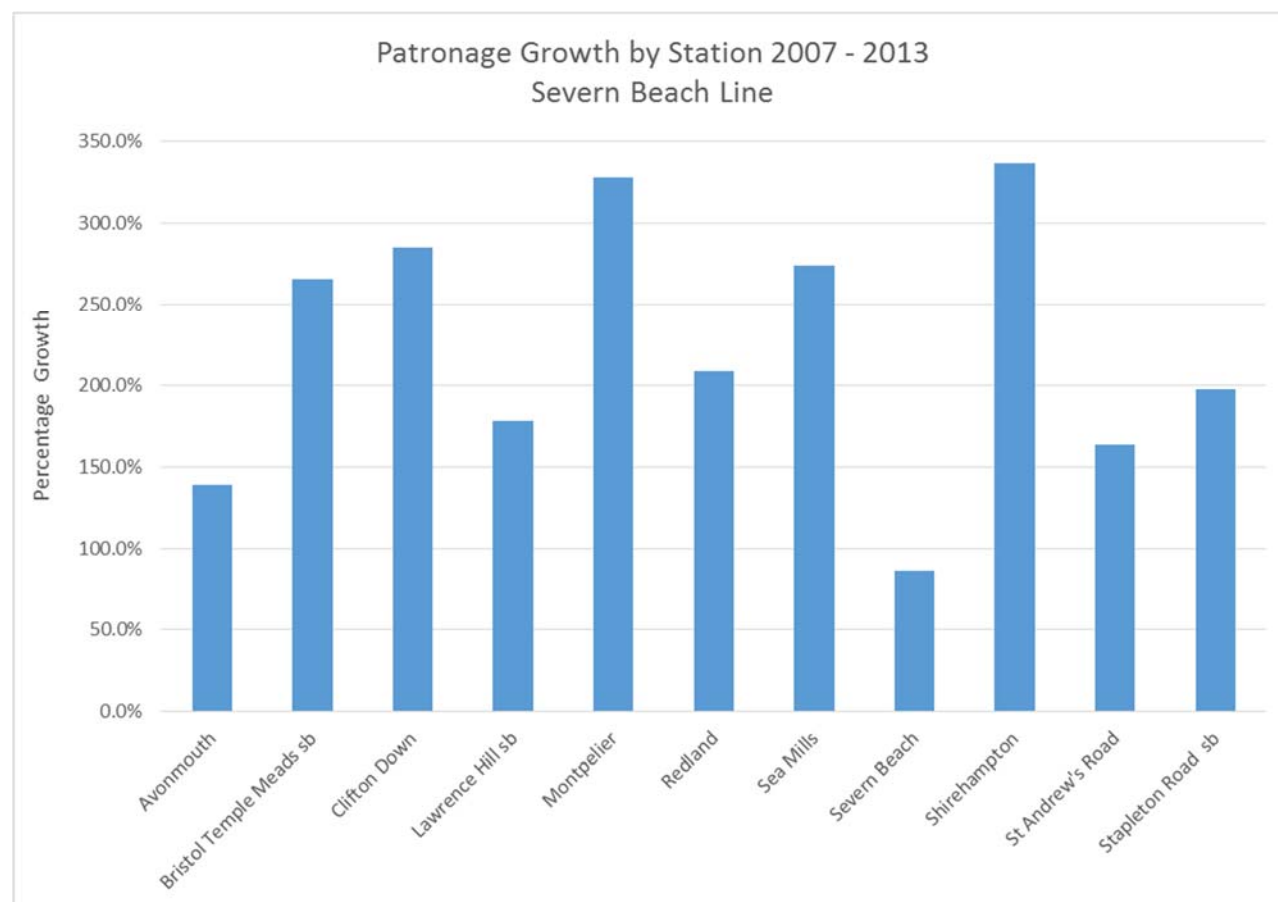
Figure 6.2 - Patronage Growth by Station 2007 - 2013 Severn Beach Line (sample day survey)

Table 6.3 - Patronage Increases 2007 - 2013 (sample day survey)

Station	Patronage Increase 2007-13	% Increase 2007-13
Bath Spa	5501	42%
Bedminster	259	166%
Bristol Parkway	2034	24%
Filton Abbey Wood	2454	125%
Freshford	45	51%
Keynsham	620	74%
Lawrence Hill nsb	408	833%
Nailsea & Backwell	273	21%
Oldfield Park	639	76%
Parson Street	345	319%
Patchway	269	194%
Stapleton Road nsb	384	422%
Weston Milton	134	51%
Weston-super-Mare	304	13%
Worle	616	73%
Yate	499	72%
Yatton	370	31%

Note 'nsb' = non Severn Beach journeys. Source: Annual West of England Rail Survey

Table 6.3 above details the patronage growth recorded at the non-Severn Beach line rail stations in the West of England. Substantial passenger growth has been seen at Bath Spa, Bristol Parkway, Bristol Temple Meads and Filton Abbey Wood. The latter may be due to the relocation of MOD jobs to the Filton Abbey Wood facility. The two very large percentage increases for Lawrence Hill (nsb) and Stapleton Road (nsb) reflect an increase from a very low baseline.


6.5 Conclusion

In terms of the GBBN target for rail patronage, **this has been met and exceeded by a significant margin.** The rail patronage growth has obviously been driven by many other factors other than the GBBN investment; however by facilitating easier transfer between modes the GBBN has positively contributed to this growth.

Area-wide traffic levels and congestion

7.1 Summary

 The target for restricting the growth in West of England area wide traffic has been met and exceeded.

 The target for restricting the increase in journey times along the GBBN corridors has largely been met.

7.2 Introduction

The GBBN set two targets related to private car usage:

- Accommodate the expected 5% increase in travel with a 13% increase in journey time (route based). This target was corridor related; and
- Restrict traffic growth to 11% across the region (i.e. 1% reduction). This was a West of England-wide target.

Although there have been mixed results on corridors, overall the increases in traffic and journey times have not been as high as we might have expected and the GBBN has played a positive role in making this the case.

7.3 Area-wide mileage

Table 7.1 details annual vehicle kilometres by local authority over the period 2004 – 2012. This shows that traffic levels in the West of England grew steadily from 2004 levels to 2008, however in 2009 this then fell compared to the previous year, and this fall continued in 2010. Traffic levels in 2012 were marginally higher than those in 2004, but were at a much lower level than the GBBN target of an 11% increase.

While the effects on traffic growth of the economic downturn cannot be ignored, the measures introduced by GBBN (and other programmes) have also assisted in encouraging alternative modes to the car.

Table 7.1: Changes in Area wide Road Traffic Mileage - actual vehicle km and indexed change.

Motor vehicle traffic (vehicle kilometres) excluding trunk roads from 2004

Local Authority	Year									
	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Bath and North East Somerset	957	1,044	1,073	1,084	1,085	1,050	1,024	1,039	1,031	
City of Bristol	1,923	1,929	1,947	1,997	1,975	1,955	1,899	1,925	1,937	
North Somerset	1,305	1,313	1,349	1,371	1,369	1,358	1,312	1,313	1,304	
South Gloucestershire	1,739	1,849	1,876	1,832	1,833	1,791	1,750	1,737	1,727	
WoE UA	5,924	6,135	6,245	6,284	6,262	6,154	5,985	6,014	5,999	
England	288,653	290,293	292,761	295,892	291,796	288,772	284,021	282,922	280,664	

Local Authority	Year									
	2004	2005	2006	2007	2008	2009	2010	2011	2012	
Bath and North East Somerset	100	109	112	113	113	110	107	109	108	
City of Bristol	100	100	101	104	103	102	99	100	101	
North Somerset	100	101	103	105	105	104	101	101	100	
South Gloucestershire	100	106	108	105	105	103	101	100	99	
WoE UA	100	104	105	106	106	104	101	102	101	
England	100	101	101	103	101	100	98	98	97	

7.4 Travel time analysis

The journey time performance of the GBBN corridors was examined using Trafficmaster™ journey time data supplied to the local authorities by the Department for Transport.

Trafficmaster™ journey time data uses anonymised data from around 60,000 probe vehicles (cars, light and heavy vehicles) equipped with GPS devices. These devices record speed and location information which is collated, digitally mapped and matched to the Integrated Transport Network (ITN) layer. Any link that has been traversed by a Trafficmaster™ vehicle within each 15 minute time period within the day will have a Trafficmaster record™. Separate records are created for each vehicle class.

Journey times along the corridors were examined prior to the commencement of GBBN works (May 2007) and after their completion (May 2013). As journey times can vary significantly from one month to another as the 'supply' of highway network is affected by roadworks, incidents and accidents, data from October 2013 was also compared to October 2007 journey times. Car-based journey times were examined in the morning peak (07:00 – 10:00) and the PM peak (16:00 – 19:00) for both inbound and outbound directions. The analysis was restricted to weekdays. Ten corridors following the alignments of the GBBN corridors were examined.

Figure 7.1 - GBBN Corridors used for journey-time analysis

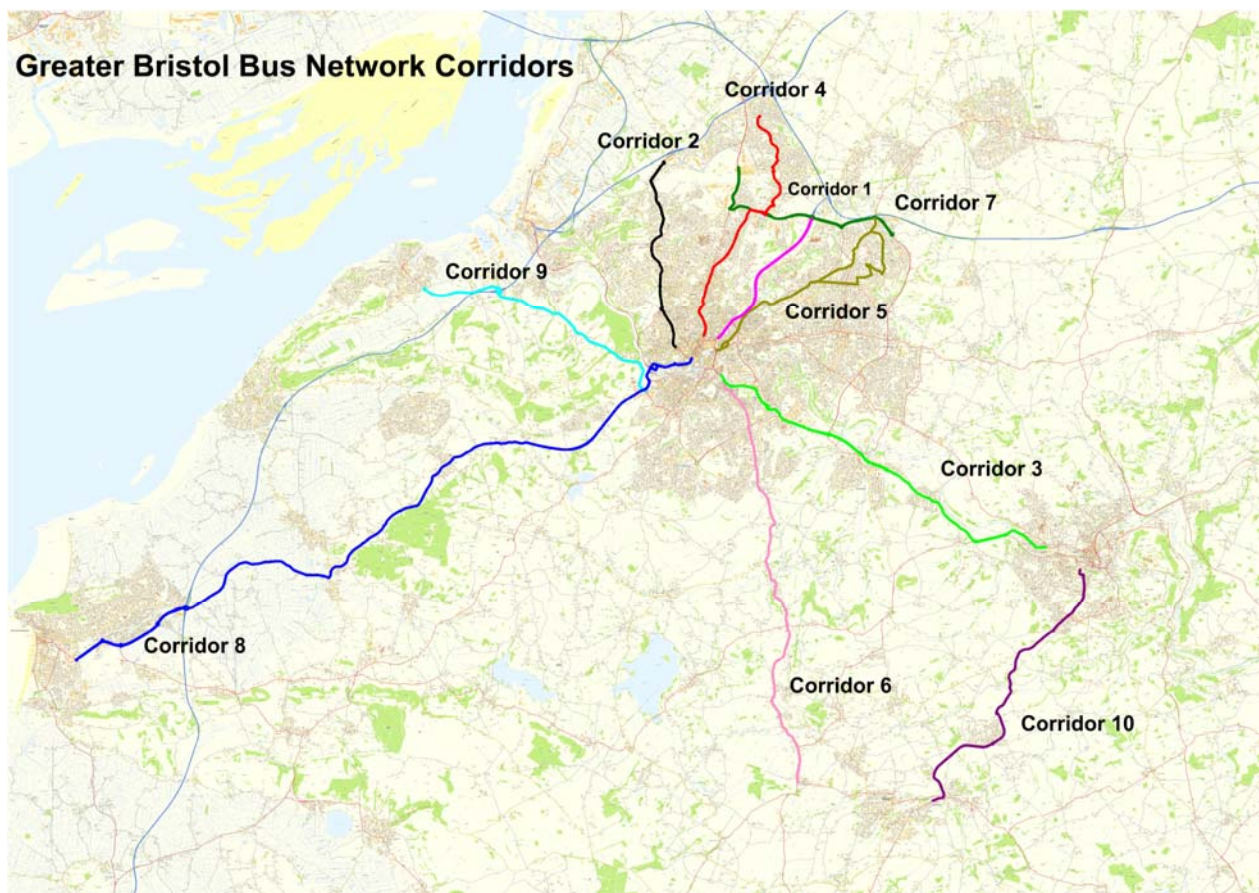


Table 7.2 details the comparison of journey times on the corridor during the typically busiest hour in the morning peak (08:00 - 09:00) and evening peaks (17:00 -18:00) for inbound Bristol traffic. Looking at the AM peak, decreases in travel time are seen on seven of the ten corridors (May) and five of the corridors (October). Decreases in travel time are less common in the PM peak, with five corridors in May and two in October. A large percentage increase in travel time is noted on corridor 1 (AM Peak October and PM Peak May). However, it should be noted that the travel time along this corridor is relatively short (around 6 minutes in free flow conditions) and the level of delay experienced by road users is quite sensitive to events on the wider network. Average travel speed across the 10 corridors are seen to increase during the AM Peak and experience a fall slightly in the PM peak (the 2% reduction noted in May relates to decrease in average speed of less than 1 km/hr). Increases in travel speed would indicate that traffic congestion is becoming less of an issue for road users

Table 7.2: Comparison of Inbound Journey Times along GBBN corridors

Corridor		Change in Journey Times				Change in Travel Speed			
		AM Peak		PM Peak		AM Peak		PM Peak	
		May 2007-2013	October 2007-2013	May 2007-2013	October 2007-2013	May 2007-2013	October 2007-2013	May 2007-2013	October 2007-2013
1	From M32 junction with A4174 to Newfoundland Way	12%	72%	71%	15%	-10%	-42%	-41%	-13%
2	From Cribbs Causeway to Triangle West	-7%	-9%	-9%	13%	10%	12%	13%	-10%
3	From Newbridge Rd w/o Station Rd to Bath Rd	-6%	-10%	3%	-9%	3%	7%	-7%	6%
4	From Brook Way to Stokes Croft	-8%	-17%	-5%	8%	7%	17%	3%	-9%
5	From Badminton Rd s/o A4174 to Old Market St	-10%	-26%	4%	14%	13%	37%	-2%	-11%
6	From A37 n/o A362 to Wells Rd	10%	10%	7%	13%	-8%	-8%	-5%	-10%
7	From Gloucester Rd North to Westerleigh Rd	21%	30%	6%	24%	-18%	-23%	-6%	-20%
8	From Herluin Way to Anchor Rd	-9%	7%	-2%	11%	9%	-6%	2%	-10%
9	From The Portbury Hundred to Anchor Rd	-6%	10%	-2%	-4%	7%	-9%	2%	4%
10	From A367 n/o Welton Rd to A367 s/o Hayesfield Park	-18%	-11%	-3%	7%	19%	10%	1%	-8%
Corridor Average						4%	2%	-2%	-8%

Table 7.3 details the comparison of journey times on the corridor during the typically busiest hour in the morning peak (08:00 - 09:00) and evening peak (17:00 -18:00) for outbound traffic.

In the AM peak decreases in travel time are seen on five of the ten corridors (May) and six of the corridors (October). Decreases in travel time are less common in the PM peak, with only five corridors in May and three in October. As previously a large percentage increases in travel time is noted on corridor 1 (AM Peak October and PM Peak May). Average travel speed across the 10 corridors are seen to increase during the AM Peak (May & October) and PM Peak (May). The 4% reduction noted in October relates to decrease in average speed of less than 1.5 km/hr).

Table 7.3: Comparison of Outbound Journey Times along GBBN Corridors

Corridor		Change in Journey Times				Change in Travel Speed			
		AM Peak		PM Peak		AM Peak		PM Peak	
		May 2007-2013	October 2007-2013	May 2007-2013	October 2007-2013	May 2007-2013	October 2007-2013	May 2007-2013	October 2007-2013
1	From Newfoundland Way to M32 junction with A4174	10%	47%	34%	11%	-9%	-32%	-26%	-10%
2	From Triangle West to Cribbs Causeway	0%	10%	-6%	-10%	0%	-7%	7%	14%
3	From Bath Rd to Newbridge Rd w/o Station Rd	11%	24%	7%	18%	-12%	-22%	-8%	-18%
4	From Stokes Croft to Brook Way	-2%	-21%	-3%	-1%	1%	23%	3%	-2%
5	From Old Market St to Badminton Rd s/o A4174	16%	-12%	27%	31%	-11%	16%	-18%	-22%
6	From Wells Rd to A37 n/o A362	-20%	6%	4%	12%	26%	-4%	-3%	-10%
7	From Westerleigh Rd to Gloucester Rd North	-4%	-16%	4%	14%	4%	19%	-5%	-13%
8	From Anchor Rd to Herluin Way	1%	-4%	-10%	4%	-1%	4%	10%	-4%
9	From Anchor Rd to The Portbury Hundred	-15%	-24%	-31%	-36%	18%	32%	45%	56%
10	From A367 s/o Hayesfield Park to A367 n/o Welton Rd	-3%	-2%	-6%	25%	-1%	1%	3%	-21%
Corridor Average						2%	4%	3%	-4%

7.5 Traffic volumes

Traffic volumes have been collected from permanent count sites located on the GBBN corridors.

The JLTP3 West of England traffic data uses an annualised Index of vehicles with a base year of 2007. Data is recorded as an Annual Average Weekday Total (AAWT), collected through a network of count sites acting as a proxy for trips across the area as a whole. Table 7.8 details the Annual Average Weekday Traffic from these sites.

Table 7.8: Annual Average Weekday Traffic:

Corridor	Location	AAWT							Index (Oldest Year = 100)						
		2007	2008	2009	2010	2011	2012	2013	2007	2008	2009	2010	2011	2012	2013
1	M32 Junction 1 -2	30100	30600	31800	30200				100	101.7	105.6	100.3			
	M32 Junction 2 -1	31000		32600	32100	32500	31500	31500	100		105.2	103.5	104.8	101.6	101.6
2	E/O Passage Rd, Cribbs Causeway	38900	31600	32900	32300	32500	30600	30200	100	81.2	84.6	83.0	83.5	78.7	77.6
	W/O Hollywood Lane	23700	23300	22900	22200	22600	21800	22300	100	98.3	96.6	93.7	95.4	92.0	94.1
	W/O Makro Entrance, Cribbs Causeway	21900	20700	22000	22000	22800	21500	22000	100	94.5	100.5	100.5	104.1	98.2	100.5
3	A4 Keynsham by-pass				27100	25600	26900					100	94.5	99.3	
	A4 Bath Road – East of Keynsham			29500	29100	28200	28300	29100			100	98.6	95.6	95.9	98.6
4		No data available													
5	N/O Westbourne Rd, Downend	12100	12300	11900	11900	12000	11600	10300	100	101.7	98.3	98.3	99.2	95.9	85.1
6	A37 Whitley Batts N of A368 Chelwood Rbt	0	0	14900	14600	15000	14800	14800			100	98.0	100.7	99.3	99.3
7	W/O Westerleigh Rd, Downend	41200	39600	39700	40900	41900	41200		100	96.1	96.4	99.3	101.7	100.0	
	W/O A432 Badminton Rd, Downend	37800	37300	37600	38300	38100	37200	34900	100	98.7	99.5	101.3	100.8	98.4	92.3
	E/O B4058, Hambrook	54300	51600	52700	53600	54000	52500		100	95.0	97.1	98.7	99.4	96.7	
	W/O B4058 Bristol Rd, Hambrook	58300	57400	57200	58300	58600	56600	56800	100	98.5	98.1	100.0	100.5	97.1	97.4
	E/O M32, Hambrook	34100	34800	33700	33800				100	102.1	98.8	99.1			
	W/O Coldharbour lane, Stoke Gifford	43300	43500	41700	42400	41800	43700	43800	100	100.5	96.3	97.9	96.5	100.9	101.2
	E/O Emma-Chris Way, Filton	41700	41500	37900	38800	39000	40900	42000	100	99.5	90.9	93.0	93.5	98.1	100.7
	W/O Shellard Rd, Filton	28700	28200	27200	26600	26600	28800	28500	100	98.3	94.8	92.7	92.7	100.3	99.3
8	Gloucester Rd North			33200	33900	33600	34400	33100			100	102.1	101.2	103.6	99.7
9	A369 west of Beggarrbush Lane	18700	19200	18700	18600	19400	19200	20000	100	102.7	100.0	99.5	103.7	102.7	107.0
	Martcombe Rd.	20700	20400	19900	19600	19300	18900	22000	100	98.6	96.1	94.7	93.2	91.3	106.3
	Portbury 100	20100	19100	23800	24800	25200	25700	26600	100	95.0	118.4	123.4	125.4	127.9	132.3

This analysis suggests that traffic volumes along the GBBN corridors have generally decreased since 2007. Undoubtedly the 2008 - 2012 economic downturn played a significant role in these decreases. Some corridors have experienced increases along parts of the corridors (corridors 2 and 7), but these increases have been within the 5% target set for GBBN. Corridor 9 has seen significant growth in traffic volume, but this is attributable to the GBBN works aimed at improving the performance of Junction 19 and facilitating greater traffic flows. The case study in Appendix B provides further details on the measures taken. Traffic data from permanent counts site for corridors 4 and 8 was not available.

Case Study: Corridor 5 - Yate network improvements

All of the following commercial services operated by First commenced in April 2014:

- *A new commercial service X46 between Bristol and Yate by First. This is in addition to the previously supported X27 which Wessex now operates commercially (corridors 1, 5)*
- *The previous supported Service 689 (Yate - Pucklechurch – Bristol) was replaced with a new commercial X49 service (corridors 1, 5)*
- *New commercial service 81 (Yate – Bristol Parkway – Kingswood) has replaced the previous supported 581 (corridor 4, 7)*

In Yate, RTI and new shelters were introduced as part of GBBN. The switch from supported to commercial services demonstrates the success of bus services using the GBBN corridors.

7.6 Conclusion

In overall terms the area-wide traffic levels and congestion targets have been met. Traffic growth across the West of England has been restricted to below GBBN target levels.

Therefore the target for restricting the growth in West of England area wide traffic has been met and exceeded.

In terms of journey times, almost all of the routes show the journey times are under the GBBN target for growth in at least some of the surveys. However, there are a few exceptions for certain corridors, depending on which of the two sample months are examined, and which time periods in the day.

Therefore the target for restricting the increase in journey times along the GBBN corridors has largely been met.

Proportion of HOVs on corridors

8.1 Summary

It is not possible to say if this target has been met or not.

8.2 Introduction

The GBBN Evaluation Plan did not define the targets for the proportion of HOVs on corridors but noted:

- Baseline - Surveys to be undertaken October 2007; and
- Target - Target to be set following baseline surveys.

There are two sections of HOV lane in NSC's area. These are:

- A369 St Georges Hill to Portbury High Street - introduced as part of the GBBN. This is a 24 hour HOV lane; and
- A370 Long Ashton Bypass (towards Bristol) - introduced prior to the GBBN. This is an AM peak only HOV lane.

There are four HOV lanes in SGC's area. These are:

- Coldharbour Lane (northbound) to the junction with the A4174 Ring Road - introduced prior to the GBBN, but enhanced as part of the GBBN measures. This is an AM and PM peak HOV lane;
- A4174 Ring Road (westbound) between the 'Wick Wick' roundabout and the Bromley Heath roundabout - introduced prior to the GBBN. This is an AM peak only HOV lane;
- A4174 Ring Road (westbound) between the Bromley Heath roundabout and Frenchay Park Road - introduced prior to the GBBN. This is an AM peak only HOV lane; and
- A4174 Ring Road (eastbound) between Coldharbour Lane and M32 Junction 1 - introduced as part of the GBBN. This is a 24 hour HOV lane.

The results of the surveys are summarised below. There is no survey data available for the HOV lane between A4174 Ring Road (eastbound) between Coldharbour Lane and M32 Junction 1.

8.3 Results

8.3.1 NSC A369 HOV lane:

Taking the month of April as a typical month, in April 2012 20.5% of the vehicles using this section of road used the HOV lane. By April 2013 this has risen to 24.7%, and by April 2014 this had risen again to 26.1%.

8.3.2 NSC A370 HOV lane:

This HOV lane was introduced prior to the GBBN. Between 2006 and 2008 the percentage of vehicles using this HOV lane increased from 22.1% to 24.6%, in an overall traffic flow of a daily average of 3,148 during the morning peak period, which is when this HOV lane is operational. However, since 2009 the percentage of vehicles using this HOV lane decreased in most years and in 2013 was 20.6% of overall traffic flow of a daily average of 2,846 during the same morning peak period.

Historically this section of the A370 had queuing traffic but in recent years this is now infrequently observed. Use of the HOV lane has likely reduced as a direct result of the lack of queuing - both due to multiple occupancy vehicles seeing no gain and thus staying in the inside lane and due to single occupancy vehicles seeing no gain in overtaking vehicles that are moving along in fairly free flowing conditions.

Case Study: Corridor 7 - New bus service - service X18

GBBN improvements on corridor 7 include:

- improvements A4174 Westbound to B4058 Frenchay;
- A4174/M32 Junction 1 improvements to roundabout;
- A4174 Coldharbour Lane to M32 HOV lanes;
- Coldharbour Lane bus lanes;
- Abbey Wood roundabout signalisation; and
- A4174 Abbey Wood eastbound bus gate

This new service was introduced in Jan 2013 with funding through the LSTF and operates at peak times to connect Kingswood and Emersons Green with the North Fringe and Aztec West employment centres. Patronage on the X18 has more than doubled since the service commenced, with an average of 1800 passenger trips per month. A survey conducted in March 2013, indicated that the vast majority of passengers surveyed used the service to travel to work and previously 44% made this journey by car.

8.3.3 SGC Coldharbour Lane HOV lane:

SGC undertook four surveys of the Coldharbour HOV lane in 2007. Two were in May and two were in November. The results are shown in Table 8.1 below:

Table 8.1 - Coldharbour Lane - Proportion of vehicles using HOV lane and proportion compliant:

	AM Peak (HOV hours of operation)	PM Peak (HOV hours of operation)	AM Peak Users in HOV lane compliant	PM Users in HOV lane compliant
2007 (average of 4 surveys)	20.6%	39.2%	70.3%	48.2%
2011 (average of 2 surveys)	23.6%	30.6%	66.5%	47.5%

This shows that the proportion of vehicles using the HOV lane has risen in the AM peak between 2007 and 2011, but has fallen in the PM peak. Compliance in both time periods has also dropped slightly over this time period.

8.3.4 SGC A4174 Bromley Heath HOV lane:

SGC has one survey of the HOV lane use on the A4174 Ring Road HOV lane at Bromley Heath which was undertaken in April 2014.

Table 8.2 - A4174 Bromley Heath - Proportion of vehicles using HOV lane and proportion compliant:

	AM Peak	AM Peak Users in HOV lane compliant
2007 (average of 4 surveys)	49.8%	59.0%
2014	45.6%	33.3%

This shows that the proportion of vehicles using the HOV lane has fallen by 4.2% between 2007 and 2014, but most significant is the large reduction in compliance of 25.7% between 2007 and 2014.

8.3.5 SGC A4174 Frenchay HOV lane:

SGC has one survey of the HOV lane use on the A4174 Ring Road HOV lane at Frenchay which was undertaken in March 2014.

Table 8.3 - A4174 Frenchay - Proportion of vehicles using HOV lane and proportion compliant:

	AM Peak	<i>AM Peak Users in HOV lane compliant</i>
2007 (average of 4 surveys)	41.3%	75.3%
2014	38.4%	54%

This shows that the proportion of vehicles using the HOV lane has fallen by 2.9% between 2007 and 2014. Again, there is a drop in compliance of 21.3% between 2007 and 2014.

8.4 Conclusion

It is difficult to draw meaningful conclusions on the effectiveness of the HOV lanes introduced as part of the GBBN project, as no specific targets were set in the GBBN Evaluation Plan relating to HOV usage. Some HOV lanes and/or certain time periods have seen an increase in the proportion of users in HOV lanes, but others have seen a decrease.

It is clear that survey data indicates a high level of illegal use of the HOV lanes, which suggests that engagement with Avon and Somerset Police is required to increase the amount of enforcement of the HOV restrictions.

Air Quality

9.1 Summary

 This target has been met.

9.2 Introduction

The GBBN Evaluation Plan defined the targets for air quality as:

- Target reduction in the concentration of NO₂ compared with 2003/04 baseline for Bristol to 44.0µg/m³.

The baseline figures are:

- baseline Bristol: 48.0µg/m³ (2004).

JLTP2 target without the GBBN:

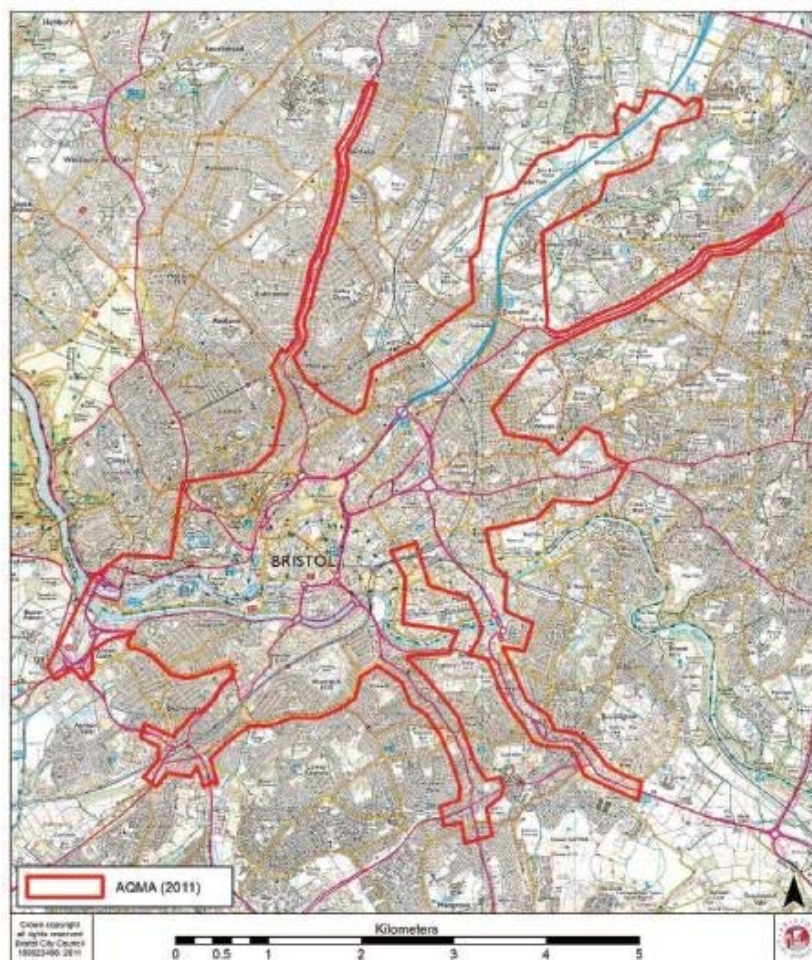
- Bristol 46.0µg/m³

This was to be measured through 18 permanent air quality monitoring sites. The Bristol Air Quality Management Area (AQMA) is shown in Figure 9.1 below.

9.3 Results

The JLTP3 2012/13 Progress Report notes that air quality in the Bristol AQMA improved during 2012 compared to the previous year with a fall in the average level of nitrogen dioxide to 43 µg/m³.

Therefore this target has been met and exceeded.

Figure 9.1 - Map of the Bristol AQMA

Source of map - http://aqma.defra.gov.uk/1aqma/aqma_detail.php?aqma_id=757

Number of cycling trips

10.1 Summary

 This target has been met.

10.2 Introduction

The cycle use target is a West of England-wide indicator. The GBBN scheme was designed to provide benefits to cyclists where practical.

The GBBN Evaluation Plan set the cycle use to increase by 40% by 2010/11.

10.3 Results

A system of permanent and periodical cycle count sites spread across the four West of England authorities allow an accurate picture of cycle usage to be gained.

The JLTP3 West of England cycling target uses an annualised Index of cycling trips with a base year of 2008/9. Cycling data is recorded as an AAWT, collected through a network of cycle count sites acting as a proxy for cycling trips across the area as a whole.

Table 10.3 details the change in cycle use over the period 2008/9 to 2012/13. It can be seen that significant growth in cycling has been achieved since 2008/9.

Table 10.3: Cycle Usage Index (2008 – 2013)

	2008/09	2009/10	2010/11	2011/12	2012/13
Cycling Index	100	104	111	130	140

Large growth has been recorded at cycle ATC counters in the BCC area, as may be expected given the urban nature and prevalence of shorter distance commuter trips by cycle mode. Bristol's Big Commuter count provides an insight into how cycle usage has changed over time in the city. In October 2009, some 11,000 commuters provided details of their commute to work of which 12.2% were made using cycle mode. A similar survey carried out in 2013 (10,700 responses) indicated that 15.6% of commuter trips were made by cycle. The South Gloucestershire Travel to work survey also provides a snapshot of commuters' trips in the area. In 2007 8.3% of commuters typically travelled to work on bicycle. In 2013 this number had increased to 12.6%.

Case Study: Corridor 7 - A4174 Ring Road - Cycle Facilities

GBBN Corridor 7 serves the northern and eastern edge of the Bristol urban area. It serves the important development sites around Filton, Stoke Gifford and Harry Stoke and links to the development of Emersons Green. Several measures were introduced to facilitate pedestrian and cycle movements along the corridor:

- Measures along the line of the A4174 to complete the cycle route (i.e. widening of footway between Filton Avenue and Abbey Wood roundabout)
- Three toucan crossings in the vicinity of the re-modelled Abbey Wood junction

Two cycle ATC counters are located in the vicinity of Corridor 7. These have recorded significant growth in cycle usage since 2007. Average daily cycle flows at both sites are now recording over 100 more cycles per day compared to 2007.

10.4 Conclusion

In conclusion the initial cycling target set for the GBBN has largely been met, albeit with a delay of 2 years. The quality of cycling infrastructure across the region, and in particular Bristol has been improved by other investment programmes such as 'Cycling City'. Unfortunately it is not possible to quantify the impact of the increase in cycle usage due solely to GBBN measures. **However, the GBBN target has been met.**

Road safety

11.1 Summary

 This target has been met.

11.2 Introduction

The GBBN Evaluation Plan defined the GBBN targets for road safety (all ages) as:

- **Target:** KSI (All Ages): 25% reduction on 2001-2004 average by 2010 (to 381).
- **Target:** Number of Slight Injury Casualties: 5% reduction on 2001-2004 average by 2010 (to 3,750).

The baseline figures are:

- **Baseline:** KSI: 508 (2001-2004 average).
- **Baseline:** Slight: 3947 (2001- 2004 average (3 year rolling averages)).

The JLTP2 target without the GBBN is KSI - 20% reduction (to 406) and Slight - no increase (3497).

The baseline is the JLTP2 target for the whole of the West of England area, so the targets are in line with this.

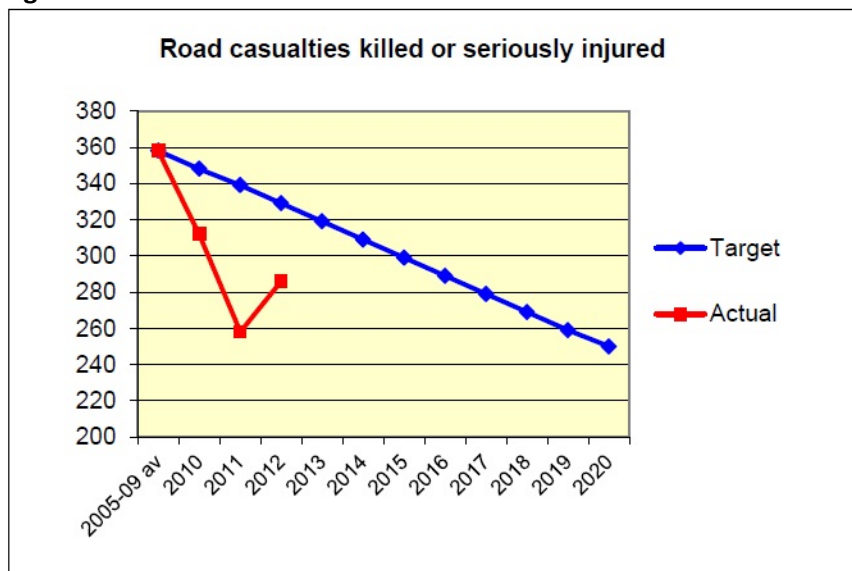
Case Study: Corridor 2 - A4018 Westbury Road - Post-scheme monitoring and feedback

Monitoring of the success of measures introduced was an important part of the GBBN. Very few changes were required, but an example where feedback and further analysis promoted a change is the Westbury Road bus lane on corridor 2. Here it was noted that the high number of turning vehicles at the White Tree roundabout was causing a queue to build back beyond the start of the bus lane and was therefore delaying buses before they could reach the bus lane. By extending the gap between the end of the bus lane and the roundabout, more turning vehicles could be accommodated, reducing the overall queue length, and speeding up buses and all road users.

11.3 Results

The JLTP3 2012/13 progress report notes that the number of KSI dropped substantially to 258 in 2011. There was a slight increase to 286 between 2011 and 2012 but these figures remained well below the trajectory as shown in Figure 11.1 below.

Figure 11.1:



Therefore the GBBN target for the whole of the West of England area has been met and exceeded.

In terms of the GBBN corridors, as the total numbers of accidents are small, care should be taken not to read too much into each individual corridor and/or for one year only. However by taking three-year rolling averages of all 10 GBBN corridors and comparing 2009 - 2011 with 2011 - 2013, the number of KSI has fallen from a three-year average of 59.0 to 57.7, which is a drop of 2.26%. Similarly the three-year average number of slight injuries dropped from 628.3 to 565.0, which is a drop of 10.1%.

Summary, recommendations and conclusion

12.1 Summary











The GBBN was an ambitious project covering 10 strategic bus corridors with the key outcomes to improve and upgrade the bus network infrastructure, and to enhance the bus passenger experience with better buses and improved information and reliability; reducing congestion and reducing emissions. The GBBN was also developed to deliver substantial improvements to the speed, quality, reliability and attractiveness of bus services.

The total £80 million investment in the GBBN from the DfT and other project partners is a significant sum, and it is a significant achievement that the project came in within 0.5% variance of the original budget.

The GBBN MSBC set out an Evaluation Plan which identified a range of strategic performance indicators from which the effectiveness of the GBBN project can be assessed in terms of achieving its objectives. **These have been described throughout this report, and have, with one exception where it is not possible to make a conclusion, largely been met. Most of the targets have been fully met, and in many cases, exceeded.**

As with most transport schemes, they can rarely be studied in isolation. Other initiatives such as LSTF, BBAF and Cycling City will also have an effect, and other external factors such as the economic downturn since 2008 will also have some effect on traffic levels and choice of transport mode. However these should not detract from the overall very positive findings of this study, not least the patronage growth on the GBBN corridors and the very high increase in bus user satisfaction.

In summary, the indicators and the results are:

-  Bus patronage - GBBN target met and exceeded.
-  Park and ride patronage - GBBN target met and exceeded.
-  Bus user satisfaction - GBBN target met and exceeded.
-  Bus punctuality - GBBN target met and exceeded.
-  Rail patronage - GBBN target met and exceeded.
-  Area wide traffic levels - GBBN target met and exceeded.
-  Congestion - GBBN targets largely met.
-  Air quality - GBBN target met and exceeded.
-  Number of cycling trips - GBBN target met.
-  Road safety - GBBN targets met and exceeded.

Case Study: Corridor 3 - A4 Bath Road - Consultation support

Due to the high levels of traffic heading towards Bath and Keynsham along the A4 in Brislington throughout the day, the conversion of the existing peak-time only bus lane to 24 hour operation was necessary to improve reliability of buses. During the consultation, this measure was supported by the local traders as the scheme design enabled parking bays to be provided on the inside of the bus lane. These could be used 24 hours a day unlike the previous off-peak only parking, and were made limited time to encourage turnover of spaces for the benefit of customers for the shops and businesses in Brislington Hill.

12.2 Recommendations for ongoing data collection

Recommendations for ongoing data collection:

- The four West of England authorities should work with bus operators under robust data sharing agreements so that relevant patronage data can be made available to inform monitoring and evaluation, whilst ensuring that commercial confidentiality is maintained.
- Given the ongoing level of investment in the West of England's transport infrastructure, the ability to identify the specific contribution to indicators is likely to decrease over time. Therefore it is recommended that there is integration of the monitoring requirements for major transport schemes and the JLTP3.
- Passenger satisfaction surveys should continue to be carried out on all corridors at annual intervals. These should be enhanced as and when appropriate to examine modal shift trends and to identify passengers using services who have changed their mode of travel.
- Greater utilisation of the capabilities of the RTI system amongst the UAs and specification of a common, detailed report to allow tracking of bus services along GBBN corridors. As many bus services operate across the four local authority boundaries, this monitoring may benefit from a single lead local authority officer. This could also be done by the bus operators directly.
- Continuation of an ATC programme across the four local authorities. Ensure regular maintenance of these sites to avoid data loss and improve their accuracy. Newer alternatives to ATCs should be examined to see if they are more robust and offer reduced revenue costs, such as automatic number plate recognition systems and 'Bluetooth' tracking.

12.3 Conclusion

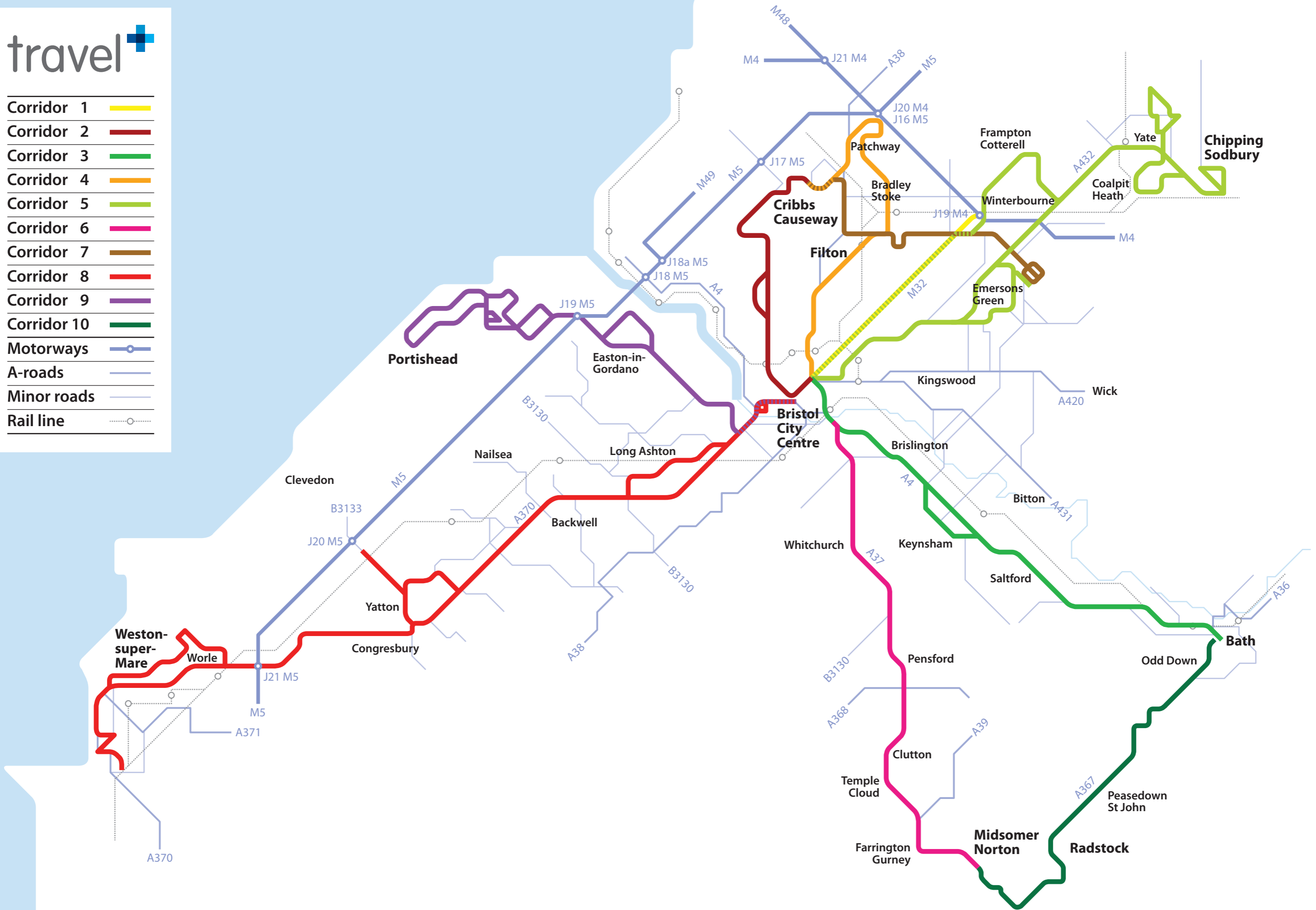
The success of the GBBN is testament to good partnership working between the local authorities and bus operators, building on the foundations of the quality partnership scheme legislation and setting in place the necessary agreements to facilitate data sharing.

This partnership working continues to evolve in the delivery of the successful bids to the BBAF (2012) and for Better Bus Area designation (2013).

It is noteworthy that the Senior Traffic Commissioner's draft revision of the statutory guidance on local bus services (April 2014) strongly encourages partnership working between local authorities and bus operators to improve punctuality.

Appendix A - Map of the 10 GBBN corridors

- Corridor 1
- Corridor 2
- Corridor 3
- Corridor 4
- Corridor 5
- Corridor 6
- Corridor 7
- Corridor 8
- Corridor 9
- Corridor 10
- Motorways
- A-roads
- Minor roads
- Rail line



Appendix B - Detailed Case Study - GBBN Corridor 9 A369 / M5 Jct 19 Improvement Works

B1 Overview

GBBN corridor 9 links Portishead with Bristol via the A369. Increasing congestion along the route, particularly around junction 19 of the M5, and the development of over 3,000 houses and employment in Portishead created a requirement for faster and more reliable journeys.

B2 The problem

The M5 Junction 19 gyratory was a well-known local congestion hot-spot. During the morning peak period it was common for long queues to form eastbound along the A369 The Portbury Hundred approach towards the motorway junction all the way back to the Sheepway roundabout - a distance of approximately 2 miles. Similar congestion on the A369 Martcombe Road westbound approach towards the motorway junction during the morning and evening peak periods was noted.

As a consequence road users encountered:

- Unreliable travel times;
- Slow average speeds; and
- Higher levels of frustration and stress.

There were also high numbers of accidents due to drivers struggling to obtain suitable 'gaps' to get onto the junction 19 roundabout.

B3 The solution

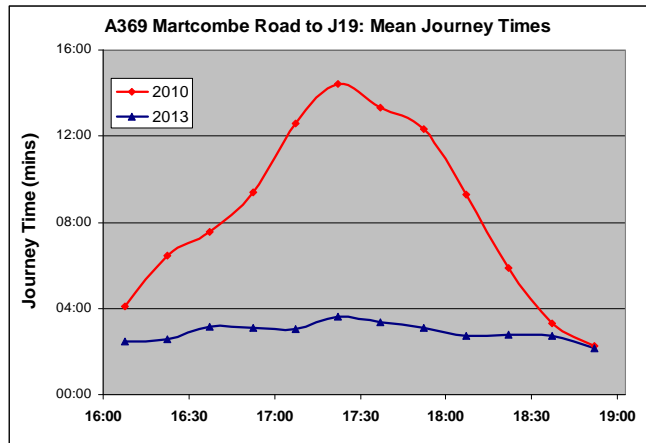
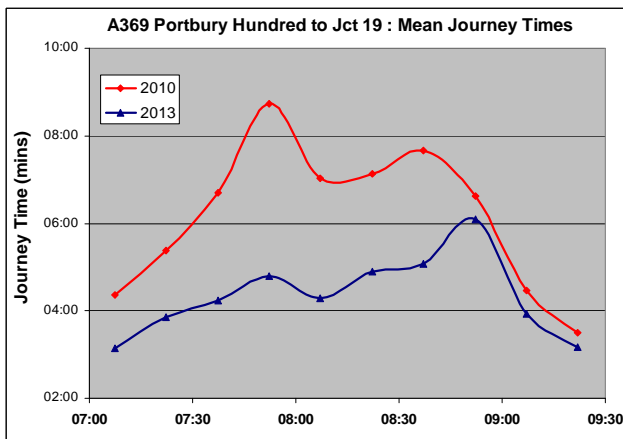
As part of the GBBN, NSC carried out extensive studies to design a scheme to help alleviate the problems around junction 19. This scheme was successfully completed and delivered in April 2012. The scheme included:

- Adding additional short approach lanes on both the A369 approaches, providing a duel merge exit arrangement on both the Northbound on-slip and The Portbury Hundred;
- Re-allocating road space on the gyratory; and
- Providing additional traffic signals with MOVA control.

B4 The impacts

Traffic adjusted rapidly and smoothly to the new layout at J19 and on the approach arms.

- **Travel Time benefits.** The graphs below show the scale of journey time savings on two of the arms to Junction 19



- Reduced Emissions:** The benefit of reducing queuing is that it has a positive effect on air quality. Idling, low-speed travel, and hard acceleration that characterise congested conditions, all result in higher emissions than travel at consistent, moderate speeds. The works carried out at junction 19 to reduce congestion, by installing new traffic signals including MOVA control, expanding exit and entry capacity, have helped to reduce emissions from motor vehicles.
- Increased Traffic Flow:** The uplift in traffic observed on the approach roads to junction 19 can be explained by two factors. Firstly a shift back to using the route following significant reductions in congestion; and secondly an increased flow of traffic resulting from demand being met thus reducing the peak spread.

**Data based on Mean Weekday flows (Mon-Thu), Apr-June 2011 vs 2013
(excluding school holidays and Public Holidays) AM and PM Peak
period flows to and from J19 (07:00-09:00) and (16:00 – 19:00)**

Portbury 100					
Mean		Pre-	Post-	% Change	Change
07-09	To J19	2376	2997	26%	621
	To Portishead	1614	1714	6%	100
16-19	To J19	2531	2662	5%	131
	To Portishead	3617	4058	12%	441

Martcombe Rd					
Mean		Pre-	Post-	% Change	Change
07-09	To Bristol	1787	2186	22%	399
	To J19	1730	1771	2%	41
16-19	To Bristol	2615	2812	8%	197
	To J19	1858	2643	42%	785

Mill Lane, Portbury					
Mean		Pre-	Post-	% Change	Change
07-09	To Failand	397	427	8%	30
	To J19	521	746	43%	225
16-19	To Failand	814	905	11%	91
	To J19	568	704	24%	136

Portbury Dock Road					
Mean		Pre-	Post-	% Change	Change
07-09	To J19	404	383	-5%	-21
	To Docks	1001	996	0%	-5
16-19	To J19	1333	1215	-9%	-118
	To Docks	409	424	4%	15

Clapton Lane					
Mean		Pre-	Post-	% Change	Change
07-09	To Portishead	493	478	-3%	-15
	To Bristol	1112	967	-13%	-145
16-19	To Portishead	1402	1205	-14%	-197
	To Bristol	733	730	0%	-3

- **Accidents:** There have been a number of personal injury collisions over the section of the works covered by the scheme. The table below shows the total number of personal injury collisions for the assessed area in the last 4 full years.

Table 7.9: Accidents in the A369 area of the M5 junction 19 by year

Year	Number of Collisions	Slight	Serious
2009	10	9	1
2010	11	11	0
2011	6	6	0
2012	4	4	0
Total	31	30	1

The accident information for 2012 post scheme has shown that signalisation of the two junctions onto the A369 and the entries to M5 Junction 19 has reduced accidents. The recent pattern of decreasing levels of accidents within the scheme is continuing. It was estimated that the scheme would result in fewer reported accidents, involving injury per year. Table 7.9 above indicates that there has been a decrease in injury accidents reported to the police in 2011 and 2012, which has continued since the scheme was completed. The decrease is proportionally greater than elsewhere in North Somerset.

With all traffic signals now being controlled by MOVA, with its superior gap assessment strategy when seeking to close the green signals, drivers now entering onto junction 19 from the A369 approaches or onto Martcombe Road from the High Street and St George's Hill do so in a controlled manner, as opposed to seeking or forcing 'gaps' in traffic.

- **Improved public transport services:** The reduction in congestion has added a further dimension to improving bus operations on the Bristol to Portishead service. It means a significant source of disruption has been lessened. Punctuality and reliability has improved and as a result of the combined improvements made to the service, patronage has increased by over 20% in the last year. New bus services were launched in March 2013 increasing the frequency from every 30 minutes to every 15 minutes on many parts of the routes. Such an improvement would not have been possible without the junction improvements.

Appendix C - Examples of Positive Local Media Reports

NEW BUS ROUTE IS JUST

The £70 million Greater Bristol Bus Network project aims to improve one of the ongoing complaints for people who live and work in the region - public transport. SAM RKAINA looks at the first of 10 new 'showcase' bus routes to be completed and at what else is in store for passengers.

Photograph: Jon Kent

A4018 COLLEGE GREEN TO CRIBBS CAUSEWAY:

CHANGES could be made to the Whiteladies Road section of one of the showcase bus routes following public consultation last year.

The A4018 College Green to Cribbs Causeway route is due to be completed by March next year.

The proposals for Whiteladies Road had a mixed response from residents and traders when they went on display in October.

A report responding to the feedback with potential changes to the scheme is due to be finished by the end of the month.

The plans include a series of banned turns and new parking restrictions that have been described as "anti-motorist".

Concerns have also been raised by the Bristol Urban Design Forum and transport campaigner Martin Cassini.

Mr Cassini, who backed the *Evening Post's* campaign to cut down the number of traffic lights in the city, believes the proposals are "over-engineered".

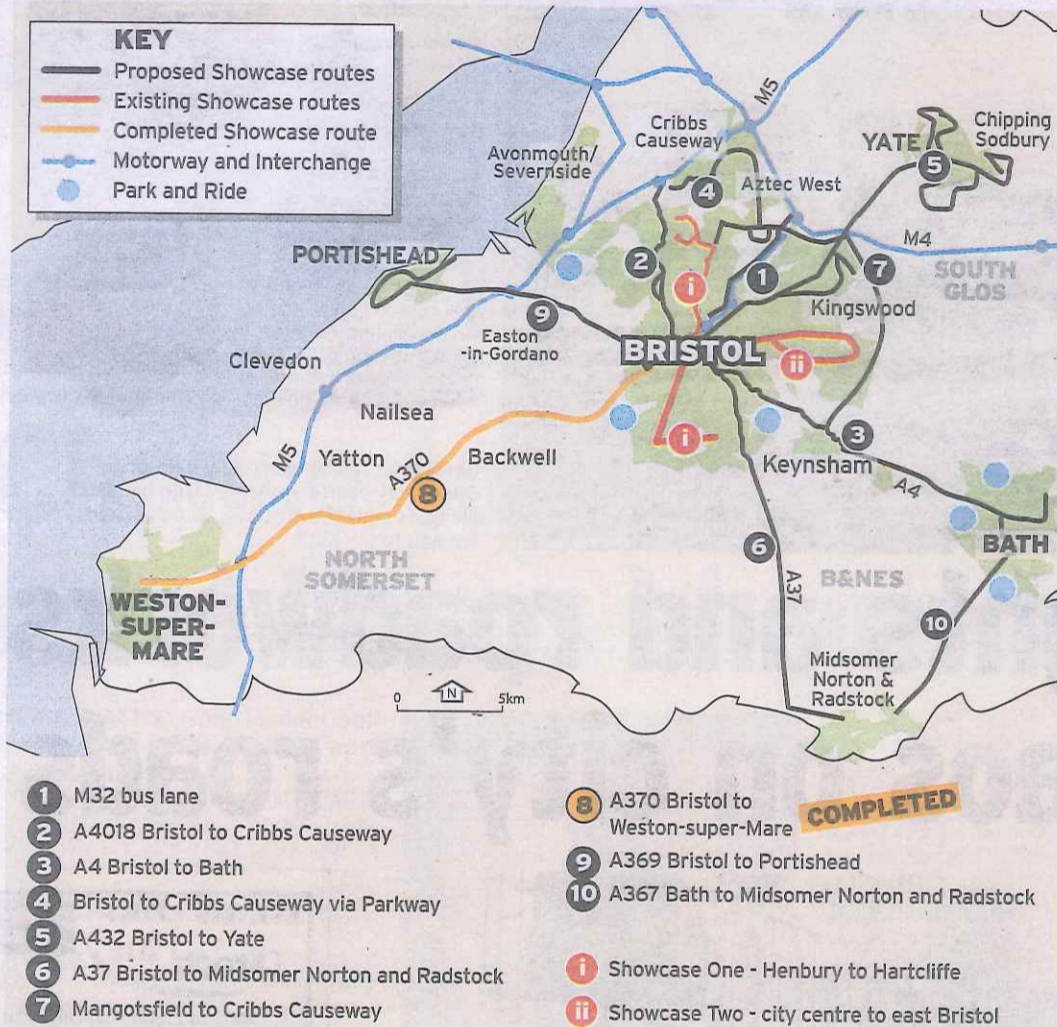
The council has stressed that new guidance on traffic management issued after the proposals were put together would be taken into consideration.

And there has also been praise from some residents who believe changes to parking arrangements will help stop commuter parking.

Council spokeswoman Kate Hartas said: "The first stage of the Whiteladies Road consultation has been completed, and all the responses and comments are being consolidated in order to give a clear picture of people's views on this corridor."

"Elements that do not require a further decision-making process, such as bus stop upgrades, will be programmed for construction starting in the spring."

"Further work on key junctions — such as Blackboy Hill — is planned to start in the summer when there tends to be less traffic on the roads."



Greater Bristol Bus Network timetable

June 21, 2011
A367 Bath to Midsomer Norton

October 21 to 31, 2011
Bristol to Cribbs Causeway via Parkway
Mangotsfield to Cribbs Causeway

November 29, 2011
A4 Bristol to Bath

March 15, 2012
M32 bus lane
A369 Bristol to Portishead
A4018 College Green to Cribbs
A432 Bristol to Yate
A37 Bristol to Midsomer Norton

When all 10 are complete:
More than 944 bus stops will

have been improved

- More than 120 new, low floor buses will operate
- More than 300 bus stops will have real-time information
- More than 20 junctions will have bus priority signals
- More than 8km of new bus or priority lane will be in use

A432 BRISTOL TO YATE:

FISHPONDS residents will have one last chance to have their say on a proposed bus route for their area later this spring.

The council is due to produce revised plans for a section of the A432 Bristol to Yate route in May.

Residents and traders have raised concerns about the Fishponds Road stretch and the proposals have divided opinion.

Critics claim the changes are not needed and the loss of parking spaces could harm businesses — something the council denies.

More than 180 people have signed a petition against the proposals, organised by Leigh Cooper, the owner of food shop Nature's Genius.

Vegan chef Shane Jordan lives in the Fishponds area and is a regular customer at the shop and shares Mr Cooper's concerns.

He said: "The bus lane will affect the trade of the store, mainly affecting parking. The loss of earnings may lead to the shop closing."

"It is little independent stores like

this that become derelict by large businesses that only care about money and profit."

Some changes have already been made to the original scheme but there are still a number of sticking points. These include proposed banning of turns in Hodges Lane and replacing parking spaces with short-term bays.

The council is hoping to resolve the outstanding issues and advertise the plans for final consultation in May.

Subject to the outcome, work

could begin in August. The council is working on extra measures to promote trade during the construction phase.

Councillor Gary Hopkins said: "The council is making many parking spaces short stay. This will prevent commuters who do not shop in the area from using them, and free them up for shoppers. That means more parking, not less. Traders don't always believe this will work, but once it is implemented, they see the benefits."



THE A370 from Bristol to Weston-super-Mare is the first of ten bus routes to be upgraded under the Greater Bristol Bus Network Scheme.

Around £2 million worth of improvements have been made to the route that runs seven bus services.

These include real time information at 27 bus stops so people know when their service is going to arrive.

In total 144 bus stops have had raised kerbs installed to make getting on and off the bus easier and a number of new shelters have been installed.

New signs have also been added to make it easier for passengers to find information on bus routes and times.

Junctions have been altered in a number of locations and 550m of extra bus lanes have been added.

All of this has been done to make bus journeys more reliable and to encourage more people to use the services.

Residents along the routes will be offered discounted travel to encourage them to use the bus and "personal travel planning roadshows" are to be held to introduce new passengers to their local bus services.

'We want to see

IMPROVED bus routes benefit everyone from passengers to local traders, according to Bristol's head of transport.

Councillor Gary Hopkins, the city council's cabinet member for transport, and managing director of First in Bristol, Somerset and Avon Tony McNiff both praised the £70 million Greater Bristol Bus Network scheme.

Mr Hopkins told the *Evening Post* that the two routes that had already been introduced were benefiting local businesses.

He said: "High-quality transport routes into Bristol are about getting people to work and to the shops, and about improving trading conditions for local business. We want to

THE TICKET

To order, quote BRJK20110315A-004_C

CITY CENTRE TO BRISTOL EAST:

BRML20110315D-002_C

A FAMILY carpet business says it is moving out of its shop after more than 60 years because of a previous showcase bus route.

Cyril Dark and Sons has been based in Church Road, Redfield, since 1947.

Owner Richard Dark, pictured, was one of a number of traders who objected to the second showcase bus route from the city centre to east Bristol during consultation five years ago.

They warned that certain changes on the city centre to Kingswood and Hanham route would have a negative effect on their business once they were introduced in 2007.

Now they say they are being forced to relocate to nearby Netham Road as the removal of parking spaces has made life difficult for potential customers and deliveries.

Mr Dark said: "One of the reasons was the bus lane and the final straw was the (bus enforcement) camera."

"It's not a lack of business but people couldn't park outside at certain times of the day and the bus lane didn't help for vans. We've had to carry carpets 100 yards down the road and it just made it impossible to carry on."

"We opposed the lane but that was a complete waste of time."

The Dark family have seven staff working for the company, which will move to the new premises on April 1. As they own the building they hope to rent it out to another business.

But there has also been praise for the scheme from other traders who say they



have benefited from the changes.

Roger Bennett, of Redfield Pet Supplies in Church Road, said: "We were a bit worried about what was going to happen but we didn't lose any trade and as the years have gone on we've actually increased trade as we're a small shop and it seems to have improved it a little bit."

Councillor Gary Hopkins said: "Several traders in Church Road have gone out of

their way to tell us that despite early concerns, the area is trading well. The area where the bus lane passes through, by St George's Park, is evidently thriving.

"As with Gloucester Road, the improved environment and reduced through traffic make it easier for shoppers to access the shops."

"Particularly considering the economic downturn, the council is pleased with the retail successes in the area."

Thumbs up: Councillor Gary Hopkins and managing director of First Bus Bristol Tony McNiff with his team at the launch of the upgraded service between Bristol and Weston-super-Mare

Photograph: Jon Kent

"This investment makes the buses more accessible and easier to use for a wide range of people and should encourage more people to give buses a try."

Councillor Elfan Ap Rees

Although the A370 route is the first to be completed in the £70 million scheme, two other showcase corridors have been up and running in Bristol for a number of years.

The Henbury to Hartcliffe via Gloucester Road and the city centre to east Bristol via Church Road have received praise from residents, passengers and traders along the routes.

Nine more routes are to be completed between now and next March in a bid to improve the much-criticised public transport network.

The bus network scheme has been worked on by all four local authorities; Bristol city, North Somerset, South Gloucestershire and Bath and North East Somerset councils.

The partnership believes that when all ten routes are completed 3.9 million additional bus journeys will be made each year, cutting carbon emissions by 43,000 tonnes.

North Somerset executive member for transport Councillor Elfan Ap Rees said: "We are delighted to have the first showcase route. The improvements to the bus network along the A370, in Weston-super-Mare, and in the surrounding villages of Long Ashton, Claverham and Yatton, highlight the important role buses have as part of a sustainable transport network."

"This investment makes the buses more accessible and easier to use for a wide range of people and should encourage more people to give the buses a try."

a modal shift away from the car'

drive the costs down too. Put simply, there aren't many other reasons for creating showcase routes.

"Shoppers by car benefit too, as we usually implement short stay parking to ensure there are plenty of spaces free throughout the day."

"The routes we've already built on Gloucester Road, Brislington Hill and Church Road have proved an unexpected boost for smaller local centres in Bristol."

"Any visitor to the area around St George's Park, for instance, can see the difference for themselves - all the shops are thriving, florists, new jazz cafes, business is booming."

Mr McNiff said: "We have been working in

partnership with the councils on the showcase network improvements for the past three years, and as each of the individual elements of the scheme are completed, we step closer to the ultimate goal of building a better quality, more reliable and punctual network of services in the Greater Bristol area."

"We are playing our part in this; we have invested £20 million in a fleet of better buses to use on the showcase routes and these are already on the road delivering real benefits for bus users. We hope all the improvements lead to a modal shift away from the car, with those who have not previously used the bus giving it a go."



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Opinion

Nativities

What fun we had driving Miss mad

HAVING enjoyed the lovely pictures of the festive plays in the *Evening Post* I thought this might strike a chord.

It reminds me of the time a harassed primary school teacher said "Nathan! Now please go over with the other shepherds" ... to which Nathan replied "But Miss, I'm not a shepherd, I'm a wise guy."

And all the children's plays still touch our hearts. Merry Christmas.

The School Nativity

"Peace on Earth" the children trilled - well, most of them at least,

For, sad to say, young Nigel was being a perfect beast!

He scowled and scuffed his sandal, and picked at the gold on his crown.

He really is a vandal, thought Miss, with an anxious frown.

Sweet Josie was truly angelic as she led the Heavenly Host,

Her movements so fluid and graceful, her proud mum would later boast.

The shepherds, on the whole, were good - until Jason trod on Pete's robe

And Peter did an emergency stop - and his crook hit him on the nose.

It only bled a little bit - but Mary burst into tears,

Dropping the infant in her fright - but Joseph caught one of his ears

And flung him in the crib face down, with posterior up in the air.

Poor Miss had yet a deeper frown as she fought hard not to despair.

The cattle lowed so loudly, one couldn't hear Jeremy speak -

So Hazel shouted for him (and our ears rang for a week).

Susan put Jesus the right way up, and adjusted his halo once more,

And it only got bent a teeny bit when she dropped it on the floor.

Miss so wished she'd worn a cotton top - her sweatshirt was so hot;

Her poor damp palms were clammy and her temples were starting to throb.

Then, suddenly it was over. Suddenly "no more sweat".

And, feeling so moved, we all agreed, 'Twas the best nativity yet!

P Fortune



● The changes to Whiteladies Road are designed to give priority to buses and pedestrians

Whiteladies Road improvements

Well done for putting buses first

THE city council must be congratulated on the terrific improvements to Whiteladies Road.

They did everything right by consulting with local residents about their plans, making adjustments but sticking to the original concept of prioritising buses and improving conditions for pedestrians.

The end result is that cars no longer dominate the road, it's much easier and quicker for buses to operate, and pedestrians have fabulous

wide pavements. What's more; new plane trees down the middle make it seem like a Parisian boulevard.

I know there are a few motorists who have complained. Perhaps they'd like to tell us how they'd deal with the problem of increasing traffic, congestion, pollution, and road injuries.

Do they feel other road users and local residents don't count and that since car has been king for 50 years, it should continue as such?

Would they just do nothing and hope for the best?

Perhaps they have trouble with buses being given priority over them. Which should come first, a bus with 50-plus passengers, or a car with one occupant?

So well done to the council.

It was a brave decision supported by the community and I'm sure any doubters will in time come on board.

Hamish Wills

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Appendix D - Examples of Positive User Feedback

There were many examples of positive user feedback received. Some examples are shown below in this Appendix. Names and personal details have been left out.

Please congratulate the person or team responsible for the alterations currently being carried out on Whiteladies Road. The wider pavements and the improved pedestrian crossings feel much safer. The trees planted in the central beds are a tremendous improvement to the urban landscape, and that's even before they show any leaves! I also appreciate how the traffic speed has been calmed and vehicles now flow along nicely at a maximum speed of 30 mph, which is safer for everyone. I wonder if you could do the same with Pembroke Road. Thanks for your time, and if possible please would you pass my comments to the people responsible.

xxxxxxxxxx
BS8 3AL

Dear Mr Kent

This is a copy of a note I sent to Sustainable Redland about the work on Whiteladies Road in response to some correspondence:

"The trees down Whiteladies Road are lovely. I can't wait until they are in leaf. I think they will have a calming effect on the traffic as well. Narrowing the road and putting the bus stops opposite each other did worry me at first when cycling up Whiteladies as you do get a sense of pressure being applied to you by the cars trailing behind as you slow down on the hill. Now that I have done it a few times I am less worried and scarred. The increase in the pavement width and the nice pedestrian crossing have definitely made it more pleasant being a pedestrian. I think well done to the council."

It does seem to me to be a great improvement, especially for pedestrian.

Your sincerely
xxxxxxxxxx
BS6 6RT

Dear Mr Kent

I live in Redland and have been witnessing the transformation of Whiteladies Road with great joy. The improvements for pedestrians has been very welcomed but it is the trees in the central median that have made such a difference. It has softened what is quite a harsh urban street scene and made the whole road look more attractive.

Thank you so much for spending the time (and public money) to improve this main thoroughfare of Bristol and please do not be distracted by the grumpy folk who have complained about these trees who clearly cannot appreciate your efforts.

Kind regards.
xxxxxxxxxx

To whom it may concern

I wanted to write to express thanks for recent works to Bath Rd improvements.

Turning left onto Sandy Park road with the new filter I a huge improvement.

The new cycle lane and light bypass is v positive alteration at Totterdown Bridge.

The trees are a fine touch to the street scene

New bus stops are much better. Are there any plans for bins?

Do First or BCC plan to bring RTI to these new stops?

Well done.

Brislington Resident

Dear GBBN team,

For a long time now I've been meaning to send congratulations and thanks to the team who implemented the landscaping improvements to Whteladies Road.

I realise that there were many different areas /layers of planning and works, but as a local resident I would just like to say that the treeplanting, and underplanting of the beds up the whole length of the road have made a truly significant impact on me week by week over the past year or so .

The space has been vastly improved in my opinion as a human space for pedestrians, cyclists and car drivers too. I am deeply impressed that the planting schemes have been so successful and beautiful. The choice of plants and colour schemes are outstanding and have given me huge pleasure during the months since completion.

I realise that this has probably come far too late to reach the people who did all this work, but if you can forward it on, please do.

Many thanks,

xxxxxxxxxx