REPORT TITLE: Ashton Vale to Temple Meads MetroBus (Rapid Transit) Review and Update

Executive Summary

Purpose of the report:

To set out the options for changes to the Ashton Vale to Temple Meads(AVTM) MetroBus scheme previously approved by Cabinet on 21st July 2011.

RECOMMENDATION for the Mayor's approval:

1. To consider the three options for the AVTM MetroBus scheme as set out in this report:
    - Option 1 - Make no substantive changes to the existing scheme
    - Option 2 - Alter to use the Cumberland Road alignment
    - Option 3 -Alter to use the Hotwell Road alignment

2. To decide which option Bristol City Council should proceed with.

The Proposal

1. The focus of the report is on the technical performance of these options and to then consider the financial, legal and reputational risks associated with them.

Rationale for the Review

2. During the Mayor's election campaign concerns were expressed about the heritage, operational and environmental impacts of the AVTM scheme on the historic harbourside railway, the harbourside itself and on Prince Street Bridge.

3. This report presents the Mayor with the technical appraisals for the options considered alongside an outline of the risk associated with each viable option.

Options Considered and Assessment Criteria

4. The following options have been considered:

    - Option 1 Make no changes to the scheme
    - Option 2 Cumberland Road alignment
    - Option 3 Hotwell Road alignment

5. Appendix A contains the scheme drawings for Option 2 and 3.

6. All options have been considered against the policy objectives of the current scheme and the business case paying particular consideration to the following criteria:
    - Value for Money (Benefit to Cost Ratio)
    - Deliverability within Funding Envelope
      Forecast Patronage
    - Financial Efficiency

- Journey Time Reliability
- Greenhouse Gas Emissions
- Statutory Powers required

Consideration of Options

7. The information contained within this report is a summary of the consultants technical reports included within Appendix B. The technical appraisals need to be carefully considered against the financial and legal risks of the options.

Option 1 – Transport and Works Act Scheme as considered at Public Inquiry

8. Continuing with the Transport and Works Act scheme represents the lowest risk to the promoting authorities.

Option 2 – Cumberland Road Alignment

9. The technical note in Appendix B demonstrates how the Cumberland Road scheme sees a reduction in public transport benefit. This reduction, however, is offset by an increase in highway benefit.

10. It is officers' view that Option 2 as a scheme variation, combined with its strong economic performance, would represent a minimal change to the technical case and that DfT would be able to support this following formal submission.

11. With the exception of planning permission required for a small section of the proposed route no additional substantive powers would be required to implement the changed section of the route. The Transport and Works Act Order would still be required for the powers to construct the guided busway section between Long Ashton Park and Ride and Avon Crescent.

12. Option 2 is likely to result in delays of up to two months based on the need for further technical approvals and the need to go through additional statutory processes.

Option 3 – Hotwell Road Alignment

13. From the detailed economic appraisal set out in Appendix B the Hotwell Road option was found to be causing negative impacts that far exceed its benefits.

14. The main issue with the option is the very high volume of dis-benefits on the highway network due to reductions in the highway capacity in order to provide the necessary priority for the on-road scheme.

Option 3 with a negative BCR represents very poor value for money.

Other options considered:

15. A fourth option which has not been set out in this report is ceasing the MetroBus scheme. This option has not been presented as a viable alternative, as option 2 performs well in terms of Value for Money and policy objectives.

AGENDA ITEM 6

BRISTOL CITY COUNCIL
CABINET
27th June 2013

REPORT TITLE: Ashton Vale to Temple Meads MetroBus (Rapid Transit) Review and Update

Ward(s) affected by this report: Cabot, Lawrence Hill, Southville, Bedminster

Strategic Director: Nicola Yates, City Director

Report author: Alun Owen, Service Director, Major Projects

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Purpose of the report:

To set out the options for changes to the Ashton Vale to Temple Meads(AVTM) MetroBus scheme previously approved by Cabinet on 21st July 2011.

RECOMMENDATION for the Mayor's approval:

1. To consider the three options for the AVTM MetroBus scheme as set out in this report:
    - Option 1 - Make no substantive changes to the existing scheme
    - Option 2 - Alter to use the Cumberland Road alignment
    - Option 3 - Alter to use the Hotwell Road alignment

2. To decide which option Bristol City Council should proceed with.

The proposal:

1. This reports sets out three options following the review of the AVTM scheme. The focus of the report is on the technical performance of these options and to then consider the financial, legal and reputational risks associated with them.

2. The AVTM MetroBus scheme forms a core part of the City's transport strategy and will deliver significant benefits to the residents and travelling public in the city. This report is not intended to revisit the policy decisions and justification for the scheme and which have been discussed and supported by successive Cabinets

3. Cabinet approved the AVTM scheme on 21st July 2011 prior to submission of the Best and Final Funding Bids to the Department for Transport on 9th September 2011. The business case for this scheme is included within the background papers for this report. Cabinet and Full Council have made a number of other decisions in relation to the AVTM scheme, which are also listed in the background papers.

4. Cabinet approved a report on 4th October 2012 releasing a further £4.65m of development funding and delegating the Strategic Director and the Section 151 Officer to approve further development of the schemes to full approval without recourse to Cabinet.

5. The remainder of the Cabinet report sets out the options for changes to the scheme following further development work over the last six months as part of the review of the scheme. Any change to the scheme would require the agreement of North Somerset Council as the joint promoters of the Transport and Works Act Order.

Policy Context

6. The four UA's promote joint transport policy for the region through the Joint Local Transport Plan for the West of England .The JLTP3 promotes rapid transit proposals for Bristol which comprises 3 key routes – Ashton Vale to Temple Meads, South Bristol Link and North Fringe to Hengrove.

7. Each of the three schemes has a different lead authority and each of the three schemes is supported by a Joint Promotion Agreement (JPA) which is entered by each of the authorities promoting the specific scheme. The JPA sets out the governance arrangements and authority resource for each project and deals with the funding and constitutional arrangements. The JPA's also make provision for the termination of the project in accordance with the Joint Working Arrangement in the event that either party decides to withdraw from the project or the project fails to achieve government funding or fails to obtain any other consents that are necessary for the progression of the project.

8. The total MetroBus expenditure across all projects is £196m. Approximately £113m is provided by DfT. The cost of AVTM is £49.6m with approximately £35m provided by DfT, £12m from Bristol and £3m from North Somerset. Until programme entry is achieved in 2014 all expenditure is at risk. The DfT will only allow expenditure of their funds on projects that have achieved programme entry. Furthermore, DfT will not allow these funds to be used on alternative local projects without completing a full new programme entry process.

9. The changes to the AVTM MetroBus scheme as part of this report are all minor modifications in policy terms and the schemes still all fully meet the objectives and aims set out within the Joint Local Transport Plan (JLTP) and as articulated in the AVTM Best and Final Bids Major Scheme Business Case. As a matter of fact and degree they would be in overall compliance with the JLTP.

Rationale for the Review

10. During the Mayor's election campaign concerns were expressed about the heritage,

operational and environmental impacts of the AVTM scheme on the historic harbourside railway, the harbourside itself and on Prince Street Bridge.

11. The Mayor has been consistent both before and since his election that he does not consider Prince Street Bridge suitable for the use of Bus Rapid Transport (MetroBus) vehicles. He is also concerned about the significant impacts on the Harbourside as an historical asset and major tourist attraction, including the city's major new museum at M-Shed, if buses are travelling with a high level of frequency through the area throughout the day.

12. The rationale of the scheme review, therefore, has been to establish if alternative options could be developed that are achievable and deliverable within the scope of the project and funding available that do not travel across Prince Street Bridge and, as a consequence, no longer use the Harbourside to access central Bristol.

13. This report presents the Mayor with the technical appraisals for the options considered alongside an outline of the risk associated with each viable option. The Mayor will need to balance all of these against the reasons for the review as stated above. The Mayor will need to weigh up the benefits and risks associated with each of the viable options and arrive at a decision as to which option should be pursued.

Options Considered and Assessment Criteria

14. The following options have been considered:

- Option 1 Make no changes to the scheme
- Option 2 Cumberland Road alignment
- Option 3 Hotwell Road alignment

A fourth option of not proceeding with the MetroBus scheme has not been presented as there are viable alternatives.

15. All options have been considered against the policy objectives of the current scheme and the business case paying particular consideration to the following criteria:

- <u>Value for Money (Benefit to Cost Ratio)</u>
  This is critical to the government's assessment of the scheme and is assessed through application of the government's appraisal methodology. The Benefit to Cost Ratio demonstrates the scale of monetised benefits achieved for each pound of public investment in the scheme. For the scheme to be considered by government it must have a Benefit to Cost Ratio greater than 2:1. Anything less than this will be rejected by DfT and not be eligible for government funding.

- <u>Deliverability within Funding Envelope</u>
  There is a fixed budget available for the scheme and profile of spend linked to the government's Comprehensive Spending Review period up to March 2015. Any changes that cannot be delivered within this same timescale represent a significant risk of losing government funding and would lead to significant risk of increased costs to the promoting authorities.

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- Forecast Patronage
  Patronage growth is a core outcome as this is a public transport scheme.

- Financial Efficiency
  Identification of the operational costs and whether there is an operating surplus or deficit is an important factor to consider over the life of the scheme.

- Journey Time Reliability
  Although not explicitly modelled within the major scheme business case the reliability of journey times is critical to efficient bus service operations and considered one of the most important factors by bus operators.

- Greenhouse Gas Emissions
  The scheme should contribute towards the city's goals of carbon reduction.

- Statutory Powers required
  The requirement of new or additional powers could be a factor in the deliverability of the scheme within the required timescales.

Description of the Options

16. Option 1 represents the scheme as planned at the Public Inquiry. The remaining two Options have been taken through to a more detailed assessment to allow a fuller consideration against the above criteria in comparison with Option 1. This included working up engineering designs for both options 2 and 3 to allow modelling and appraisal of the options to enable a clear comparison with the Public Inquiry scheme.

17. Option 2 , the Cumberland Road alignment, comprises:

- Using the segregated busway/guideway from the Park & Ride site to the Create Centre

- Joining the highway at Avon Crescent and then running on-street on Cumberland Road with bus lanes

- A bus gate is provided where the carriageway narrows to ensure bus can get through the section without priorities

- Bathurst Basin bridge is replaced to facilitate the movement towards Bedminster roundabout along Commercial Road

- Bus lanes are provided on Commercial Road and Redcliffe Hill where the route then re-joins the previous alignment towards Bristol Temple Meads

18. Option 3, the Hotwell Road alignment, comprises:

- From the Long Ashton P&R site, the Hotwell Road scheme joins the A370 via new/extended bus lanes and signals on the B3128.

- The scheme follows the A370 using a new bus lane until Jessops Underpass where buses join the mainline traffic through a bus gate.

- Buses would run with the mainline traffic on the A370 until junction of Brunel Way and Hotwell Road where a new bus lane connects with new peak hour bus lanes along Hotwell Road.

- A new eastbound peak only bus lane is added on Hotwell Road towards the junction with Jacobs Wells Road linking in with a new 24 hour bus lane along Anchor Road from Jacobs Wells Road.

19. Plans of the revised scheme drawings are set out in Appendix A.

Consideration of Options

20. This section provides a commentary on the three options and then a comparison of the three options together.

21. The information contained within this report is a summary of the consultants technical reports included within Appendix B. This appendix covers the technical appraisal of Options 2 and 3. The outputs of these assessments are compared against the performance of the Public Inquiry scheme (option 1).

22. The technical appraisals need to be carefully considered against the financial and legal risks of the options. These are considered as part of the assessment with further implications set out in the risk and financial implication sections of this report.

Option 1 – Transport and Works Act Scheme as considered at Public Inquiry

23. Continuing with the Transport and Works Act scheme represents the lowest risk to the promoting authorities. Whilst the scheme is awaiting the outcome of the public inquiry it has been through the statutory process and (if approved) will have the necessary powers in place and can proceed to programme.

24. The other options have been considered in relation to this option to give a bench mark with which to compare the benefits and risks associated with moving to one of the other options.

Option 2 – Cumberland Road Alignment

25. The technical note in Appendix B demonstrates how the Cumberland Road scheme sees a reduction in public transport benefit, although these still contribute 90% of the total scheme benefits. This reduction, however, is offset by an increase in highway benefit. Overall the BCR is almost identical to option 1.

26. The cause of this is that the revised scheme allows us to provide bus lanes where there is additional highway capacity (Redcliffe Hill) and the retention of general traffic through the shuttle system at Prince Street effectively removes some of the delays to traffic caused by Option 1 (Public Inquiry Scheme).

27. The impacts of changing to the Cumberland Road scheme are summarised as:

- Delay to traffic on Cumberland Road through bus priority and bus gate (small negative)
- Reduced delays to traffic using Prince Street Bridge (large positive)
- Traffic on Commercial Road experiences similar journey times/delays as previously on The Grove (neutral)
- Additional delay on Redcliff Hill for general traffic (small negative)
- Additional delay at Bedminster Roundabout (small negative)
- Additional delay at Redcliffe Roundabout (small negative)
- Additional journey time for MetroBus passengers on Cumberland Road (small negative)
- Additional journey time for passengers on MetroBus and North Somerset services in the outbound direction due to the routing via The Grove, Redcliffe Way, Redcliff Hill and Commercial Road instead of Prince Street Bridge (small negative)
- Link to Temple Quarter from Bedminster replaces link from Arnolfini (neutral)
- Improved public transport reliability through diversion of services away from Prince Street bridge with its signalised alternate working and occasional bridge swings (small positive)

28. With the exception of planning permission required for a small section of the proposed route no additional substantive powers would be required to implement the changed section of the route. The Transport and Works Act Order would still be required for the powers to construct the guided busway section between Long Ashton Park and Ride and Avon Crescent. Depending upon final design considerations some additional land may be necessary to accommodate an enlarged Bathurst basin bridge.

29. The changed scheme could be implemented within approximately two months of the timescale as the original scheme. However, there are some key assumptions in this, including:

- Assumed that that there is no significant challenge to the additional necessary planning permission.
- Timely decision on the Transport and Works Order (the decision is required for both option 1 and option 2. In both cases it is not strictly critical in programming terms until the Full Approval submission in 2014 but does necessitate considerable activity and expenditure ‘at risk’.)
- Assumed that procurement of a design & build contractor can be achieved within the same timescale as for original scheme (option 1).

30. The changes to the scheme that Option 2 makes have minimal implications on the South Bristol Link scheme other than on the route and journey time of the Airport Flyer that would be subject to the same route changes as the MetroBus scheme as set out in detail in Appendix B.

31. The change of the route away from Prince Street Bridge would affect the North Fringe to Hengrove Package (NFHP) through necessitating the MetroBus service to use Bedminster Parade and Redcliff Hill. It should be noted, however, that these changes to use this alternative route alignment are already, independently, under consideration for the NFHP scheme due to technical and programming issues. This change will require formal agreement by the joint scheme promoters.

Option 3 – Hotwell Road Alignment

32. From the detailed economic appraisal set out in Appendix B the Hotwell Road option was found to be causing negative impacts that far exceed its benefits. The primary cause of this is the major increases in delay which account for the increase in journey times and decrease in traffic flow. There are delays for vehicles on the A370 and those joining from Long Ashton. In addition, those vehicles going to the city centre would experience delays as they leave the A370 at Hotwell Road. There are also delays on the A4 Hotwell Road west of the A370 junctions.

33. The scheme achieves some benefits to public transport passengers, although the volume is significantly less than the level generated by Option 1 or Option 2.

34. The main issue with the option is the very high volume of dis-benefits on the highway network due to reductions in the highway capacity in order to provide the necessary priority for the on-road scheme. As a result, the highway dis-benefits outweigh the public transport benefits, producing net dis-benefits.

35. Although the Hotwell Road option is less expensive than Option 1, the magnitude of the dis-benefits results is a significantly poorer economic performance with the Hotwell Road scheme.

36. Option 3 would have implications for the route of the Airport Flyer in the context of the South Bristol Link scheme but no other impacts on the South Bristol Link or the North Fringe to Hengrove Package.

Comparison of Options

37. Table 1 below sets out a high level comparison of the three Ashton Vale to Temple Meads Options. Further detail can be found in the technical reports in Appendix B.

Table 1 – Comparison of Options

	Option 1 TWA Public Inquiry Scheme	Option 2 Cumberland Road	Option 3 Hotwell Road
Benefit Cost Ratio (*partial BCRs excluding non-TUBA benefits to make comparable with previous business case.)	3.79*	3.78*	-1.74*
Deliverability within cost estimate of option 1	N/A	Yes	Yes
Forecast MetroBus Service Patronage AM peak 2016 (passengers)*	820	650	430
Financial Efficiency	No revenue support	No revenue support	Revenue support required
Reliability compared to Option 1	N/A	Better	Worse
Monetised Green House gases Benefits (£m)	-9	+323	-281
Programme	No Change	Up to 2 month delay for full Approval	Significant – scheme does not represent value for money and would need significant changes
Statutory Powers	Transport and Work Act Order	Transport and Works Act Order plus two further planning applications required	No additional powers to Option 1 Transport and Works Act not required.

**Compared to current peak hour patronage of Park and Ride service of around 210*

Benefit to Cost Ratio (BCR)

38. The Value for Money assessment focuses on the economic case and forms part of the overall advice that the DfT provides to Ministers. The information is obtained through an appraisal in line with the DfT WebTAG guidance. BCR appraisals are defined as follows:

- Poor Value for Money if the BCR is less than 1.0
- Low Value for Money if the BCR is between 1.0 and 1.5
- Medium Value for Money if the BCR is between 1.5 and 2.0
- High Value for Money if the BCR is between 2.0 and 4.0
- Very High Value for Money if the BCR is above 4.0

39. The Cumberland Road Scheme has an almost identical BCR to the Public Inquiry scheme. Of the two 'change' options overall Option 2 represents a relatively minimal route change to Option 1, essentially shifting the route within the two fixed points of Ashton Avenue Bridge and Redcliffe Way.

40. Both Options 1 and 2 represent high value for money in the Governments value for

money assessment with the partial BCR. It should be noted that this is a partial BCR excluding the assessment of the non-monetised benefits. The consultant report in Appendix B sets out that the full BCR taking into account the wider benefits for both Option 1 and Option 2 will be greater than 4:1 representing very high value for money.

41. It is officers' view that Option 2 as a scheme variation, combined with its strong economic performance, would represent a minimal change to the technical case and that DfT would be able to support this following formal submission.

42. Option 3 with a negative BCR represents very poor value for money and does not meet the threshold criteria generally applied by the DfT of 2:1 and therefore is not considered a viable option. On that basis, from this point onwards in the report we have excluded it from further commentary or analysis.

Deliverability Within Budget/Timescale

43. Option 1 represents the lowest risk to changes to the current timescales for the project, although both Option 1 and 2 are dependent on the Transport and Works Act Order being granted by the Secretary of State.

44. Option 2 represents a reduction in scheme costs when compared to option 1 but it is acknowledged that this option could place greater risk on determination of the Transport and Works Act Order as the change to the scheme could introduce a delay whilst the implications of the changes are considered by the TWAO Unit at DfT.

Forecast MetroBus Patronage

45. Option 1 performs best in terms of patronage.

46. Patronage with Option 2 is still significantly higher than current day loadings that are around 415 passengers during the full 7am to 9am period (so around 208 in a peak hour). It should be noted that a slightly less peak orientated shift in patronage may well be beneficial operationally as it will reduce the pressures of providing additional capacity in peak periods with the subsequent increase to the Peak Vehicle Requirement (PVR) and operational costs.

Financial Efficiency

Options 1 and 2 do not require any financial support to the MetroBus service operation.

Reliability

47. The consultant's report in Appendix B concludes there is a 'small positive' benefit of Option 2 when compared to Option 1 through improving public transport reliability arising from the diversion of services away from Prince Street Bridge with its signalised alternate shuttle working and occasional bridge swings.

Greenhouse Gases

48. Although the figures look significant, they represent a monetised value over the 60 year appraisal period and overall the changes in Greenhouse gases are a marginal part of the economic assessment of the options appraisal representing less than 1% of the economic benefits or costs.

49. Option 1 has no significant impact on Carbon. The figure is so low that it could be due to small dis-benefits across the model area and this figure could easily fluctuate and be positive if minor network changes are applied to the appraisal.

50. Option 2 represents a slight positive in comparison. This will be linked to the more favourable impact on wider traffic movements.

Programme

51. Option 2 is likely to result in delays of up to two months based on the need for further technical approvals and the need to go through additional statutory processes. This change needs to be caveated that it is based on the assumption that the Transport and Works Act Order is granted in a timely fashion. Should this be delayed either in terms of the Secretary of State's determination or a challenge to that determination, programme delays could far exceed this. Further detail on this risk, which also applies to option 1, is covered later in this report.

Statutory Powers

52. Option 2 will require additional planning permission for the junction with Avon Crescent and some additional powers in relation to the replacement of the bridge at Bathhurst Basin.

Consultation and scrutiny input:

a. Internal consultation:

53. Internal stakeholders have been extensively consulted as part of the review.

b. External consultation:

54. No consultation has been undertaken to date. Following a decision consultation will be undertaken and the affected properties will be given opportunity to formally comment during the Traffic Regulation Order process. This is subject to the scheme achieving full approval by Government.

Other options considered:

55. A fourth option which has not been set out in this report is ceasing the MetroBus scheme. This option has not been presented as a viable alternative, as option 2 performs well in terms of Value for Money and policy objectives.

Risk management / assessment:

56. This section focuses on the risks of approving a change to the scheme. It should be noted that some of these risks apply to the current scheme (option 1).

DfT Business Case Assessment

57. The Council is already incurring costs on the current scheme, option 1, at risk until the final business case is signed off by DfT, expected to be in Spring 2014. If at any time the funding risk is realised, these costs become 'sunk' costs and the Council will have to pay for them out of its own resources.

58. Whilst a formal view has yet to be sought from DfT it is officers' consideration that the change in route associated with Option 2 is a minimal change in the context of the whole route. When this is considered alongside the strong economic performance officers do not consider gaining DfT approval for this change to be a significant risk to the approval of the final business case but, nonetheless, it will still require formal engagement to secure this comfort.

Possibility of Delays

59. Delays to the scheme could have the following consequences:

- The potential loss of DfT funding either in part or full due to our failure to spend in line with agreed funding profiles, particularly across CSR periods
- Any further spend at risk would add to the estimated £10m at risk costs already incurred and become 'sunk' should the scheme fail to proceed.
- Any delays will result in slippage of spend during the current CSR period at an estimated average rate of £1.5m per month. Any slippage without DfT approval will be at risk.

60. The introduction of any change to the scheme is inherently higher risk than continuing with the scheme as set out in the public inquiry. Delays to the scheme could result in partial, or in a worst case all, of the government's financial contribution to the scheme being lost.

61. The joint promoters are seeking approval from the Secretary of State for the Transport and Works Act Order following on from the public inquiry in summer 2012. The promoters have been advised that the Transport and Works Act unit is progressing with the necessary work to allow the Secretary of State to reach a decision.

62. It should be noted that obtaining the Transport and Works Act Order is critical to the delivery of both Options 1 and 2. It is recognised, however, that through the introduction of a change, Option 2 would represent an additional risk through the potential for further delay as the implications of those changes are considered.

The cost of a delay

63. At present it is anticipated that a decision will be made on the Transport and Works Act Order (TWAO) application in late July 2013 and this will have no material impact on the timescales for the option 1 scheme.

64. The TWAO is required to implement Option 2, however it is possible that there may be a delay if the TWAO Unit needs time to assimilate the changes to the scheme if option 2 is adopted, but at this point in time it is not possible to say how long that delay could be. An estimate of delay is highlighted in paragraph 59.

Headline Risks of Options 1 and 2

65. The tables below set out the headline risks associated with delivering option 1 and option 2. The risks of not delivering any of the options is that all the funding spent to date will be lost, DfT funding not secured and the scheme will not be delivered.

Risks of Option 1

The risks associated with the implementation of Option 1:

No.	RISK Threat to achievement of the key objectives of the report	INHERENT RISK (Before controls) Impact	INHERENT RISK (Before controls) Probability	RISK CONTROL MEASURES Mitigation (ie controls) and Evaluation (ie effectiveness of mitigation).	CURRENT RISK (After controls) Impact	CURRENT RISK (After controls) Probability	RISK OWNER
1	Failure to secure the Transport and Works Act Order	H	M	• On going engagement with DfT to clarify the Council's position and requirement for Transport and Works Order • Continue to progress scheme at risk whilst awaiting outcome	H	L	Alun Owen
2	Delays to Programme	H	H	• Continuation with procurement programme at risk	H	M	Alun Owen
3	Risk of Legal Challenge	M	M	• Ensure that all relevant legal financial and technical information is available for the Mayor to take into account when he reviews the options and takes the decision	M	M	Alun Owen

Risks of Option 2

The risks associated with the implementation of Option 2:

No.	RISK Threat to achievement of the key objectives of the report	INHERENT RISK (Before controls) Impact	INHERENT RISK (Before controls) Probability	RISK CONTROL MEASURES Mitigation (ie controls) and Evaluation (ie effectiveness of mitigation).	CURRENT RISK (After controls) Impact	CURRENT RISK (After controls) Probability	RISK OWNER
1	Failure to secure the Transport and Works Act Order	H	M	• On going engagement with DfT to clarify our position and requirement for Transport and Works Order • Continue to progress scheme at risk whilst awaiting outcome	H	L	Alun Owen
2	Delays to Programme	H	H	• Continuation with procurement programme at risk	H	M	Alun Owen

3	DfT consideration of changed scheme	H	H	• Ensure the alternative option would meet DfT business case criteria	H	L	Alun Owen
4	Risk of Legal Challenge	M	M	• Ensure that all relevant legal financial and technical information is available for the Mayor to take into account when he reviews the options and takes the decision	M	M	Alun Owen
5	Legal Claim from Other Joint Promoters as a result to the changes to the scheme	H	M	• Redesign the scheme to meet project and business case requirements • Ensure scheme is acceptable to DfT • Ensure scheme is within time and budget of original scheme	M	L	Alun Owen
6.	Failure to secure other statutory powers	M	M	• Provide necessary design information and business case to secure other statutory powers.	L	L	Alun Owen

Equalities Impact Assessment

66. Public sector equality duties:

Before making a decision, section 149 of the Equality Act 2010 requires that each decision-maker considers the need to promote equality for persons with the following "protected characteristics": age, disability, gender reassignment, pregnancy and maternity, race, religion or belief, sex, sexual orientation. Each decision-maker must, therefore, have due regard to the need to:

i) eliminate discrimination, harassment, victimisation and any other conduct prohibited under the Equality Act 2010.

ii) advance equality of opportunity between persons who share a relevant protected characteristic and those do not share it. This involves having due regard, in particular, to the need to:
   - remove or minimise disadvantage suffered by persons who share a relevant protected characteristic.
   - take steps to meet the needs of persons who share a relevant protected characteristic that are different from the needs of people who do not share it (in relation to disabled people, this includes, in particular, steps to take account of disabled persons' disabilities);
   - encourage persons who share a protected characteristic to participate in public life or in any other activity in which participation by such persons is disproportionately low.

iii) foster good relations between persons who share a relevant protected characteristic and those who do not share it. This involves having due regard, in particular, to the need to tackle prejudice and promote understanding

67. A detailed Equalities Impact Assessment was included in the Cabinet Report in July 2011 and is attached for reference as Appendix D. Equalities Impact Assessments

have been separately carried out since the beginning on all three MetroBus projects and have been reviewed during this time from an equalities perspective with regard to the original proposals. Although the Equalities Impact Assessments have been completed separately there has continued to be overarching consideration given to changes that may need to be made regarding relevant projects such as the South Bristol Link, Bristol North Fringe and Ashton Vale to Temple Meads which takes into consideration the planning, construction and implementation stages of the project so that the decision making processes are robust and comply not only with current national legislation but also includes local guidance such as the Environmental Access Standard.

The main change in the new proposal is that the route will not go over Prince Street Bridge and instead will go over Redcliffe Hill. This has not been out for consultation with equality stakeholders to date but as stated in the Equalities Impact Assessment dated 6th July 2011 it recognises that further equalities work will be necessary as the projects move forward.

The proposed changes from the original scheme represent small changes to the routing and whilst it is expected that further consultation will take place looking at possible impacts and the benefits of the proposed route the likely overall impact will be minimal.

Further updates will be brought forward as the scheme progresses.

Advice given by Jane Hamill, Equalities Adviser.

Eco impact assessment

68. A detailed Eco Impact Assessment for option one was included within the Cabinet report in July 2011, and is attached for reference at appendix C.

69. In comparison to option 1, differences for options 2 are summarised below;

Option 2:

Positive:

- Similar overall environmental impact, on the section from Long Ashton P&R to Ashton Avenue Swing Bridge
- Reduced heritage and environmental impact due to re-routing away from the historic harbourside
- The increased reallocation of the existing highway for bus lanes may encourage modal shift, and routing away from Prince Street Swing Bridge may reduce traffic congestion and associated pollution in that area.
- A small reduction in greenhouse gas emissions

Negative:

- The proposed new bridge at Bathurst Basin would require additional infrastructure & resources to deliver,
- Patronage would be less than option 1

70. Mitigation measures are listed within the Eco Impact Assessment produced for the July 2011 Cabinet report.

71. For Option 1, using DfT appraisal criteria, it was predicted that the positive impacts will outweigh the negative impacts. If option 2 was chosen then it may be necessary to carry out some further work using DfT appraisal criteria to finally assess the overall impact.

Advice given by Steve Ransom, Environmental Coordinator
Date 12th June 2013

Resource and legal implications:

a. Financial (revenue) implications:

72. The operational business case for AVTM has been reconsidered in light of the proposed changes within this report. The updated business case indicates that there will be no requirement for on-going operational revenue support for either Options 1 and 2. Option 3 has not been costed as it was not deemed operationally viable.

b. Financial (capital) implications:

73. The capital cost of Option 1, approved by Cabinet, was originally estimated to be £49.6m. Current estimates show that continuing this option will cost £52.8m due to increases identified within the scheme. Option 2 is estimated to have a capital cost of £51.2m, which is lower than the current proposal due to engineering changes associated with the revised scheme. Both cost estimates are subject to value engineering, but Option 2 is the lower cost option.

74. A review of the cash flow for Option 2 shows that eligible expenditure of £18m would be achieved before the end of CSR period 1 assuming no material delays on the critical path. This is currently expected to be acceptable to DfT.

75. The overall MetroBus programme has an estimated cost to Bristol of £42m, £27m of this funding has not been ear-marked but is an acknowledged pressure in the medium term financial strategy. If no capital funding is available this will culminate in an annual cost, based on current operational delivery gives a prudential borrowing cost of £0.3m in 15/16, increasing to £0.8m in 16/17, £1.0m in 17/18 and £1.6m in 18/19 which will continue for 25 years.

76. A further Cabinet report will be taken later during 2013 to seek approval for an updated funding strategy.

Advice given by Mike Allen / Finance Business Partner
Date 12th June 2013

c. Legal implications:

The legal implications are exempt by virtue of paragraph 5 of Part 1 of Schedule 12A of the Local Government Act and are set out in confidential Appendix E.

d. Land / property implications:

77. The changes to Land and Property proposed by options 2 and 3 are small and should have no impact on the delivery of the project when compared to option 1

Advice given by Alun Owen, Service Director, Major Projects
Date 12th June 2013

e. Human resources implications:

78. Not applicable – there are no human resources implications from this report.

Appendices:

Appendix A – Scheme Drawings for Option 2 and 3
Appendix B – Detailed Technical Appraisal of Ashton Vale to Temple Meads Cumberland Road and Hotwell Road Options
Appendix C – Eco-Impact Assessment from 21st July 2011 Cabinet Report
Appendix D – Equalities Impact Assessment from 21st July 2011 Cabinet Report
Confidential Appendix E – Legal Implications (EXEMPT)

Access to information (background papers):

Bristol City Council Cabinet Report 2nd February 2009
https://www.bristol.gov.uk/committee/2009/ua/agenda/0202_1800_ua000.html

Bristol City Council Cabinet Report 10th December 2009
https://www.bristol.gov.uk/committee/2009/ua/agenda/1210_1800_ua000.html

Bristol City Council Full Council 19th January 2010
https://www.bristol.gov.uk/committee/2010/ta/agenda/0119_1400_ta000.html

Bristol City Council Cabinet Report 25th March 2010
https://www.bristol.gov.uk/committee/2010/ua/agenda/0325_1800_ua000.html

Bristol City Council Full Council 29th June 2010
https://www.bristol.gov.uk/committee/2010/ta/agenda/0629_1800_ta000.html

Bristol City Council Cabinet Report 21st July 2011
https://www.bristol.gov.uk/committee/2011/ua/agenda/0721_1800_ua000.html

Bristol City Council Cabinet Report 1st September 2011
https://www.bristol.gov.uk/committee/2011/ua/agenda/0901_1800_ua000.html

Bristol City Council Cabinet Report 4th October 2012
https://www.bristol.gov.uk/committee/2012/ua/agenda/1004_1800_ua000.html

Appendix A – Scheme Drawings for Options 2 and 3

**

Appendix B
Technical Appraisal of Option 2 and 3

Appendix A

Scheme drawings for:

Option 2 - Cumberland Road

Option 3 – Hotwell Road

OS NORTH

DH0276-12-473
Plan 9 of 9

DH0276-12-472
Plan 8 of 9

DH0276-12-470
Plan 6 of 9

DH0276-12-466
Plan 2 of 9

DH0276-12-467
Plan 3 of 9

DH0276-12-468
Plan 4 of 9

DH0276-12-465
Plan 1 of 9

DH0276-12-469
Plan 5 of 9

DH0276-12-471
Plan 7 of 9

Key Plan:

Notes:

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Project

BRISTOL METRO-BUS
ASHTON VALE to TEMPLE MEADS
and BRISTOL CITY CENTRE

Drawing

Options Review
Option 2
Cumberland Road to
Redcliffe Roundabout
Overview Plan

Drawn by: JGM	Date: 11/06/2013
Checked by: SCW	Date: 11/06/2013
Approved by: SCW	Date: 11/06/2013

Drawing No. DH0276 - 12 - 488

Revision

Drawing Scale: NTS @ A1

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Xreference file path: S:\TRAFFIC\EngCon\PROJECTS\DT_DET_LDH\DH0276-12\12 BRT Review 2013\Drawings\Working Drawings
User and Plot Date: brbigs - 11 Jun 2013 - 5:13 pm

OS NORTH

Wharf
Sluice
FB
Car Park
BRUNEL LOCK ROAD
JUNCTION LOCK BRIDGE
Old Dock Cottages
Wharf
Avon Quay
(Activities Centre)
Rescue Post
Deal Cottage
TS Adventure
(Sea Cadet Corps)
NOVA SCOTIA PLACE
PH
Slipway
HARBOURSIDE
ASHTON AVENUE
AVON CRESCENT
Underfall Yard
Chy
Hydraulic Engine House
Tk
Patent Slip
Underfall Yard
Depot
Slipway
The Cottage Inn
Club
Water Leisure Centre
A BOND
Proposed retaining wall with re-graded footway
CUMBERLAND ROAD
BUS LANE
CYCLE LANE
Retaining Wall to be rebuilt with new Vehicle Safety Barrier
Existing Chocolate Path
Informal crossing facility
Rebuilt arched retaining wall
RIVER AVON NEW CUT
Re-alligned section of Chocolate Path
River Avon (New Cut)
Garden Centre
Works

Key Plan:

Notes:

Key

- Bus lane / bus only street
- Proposed carriageway widening
- Cycle path / shared use footpath
- New footway areas
- Rebuilt retaining wall with Vehicle Safety Barrier
- Traffic signal equipment for controlled pedestrian crossing
- Tactile paving for controlled pedestrian crossing

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BRISTOL METRO-BUS
ASHTON VALE to TEMPLE MEADS
and BRISTOL CITY CENTRE

Drawing

Options Review
Option 2
Cumberland Road
to Redcliffe Roundabout
Plan 1 of 9

Drawn by: ND	Date:	11/06/2013
Checked by: SCW	Date:	11/06/2013
Approved by: SCW	Date:	11/06/2013

Drawing No. DH0276 - 12 - 465

Revision

Drawing Scale: 1:500 @ A1

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Xreference file path : S:\TRAFFIC\EngCon\PROJECTS\DT_DET_DH0276-2012 BRT Review 2013\Drawings\Working Drawings\
User and Plot Date : brtlgs5 - 12 Jun 2013 - 5.19 pm

OS NORTH

Harbour

Sloping masonry

Baltic Wharf

Caravan Site

Westbrooke Court

John Cabot Court

Hope Court

Weare Court

Meredith Court

Napier Court

Rowing Club

El Sub Sta

MARDYKE FERRY ROAD

CUMBERLAND ROAD

SBC

UNE

Proposed Metro-bus stop

Heritage Railway

Existing Chocolate Path

Retaining Wall to be rebuilt with new Vehicle Safety Barrier

Retaining Wall to be rebuilt with new Vehicle Safety Barrier

VAUXHALL FOOTBRIDGE

Vauxhall Bridge (Foot)

Mooring Posts

Trees

Bollard

TCB

Avon Packet (PH)

PC

LB

Key Plan:

Notes:

Key

- Bus lane / bus only street
- Proposed carriageway widening
- Cycle path / shared use footpath
- New footway areas
- Rebuilt retaining wall with Vehicle Safety Barrier

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Project

BRISTOL METRO-BUS
ASHTON VALE to TEMPLE MEADS
and BRISTOL CITY CENTRE

Drawing

Options Review
Option 2
Cumberland Road
to Redcliffe Roundabout
Plan 2 of 9

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Checked by: SCW	Date: 11/06/2013
Approved by: SCW	Date: 11/06/2013

Drawing No. DH0276 - 12 - 466

Revision

Drawing Scale: 1:500 @ A1

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Xreference file path : S:\TRAFFIC\Eng\Con\PROJECTS\DT_DET\LDH\276-2012 BRT Review 2013\Drawings\Working Drawings\
User and Plot Date : brbjg5- 11 Jun 2013 - 3:04 pm

OS NORTH

Spike Island Metro-bus stop.

HANOVER PLACE

GASFERRY ROAD

CUMBERLAND ROAD

Existing Chocolate Path

Existing tree to remain

Heritage Railway

Retaining Wall to be rebuilt with new Vehicle Safety Barrier

Retaining Wall to be rebuilt with new Vehicle Safety Barrier

RIVER AVON NEW CUT

River Avon (New Cut)

Trees

Trees

Car Park

El Sub Sta

Works

Day Nursery

Builder's Yard

Garage

Works

Works

PH

PH

Key Plan:

Notes:

Key

- Bus lane / bus only street
- Proposed carriageway widening
- Cycle path / shared use footpath
- New footway areas
- Rebuilt retaining wall with Vehicle Safety Barrier

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Project

BRISTOL METRO-BUS
ASHTON VALE to TEMPLE MEADS
and BRISTOL CITY CENTRE

Drawing

Options Review
Option 2
Cumberland Road
to Redcliffe Roundabout
Plan 3 of 9

Drawn by: ND	Date: 11/06/2013
Checked by: SCW	Date: 11/06/2013
Approved by: SCW	Date: 11/06/2013

Drawing No. DH0276 - 12 - 467

Revision

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User and Plot Date : brbigs - 11 Jun 2013 - 3:03 pm

OS NORTH

Mooring Posts

Floating Harbour

Wapping Railway Wharf

Merchants Row

Liberty Gardens

Pennon Rise

Westgate

Harbour Walk

CUMBERLAND COURT

CUMBERLAND ROAD

Parking Bays

Retaining Wall to be rebuilt with new Vehicle Safety Barrier

New bus gate - see Inset A

RIVER AVON NEW CUT

Existing bus stop to remain

Width of existing Footway/Cycleway reduced

Existing bus stop to remain

River Avon (New Cut)

Inset A - Scale 1:200 @ A1

New bus gate - Free flowing for buses.
Red light for general traffic when bus is approaching.

OS NORTH

Key Plan:

Notes:

Key

- Bus lane / bus only street
- Proposed carriageway widening
- Cycle path / shared use footpath
- New footway areas
- Rebuilt retaining wall with Vehicle Safety Barrier
- Traffic signal equipment for bus gate

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Project

BRISTOL METRO-BUS
ASHTON VALE to TEMPLE MEADS
and BRISTOL CITY CENTRE

Drawing

Options Review
Option 2
Cumberland Road
to Redcliffe Roundabout
Plan 4 of 9

Drawn by: ND	Date: 11/06/2013
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Approved by: SCW	Date: 11/06/2013

Drawing No. DH0276 - 12 - 468

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User and Plot Date:

OS NORTH

Proposed location of Wapping Wharf Primary School

Existing bus stop to be upgraded to Metro-bus stop at current location

Existing Parking

CUMBERLAND ROAD

WAPPING ROAD

Proposed Gaol Ferry Metro-bus stop

Existing controlled crossing point to be upgraded

GAOL FERRY BRIDGE

Gaol Ferry Bridge

RIVER AVON NEW CUT

Proposed location of zebra crossing for Wapping Warf Primary School

Car Park

Old Jail Workshops

1 to 12
14 to 49
The Quays

Sloping masonry

Key Plan:

Notes:

Key

- Bus lane / bus only street
- Proposed carriageway widening
- Cycle path / shared use footpath
- New footway areas
- Traffic signal equipment for controlled pedestrian crossing
- Tactile paving for controlled pedestrian crossing

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Project: BRISTOL METRO-BUS
ASHTON VALE to TEMPLE MEADS
and BRISTOL CITY CENTRE

Drawing: Options Review
Option 2
Cumberland Road
to Redcliffe Roundabout
Plan 5 of 9

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Approved by: SCW	Date: 11/06/2013

Drawing No.: DH0276 - 12 - 469
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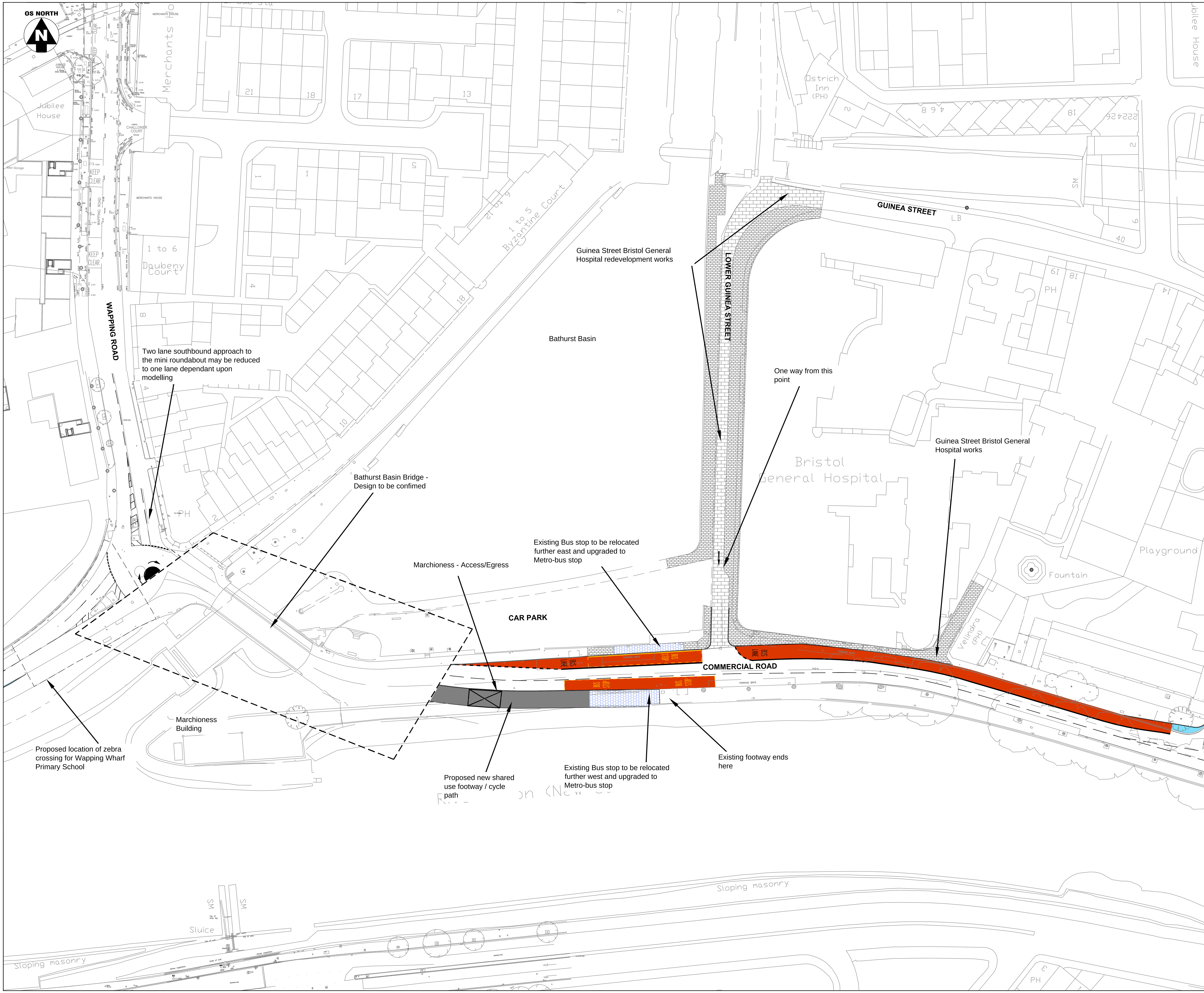

OS NORTH
N
Jubilee House
Merchants House
Challoner Court
Merchants House
1 to 6 Daubeny Court
KEEP CLEAR
KEEP CLEAR
WAPPING ROAD
1 to 5 Byzantine Court
Ostrich Inn (PH)
GUINEA STREET
LB
LOWER GUINEA STREET
Bristol General Hospital
Guinea Street Bristol General Hospital redevelopment works
Bathurst Basin
Two lane southbound approach to the mini roundabout may be reduced to one lane dependant upon modelling
One way from this point
Guinea Street Bristol General Hospital works
Bathurst Basin Bridge - Design to be confimed
PH
Existing Bus stop to be relocated further east and upgraded to Metro-bus stop
Marchioness - Access/Egress
CAR PARK
COMMERCIAL ROAD
BUS LANE
BUS STOP
Playground
Fountain
Velindra (PH)
Marchioness Building
Proposed location of zebra crossing for Wapping Wharf Primary School
Proposed new shared use footway / cycle path
Existing Bus stop to be relocated further west and upgraded to Metro-bus stop
Existing footway ends here
Sloping masonry
Sluice
Sloping masonry
SM
PH

Key Plan:

Notes:

Key

- Bus lane
- Proposed carriageway widening
- Cycle path / shared use footpath
- Existing/Upgraded footways

Work as proposed by general Hospital Development

- Carriageway in pennant stone
- Footway in pennant stone

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BRISTOL METRO-BUS
ASHTON VALE to TEMPLE MEADS
and BRISTOL CITY CENTRE

Drawing

Options Review
Option 2
Cumberland Road
to Redcliffe Roundabout
Plan 6 of 9

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Approved by:	SCW	Date:	11/06/2013

Drawing No. DH0276 - 12 - 470

Revision

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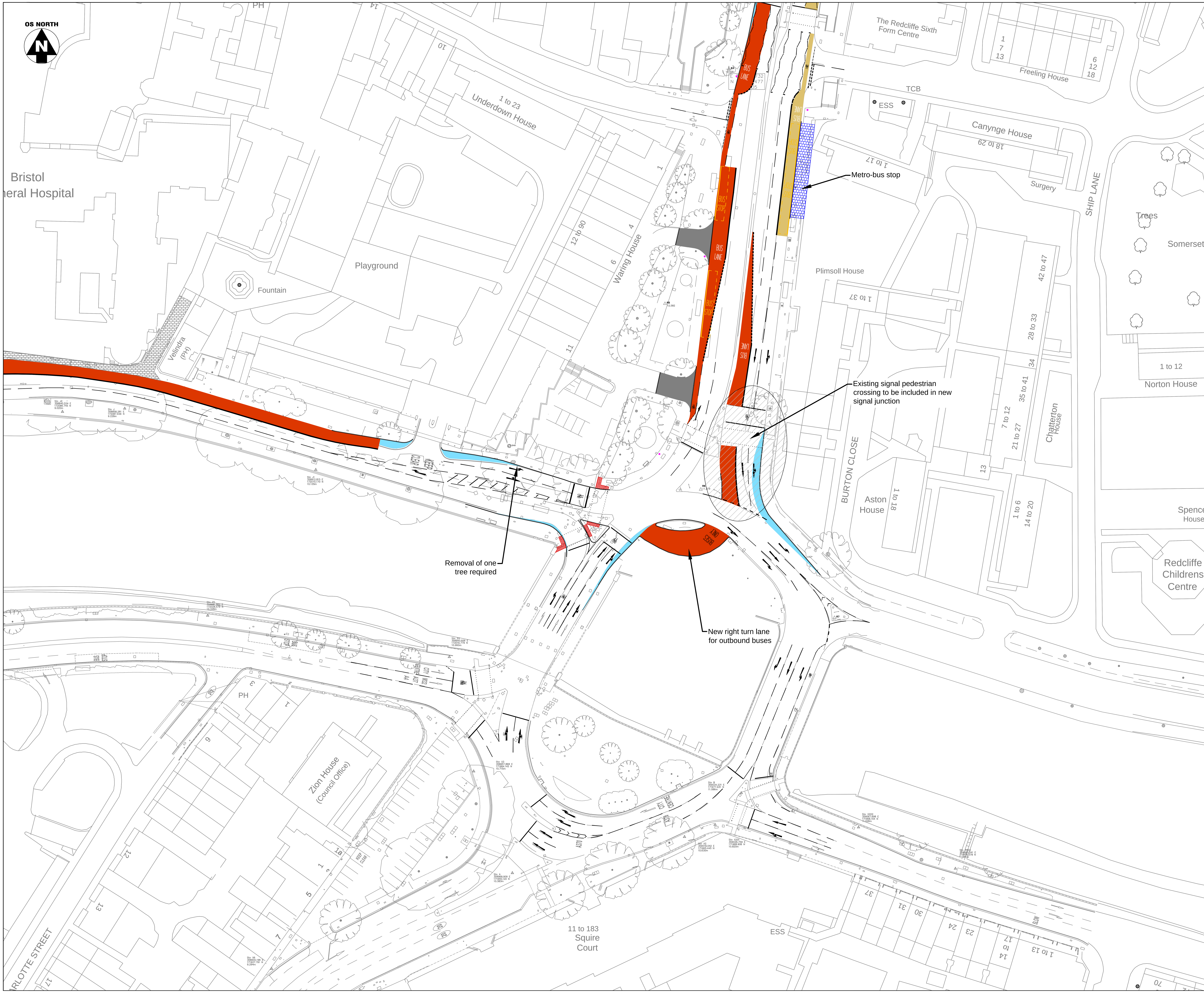

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- Proposed bus lane / bus only street
- Existing bus lane
- Proposed carriageway widening
- New footway area
- Tactile paving for controlled pedestrian crossings

Rev	By	Chkd	Apprvd	Date	Description
A	JGM	SCW	SCW	14/03	Metro-Bus stops added

Client

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BRISTOL METRO-BUS
ASHTON VALE to TEMPLE MEADS
and BRISTOL CITY CENTRE

Drawing

Options Review
Option 2
Cumberland Road
to Redcliffe Roundabout
Plan 7 of 9

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Drawing No. DH0276 - 12 - 471
Revision

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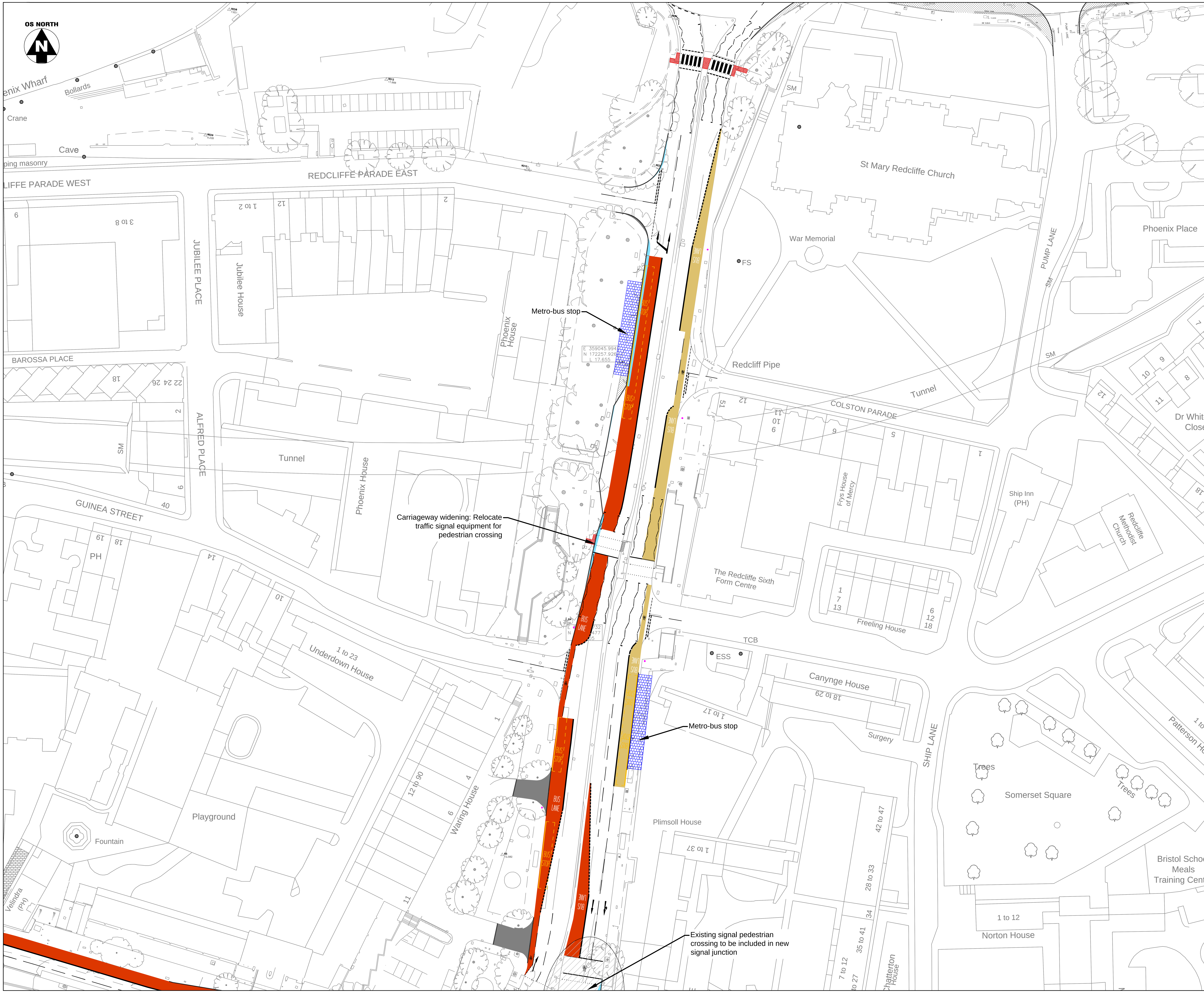
Xreference file path : S:\TRAFFIC\EngCon\PROJECTS\DT_DETL\DH0276-2012 BRT Review 2013\Drawings\Working Drawings\
User and Plot Date : brlsjg5 : 11 Jun 2013 - 3:30 pm



OS NORTH
N
Phoenix Wharf
Bollards
Crane
Cave
ping masonry
REDCLIFFE PARADE EAST
LIFFE PARADE WEST
JUBILEE PLACE
Jubilee House
BAROSSA PLACE
ALFRED PLACE
Tunnel
Phoenix House
GUINEA STREET
PH
Underdown House
1 to 23
Playground
Fountain
Waring House
12 to 90
Velindra (PH)
Metro-bus stop
Carriageway widening: Relocate traffic signal equipment for pedestrian crossing
BUS STOP
BUS LANE
St Mary Redcliffe Church
War Memorial
FS
Redcliff Pipe
COLSTON PARADE
Tunnel
PUMP LANE
Phoenix Place
Dr White Close
Frys House of Mercy
Ship Inn (PH)
Redcliffe Methodist Church
The Redcliffe Sixth Form Centre
Freeling House
TCB
ESS
Canynge House
Surgery
SHIP LANE
Metro-bus stop
Plimsoll House
Trees
Somerset Square
Patterson House
Bristol School Meals Training Centre
Norton House
Chatterton House
Existing signal pedestrian crossing to be included in new signal junction

Key Plan:

Notes:

- Proposed bus lane / bus only street
- Existing bus lane
- Proposed carriageway widening
- New footway area
- Tactile paving for controlled pedestrian crossings

Rev	By	Chkd	Apprvd	Date	Description
A	JGM	SCW	SCW	14/03	Metro-Bus stops added

Client

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BRISTOL METRO-BUS ASHTON VALE to TEMPLE MEADS and BRISTOL CITY CENTRE

Drawing

Options Review Option 2 Cumberland Road to Redcliffe Roundabout Plan 8 of 9

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Approved by: SCW Date: 11/06/2013

Drawing No. DH0276 - 12 - 472 | Revision

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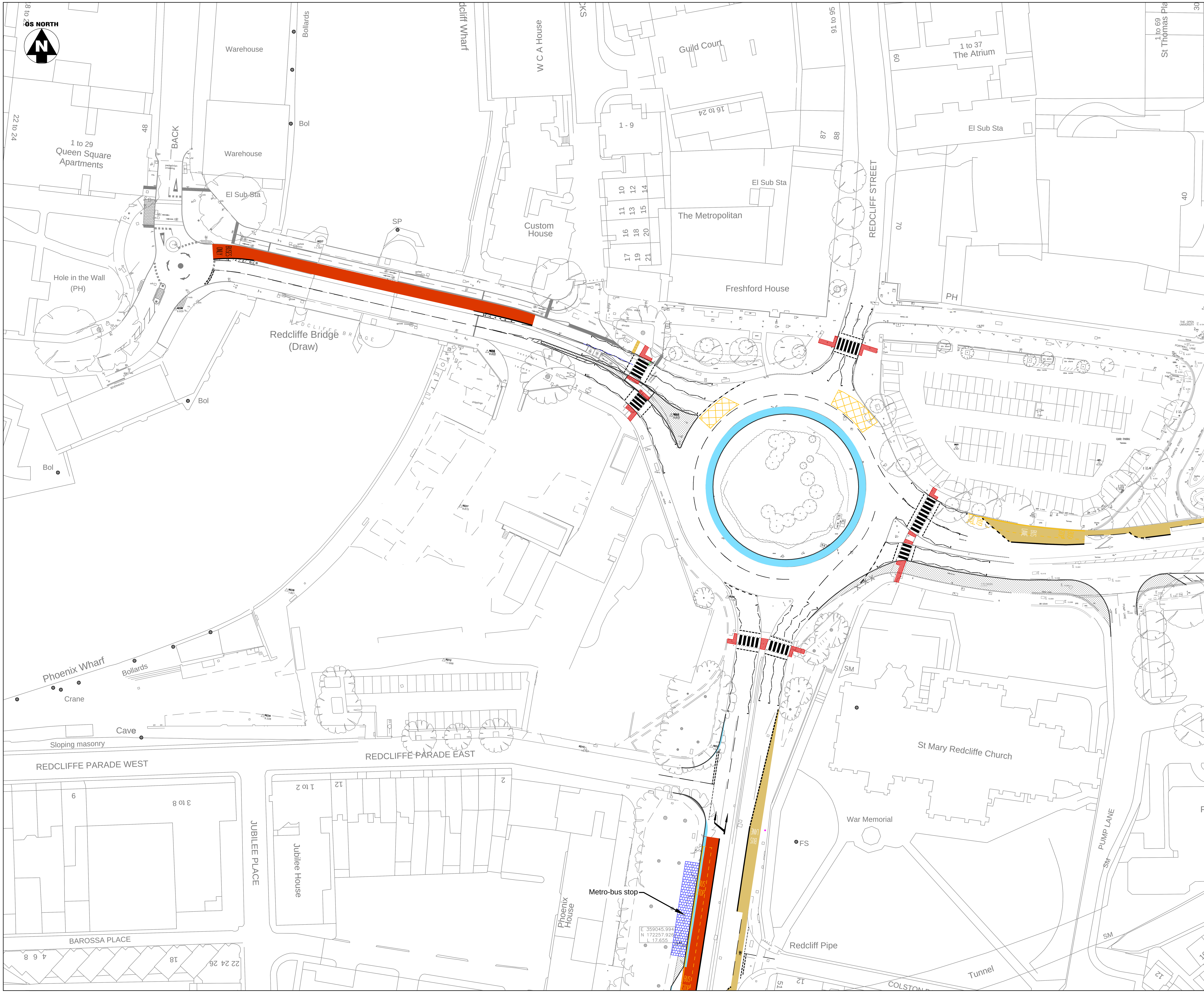

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- Proposed bus lane / bus only street
- Existing bus lane
- Proposed carriageway widening
- New footway area
- Tactile paving for controlled pedestrian crossings

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Project

BRISTOL METRO-BUS
ASHTON VALE to TEMPLE MEADS
and BRISTOL CITY CENTRE

Drawing

Options Review
Option 2
Cumberland Road
to Redcliffe Roundabout
Plan 9 of 9

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Drawing No. DH0276 - 12 - 473

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OS NORTH

DH0276-12-483
Plan 10 of 14

DH0276-12-484
Plan 11 of 14

DH0276-12-485
Plan 12 of 14
- 1st viewport

DH0276-12-485
Plan 12 of 14
-2nd viewport

DH0276-12-486
Plan 13 of 14

DH0276-12-487
Plan 14 of 14

DH0276-12-481
Plan 9 of 14

DH0276-12-482
Plan 8 of 14

DH0276-12-480
Plan 7 of 14

DH0276-12-478
Plan 5 of 14

DH0276-12-479
Plan 6 of 14

DH0276-12-477
Plan 4 of 14

DH0276-12-476
Plan 3 of 14

DH0276-12-475
Plan 2 of 14

DH0276-12-474
Plan 1 of 14

Notes:

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BRISTOL METRO-BUS
ASHTON VALE to TEMPLE MEADS
and BRISTOL CITY CENTRE

Drawing

Options Review
Option 3
Long Ashton Park & Ride
to Anchor Road
Overview Plan

Drawn by: JGM	Date:	11/06/2013
Checked by: SCW	Date:	11/06/2013
Approved by: SCW	Date:	11/06/2013

Drawing No.	Revision
DH0276 - 12 - 489	

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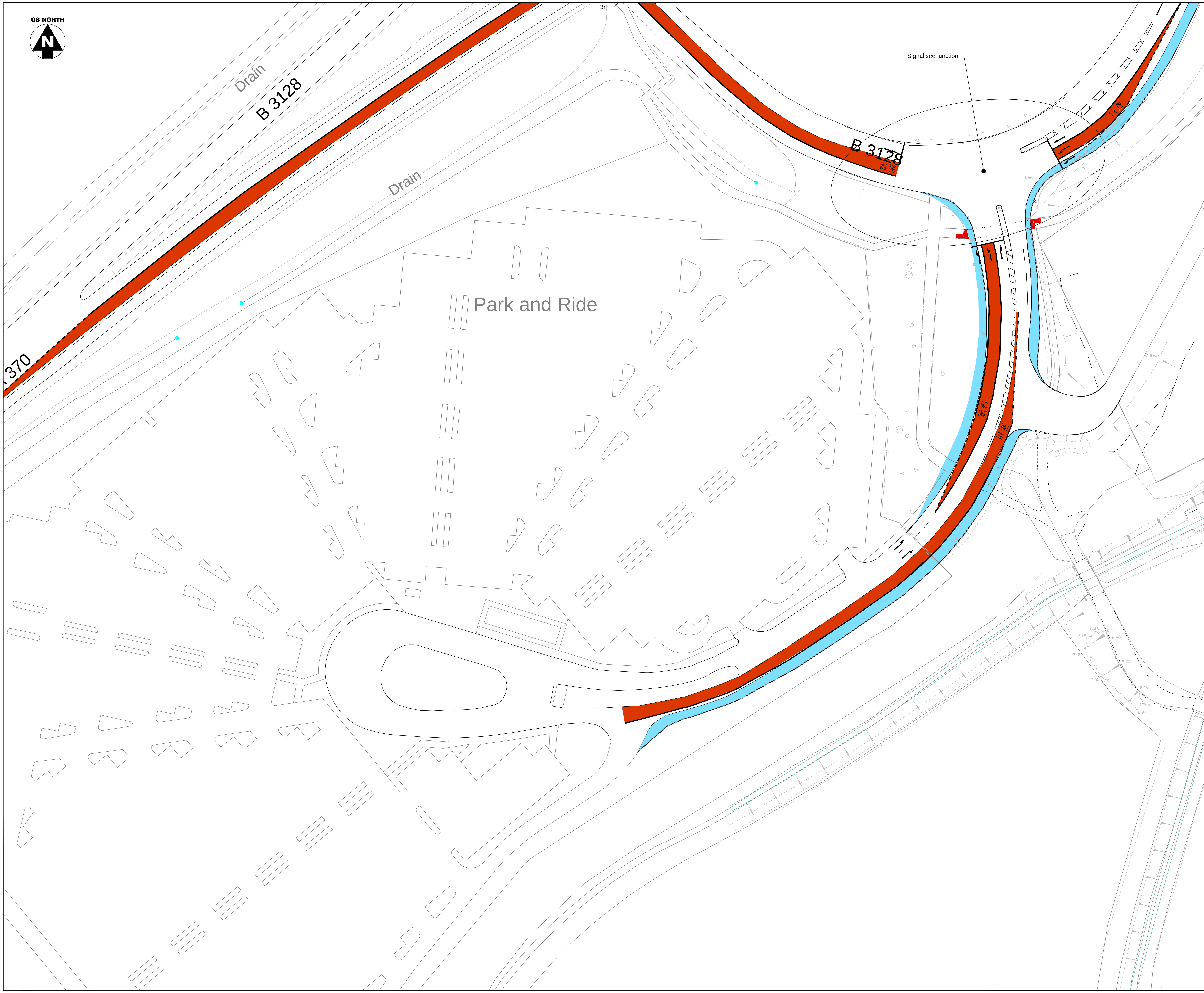

Key Plan:

Notes:

Key

- Proposed 24 hour bus lane / bus only street
- Proposed Peak hour bus lane
- Existing 24 hour bus lane
- Proposed carriageway widening
- New footway areas

Rev	By	Chkd	Apprvd	Date	Description

Client

West of England

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Bristol City Council

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Project

BRISTOL METRO-BUS
ASHTON VALE to TEMPLEMEADS
and BRISTOL CITY CENTRE

Drawing

Options Review
Option 3
Long Ashton Park & Ride
to Anchor Road
Plan 1 of 14

Drawn by: JGM	Date: 11/06/2013
Checked by: SCW	Date: 11/06/2013
Approved by: SCW	Date: 11/06/2013

Drawing No.	Revision
DH0276 - 12 - 474	

Drawing Scale: 1:500 @ A1

Drawing file path & name : S:\TRAFFIC\EngCon\PROJECTS\DT_DETL\DH0276-2012 BRT Review 2013\Drawings\Working Drawings\ DH0276-12 474 to 482 Cab report AVTM op3 A370.dwg
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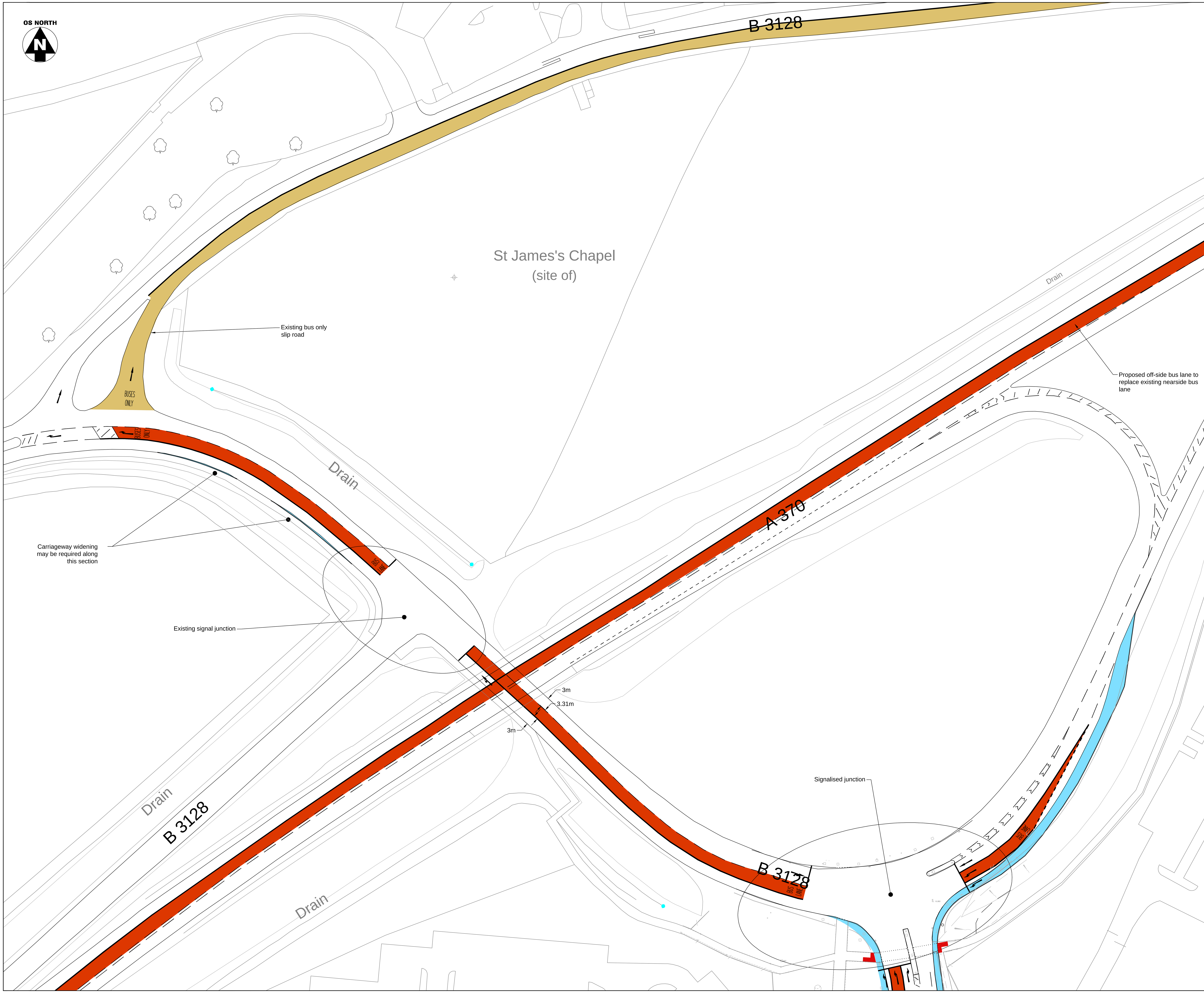

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Key

- Proposed 24 hour bus lane / bus only street
- Proposed Peak hour bus lane
- Existing 24 hour bus lane
- Proposed carriageway widening
- New footway areas

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Drawing

Options Review
Option 3
Long Ashton Park & Ride
to Anchor Road
Plan 2 of 14

Drawn by: JGM Date: 11/06/2013
Checked by: SCW Date: 11/06/2013
Approved by: SCW Date: 11/06/2013

Drawing No. DH0276 - 12 - 475

Revision

Drawing Scale: 1:500 @ A1

OS NORTH

New signalised junction

ASHTON ROAD

B 3128

ASHTON ROAD

Existing bus lane stops short of junction. Propose to widen carriageway at junction to allow bus lane to continue to stop line as shown

Drain

B 3128

Drain

Proposed off-side bus lane to replace existing nearside bus lane

3m

3m

3m

3m

3m

3.03m

3m

48

50

56

Key Plan:

Notes:

Key

- Proposed 24 hour bus lane / bus only street
- Proposed Peak hour bus lane
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- New footway areas

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BRISTOL METRO-BUS
ASHTON VALE to TEMPLEMEADS
and BRISTOL CITY CENTRE

Drawing

Options Review
Option 3
Long Ashton Park & Ride
to Anchor Road
Plan 3 of 14

Drawn by: JGM	Date: 11/06/2013
Checked by: SCW	Date: 11/06/2013
Approved by: SCW	Date: 11/06/2013

Drawing No. DH0276 - 12 - 476

Revision

Drawing Scale: 1:500 @ A1

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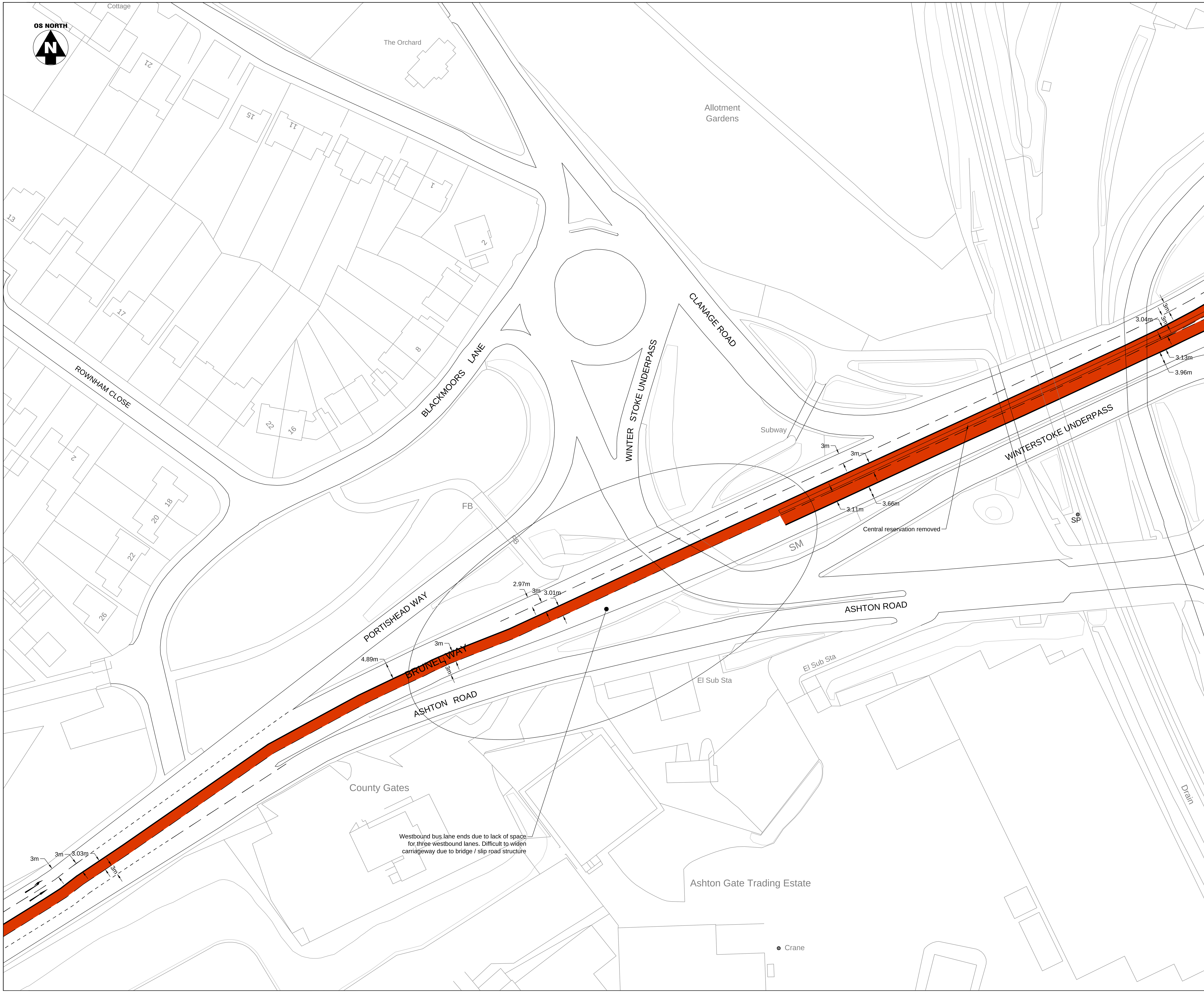

Key Plan:

Notes:

Key

- Proposed 24 hour bus lane / bus only street
- Proposed Peak hour bus lane
- Existing 24 hour bus lane
- Proposed carriageway widening
- New footway areas

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BRISTOL METRO-BUS
ASHTON VALE to TEMPLEMEADS
and BRISTOL CITY CENTRE

Drawing

Options Review
Option 3
Long Ashton Park & Ride
to Anchor Road
Plan 4 of 14

Drawn by: JGM Date: 11/06/2013
Checked by: SCW Date: 11/06/2013
Approved by: SCW Date: 11/06/2013

Drawing No.: DH0276 - 12 - 477

Revision:

Drawing Scale: 1:500 @ A1

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Xreference file path : S:\TRAFFIC\EngCon\PROJECTS\DT_DETL\DH0276-2012 BRT Review 2013\Drawings\Working Drawings\
User and Plot Date : brlsjg5 : 11 Jun 2013 - 4:29 pm

Key Plan:

Notes:

Key

- Proposed 24 hour bus lane / bus only street
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- Existing 24 hour bus lane
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- New footway areas

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BRISTOL METRO-BUS
ASHTON VALE to TEMPLEMEADS
and BRISTOL CITY CENTRE

Drawing

Options Review
Option 3
Long Ashton Park & Ride
to Anchor Road
Plan 5 of 14

Drawn by: JGM		Date: 11/06/2013
Checked by: SCW		Date: 11/06/2013
Approved by: SCW		Date: 11/06/2013

Drawing No. DH0276 - 12 - 478

Revision

Drawing Scale: 1:500 @ A1

OS NORTH

Existing road layout / road markings from here to new bus lane on Bristol Gate

CLIFT HOUSE ROAD

JESSOP UNDERPASS

CLIFT HOUSE SPUR

PAXTON DRIVE

TUNNEL WAY

New signalised junction (bus gate)

Pumping Station

Subway

Ashton Gate Depot

The Stone Yard

El Sub Sta

ESS

Playground

161 to 184

140 to 160

32 to 63

1 to 16

17 to 31

Key Plan:

Notes:

Key

- Proposed 24 hour bus lane / bus only street
- Proposed Peak hour bus lane
- Existing 24 hour bus lane
- Proposed carriageway widening
- New footway areas

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Project

BRISTOL METRO-BUS
ASHTON VALE to TEMPLEMEADS
and BRISTOL CITY CENTRE

Drawing

Options Review
Option 3
Long Ashton Park & Ride
to Anchor Road
Plan 6 of 14

Drawn by: JGM	Date: 11/06/2013
Checked by: SCW	Date: 11/06/2013
Approved by: SCW	Date: 11/06/2013

Drawing No.	Revision
DH0276 - 12 - 479	

Drawing Scale: 1:500 @ A1

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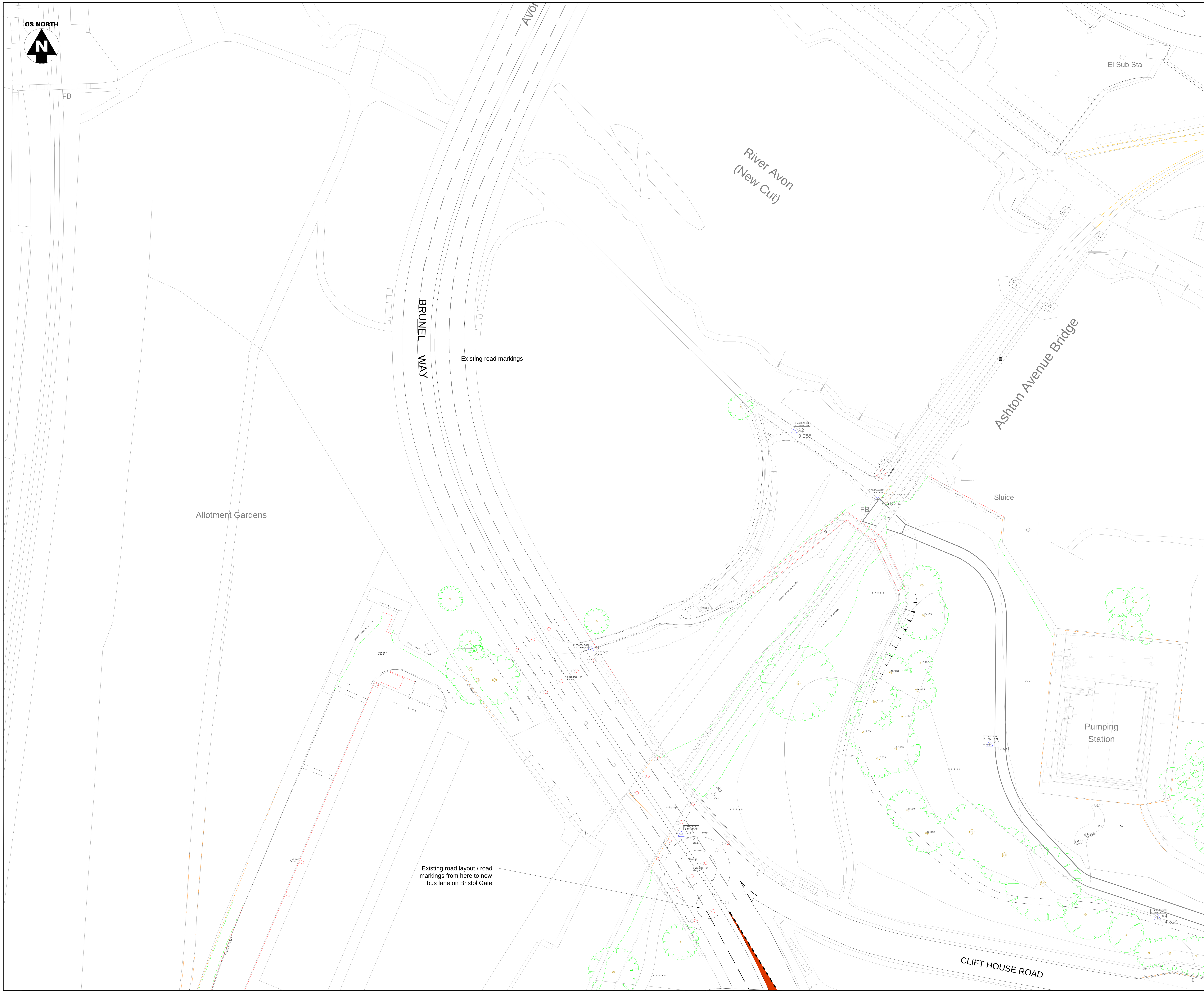

Key Plan:

Notes:

Key

- Proposed 24 hour bus lane / bus only street
- Proposed Peak hour bus lane
- Existing 24 hour bus lane
- Proposed carriageway widening
- New footway areas

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BRISTOL METRO-BUS
ASHTON VALE to TEMPLEMEADS
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Drawing

Options Review
Option 3
Long Ashton Park & Ride
to Anchor Road
Plan 7 of 14

Drawn by: JGM Date: 11/06/2013
Checked by: SCW Date: 11/06/2013
Approved by: SCW Date: 11/06/2013

Drawing No. DH0276 - 12 - 480

Revision

Drawing Scale: 1:500 @ A1

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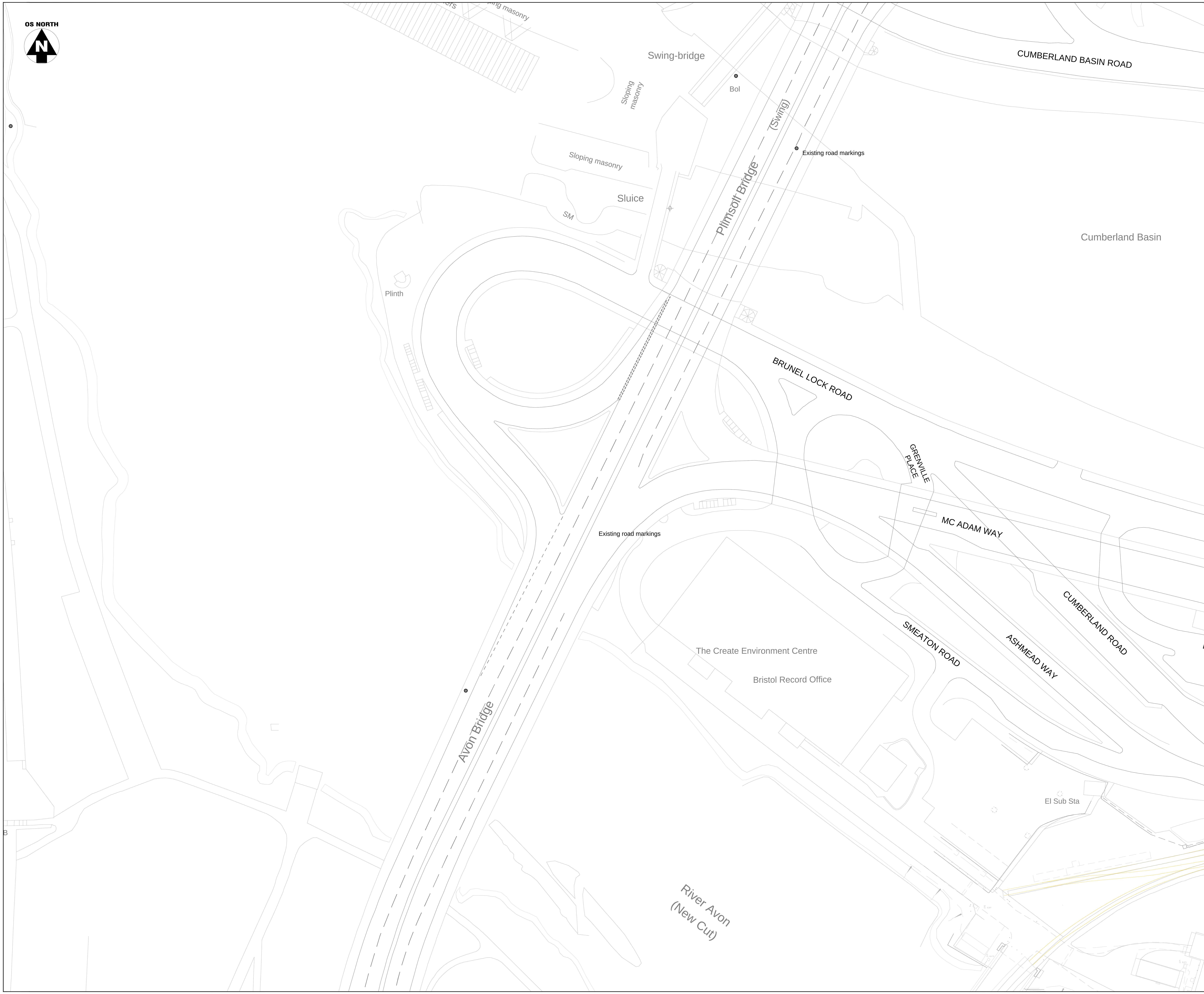

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Key

- Proposed 24 hour bus lane / bus only street
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- Proposed carriageway widening
- New footway areas

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BRISTOL METRO-BUS
ASHTON VALE to TEMPLEMEADS
and BRISTOL CITY CENTRE

Drawing

Options Review
Option 3
Long Ashton Park & Ride
to Anchor Road
Plan 8 of 14

Drawn by: JGM Date: 11/06/2013
Checked by: SCW Date: 11/06/2013
Approved by: SCW Date: 11/06/2013

Drawing No. DH0276 - 12 - 481

Revision

Drawing Scale: 1:500 @ A1

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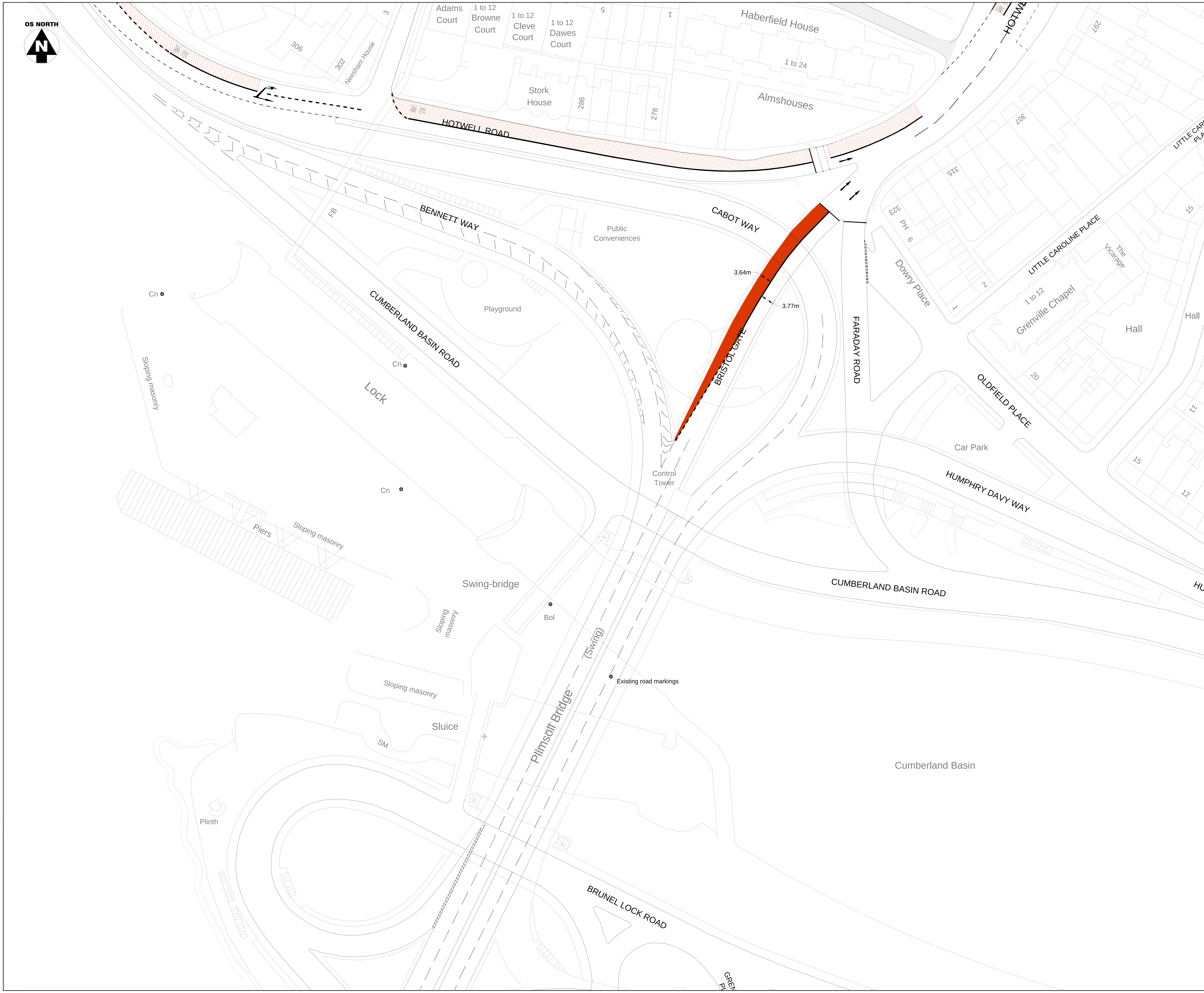

Key Plan:

Notes:

Key

- Proposed 24 hour bus lane / bus only street
- Proposed Peak hour bus lane
- Existing 24 hour bus lane
- Proposed carriageway widening
- New footway areas

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Project

BRISTOL METRO-BUS
ASHTON VALE to TEMPLEMEADS
and BRISTOL CITY CENTRE

Drawing

Options Review
Option 3
Long Ashton Park & Ride
to Anchor Road
Plan 9 of 14

Drawn by: JGM Date: 11/06/2013
Checked by: SCW Date: 11/06/2013
Approved by: SCW Date: 11/06/2013

Drawing No. DH0276 - 12 - 482
Revision

Drawing Scale: 1:500 @ A1

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Xreference file path : S:\TRAFFIC\EngCon\PROJECTS\DT_DETL\DH0276-2012 BRT Review 2013\Drawings\Working Drawings\
User and Plot Date : brlsjg5 : 11 Jun 2013 - 4:38 pm

OS NORTH

ALBERMARLE ROAD

HOPE CHAPEL HILL

DOWRY SQUARE

SOUTH GREEN STREET

Existing Parking

Joy Hill to be pedestrianised

Existing currently unused bus stop

10.8

Existing Parking

CUMBERLAND PLACE

JOY HILL

New Bus Lane - For existing services including Park and Ride

GRANBY HILL

11.6

New Bus Lane - For existing services including Park and Ride

New Bus Lane - For existing services including Park and Ride

HOTWELL ROAD

HOTWELL ROAD

BENNETT WAY

CABOT WAY

17.3

7

Key Plan:

Notes:

Key

- Proposed 24 hour bus lane
- Proposed Peak hour bus lane
- Proposed carriageway widening
- New footway areas
- Existing 24 hour bus lane
- Existing Peak hour bus lane
- Existing 24 hour bus lane to be removed

Rev	By	Chkd	Apprvd	Date	Description

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Project

BRISTOL METRO-BUS
ASHTON VALE to TEMPLE MEADS
and BRISTOL CITY CENTRE

Drawing

Options Review
Option 3
Long Ashton Park & Ride
to Anchor Road
Plan 10 of 14

Drawn by: JGM	Date: 11/06/2013
Checked by: SCW	Date: 11/06/2013
Approved by: SCW	Date: 11/06/2013

Drawing No. DH0276 - 12 - 483

Revision

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Xreference file path : S:\TRAFFIC\ENGCon\PROJECTS\DT_DET\DH0276-2012 BRT Review 2013\Drawings\Working Drawings\
User and Plot Date : brbjg5 - 11 Jun 2013 - 4:48 pm

OS NORTH
N
Existing Parking
Existing currently unused bus stop
10.8
Existing Parking
Proposed Metrobus standard stop
11.6
HOTWELL ROAD
CLIFTON VALE
Proposed one-way street
HOLY TRINITY CHURCH
Trees will need to be removed to allow for highway modifications
AMBRA VALE
Existing bus stop to be removed
14.2
7.1
HOTWELL ROAD
14.5
HOTWELL ROAD
CHARLES PLACE
Proposed one-way street
OLDFIELD ROAD
Proposed one-way street
MERCHANTS ROAD
New signalised junction configuration with dedicated bus link
Existing bus stop to be removed and replaced by new Metrobus stop near to 183 Hotwell Road
ROWNHAM MEAD
Wessex Water services are present and may need adjustment
MERCHANTS ROAD
HUMPHRY DAVY WAY
CUMBERLAND BASIN ROAD
CUMBERLAND BASIN
MERCHANTS ROAD

Key Plan:

Notes:

Key

- Proposed 24 hour bus lane
- Proposed Peak hour bus lane
- Proposed carriageway widening
- New footway areas
- Existing 24 hour bus lane
- Existing Peak hour bus lane
- Existing 24 hour bus lane to be removed

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BRISTOL METRO-BUS
ASHTON VALE to TEMPLE MEADS
and BRISTOL CITY CENTRE

Drawing

Options Review
Option 3
Long Ashton Park & Ride
to Anchor Road
Plan 11 of 14

Drawn by: JGM Date: 11/06/2013
Checked by: SCW Date: 11/06/2013
Approved by: SCW Date: 11/06/2013

Drawing No. DH0276 - 12 - 484
Revision

Drawing Scale: 1:500 @ A1

OS NORTH

ROWNHAM MEAD

PEMBROKE PLACE

New bus stop to replace existing bus stop at Merchants Road and built to Metrobus standard stop

BUS LANE

12.3

HOTWELL ROAD

Parking

Existing bus stop to be upgraded to Metrobus standard stop

Existing signallised crossing to be refurbished and upgraded

LOCK GATE LANE

Parking

Parking

Parking

12.1

11.0

HOTWELL ROAD

FLOATING HARBOUR

Existing bus stop to be upgraded to Metrobus standard stop

OS NORTH

JACOB'S WELLS ROAD

ST. GEORGES ROAD

ANCHOR ROAD

HOTWELL ROAD

11.3

11.0

11.3

HOTWELL ROAD

FLOATING HARBOUR

WESTERN WHARF

Key Plan:

Notes:

Key

- Proposed 24 hour bus lane
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- New footway areas
- Existing 24 hour bus lane
- Existing Peak hour bus lane
- Existing 24 hour bus lane to be removed

Rev	By	Chkd	Apprvd	Date	Description

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BRISTOL METRO-BUS
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and BRISTOL CITY CENTRE

Drawing

Options Review
Option 3
Long Ashton Park & Ride
to Anchor Road
Plan 12 of 14

Drawn by: JGM	Date:	11/06/2013
Checked by: SCW	Date:	11/06/2013
Approved by: SCW	Date:	11/06/2013

Drawing No. DH0276 - 12 - 485

Revision

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Xreference file path : S:\TRAFFIC\Eng\Com\PROJECTS\DT_DET_LDH\DH0276-2012 BRT Review 2013\Drawings\Working Drawings\
User and Plot Date : brtsgs - 11 Jun 2013 - 4:50 pm

OS NORTH

ST. GEORGES ROAD

10.7

Existing bus stops to remain

LOWER COLLEGE STREET

LOWER LAMB STREET

Existing kerblines amended to accommodate new bus lane

COLLEGE SQUARE

14.1

15.5

ANCHOR ROAD

16.4

LIME KILN ROAD

CANONS WAY

Key Plan:

Notes:

Key

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- Proposed Peak hour bus lane
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- Existing 24 hour bus lane to be removed

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BRISTOL METRO-BUS
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and BRISTOL CITY CENTRE

Drawing

Options Review
Option 3
Long Ashton Park & Ride
to Anchor Road
Plan 13 of 14

Drawn by: JGM	Date: 11/06/2013
Checked by: SCW	Date: 11/06/2013
Approved by: SCW	Date: 11/06/2013

Drawing No. DH0276 - 12 - 486

Revision

Drawing Scale: 1:500 @ A1

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User and Plot Date : bridg5 - 11 Jun 2013 - 4:51 pm

OS NORTH

BRISTOL CATHEDRAL

BRISTOL CENTRAL LIBRARY

BRISTOL CATHEDRAL CHOIR SCHOOL

COLLEGE SQUARE

ANCHOR ROAD

CANONS ROAD

EXPLORE LANE

AT BRISTOL

Existing Bus Lane to be removed and openned to general traffic

Existing Bus Lane to be removed and openned to general traffic

New termination point of existing bus lane

Existing bus stop to be upgraded to Metrobus standard stop

Existing bus stop to be upgraded to Metrobus standard stop

Tie in with Existing Bus Lane

14.6

14.6

1.7

1

Key Plan:

Notes:

Key

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- Proposed Peak hour bus lane
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- New footway areas
- Existing 24 hour bus lane
- Existing Peak hour bus lane
- Existing 24 hour bus lane to be removed

Rev	By	Chkd	Apprvd	Date	Description

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BRISTOL METRO-BUS
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and BRISTOL CITY CENTRE

Drawing

Options Review
Option 3
Long Ashton Park & Ride
to Anchor Road
Plan 14 of 14

Drawn by: JGM	Date: 11/06/2013
Checked by: SCW	Date: 11/06/2013
Approved by: SCW	Date: 11/06/2013

Drawing No. DH0276 - 12 - 487

Revision

Drawing Scale: 1:500 @ A1

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Xreference file path : S:\TRAFFIC\EngCon\PROJECTS\DT_DET\DH0276-2012 BRT Review 2013\Drawings\Working Drawings\
User and Plot Date : brbigs5 - 11 Jun 2013 - 4.52 pm

Appendix B

Technical Notes for Options 2 and 3

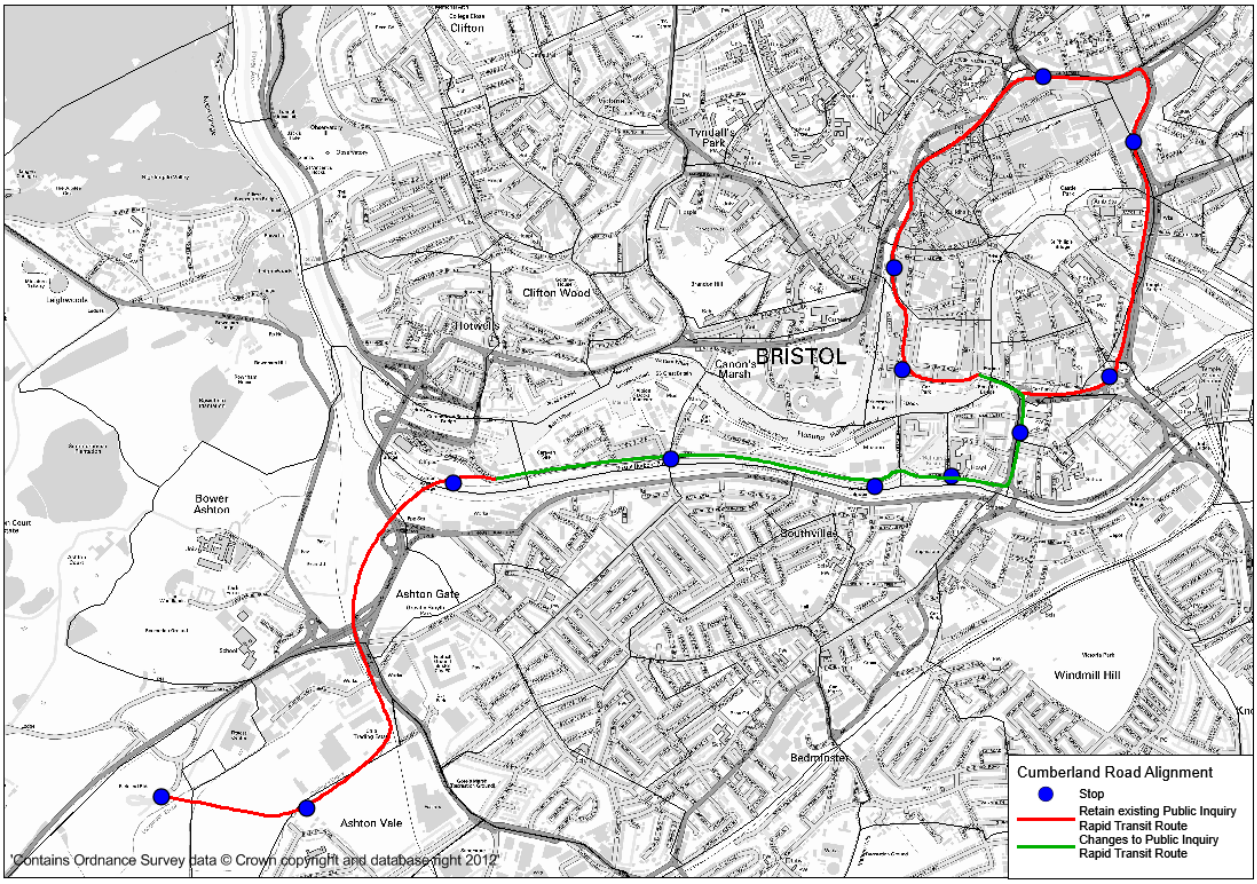
Technical note

Project:	Assessment of Cumberland Road AVTM Option [Option 2]	**To:**	Peter Mann, Alistair Cox
Subject:	Business Case Appraisal	**From:**	Rob Thompson
Date:	19 April 2013	**cc:**	

1. Introduction

Changes to the Ashton Vale to Temple Meads (AVTM) scheme have been identified in the Mayor's review and include an amended route along Cumberland Road, Commercial Road and Redcliff Hill which replaces the section of the AVTM scheme along the Heritage railway, through the Harbourside and across Prince Street Bridge. Details of the revised option, including plan drawings are included in a separate document with Figure 1 summarising the revised option and stops.

Figure 1. Cumberland Road Option – Route Alignment and Stops



With the Cumberland Road option, the AVTM Public Inquiry (PI) scheme is unchanged between the Long Ashton Park and Ride site and the Avon Crescent/Cumberland Road junction and on the anti-clockwise city centre loop between Redcliffe roundabout and The Grove. The principal changes from the PI scheme in the revised proposals are on the section shown in green in Figure 1 and include:

1. Prince Street Bridge open to general traffic
2. Segregated RT operation alongside Cumberland Road replaced by on-street working with:
   - Signalised junction between Avon Crescent, Cumberland Road and the RT off-road-section
   - Bus lane on westbound RT operation on Cumberland Road between Vauxhall Bridge and Avon Crescent

- Bus lane and bus gate on eastbound RT operation on Cumberland Road between Vauxhall Bridge and Cumberland Road Bridge

3. Stops at Vauxhall Bridge and Gaol Ferry Bridge
4. Diversion of RT from Harbourside, Wapping Road, Prince Street Bridge, The Grove and Redcliffe Way to run on Cumberland Road, Commercial Road and Redcliff Hill
   - Avoid alternate working on Prince Street Bridge
   - On-street with priority lane eastbound on Commercial Road
   - Priority lanes northbound and southbound on Redcliff Hill
   - PT chord on north–west quadrant of Bedminster Roundabout
5. Change to Redcliffe Roundabout for general traffic and pedestrians
6. Change to Bedminster Roundabout for general traffic
7. No change to infrastructure and stops from PI scheme on anti-clockwise city centre loop from Redcliffe Roundabout via Redcliffe Way (east), Temple Way, Bond Street, Haymarket, Rupert Street, Colston Avenue, Broad Quay, Prince Street, The Grove and Redcliffe Way (west)
8. Assumed that selected North Somerset services (X1, 354 and 361) continue to operate on the AVTM RT alignment, running to the Bus Station via the Centre.

This note contains a review of the impact of the amended AVTM Cumberland Road option in relation to the five elements of the DfT Transport Business Case:

- Strategic Case;
- Economic Case;
- Financial Case;
- Commercial Case; and
- Management Case

In considering the individual components of the business case, where relevant the review indicates changes from the most recently published Business Case for the scheme – as presented at the Public Inquiry for AVTM in May to July 2012.

2. Strategic Case

The alignment of the AVTM Cumberland Road option closely follows the route of the main AVTM scheme which formed the basis for the public inquiry held between May and July 2012. Consequently, the strategic case for the Cumberland Road option is the same as for the AVTM scheme which was covered by the relevant evidence presented at the public inquiry. It is therefore not necessary to repeat the full strategic case for the AVTM PI scheme but rather to highlight the main features which are relevant for the Cumberland Road option.

In particular, the evidence presented by Peter Mann and Bill Davies to the PI highlighted the national and local transport policy context within which the AVTM scheme would be placed. Within the national policy framework, the local transport policy has been driven by local transport plans and specific studies:

- LTP 2006/2011 was the first Local Transport Plan covering the West of England as a whole which set the overall direction for transport investment across the sub-region that continues today.
- Greater Bristol Strategic Transport Study (GBSTS) informed the content of the LTP with the development of a series multi-modal transport strategies extending through to 2031 containing a programme of transport investments that were affordable and capable of being implemented which included a network of rapid transit operations, one of which was essentially the AVTM corridor.
- LTP 2011/2026 (LTP3) further endorsed the rapid transit network amongst a package of transport improvements across the sub-region and contained an implementation programme to deliver the schemes, including bids to Government to assist funding of the planned schemes.
- The establishment of the Local Enterprise Partnership for the West of England sub-region highlighted the need for future economic growth and the role that transport investment can play in achieving this. A particular emphasis is placed by the LEP on the Enterprise Zone at the Temple Quarter which would be served by the AVTM route.

- Bristol City Council Core Strategy, adopted in 2011, stated that the Council supported the delivery of improvements to transport infrastructure to provide an integrated transport system with specific reference to the rapid transit network as well as support for rail, park and ride, walking and cycling routes.
- North Somerset Core Strategy also highlights rapid transit including a specific mention of the AVTM scheme within its schedule of proposed major transport investments.

Following the identification of the network of rapid transit services within the GBSTS, the LTP (2006/2011) included the emerging proposals for the scheme which at that point comprised a service from Ashton Vale P&R to Emerson's Green. Both the GBSTS and the LTP preparation included extensive and co-ordinated consultation on the contents of the plans. Following completion of the GBSTS, the work on taking forward the rapid transit element of the transport strategy progressed from 2007 with a series of further studies. At the PI, evidence by Bob Fowler contained details of the evolution of the AVTM scheme, including the following areas of work:

- Public Transport Corridor Options Study (2007) reviewed a long list of potential corridors and distilled the list into a prioritised set of options with the outcome identifying Ashton Vale to Bristol City Centre, Hengrove to Bristol City Centre, North Fringe to Bristol City Centre and Emerson's Green to Bristol City Centre.
- This was followed by the Options Short List Report (2007) which recommended that a route from Emerson's Green to Bristol City Centre and Long Ashton P&R should be taken forward through the Regional Funding Allocation process.
- The corridor selection/prioritisation work was then shared with Joint Local Transport Forum (2007) which was attended by stakeholder representatives from across the sub-region and was asked to rate the attributes of the rapid transit system.
- In response to public opposition in 2007/2008 to a section of the Emerson's Green to Bristol City Centre route which followed the Bristol to Bath cycle path, the scheme to be taken forward concentrated on the Ashton Vale to Bristol City Centre section.
- In the work towards the preparation of the Major Scheme Business Case (MSBC), further studies examined the 'Lower Cost' and 'Next Best Alternative' options in order to confirm the selection of the preferred scheme together with a High Level Strategic Review of technology options, and a more detailed Technology Review which considered alternative modes including tram-train, light weight rail, Ultra Light Rail and bus-based rapid transit. Consultation on the results of the review was held with relevant groups and promoters to discuss the recommendation of the study for a bus-based approach.
- Route-wide consultation was held in Autumn 2008 together with an exhibition and meetings with stakeholders, interest groups, community groups and the BCC Neighbourhood Planning Network.
- The results from the consultation and the continued technical development of the scheme were combined in the preparation and submission of the MSBC document to the DfT in March 2009 which contained a comprehensive case for the scheme covering the full range of assessments required by the MSBC process.
- While the MSBC submission was being considered by the DfT, the project team responded to queries from the DfT, and the scheme was amended to reflect the planning application by Bristol City Football Club to develop a site on Ashton Fields for a new stadium. Consultation on the scheme continued in parallel.
- The AVTM rapid transit scheme was granted Programme Entry status by the DfT in March 2010. This was followed by the submission of a draft Transport and Works Order in June 2010 which coincided with a Government announcement of a delay to all local authority promoted transport schemes pending the outcome of the Comprehensive Spending Review.
- In addition to considering the formal statutory objections triggered by the TWAO submission, attention was concentrated on continued consultation, before the DfT announced in October 2010 that the AVTM scheme had been allocated to the major scheme development pool. In November 2010, the DfT invited the authorities to submit an Expression of Interest for funding the AVTM scheme which was followed in February 2011 by an invitation to submit a Best and Final Funding Bid for the scheme by September 2011.
- Following the BAFB submission, funding approval for AVTM and reconfirmation of the Programme Entry status was included in the Chancellor's Autumn Statement in November 2011 with formal confirmation of funding from the DfT in December 2011 together with an announcement that it intended to hold a public inquiry for the scheme. The public inquiry was held between May and July 2012 with the report from the Inspector being awaited.
- In November 2012, Bristol elected George Ferguson as Mayor for the city for the period to May 2016. An early action by the Mayor was to initiate a review of the rapid transport schemes and programme

aimed at assessing potential revisions to the alignment of the AVTM scheme via Cumberland Road, Commercial Road and Redcliff Hill as an alternative to the Harbourside, Wapping Road and Prince Street Bridge section of the BAFB scheme.

The variation to the original AVTM BAFB scheme which has emerged from the Mayor's review represents a localised variation to the BAFB scheme which continues to address the problems, originally identified in the development of the PI scheme, of:

- Congestion in Bristol;
- Poor accessibility and integration of public transport;
- Climate change and air quality issues;
- Safety and quality of life concerns; and
- Inclusion of housing and economic growth aspirations.

Furthermore the original scheme objectives continue to be supported by the variation to the scheme:

- Extend choice of transport modes for all, in particular for private car drivers, to encourage a shift to public transport;
- Promote sustainable development by providing high quality public transport links;
- Improve access to public transport for areas that currently have poor provision;
- Improve integration of the public transport network;
- Promote social inclusion by improving access to employment, retail, community, leisure and educational facilities; and
- Improve safety along the corridors by reducing use of private cars.

Further aspects of relevance to the strategic case for the Cumberland Road option are provided in the evidence to the public inquiry by Bob Fowler and Rob Thompson. The difference between the PI scheme and the Cumberland Road option would not have a significant impact on the original strategic case.

3. Economic Case

The evidence that supports the economic case for the Cumberland Road option is based on the comprehensive, WebTAG-compliant, G-BATS3 transport model. The model has been prepared and enhanced in parallel with the development of the AVTM scheme. The relevant model documentation (model development and validation reports, forecasting report, etc) were included as supporting evidence for the PI. At each major stage within the review of the AVTM scheme by the DfT (e.g. MSBC and BAFB), the model has been the subject of scrutiny by the DfT.

The Cumberland Road option has been modelled on the same version of the G-BATS3 model that was used to provide the results for the AVTM Public Inquiry. Forecast years 2016 and 2031 have been modelled, with a base year of 2006. Details of the model outputs are included in Appendix A.

The total patronage for the AM and PM peak hour RT service and North Somerset buses using the AVTM alignment is shown in Table 1.

Table 1. 2016/31 AM and PM Peak Hour Patronage

		Cumberland Road Alignment				PI Alignment			
Service No.	**Description**	**2016**		**2031**		**2016**		**2031**	
		AM	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
RT	Ashton Vale to Temple Meads RT	650	390	830	500	820	510	1140	690
354 Nbnd	Nailsea to Bristol	30	20	50	20	50	20	60	20
354 Sbnd	Bristol to Nailsea	10	60	40	70	30	70	40	80
X1 Nbnd	Weston-super-Mare to Bristol	150	70	180	80	160	70	200	90
X1 Sbnd	Bristol to Weston-super-Mare	110	130	160	150	110	130	150	170
361 Nbnd	Clevedon to Bristol	30	10	30	10	40	10	40	10
361 Sbnd	Bristol to Clevedon	20	20	20	30	20	30	20	30

The Cumberland Road alignment for the RT service therefore has fewer passengers on combined RT and North Somerset services than with the original AVTM alignment, with a drop of around 22% in 2016 and 27% in 2031. This is due to the longer journey times of the RT service when it is routed along Cumberland Road and Redcliff Hill, shown in Table 2. The change in times is more evident in the outbound direction from Cabot Circus where the Cumberland Road option follows the longer route along The Grove, Redcliff Way, Redcliff Hill and Commercial Road. All times may be compared with the current total scheduled journey time of 40 minutes for the round trip on the existing 903 P&R service. Due to increasing congestion along the route, the 903 journey time has been growing in recent years and is expected to continue to do so.

Table 2. 2016/31 AM and PM Peak Hour Journey Times (minutes)

	2016		2031	
	AM	**PM**	**AM**	**PM**
PI Inbound to Cabot Circus	17	17	17	18
PI Outbound from Cabot Circus	16	15	16	16
PI Total	**33**	**33**	**33**	**34**
Cumberland Road Inbound to Cabot Circus	19	19	21	21
Cumberland Road Outbound from Cabot Circus	21	21	22	24
Cumberland Road Total	**41**	**41**	**43**	**45**

Appendix A includes figures which show the boarding and alighting patterns in the 2016/31 AM and PM peak hours for the Cumberland Road option and the original PI alignment. The diagrams show the number of passengers boarding and alighting at each stop together with the total passengers volumes along the route. These demonstrate that, notwithstanding the reduction in total passenger demand for the RT services, the Cumberland Road option maintains the broad demand profiles from the PI scheme.

3.1. Present Value of Benefits

The key indicator from the Value for Money assessment, the Benefit Cost Ratio, is formed by two elements – Present Value of Benefits (PVB) and Present Value of Costs (PVC). The two elements are examined in turn, considering firstly the benefits component, and the potential changes to the size of the PVB for the

Cumberland Road option, before reviewing the revisions to the scheme costs and construction programme and hence the PVC.

The benefits from the AVTM PI and revised Cumberland Road option are compared below, firstly considering the headline benefit categories before looking at their disaggregation and geographical distribution at a sector level. For the Cumberland Road option, the Transport Economic Efficiency, Analysis of Monetised Costs and Benefits and Public Accounts tables are included in Appendix B. At the same time, the components of the wider, mainly qualitative, appraisal are brought together in the Appraisal Summary Table which is also included in Appendix B.

Before considering the Cumberland Road option, the economic appraisal of the PI scheme is summarised in order to provide the context for the revised option. Table 3 shows the main elements of the PVB as presented at the PI. When combined with the PVC for the PI scheme of £42.4m, a BCR at the PI of 4.22 was obtained. The three Economic Efficiency categories amount to £169.7m with all but £0.95m attributable to the public transport rather than highway network.

Table 3. Summary of AVTM PVB at PI (£m 2002 prices)

Benefit	PVB (£million discounted)	%PVB
Economic Efficiency Consumer Commuting	55.1	30.8
Economic Efficiency Consumer Other	67.0	37.5
Economic Efficiency Consumer Business	47.6	26.6
Indirect Tax Revenue	-9.0	-5.0
Greenhouse Gases	0.0	0.0
Reliability	2.9	1.6
Accidents	4.5	2.5
Wider Impacts	10.7	6.0
Others	0.0	0.0
Total	178.8	100.0

Of the total benefits of £178.8m, £160.7m (or 90%) are formed by the economic efficiency and indirect tax revenue headings derived from TUBA. The other elements (reliability, accidents, wider impacts) were calculated separately outside the TUBA process but make a relatively small contribution to the total benefits.

At this stage, the economic appraisal of the Cumberland Road option has concentrated on the TUBA-based benefits (Economic Efficiency and Indirect Tax Revenue). However, the TUBA-based benefits represent 90% of the PVB for the PI scheme and it is reasonable to assume a similar relationship for the Cumberland Road option, which represents a small variation to the overall AVTM scheme.

The appraisal uses TUBA V1.8 which therefore presents costs and benefits in 2002 prices; V1.8 was the version current at the time of the preparation for the PI. Although TUBA V1.9, which uses 2010 prices as well as other changes, is now the current version, the appraisal of the Cumberland Road option has continued to use V1.8 in order to maintain compatibility with the earlier PI appraisal.

Table 4 summarises the TEE components for the PI scheme, representing a partial PVB and showing the breakdown between highway and public transport benefits. The appraisal in Table 4 highlights the major contributions made by public transport benefits to the total benefits for the scheme.

Table 4. PI Scheme TEE (£m 2002 prices)

Highway Economic Efficiency: Consumer Users	-9,296
Highway Economic Efficiency: Business Users and Providers	10,250
Total	954
Public Transport Economic Efficiency: Consumers	131,362
Highway Economic Efficiency: Consumer Users (Commuting)	37,396
Total	168,758
Wider Public Finances (Indirect Taxation Revenues)	-9,036
Greenhouse Gases	-9
Partial Present Value of Benefits (PVB)	**160,667**
Broad Transport Budget	42,351
Present Value of Costs (PVC)	**42,351**
OVERALL IMPACTS	
Partial Net Present Value (NPV)	**118,316**
Partial Benefit to Cost Ratio (BCR)	**3.79**

The main effects of the Cumberland Road option compared with AVTM PI scheme, with reference to the impacts on benefits, include:

1. Delay to traffic on Cumberland Road through bus priority and bus gate **(small negative)**
2. Reduced delays to traffic using Prince Street Bridge **(large positive)**
3. Traffic on Commercial Road experiences similar journey times/delays as previously on The Grove **(neutral)**
4. Additional delays on Redcliff Hill for general traffic **(small negative)**
5. Additional delay at Bedminster Roundabout **(small negative)**
6. Additional delay at Redcliffe Roundabout **(small negative)**
7. Additional journey time for RT passengers on Cumberland Road **(small negative)**
8. Additional journey time for passengers on RT and North Somerset services in the outbound direction due to the routeing via The Grove, Redcliffe Way, Redcliff Hill and Commercial Road instead of Prince Street Bridge **(small negative)**
9. Link to Temple Quarter from Bedminster replaces link from Arnolfini **(neutral)**
10. Improved public transport reliability through diversion of services away from Prince Street bridge with its signalised alternate working and occasional bridge swings **(small positive)**

Table 5 summarises the results from the partial appraisal of the Cumberland Road option. In comparison with Table 4, the overall BCR at 3.77 is very similar to the value of 3.79 for the PI scheme. The build-up of the Cumberland Road option benefits shows a different picture from the PI scheme in terms of the relative contributions from the highway and public transport components. This reflects the range of impacts to public transport passengers and highway users identified above. In particular, the highway sector makes a more positive contribution to the option benefits, reflecting the re-opening of Prince Street Bridge to general traffic. At the same time, the PVB of benefits from the public transport network falls from £168.8m in the PI scheme to £126.3m for the Cumberland Road option which indicates the impacts on journey times of the Redcliff Hill route, especially in the evening peak period, for both RT and North Somerset services.

Table 5. Cumberland Road Option TEE (£m 2002 prices)

Highway Economic Efficiency: Consumer Users	5,267
Highway Economic Efficiency: Business Users and Providers	14,047
Total	19,314
Public Transport Economic Efficiency: Consumers	100,500
Highway Economic Efficiency: Consumer Users (Commuting)	25,817
Total	126,317
Wider Public Finances (Indirect Taxation Revenues)	-6,634
Greenhouse Gases	323
Partial Present Value of Benefits (PVB)	**139,320**
Broad Transport Budget	36,846
Present Value of Costs (PVC)	**36,846**
OVERALL IMPACTS	
Partial Net Present Value (NPV)	**102,474**
Partial Benefit to Cost Ratio (BCR)	**3.78**

Nevertheless, although the option does not generate the same magnitude of benefits as the PI scheme, the reduction in costs (outlined in the next section) results in a (Partial) BCR of 3.78 which is closely aligned with the corresponding value for the PI scheme. As a result, the robustness of the Cumberland Road option is confirmed.

At this stage, the sensitivity tests for low and high growth assumptions have not been undertaken, although in view of the relatively small differences between the PI scheme and the Cumberland Road option, the impacts of the sensitivity tests for the two options are expected to be very similar.

The analysis above has concentrated on the partial economic appraisal provided by the output from the TUBA process. Given the similarity between the Cumberland Road option and the earlier PI route, it is a reasonable assumption that the additional non-TUBA benefits, i.e. reliability, accidents and wider impacts, would represent an equivalent relative increase of 11.3%. On this basis, the estimated total benefits for the Cumberland Road option would be £154.7m with a corresponding BCR of 4.20, which under the DfT Value for Money criteria represents **Very High Value for Money**.

3.2. Present Value of Costs

The capital costs of the Cumberland Road option were prepared for the purposes of the appraisal by Bristol Engineering Practice and Sweett. Although the costs were generally compatible with those used in the PI scheme, there were a number of changes to the approach which reflected new circumstances or updated information. In particular:

- The Cumberland Road option costs were based on rates in Q3 2012 rather than the Q4 2010 levels for the PI scheme and therefore took account of the current competitive construction rates;
- The PI costs included assumptions about inflation levels for construction to 2013 which have not materialised and have been running at below RPI;
- Similar changes have been made to the inflation assumptions for land and supervision costs;
- Operating and maintenance costs have been kept unchanged between the PI scheme and Cumberland Road option;

- A large element of the Preparatory costs which were estimated in the PI scheme (e.g. the public inquiry costs and other design and investigation costs) are now known and have been treated as a sunk costs for the Cumberland Road appraisal – such sunk costs are not usually included in the economic appraisal;
- The risk budget for the PI scheme included an allowance for the costs of the public inquiry which are now known and therefore the risk budget for the Cumberland Road option may be reduced; and
- Cost savings with the Cumberland Road option e.g. Prince Street Bridge, Harbour railway alignment are broadly outweighed by costs for the Bathurst Bridge and Bedminster Bridge elements.

The net impact is that the PVC for the Cumberland Road option to be reduced to £36.8m in 2002 prices compared with £42.4m for the PI scheme. This therefore contributes to the strength of the BCR for the Cumberland Road option.

3.3. Appraisal Summary Table

In addition to the economic appraisal of the Cumberland Road option, the Appraisal Summary Table has been updated to reflect the changes from the PI scheme. A copy of the revised AST is included in Appendix B. Apart from the TUBA-based quantitative elements, the updated AST is mainly a qualitative review of the main features of the option. This takes into account the limited aspects which change between the PI scheme and Cumberland Road option, in the context of the overall length of the scheme. At this stage, a detailed environmental appraisal has not been undertaken although it is not expected that significant issues will be raised.

The appraisal of the scheme has concentrated on the single central case for the scheme. Sensitivity tests involving variations to this central case have not been undertaken at this point.

4. Financial Case

The construction costs for the Cumberland Road option have been summarised in the previous section and form an element of the Economic Case assessment. The funding of the Cumberland Road option would be in line with the corresponding AVTM PI. Hence the content of the BAFB submission for the AVTM PI scheme and the evidence of Peter Robinson at the public inquiry provide further supporting information for the PI scheme which is relevant for the Cumberland Road option.

The analysis below updates the corresponding analysis of operating costs and revenues for the Cumberland Road option in line with the approach adopted for the PI scheme. The evidence of James Willcock from the public inquiry provides further supporting information for the PI scheme which is relevant for the Cumberland Road option

4.1. Revenue and Operating Costs

Emerging conclusions are such that the AVTM Cumberland Road option will generate fare-box revenues of approximately £0.9 million per year (2010 prices). With the operation of the service with standard single decked vehicles the annual operating would be slightly under £0.9m, i.e. essentially a break-even operation.

Elements such as advertising, levying access charges, and Park and Ride revenue will also be considered further as the scheme progresses and we will seek to optimise and generate additional revenues to further increase the opportunity to enhance the operating surplus of the scheme.

5. Commercial Case

Considerable work has been undertaken in preparing for the procurement of the AVTM scheme in combination with the parallel major schemes (North Fringe to Hengrove Package and South Bristol Link) which are being progressed by the authorities within the West of England Partnership. Any procurement and other issues associated with the Commercial Case for the Cumberland Road option would be covered by

existing work on the AVTM PI scheme. The overall procurement was outlined in the BAFB and key aspects are considered below.

5.1. Procurement

The procurement strategy was described in the BAFB submission and the details have not changed materially since then, including for the amended Cumberland Road option. The West of England authorities have developed a Joint Procurement Strategy covering the three rapid transit routes. Key aspects of the Joint Strategy include:

- Alliance Charter - all the parties sign up to an overarching agreement providing for a common approach for the design, construction and implementation of the Rapid Transit schemes;
- Package Approach to construction procurement - put design and construction where best placed to manage costs and reduce risks through Design and Build and Task Order Packages;
- Area wide smartcard ticketing building on established procurement processes;
- Merge major scheme procurement with renewal of existing joint frameworks; and
- Area wide Quality Partnership Scheme (QPS) approach to Rapid Transit services incorporating appropriate, targeted contract arrangements.

The Joint Procurement Strategy uses a programme level approach to procurement to maximise delivery economies and efficiencies. The strategy comprises three main procurement elements; infrastructure, rapid transit and feeder bus operations and ticketing.

5.1.1. Infrastructure

Infrastructure design/main works (permanent way) – separate design and build contract utilising elements of detailed design, except city centre loop which is to be procured through the existing or replacement Term or Framework contract utilising the Regional Improvement and Efficiency Framework (RIEP) for design support. The structures including Bathurst Bridge and Ashton Avenue Swing Bridge would be part of a programme wide structures design and build package of works.

- Network Rail over-bridge – procurement route pending outcome of on-going dialogue with Network Rail.
- Hardware & systems such as traffic signals, shelters, RTPI, CCTV – procured through existing (replacement) Framework contracts.
- Infrastructure maintenance and vehicle recovery - procured through existing and replacement framework contracts.

5.1.2. Rapid Transit and Feeder Bus Operations

An Area wide Quality Partnership Scheme will provide the overarching standards for all operations across all the local authorities. The councils have pro-actively engaged with potential operators of the rapid transit network including an Operator Engagement Day in July 2011. This has demonstrated strong interest in the proposals and a willingness to engage further.

5.1.3. Ticketing

The ticketing strategy is in line with the DfT guidance by seeking to build upon the existing ITSO ticketing architecture via the sub-regional technological platform Host Operator Processing System (HOPS) and Card Management System (CMS). This is already supported by all of the commercial and tendered service operators of the West of England.

5.2. Risk

The head-line risks are summarised below

- Lack of clarity on procurement approach results in delay:
  - Likelihood before mitigation – ‘Medium/High’
  - Impact on Programme – up to 12 months
  - Mitigation – Develop coherent procurement strategy across the West of England major schemes and resource accordingly for delivery.
  - Likelihood after mitigation – ‘Medium/Low’

- Failure to secure powers and/or operating rights:
  - Likelihood before mitigation – 'Medium'
  - Impact on Programme - up to 12 months
  - Mitigation – Ensure political support, ensure robust technical case, and reduce opposition to the scheme as far as possible.
  - Likelihood after mitigation – 'Low'

- Change of political balance in the sub-region during project lifecycle
  - Likelihood before mitigation – 'Medium'
  - Impact on Programme – up to 12 months
  - Mitigation – aim for cross party support and ensure regular Member briefings
  - Likelihood after mitigation – 'Low'

6. Management Case

Considerable work has been undertaken in establishing the management and governance principles for the AVTM scheme in combination with the parallel major schemes (North Fringe to Hengrove Package and South Bristol Link) which are being progressed by the authorities within the West of England Partnership. Any management and governance issues associated with the Management Case for the Cumberland Road option would be covered by the work which has been undertaken. The key aspects were described in the BAFB submission and are considered below.

6.1. Governance

6.1.1. Joint Transport Executive Committee (JTEC)

The creation of the Joint Transport Executive Committee (JTEC) in April 2009 brought together the four authority's Executive Members with responsibility for transport in a forum legally constituted via a Joint Working Agreement. The Councils set the framework for policy and scheme development which is enacted by the Joint Executive Transport Committee with challenge and advisory roles provided by the Local Enterprise Partnership and Joint Scrutiny Committee. Meeting quarterly, one of the first actions of the Committee was to approve the governance arrangements, Senior Responsible Owners (SROs) and other key responsibilities across the major schemes programme. This has provided a consistent approach to the project management and governance across the major schemes.

6.1.2. Programme Delivery Board

The councils, via the Programme Delivery Board, have put in place structures to resource project delivery and ensure consistency between the major schemes. Governance for the three rapid transit schemes is further strengthened through the provision of a Rapid Transit Network Senior Responsible Owner and Integrated Network Manager. These posts will direct the promotion of the rapid transit network with a consistent set of vehicle, interchange and service standards, and co-ordinate integration between the new mode and the wider commercial, supported bus network and rail network, working closely with the scheme SROs, project managers and the public transport teams in the councils. In addition, the SRO and Network Manager will co-ordinate engagement with operators, service provision and procurement, ticketing and fares strategy.

6.1.3. Project Board

The Project Board (PB) is the group which guides and steers the direction of the scheme and is responsible for its delivery. The PB consists of representatives of the Authorities at sufficiently senior level to have the authority to act on behalf of their organisation. Meetings of the PB are linked to key milestones, where they consider highlight and exception reports, changes to the risk log and other key deliverables as defined in the Project Plan. The Project Board nominates the SRO who is responsible for chairing Project Board meetings and providing guidance and direction to the Project Manager. The SRO ensures the scheme progresses in line with the Project Plan and that outputs and milestones agreed by the Project Board are achieved. The Project Manager is responsible for delivering the project in line with the agreed controls and procedures set out in the Project Plan.

6.2. Stakeholder Engagement

Working under the Travel+ brand, the West of England authorities, together with the Local Enterprise Partnership, have continued to build on the high level of public and stakeholder awareness across the major schemes programme.

Each SRO has developed a scheme-specific communications strategy to manage contact with local public and stakeholders to their scheme. These are shared via the Programme Delivery Board and West of England Joint Communications Officer ensuring that the interrelationship between the schemes is not forgotten, duplication is avoided and no gaps are left.

Consultation has included specific consultation groups:

(a) The Public – A full public consultation programme was undertaken consisting of advertised public exhibitions, stakeholder presentations and consultation questionnaire. The project also consulted with the BCC Neighbourhood Planning Network (NPN) which was set up to increase and improve the ability of community groups to be involved in the local planning and development process.

The submission of the TWAO application for the PI scheme was followed by the statutory objection period. The current project phase means that stakeholder engagement concentrates on responding to objectors to the TWAO and Listed Building and Conservation Area Consents and Continued engagement with stakeholders, supporters and the public.

(b) Statutory Environmental Bodies – Consultation on the AVTM scheme has included all the designated statutory environmental bodies. Given the sensitivity and importance of heritage and flood risk issues, the project has had further more detailed meetings with English Heritage and the Environment Agency.

(c) Other Stakeholders – There are a range of stakeholders that we continue to engage with on a periodic basis in accordance with the wider needs of the project. This includes:

- Decision Makers – elected Members, funders and officers who are all involved in decision making on the scheme or preparatory work for decision making.
- Statutory Bodies – those organisations with whom the Authorities have a statutory obligation to consult including utility companies, emergency services and environmental groups,.
- Sub-regional stakeholders – those organisations and groups which have an interest in the economic, social well-being and development of the sub-region and the impacts rapid transit may have.
- Special interest groups – identified groups which have particular interest related to the scheme such as transport or the environment and who are not statutory consultees.
- Industry groups – organisations which have an interest in transport in the sub-region.
- Potential Users – future users of rapid transit including residents within the catchment and employers, shops, health and leisure facilities along the alignments.

This has remained ongoing throughout scheme development.

6.3. Project Evaluation

The councils place a strong emphasis on the need for, and the value of, scheme evaluation, both during and following delivery of the scheme. A robust package of performance indicators will be assessed, linked to the scheme objectives, against a clear set of targets including:

- Direct Indicators – patronage, reliability, passenger satisfaction;
- Indirect Indicators – decongestion, casualty reduction, cycling, rail patronage, carbon emissions and air quality; and
- Complementary Indicators – including assessment of economic impact and jobs creation.

Technical note

Appendix A – Boarding/Alighting Profiles for AVTM Cumberland Road Option

The Cumberland Road option has been modelled on the same version of the G-BATS3 model that was used to provide the results for the AVTM Public Inquiry. Forecast years 2016 and 2031 have been modelled, with a base year of 2006.

Figures 4 to 7 show the boarding and alighting patterns on the RT service for the Cumberland Road alignment for 2016/31 AM and PM peak hours and Figures 8 to 11 show the same for the original PI alignment. The diagrams show the number of passengers boarding and alighting at each stop together with the total passengers volumes along the route. These demonstrate that, notwithstanding the reduction in total passenger demand for the RT services, the Cumberland Road option maintains the broad demand profiles from the PI scheme.

Figure 2. Cumberland Road Option – 2016 Boarding/Alighting Profile AM Peak Hour

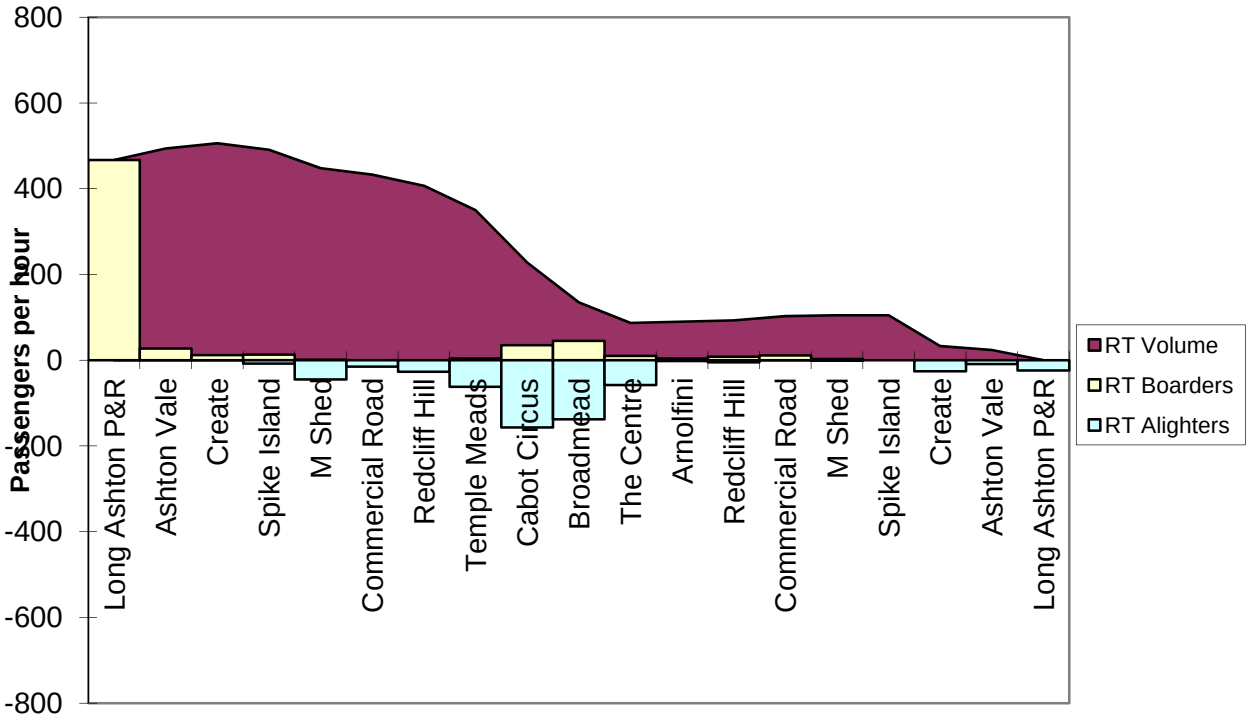


Figure 3. Cumberland Road Option – 2016 Boarding/Alighting Profile PM Peak Hour

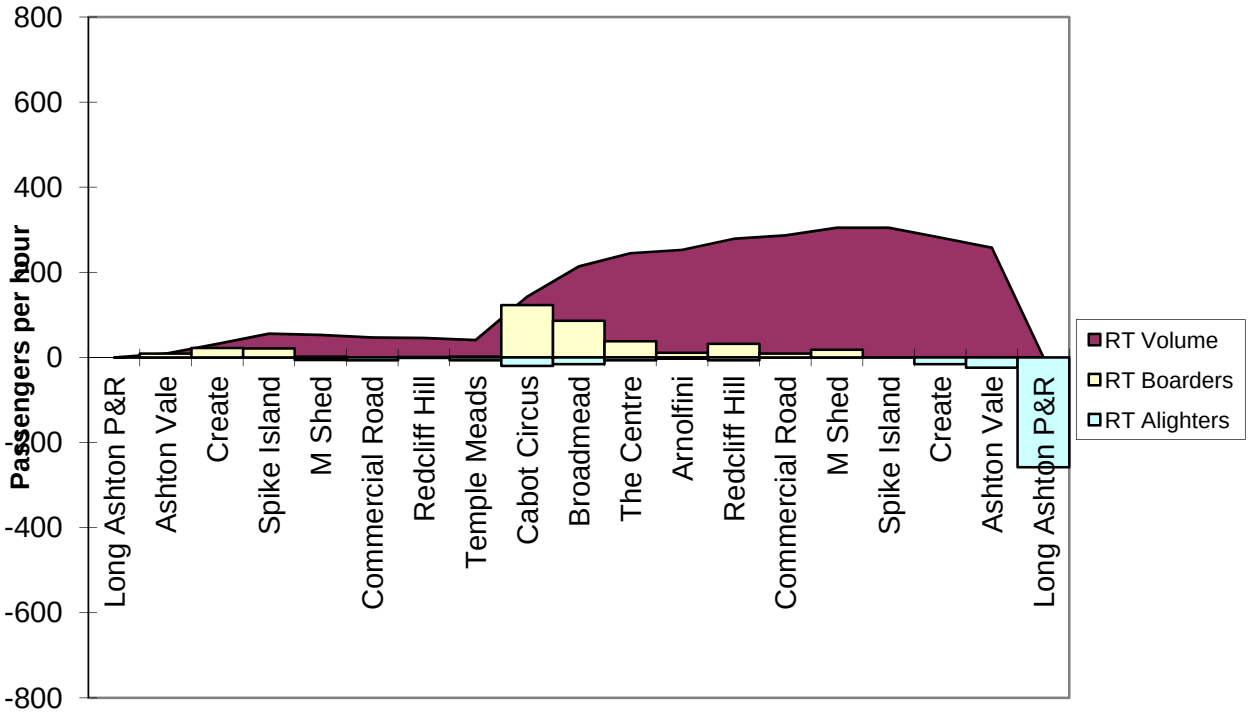


Figure 4. Cumberland Road Option – 2031 Boarding/Alighting Profile AM Peak Hour

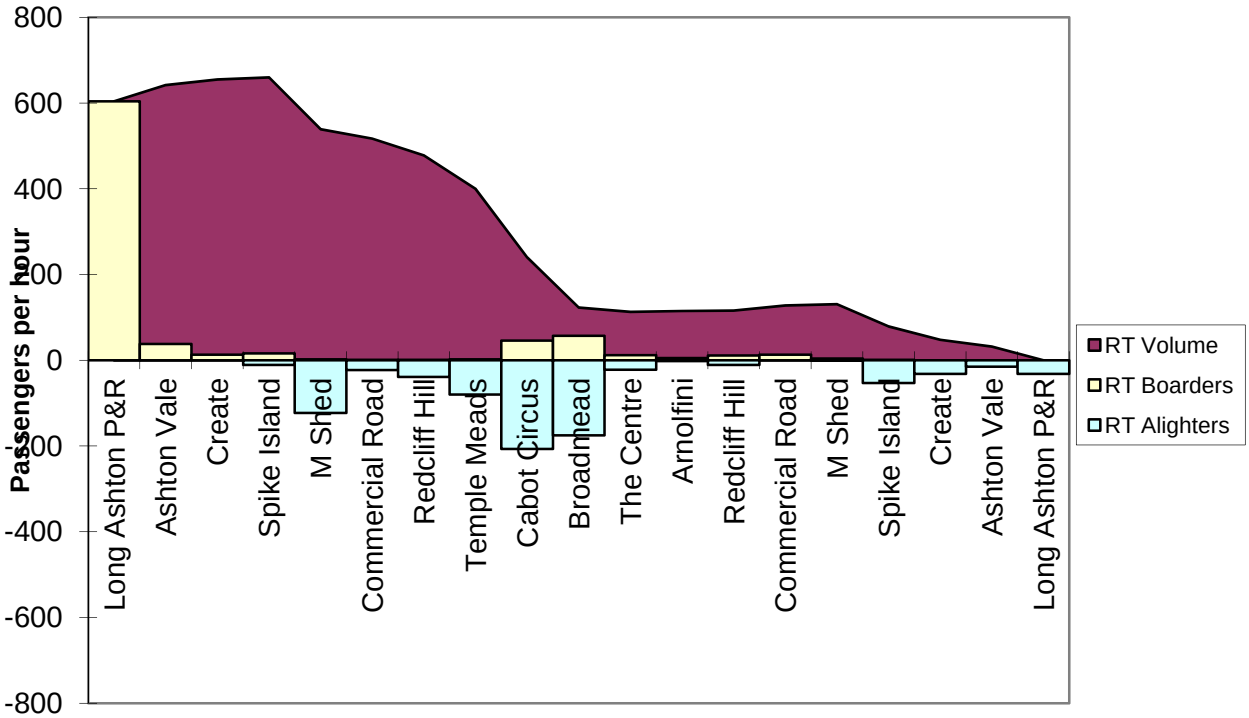


Figure 5. Cumberland Road Option – 2031 Boarding/Alighting Profile PM Peak Hour

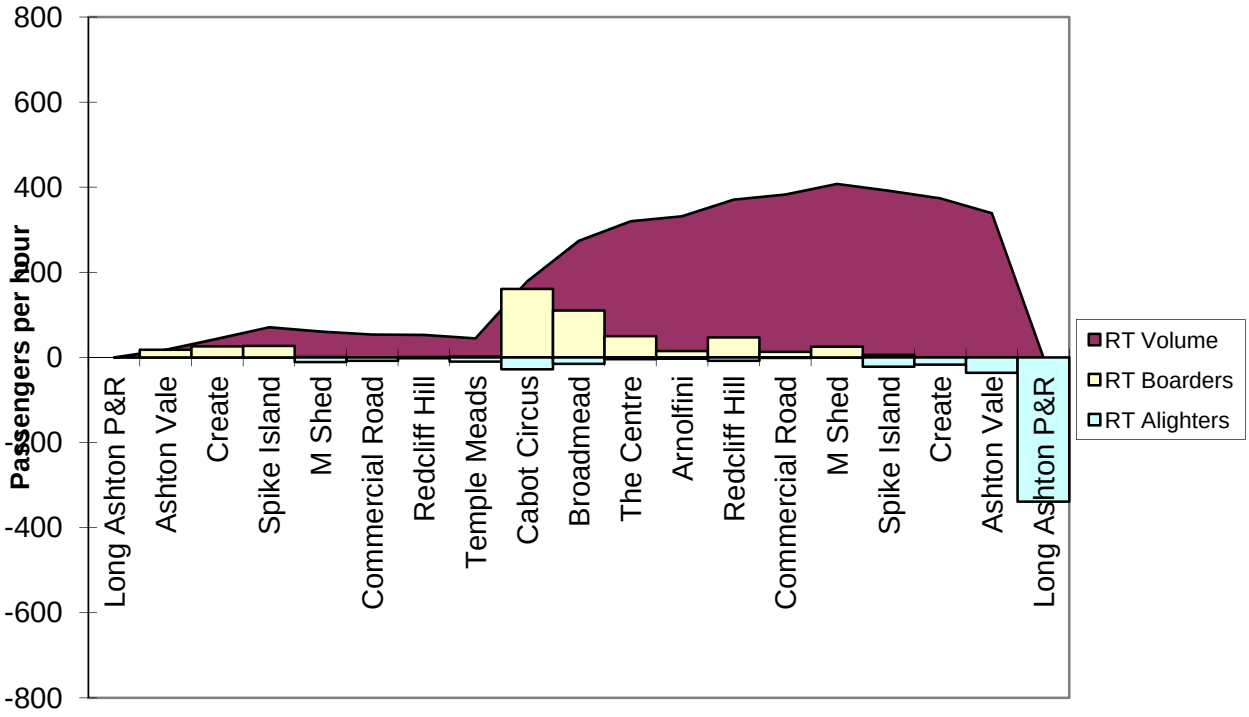


Figure 6. PI Scheme – 2016 Boarding/Alighting Profile AM Peak Hour

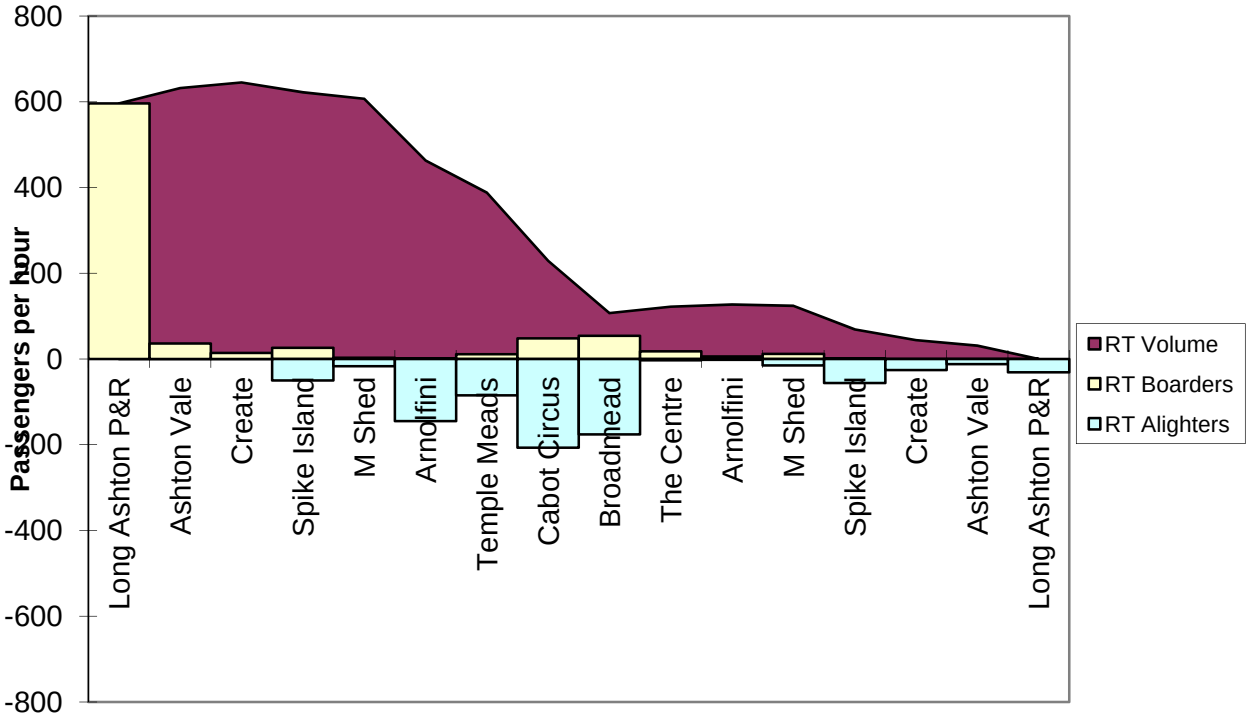


Figure 7. PI Scheme – 2016 Boarding/Alighting Profile PM Peak Hour

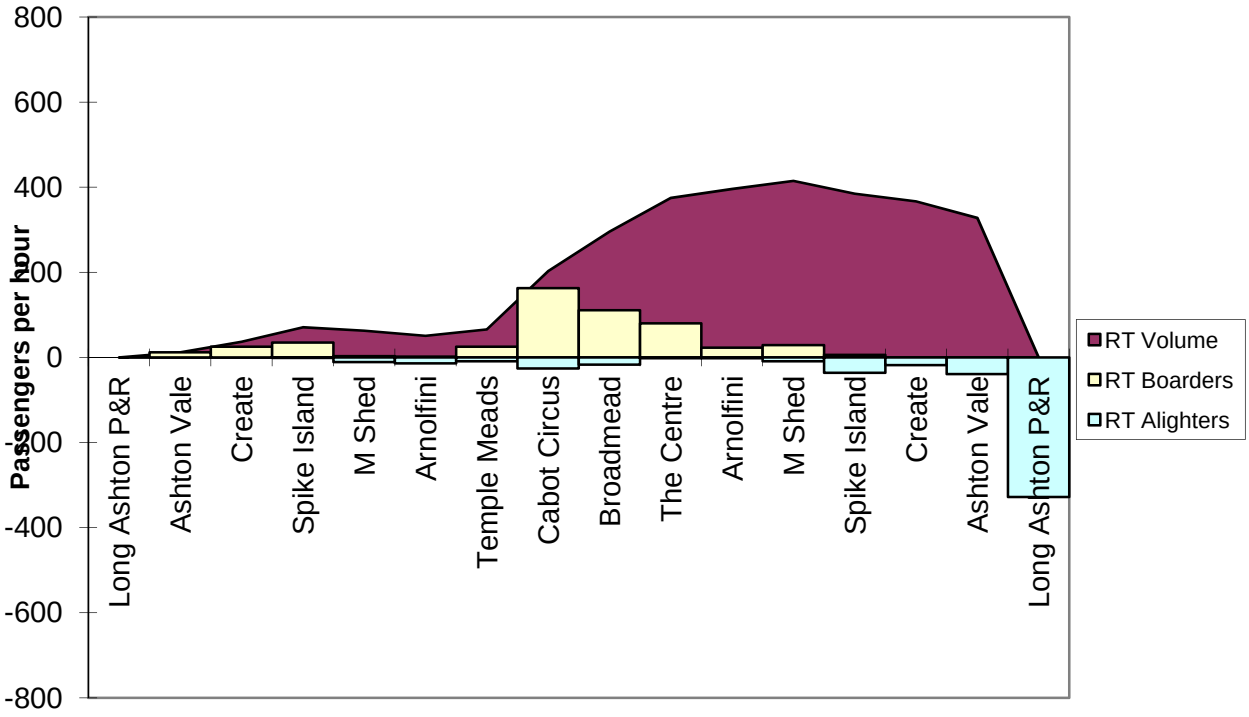


Figure 8. PI Scheme – 2031 Boarding/Alighting Profile AM Peak Hour

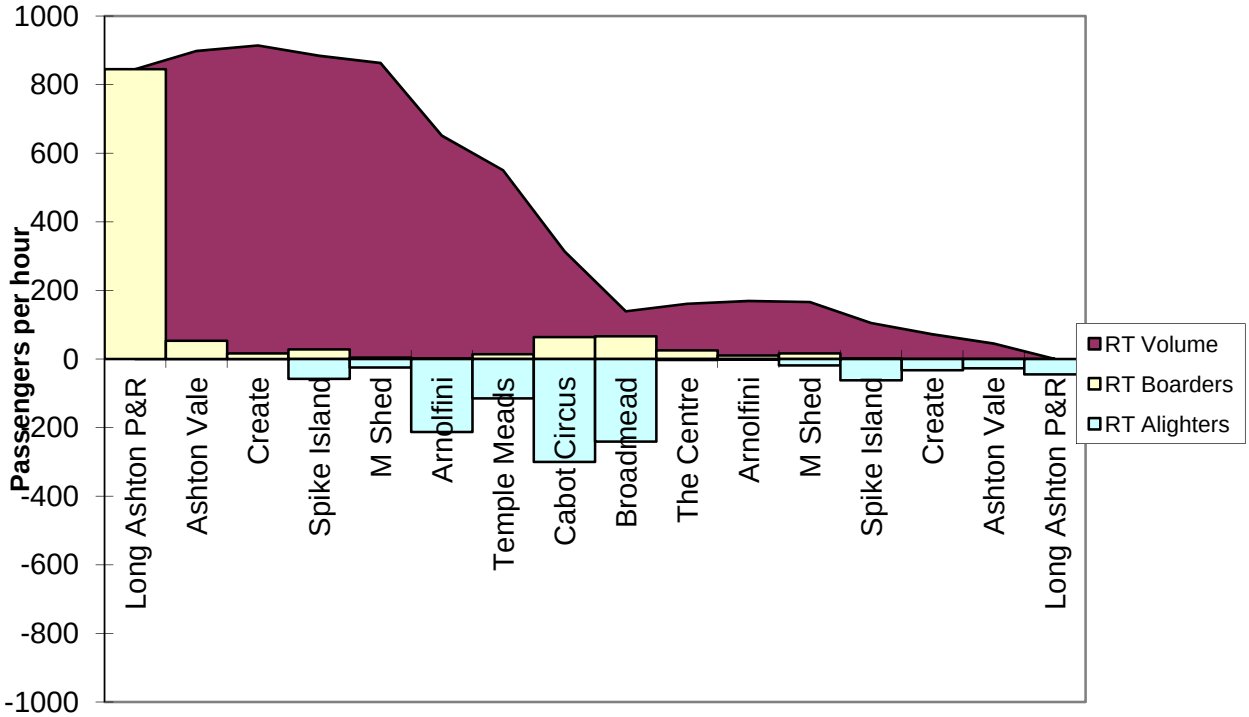
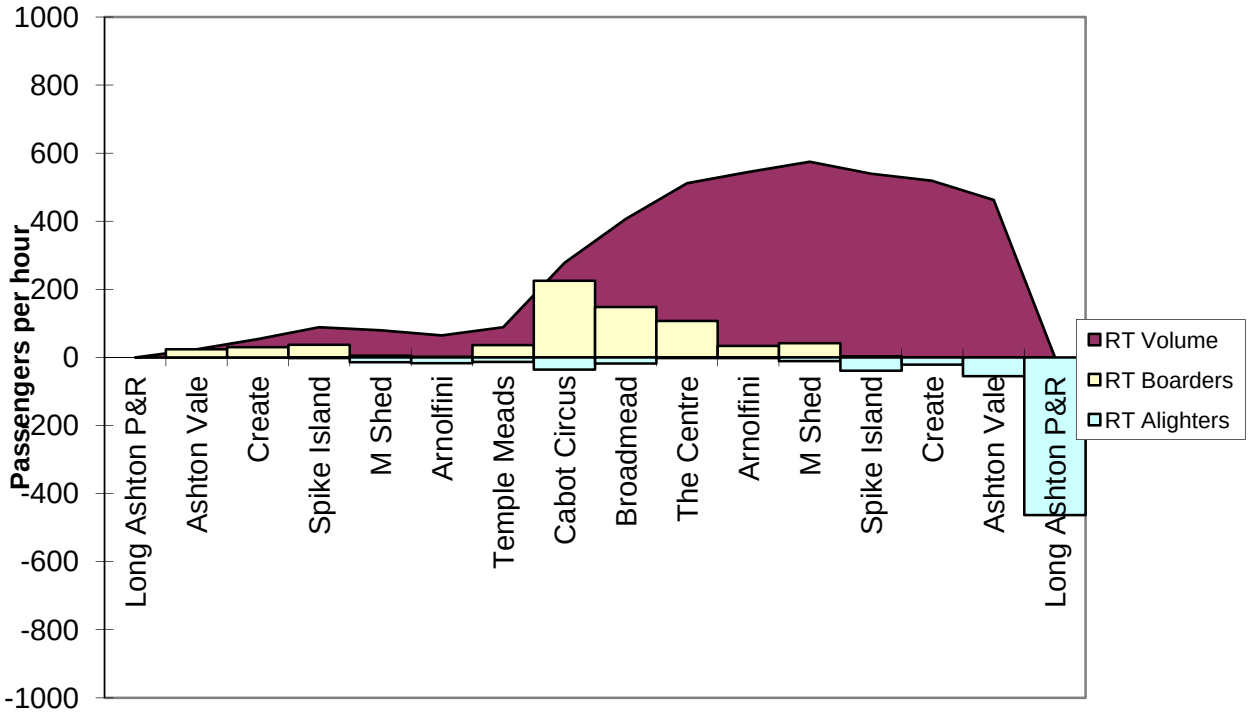


Figure 9. PI Scheme – 2031 Boarding/Alighting Profile PM Peak Hour



Technical note
Appendix B – Appraisal Tables

Appraisal Summary Table

Date produced:	12	4	2013

Contact:	
Name	Alistair Cox
Organisation	Bristol City Council
Role	Promoter/Official

Name of scheme:	Bus Rapid Transit Ashton Vale to Temple Meads via Cumberland Road
Description of scheme:	Implementation of Rapid Transit line in south-west Bristol between Ashton Vale and Bristol City Centre via Cumberland Road, Commercial Road and Redcliff Hill comprising segregated alignment, priority measures, improved stops, real-time passenger information and new modern vehicles.

Impacts		Summary of key impacts	Assessment			
			Quantitative	Qualitative	Monetary £(NPV)	Distributional 7-pt scale/ vulnerable grp
Economy	Business users & transport providers	Public transport users experience travel time benefits resulting from the reduced journey times provided by the new route. Small benefits to highway users due to junction improvements. Transport providers experience ongoing operating costs which are more than offset by increased revenue resulting from additional trips generated by the new route.	Value of journey time changes(£): £13.548m Net journey time changes (£): 0 to 2min £5.998m; 2 to 5min £2.431m; > 5min £5.182m	Moderate Beneficial	£39.865m	Social Distributional Impact to be undertaken
	Reliability impact on Business users	The priority measures and segregated section will provide improved reliability for bus/Rapid Transit journeys along the route. Reliability benefits for general traffic achieved due to junction improvements.	To be estimated	Slight Beneficial	To be estimated	
	Regeneration	Not assessed as scheme will not affect a regeneration area.	Not Applicable	Not Applicable	Not Applicable	
	Wider Impacts	From experience based on the AVTM PI scheme, the journey time improvements generated by the scheme are expected to produce benefits from Wider Impacts, although these have not been quantified at this stage.	To be estimated	Slight Beneficial	To be estimated	
Environmental	Noise	A 2m tall acoustic barrier is included in the scheme design at Ashton Vale, which reduces the assessment from moderate adverse to slight adverse. At most dwellings there would be a slight increase in noise level caused by a general increase in traffic over the assessment period.	Based on the AVTM PI scheme	Slight Adverse	Not Applicable	Social Distributional Impact to be undertaken
	Air Quality	Improved local air quality in some locations and worsened local air quality in others. Overall, the predicted impacts range from moderate beneficial to moderate adverse in terms of nitrogen dioxide. The predicted impacts are negligible for PM10 and PM2.5. Based upon the receptor locations chosen for this assessment, more locations would experience improved air quality than worsened air quality as a result of the scheme. Taking account of the balance between adverse and beneficial impacts, the overall impact of the scheme is judged to be slight beneficial.	Based on the AVTM PI scheme	Slight Beneficial	Not Applicable	Social Distributional Impact to be undertaken
	Greenhouse gases	The scheme will cause a reduction in vehicle-kilometres and associated emissions by encouraging mode switch to public transport.	Change in non-traded carbon over 60y (CO2e): - 10,853 Change in traded carbon over 60y (CO2e): N/A	Slight Beneficial	£0.323m	
	Landscape	There are a range of effects on the landscape character of the overall route of the scheme. The areas on the urban fringe are affected to a greater extent as a new engineering feature is being introduced into the urban fringe landscape.	Not Applicable	Moderate Adverse	Not Applicable	
	Townscape	The relatively complex and historic landscapes around Cumberland Basin and the New Cut would potentially lose many of their small scale historic features, as well as having the busway and RT vehicles introduced into the landscape. The city centre landscape is one where public transport elements are already features of the existing landscape and the changes therefore tend to fit within the existing character. The urban context means that there are large numbers of receptors who would experience a change in view. Some of these views are direct and in close proximity; others more distant or where the scheme forms part of a wider view. The urban context also means that there is little scope to provide screening of any effects.	Not Applicable	Slight Adverse	Not Applicable	
	Heritage of Historic resources	It is anticipated that the main adverse impacts from the Scheme will be to designated built heritage receptors namely Ashton Avenue Bridge which will require Listed Building Consent (LBC) prior to the start of works on the structure. There will be some change to the appearance of some of the Conservation Areas, although this will vary from area to area. Where buildings are proposed for clearance, such as near the A Bond building, Conservation Area Consent (CAC) would be required. There would be some change to the historic settings of many of the listed buildings along the proposed route of the scheme at Cumberland Road and within the City Centre section of the route. This change cannot be mitigated. The nature of the groundworks to enable the scheme is generally superficial, with the creation of bus stops, coach bays and widening of existing road corridors likely to be the most intrusive and have the highest potential for disturbing buried archaeological remains. There are three main areas where impacts to buried archaeology are a possibility namely Temple Circus, The Haymarket and Broad Quay/Prince Street roundabout area, where significant archaeology is known to be present. However, this potential impact can be mitigated with the implementation of programmes of archaeological monitoring during construction via a watching brief to an agreed scope with the Bristol City Council Archaeologist. This would be applied as a condition of any planning consent.	Not Applicable	Slight Adverse	Not Applicable	
	Biodiversity	Proposed mitigation for protected species includes translocation of reptiles and appropriate construction lighting for bats and with the potential loss and disturbance to one pipistrelle roost would be subject to a Natural England European Protected Species Licence application. By these means the potential for significant adverse impact to valuable resources, such as protected species is intended to be avoided. Management to deliver the long term protection of features and maximise the wildlife benefits of the open areas within the site will be undertaken for an agreed period of time. This is proposed to be specified in an Ecological Management Plan. The proposed Scheme occupies a section of Bower Ashton Mineral Railway (disused) SNCI where the loss and fragmentation of habitat cannot be fully mitigated. Overall, provided the mitigation and compensation strategy is implemented, the scheme should avoid, mitigate or compensate for potentially significant adverse impacts over the long term.	Not Applicable	Moderate Adverse	Not Applicable	
	Water Environment	Although a small number of risks are identified with regard to the water environment, it is considered that were they arise, they are generally considered acceptable in the context of the scheme, or can be mitigated through simple environmental management practices. The overall predicted assessment score is neutral. There are minimal residual effects during operation as a direct result of the scheme on flooding (neutral impact). The majority of the proposed scheme has a good level of protection against flooding. As a result, the sections of the route between Ashton Vale Park and Ride and Ashton Avenue Bridge, and the City Centre Section will be constructed at levels which provide at least 1% Annual Exceedance Probability (AEP) (1 in 100 year) protection from fluvial or combined fluvial/tidal events. The section between Ashton Avenue Bridge and Cumberland Road Bridge is subject to a significantly higher flood risk, close to 20% AEP (1 in 5 year) tide levels in this reach of the River Avon New Cut. The construction method of the proposed scheme in this section will permit some raising of route levels and thus the reduction of flood risk to the running surface at limited cost.	Not Applicable	Neutral	Not Applicable	
Social	Commuting and Other users	Commuters and other users experience travel time benefits resulting from the reduced journey times provided by the new route.	Value of journey time changes(£): £104.452m Net journey time changes (£): 0 to 2min £9.905m; 2 to 5min £14.695m; > 5min £57.308m	Large Beneficial	£105.767m	Social Distributional Impact to be undertaken
	Reliability impact on Commuting and Other users	The priority measures and segregated section will provide improved reliability for bus and Rapid Transit journeys along the route.	To be estimated	Slight Beneficial	To be estimated	
	Physical activity	The scheme would encourage additional walking and cycling journeys as a result of the segregated route along the alignment and increased public transport trips (potentially accessed by foot or cycle).	Not Applicable	Slight Beneficial	Not Applicable	
	Journey quality	The high quality facilities, surrounding environment and passenger information provided with the new route will reduce traveller care and stress and improve views and therefore improve journey ambience for those passengers using the route	Not Applicable	Moderate Beneficial	Not Applicable	
	Accidents	Mode switch to the new route will cause a reduction in road traffic and associated reduction in road accidents. Additional benefits will also be experienced by pedestrians as a result of priority measures and improved crossing facilities and by cyclists through the construction of the cycle route along the segregated alignment.	To be estimated	Slight Beneficial	To be estimated	Social Distributional Impact to be undertaken
	Security	Increased use of CCTV and high standard of lighting at stops and CCTV on the Rapid Transit vehicles will provide high levels of security for passengers.	Not Applicable	Slight Positive	Not Applicable	Social Distributional Impact to be undertaken
	Access to services	The impact of the RT scheme is small when measured across the whole sub-region, but is more significant when viewed locally within the areas directly served by the scheme.	Not Applicable	Moderate Beneficial	Not Applicable	Social Distributional Impact to be undertaken
	Affordability	The assumptions for fares policy underlying the modelling and appraisal of AVTM are to mirror existing public transport fares and hence the impact on passengers will be neutral..	Not Applicable	Neutral	Not Applicable	Social Distributional Impact to be undertaken
	Severance	The provision of walking and cycling routes along the alignment will offset any increase in severance caused by the route itself.	Not Applicable	Slight Beneficial	Not Applicable	Social Distributional Impact to be undertaken
	Option values	The scheme will increase the transport options available in the south-west of Bristol.	Not Applicable	Slight Beneficial	Not Applicable	
Public Accounts	Cost to Broad Transport Budget	The public sector experiences costs associated with scheme construction, ongoing maintenance and operation of the scheme and loss in indirect tax revenue.	PVC = £36.846m	Not Applicable	£36.846m	
	Indirect Tax Revenues	Loss of indirect taxation through reductions in fuel duty paid and loss of VAT due to consumers switching expenditure to public transport fares which are zero rated for VAT. Indirect tax revenues are treated as a disbenefit to wider society rather than a cost to Central Government. This is in recognition of the benefits that result from the redistribution of taxes.	PVB = -£6.634m	Not Applicable	-£6.634m	

Economy:Economic Efficiency of the Transport System(TEE)

Run title	output_1631CRT2293
Run Descri	AVTM Cumberland Road FDA3
Date	11 April 2013
TUBA Control	v3.42.109.xlsm

Hours	Highway	Bus	Rail	In TUBA Run
AM	2.55	2.40	2.70	1
IP	6.00	6.00	6.00	1
PM	2.56	2.8	2.1	1
OP	0.48	0.28	0.42	1
WE	6.54	17.23	17.23	1

Consumer - Commuting user benefits	**All Modes**	**Road**	**Bus**	**Rail**
Travel Time	58,315	4,034	45,917	8,364
Vehicle operating costs	1,740	1,740	0	0
User charges	-443	-508	0	65
During Construction & Maintenance	0	0	0	0
NET CONSUMER - COMMUTING BENEFITS	**59,613**	**5,267**	**45,917**	**8,429**

Consumer - Other user benefits	**All Modes**	**Road**	**Bus**	**Rail**
Travel Time	46,137	0	42,353	3,784
Vehicle operating costs	0	0	0	0
User charges	17	0	0	17
During Construction & Maintenance	0	0	0	0
NET CONSUMER - OTHER BENEFITS	**46,154**	**0**	**42,353**	**3,801**

Business	All Modes	Personal	Freight	Personal	Freight	Personal	Freight
Travel Time	13,548	3,310	1,085	5,036	0	4,117	0
Vehicle operating costs	383	216	167	0	0	0	0
User charges	19	-9	14	0	0	14	0
During Construction & Maintenance	0	0	0	0	0	0	0
Subtotal	**13,951**	**3,517**	**1,266**	**5,036**	**0**	**4,131**	**0**

Private Sector Provider Impacts				
Revenue	31,858	9,264	22,475	119
Operating costs	-5,070	0	-5,070	0
Investment costs	-231	0	-231	0
Grant/subsidy	0	0	0	0
Subtotal	**26,557**	**9,264**	**17,174**	**119**

Other business Impacts				
Developer contributions	-643	0	-643	0
NET BUSINESS IMPACT	**39,865**			

TOTAL				
Present Value of Transport Economic **Efficiency Benefits (TEE)**	**145,631**			

Note: Benefits appear as positive numbers, while costs appear as negative numbers.
Note: All entries are present values discounted to 2002, in 2002 prices

Public Accounts

Local Government Funding	**ALL MODES**	**Road**	**Bus**	**Rail**
Revenue	54	54	0	0
Operating Costs	6,027	0	6,027	0
Investment Costs	7,369	0	7,369	0
Developer Contributions	-643	0	-643	0
Grant/Subsidy Payments	0	0	0	0
NET IMPACT	**12,807**	**54**	**12,753**	**0**

Central Government Funding: Transport	**ALL MODES**	**Road**	**Bus**	**Rail**
Revenue	0	0	0	0
Operating costs	0	0	0	0
Investment costs	24,039	0	24,039	0
Developer Contributions	0	0	0	0
Grant/Subsidy Payments	0	0	0	0
NET IMPACT	**24,039**	**0**	**24,039**	**0**
Central Government Funding: Non-Transport				
Indirect Tax Revenues	6,634	2,724	3,846	63

TOTALS				
Broad Transport Budget	36,846	54	36,792	0
Wider Public Finances	6,634	2,724	3,846	63

Note: Costs appear as positive numbers, while revenues and developer contributions appear as negative numbers.
Note: All entries are present values discounted to 2002, in 2002 prices

Analysis of Monetised Costs and Benefits

Greenhouse Gases	323
Economic Efficiency: Consumer Users (Commuting)	59,613
Economic Efficiency: Consumer Users (Other)	46,154
Economic Efficiency: Business Users and Providers	39,865
Wider Public Finances (Indirect Taxation Revenues)	-6,634
Present Value of Benefits (PVB)	**139,320**
Broad Transport Budget	36,846
Present Value of Costs (PVC)	**36,846**
OVERALL IMPACTS	
Net Present Value (NPV)	**102,474**
Benefit to Cost Ratio (BCR)	**3.78**

Note: This table includes costs and benefits which are regularly or occasionally presented in monetised form in transport appraisals, together with some where monetisation is in prospect. There may also be other significant costs and benefits, some of which cannot be presented in monetised form. Where this is the case, the analysis presented above does NOT provide a good measure of value for money and should not be used as the sole basis for decisions.

Technical note

Project:	AVTM	**To:**	Alistair Cox
Subject:	Hotwell Road Alignment [Option 3]	**From:**	Rob Thompson
Date:	18 Apr 2013	**cc:**	Helen Bartlett

1. Hotwell Road Alignment of AVTM

1.1. Introduction

After his election in November, and following the conclusion of the Ashton Vale to Temple Meads (AVTM) Public Inquiry, the Mayor of Bristol requested a review of the AVTM BRT scheme, to see what measures could be implemented as an alternative to buses/rapid transit vehicles crossing Prince Street Bridge and travelling through the Harbourside area.

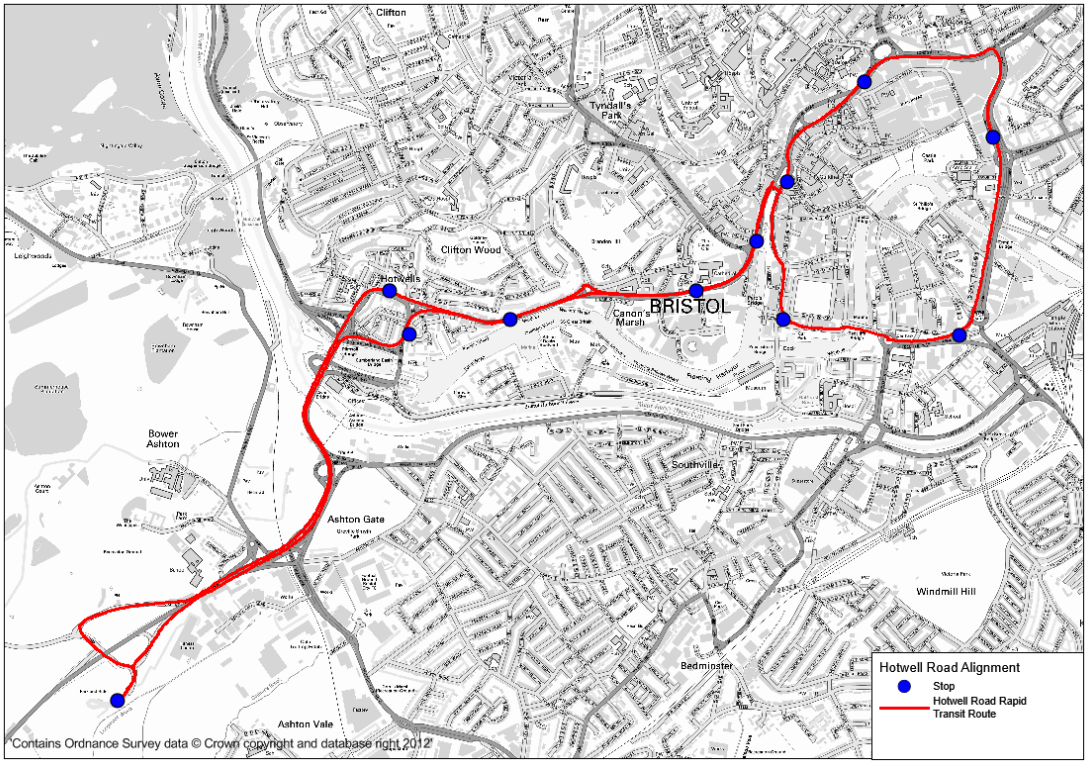
Two options have been considered, a partially offline Cumberland Road/Redcliff Hill alignment and an online Hotwell Road alignment. This note sets out the impact of the Hotwell Road alignment compared with a Do Minimum and the original AVTM Public Inquiry route.

1.2. Scheme

From the Long Ashton P&R site, the Hotwell Road scheme joins the A370 via new/extended bus lanes on the B3128. A new signalised junction controls access to the A370. The scheme follows the A370 using a new bus lane until Jessops Underpass where buses join the mainline traffic through the use of a bus gate. Buses would run with the mainline traffic on the A370 until Bristol Gate (junction of Brunel Way and Hotwell Road) where a new bus lane connects the A370 with new peak hour bus lanes along Hotwell Road. The junction of Hotwell Road and Merchants Road outside Holy Trinity Church is redesigned. A new eastbound peak only bus lane is added on Hotwell Road towards the junction with Jacobs Wells Road. A new 24 hour bus lane would be introduced along Anchor Road from Jacobs Wells Road to the existing bus lane at College Square. The existing bus lane would be terminated early at the foot of Trinity Street steps to the east of the Anchor Road stop. The scheme would then head north into the city centre to rejoin the PI city centre alignment.

Heading away from the city centre the reverse route would be followed along Anchor Road and Hotwell Road with new bus lanes introduced to complete existing bus lanes. At Merchants Road, the buses would travel with mainline traffic until the Clift House Road junction where an existing main traffic lane would be replaced by a 24 hour bus lane until the Ashton Road junction where the bus lane would end; buses would access the Park and Ride site using the Long Ashton junction. Figure 1 shows the route and stop locations.

Figure 1. Hotwell Road Route Alignment and Stops



1.3. Model Results

The Hotwell Road scheme has been modelled on the same G-BATS3 model used to provide the results for the AVTM Public Inquiry. Forecast years 2016 and 2031 have been modelled, with a base year of 2006. The following sections compare the summary results of the Hotwell Road Alignment with the Do Minimum and PI alignment.

1.3.1. AM Peak Hour

Table 1. 2016/31 AM Peak hour Highway Statistics (Simulation area only)

	Do Minimum		Hotwell Road Alignment		Public Inquiry Alignment	
Mode	**2016**	**2031**	**2016**	**2031**	**2016**	**2031**
Vehicle kms	5,979,000	7,051,000	5,976,000	7,047,000	5,978,000	7,050,000
Free Flow Travel Time (hrs)	75,600	90,950	75,500	90,830	75,610	90,970
Congested Travel Time (hrs)	93,910	125,830	93,990	125,760	94,190	126,100
Average Speed (kph)	64	56	64	56	64	56
Congestion Index (delay in mins per veh km)	0.63	0.96	0.64	0.97	0.64	0.97

There is a decrease in distance travelled compared to both the Do Minimum and PI alignment in both forecast years. The free flow travel time decreases compared to all other scenarios, whilst the congested travel time is greater than the Do Minimum and less than the PI alignment in 2016. The average speeds remain unchanged and the delay experienced sees and increase on the Do Minimum but it is no greater than the PI alignment.

Overall model mode split is shown in Table 2.

Table 2. 2016/31 AM Peak hour Mode share

	Do Minimum		Hotwell Road Alignment		Public Inquiry Alignment	
Mode	**2016**	**2031**	**2016**	**2031**	**2016**	**2031**
Car	88.4%	88.7%	88.2%	88.5%	88.1%	88.3%
Bus	8.2%	7.9%	8.2%	7.9%	8.1%	7.8%
Rail	2.9%	2.8%	2.9%	2.8%	2.9%	2.8%
BRT	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%
P&R	0.5%	0.6%	0.7%	0.8%	0.8%	1.0%
Total	100%	100%	100%	100%	100%	100%

There is slight increase in P&R split with the Hotwell Road alignment in both forecast years when compared to the Do Minimum but this would be smaller than the PI alignment. The difference is accounted for by the car share. The BRT mode share would not see the increase it did for the PI alignment.

Rapid Transit Statistics

The total patronage for the AM peak hour RT service and North Somerset buses using the AVTM alignment is shown in Table 3.

Table 3. 2016/31 AM Peak Hour Patronage

		Do Minimum		Hotwell Road Alignment		PI Alignment	
Service No.	**Description**	**2016**	**2031**	**2016**	**2031**	**2016**	**2031**
X47	Ashton Vale to Temple Meads RT	600	720	430	540	820	1140
354 Nbnd	Nailsea to Bristol	40	50	50	60	50	60
354 Sbnd	Bristol to Nailsea	20	20	20	20	30	40
X1 Nbnd	Weston-super-Mare to Bristol	140	160	140	160	160	200
X1 Sbnd	Bristol to Weston-super-Mare	90	120	90	110	110	150
361 Nbnd	Clevedon to Bristol	30	40	30	40	40	40
361 Sbnd	Bristol to Clevedon	20	20	10	10	20	20

The Hotwell Road alignment has fewer passengers on all RT services than the original AVTM alignment, and in many cases is no better than the Do Minimum. In addition, with the PI scheme, the North Somerset services also increase patronage due to the journey time savings; such patronage gains are not achieved with the Hotwell Road option. This is due to the significantly longer journey times of the service when it is routed along Hotwell Road, shown in Table 4.

Table 4. 2016/31 AM Peak Hour Journey Times

Time in Minutes	2016	2031
Original PI Inbound	17	17
Original PI Outbound	16	16
Original Total	**33**	**33**
Hotwell Road Inbound	29	31
Hotwell Road Outbound	18	21
Hotwell Road Total	**46**	**51**

Figures 2 and 3 show the boarding and alighting patterns on the RT for the Hotwell Road alignment for 2016/31 AM peak hours and Figures 4 and 5 show the same for the original AVTM PI alignment.

Figure 2. Hotwell Road Alignment - 2016 Boarding/Alighting Profile AM Peak Hour

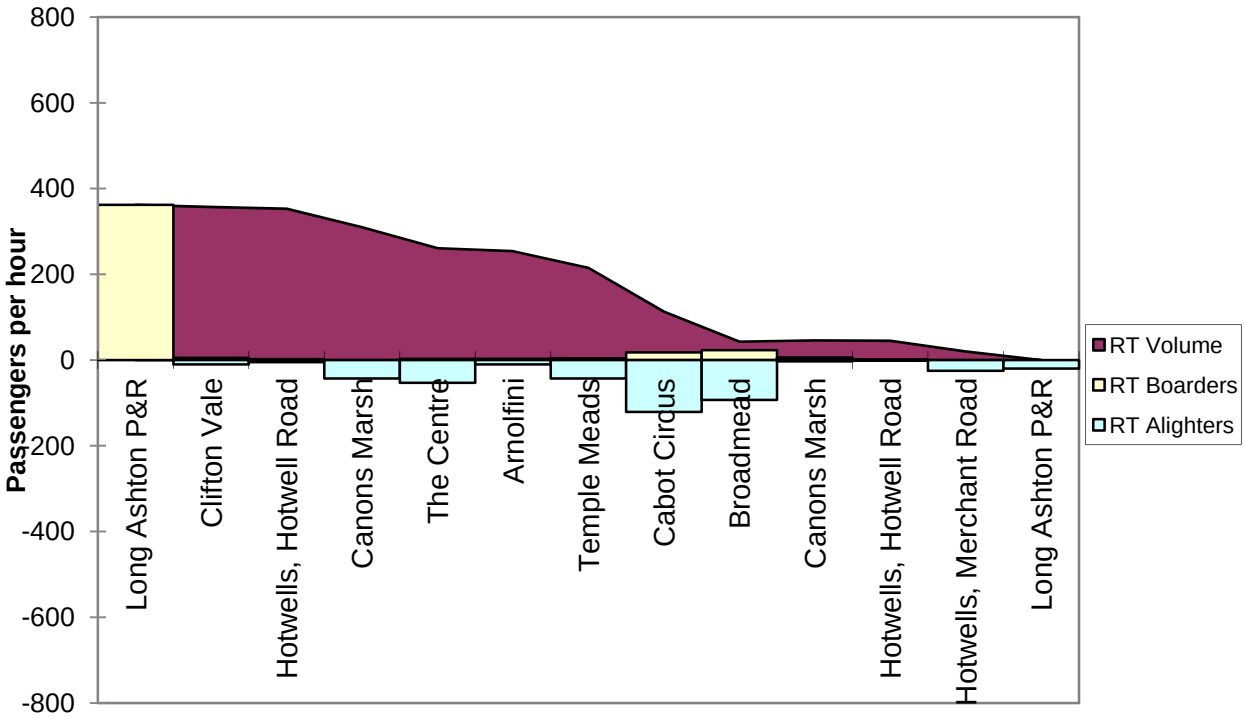


Figure 3. Hotwell Road Alignment - 2031 Boarding/Alighting Profile AM Peak Hour

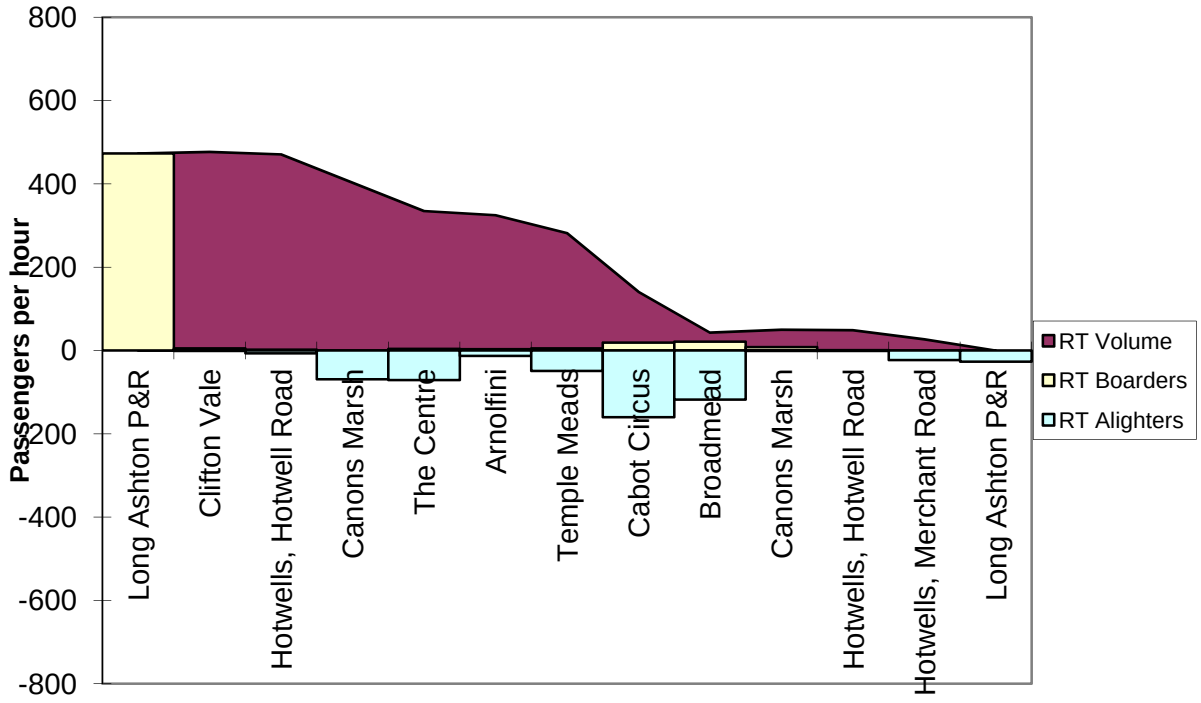


Figure 4. Original PI Alignment – 2016 Boarding/Alighting Profile AM Peak Hour

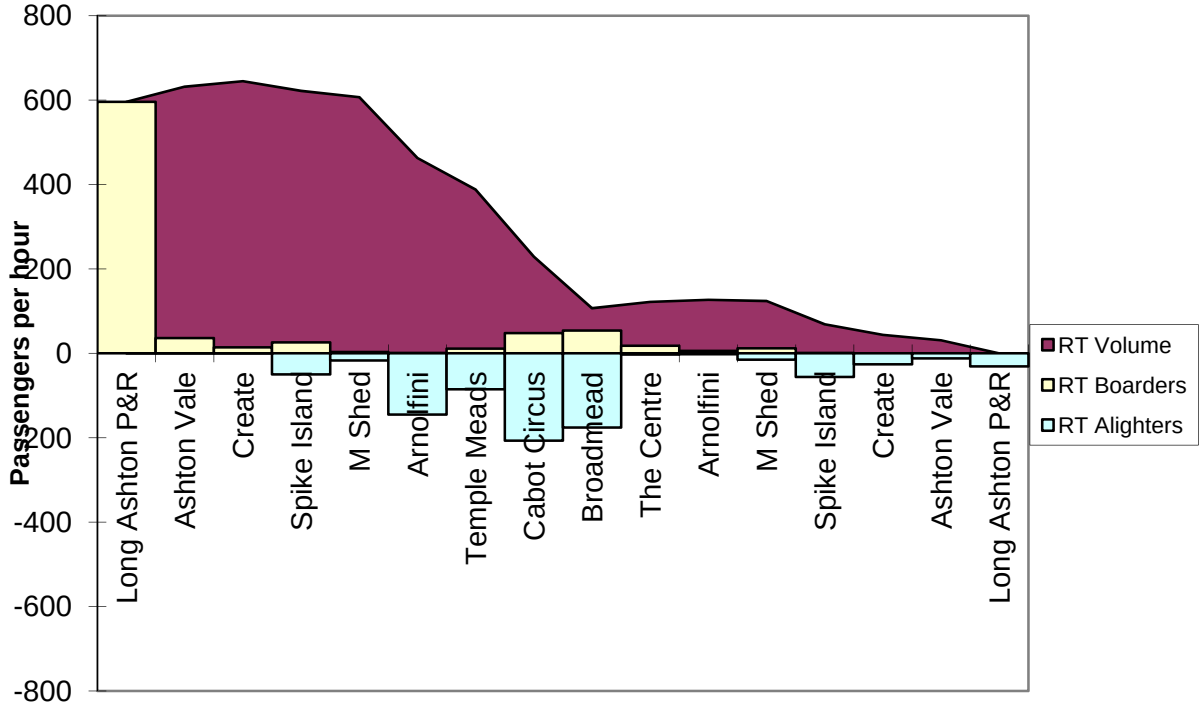
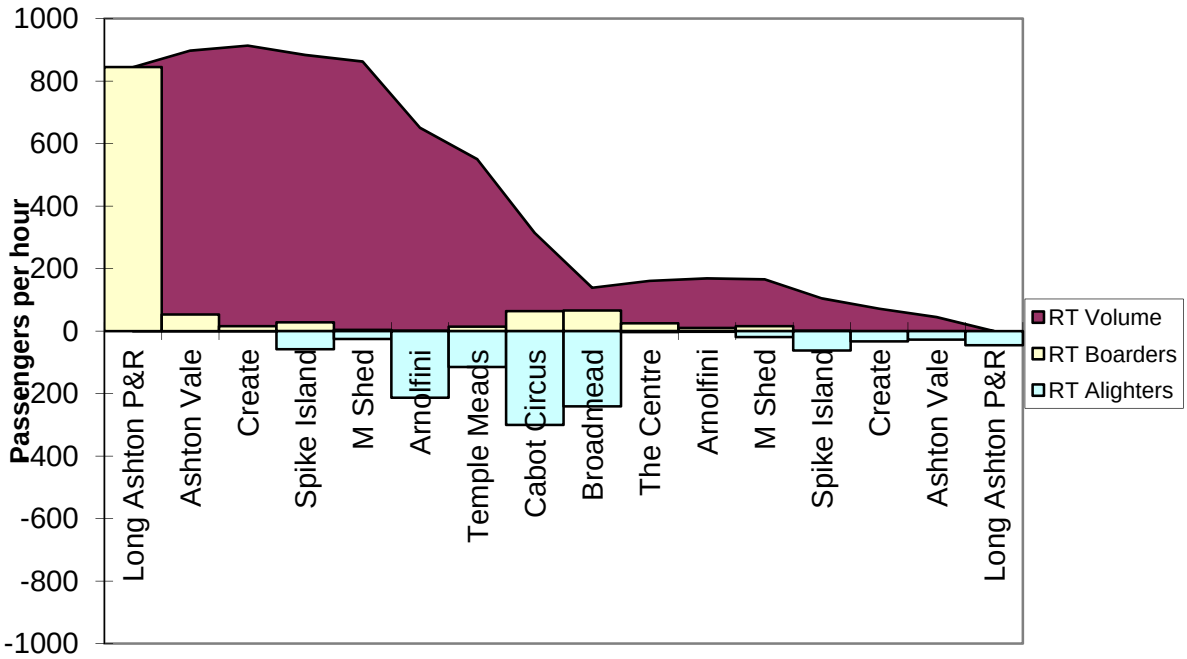


Figure 5. Original PI Alignment – 2031 Boarding/Alighting Profile AM Peak Hour



The boarding and alighting patterns are very similar to the PI alignment; typically the main difference is a decrease in the number of passengers boarding at Long Ashton P&R site. Due to the extended journey times, the city centre is not as attractive for passengers boarding at the P&R site in the Hotwell Road option.

Highway Differences

Figure 6 shows the changes in traffic flow between the Hotwell Road option and the Do Minimum for the 2016 AM peak hour. There is a large decrease in flow over the Cumberland Basin (northbound decreases by approximately 500 pcus and southbound by 300 pcus); some of this traffic queues whilst some re-routes (onto longer routes) whilst some remain in queues and experiences delays. The decrease in mainline flow creates an increase in flow on Clift House Road. Other traffic diverts from further afield onto the Clifton Suspension Bridge and through Clifton.

Figure 7 shows the change in delay as a result of the Hotwell Road scheme. On the A370 northbound there are two major increases in delay which account for the increase in journey times and hence decrease in flow. The first is over a minute of delay for vehicles on the A370 and those joining from Long Ashton. In addition, those vehicles going to the city centre would experience approximately one more minute delay as they leave the A370 at Hotwell Road. There are also delays on the A4 Hotwell Road west of the A370 junction, due to the creation of the peak hour bus lane inbound towards Bristol. Some delay would also be experienced at the bus gate at the end of the bus lane. In the southbound direction, after Jessops Underpass (where a main traffic lane is replaced by a bus lane) there is over a minute of delay. There would be a slight decrease in delay (caused by the weaving of vehicles in the Do Minimum) through the Winterstoke Road junction where a bus lane has removed a traffic lane but this is not enough to neutralise the impact at the previous junction.

A similar story is true for 2031, although the impact is amplified. Figures 8 and 9 show the flow and delay differences for the later forecast year. In 2031, delay accessing the A370 northbound from Winterstoke Road and Clift House Road reduces because the delay was so great in the Do Minimum and with the Hotwell Road alignment the re-routing caused by the signalised junction at Ashton Road reduces the congestion on the A370 enabling quicker access to the A370

Figure 6. 2016 AM Flow Difference (pcus) (Hotwell Road alignment – Do Minimum)

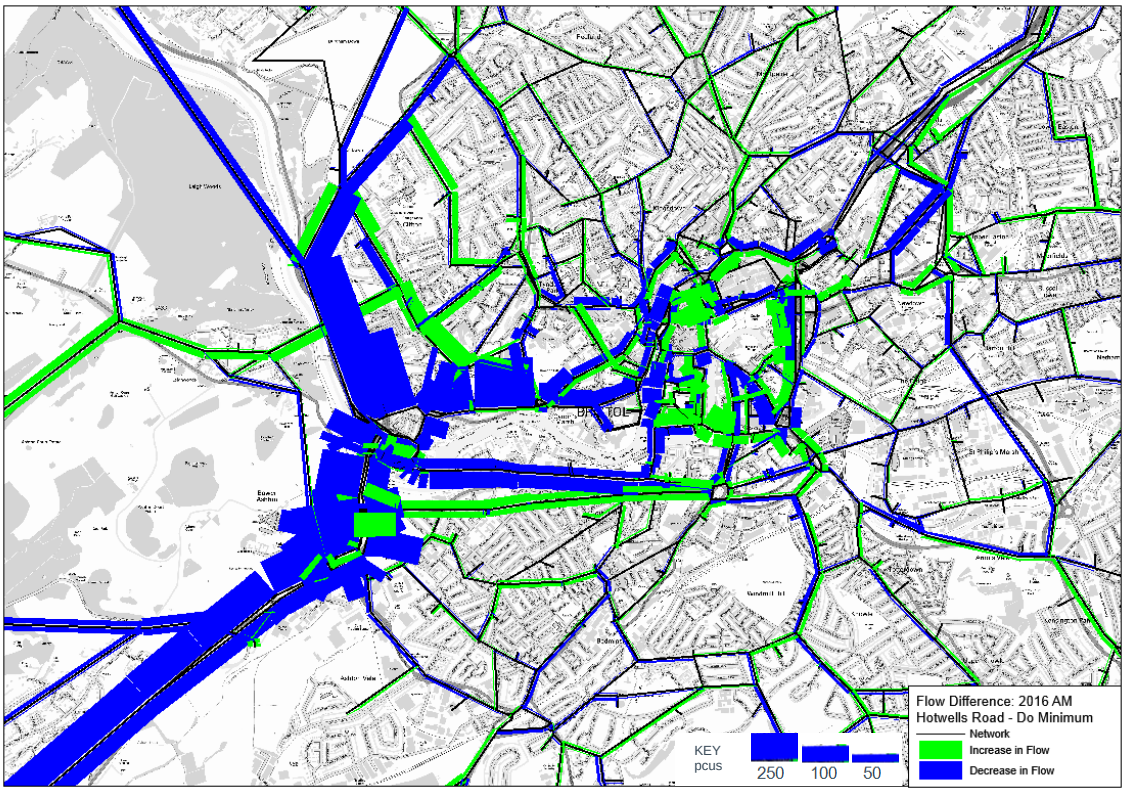


Figure 7. 2016 AM Delay Difference (Hotwell Road alignment – Do Minimum)

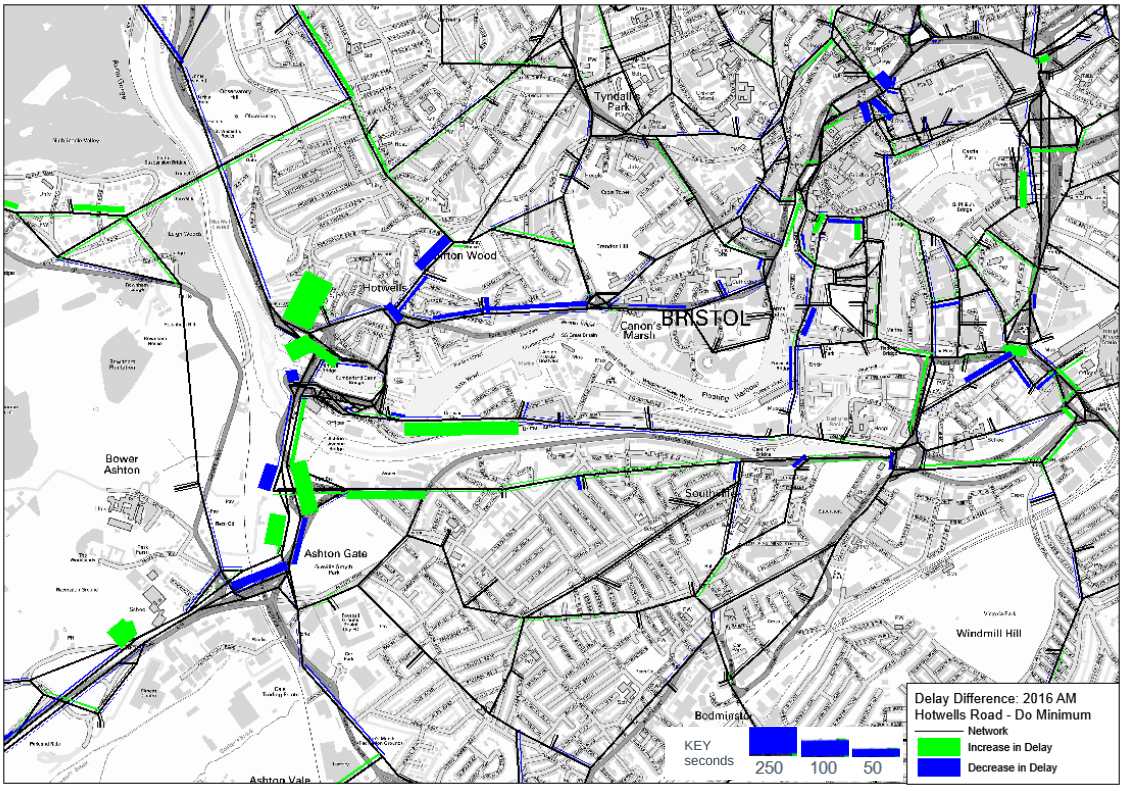


Figure 8. .2031 AM Flow Difference (Hotwell Road alignment – Do Minimum)

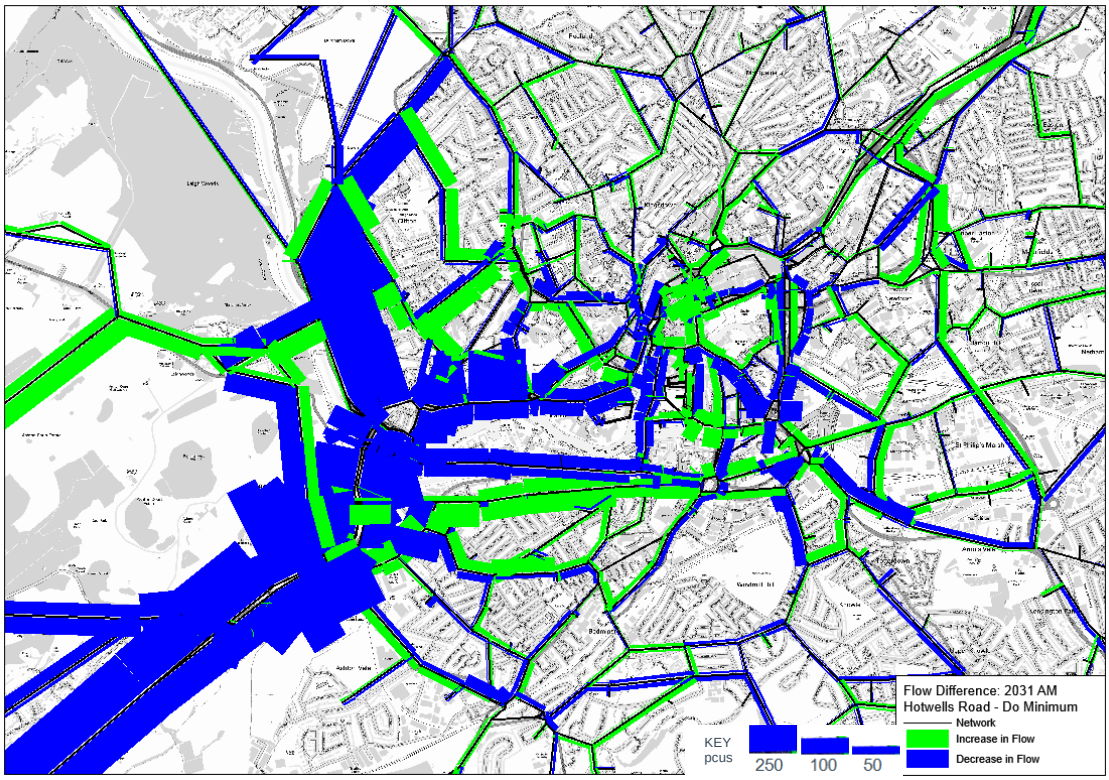
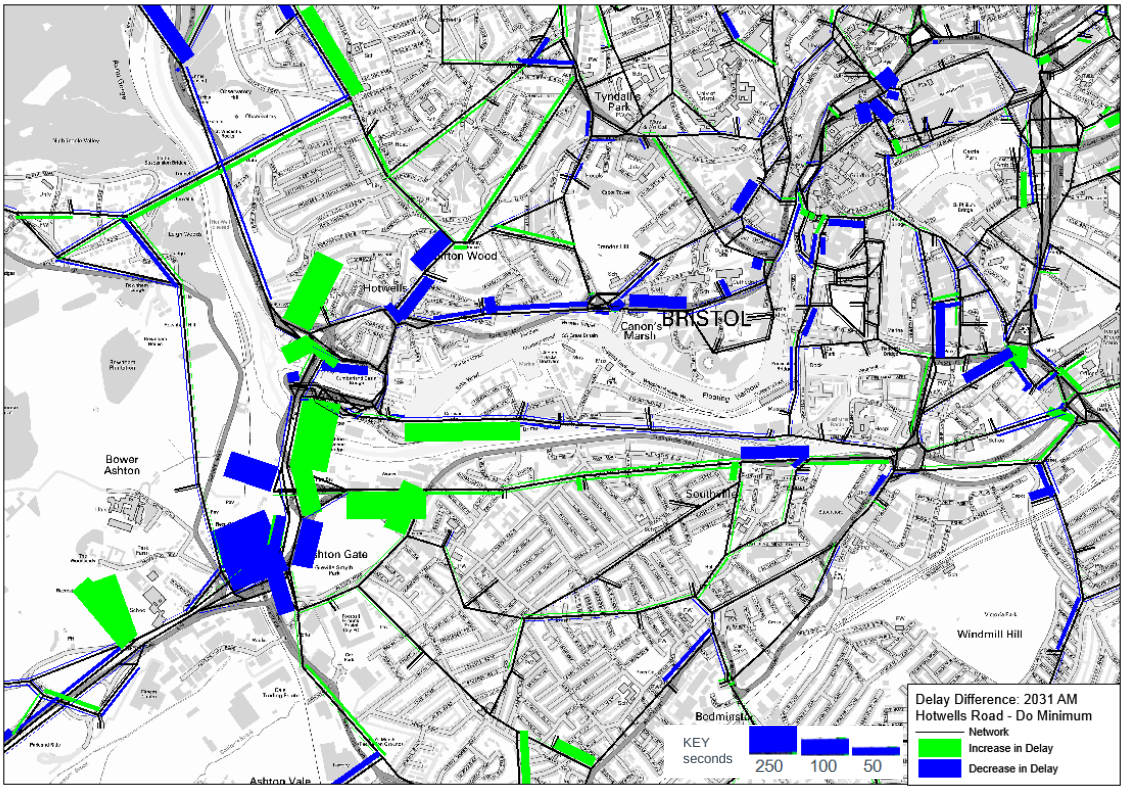


Figure 9. 2031 AM Delay Difference (Hotwell Road alignment – Do Minimum)



1.3.2. Inter Peak Hour

Table 5. 2016/31 IP hour Highway Statistics (Simulation area only)

	Do Minimum		Hotwell Road Alignment		Public Inquiry Alignment	
Mode	**2016**	**2031**	**2016**	**2031**	**2016**	**2031**
Vehicle kms	4,973,000	6,113,000	4,973,000	6,114,000	4,971,000	6,111,000
Free Flow Travel Time (hrs)	60,560	76,020	60,550	76,020	60,540	76,010
Congested Travel Time (hrs)	68,350	90,110	68,410	90,230	68,410	90,150
Average Speed (kph)	73	68	73	68	73	68
Congestion Index (delay in mins per veh km)	0.36	0.47	0.37	0.47	0.37	0.47

There is very little difference in any of the key indicators for the inter peak hour, the most notable is the increase in vehicle km to the PI alignment.

Overall model mode split is shown in Table 6.

Table 6. 2016/31 IP hour Mode share

	Do Minimum		Hotwell Road Alignment		Public Inquiry Alignment	
Mode	**2016**	**2031**	**2016**	**2031**	**2016**	**2031**
Car	91.8%	92.5%	91.7%	92.4%	91.7%	92.3%
Bus	6.9%	6.4%	6.9%	6.4%	6.9%	6.3%
Rail	1.0%	0.9%	1.0%	0.9%	1.0%	0.9%
BRT	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%
P&R	0.3%	0.3%	0.3%	0.3%	0.4%	0.4%
Total	100%	100%	100%	100%	100%	100%

There is a marginally lower P&R and BRT mode splits with the Hotwell Road alignment in both, with the slack taken up by the car mode.

Rapid Transit Statistics

The total patronage for the IP hour RT service and North Somerset buses using the AVTM alignment is shown in Table 7.

Table 7. 2016/31 IP Hour Patronage

		Do Minimum		Hotwell Road Alignment		PI Alignment	
Service No.	**Description**	**2016**	**2031**	**2016**	**2031**	**2016**	**2031**
X47	Ashton Vale to Temple Meads RT	180	230	170	200	320	430
354 Nbnd	Nailsea to Bristol	10	10	10	10	10	10
354 Sbnd	Bristol to Nailsea	10	10	10	10	20	30
X1 Nbnd	Weston-super-Mare to Bristol	40	50	40	50	50	60
X1 Sbnd	Bristol to Weston-super-Mare	50	60	50	60	70	80
361 Nbnd	Clevedon to Bristol	10	10	10	10	10	10
361 Sbnd	Bristol to Clevedon	10	10	10	10	20	20

The Hotwell Road alignment has fewer passengers on all RT services than the original AVTM alignment. This is due to the longer journey times of the service, particularly on its journey in to the city centre, when it is routed along Hotwell Road, shown in Table 8.

Table 8. 2016/31 IP Hour Journey Times

Time in Minutes	**2016**	**2031**
Original PI Inbound	19	19
Original PI Outbound	14	14
Original Total	**32**	**33**
Hotwell Road Inbound	28	31
Hotwell Road Outbound	16	18
Hotwell Road Total	**44**	**48**

Figures 10 and 11 show the boarding and alighting patterns on the RT for the Hotwell Road alignment for 2016/31 IP hour and Figures 12 and 13 show the same for the original alignment.

Figure 10. Hotwell Road Alignment - 2016 Boarding/Alighting Profile IP Hour

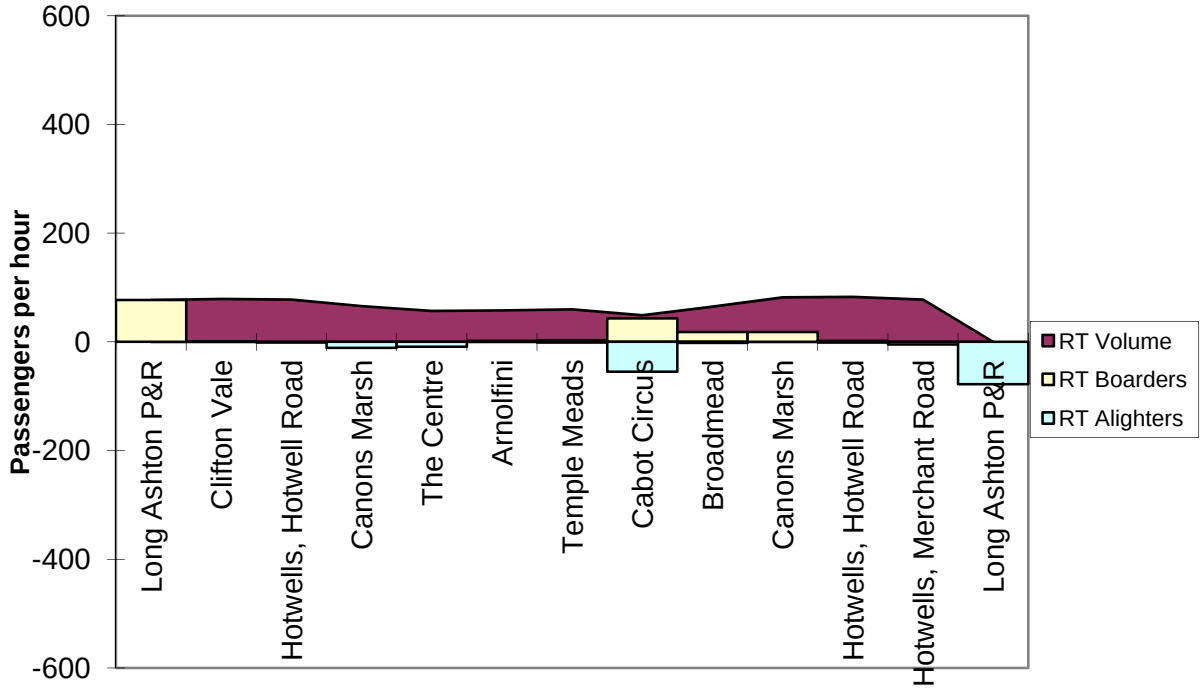


Figure 11. **Hotwell Road Alignment - 2031 Boarding/Alighting Profile IP Hour**

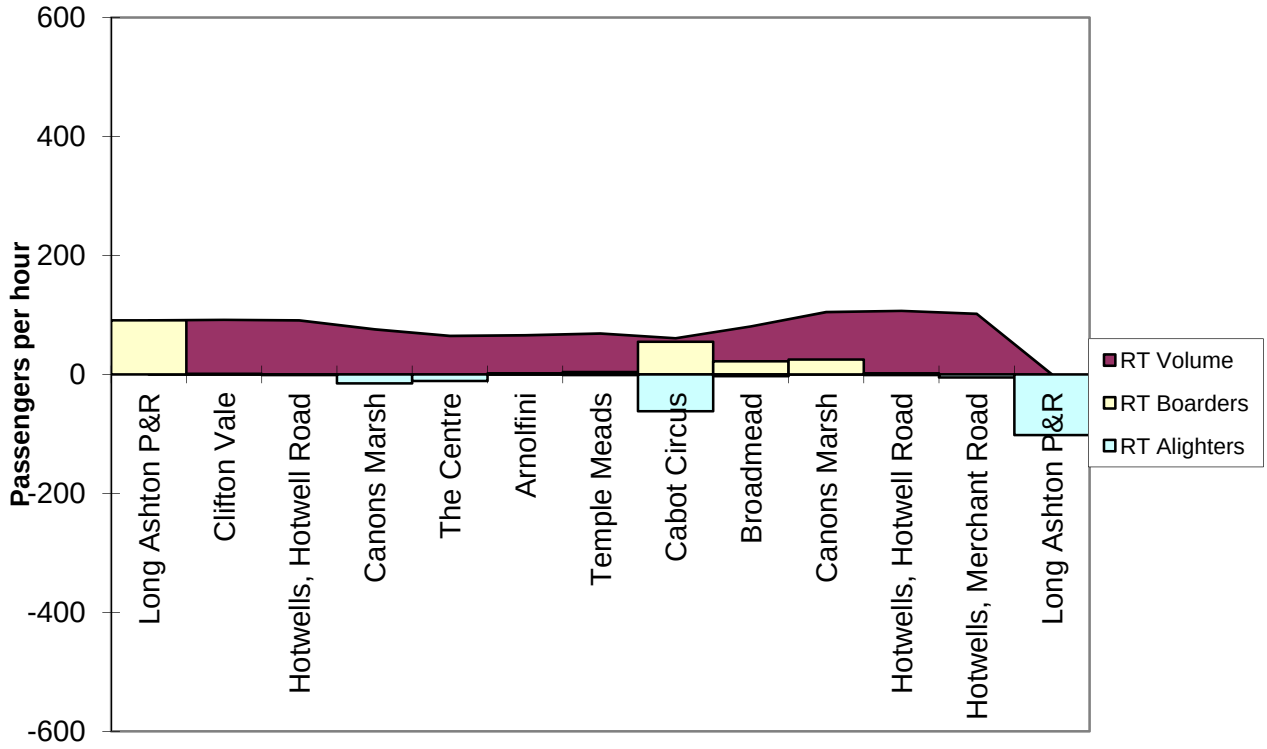


Figure 12. Original Alignment – 2016 Boarding/Alighting Profile IP Hour

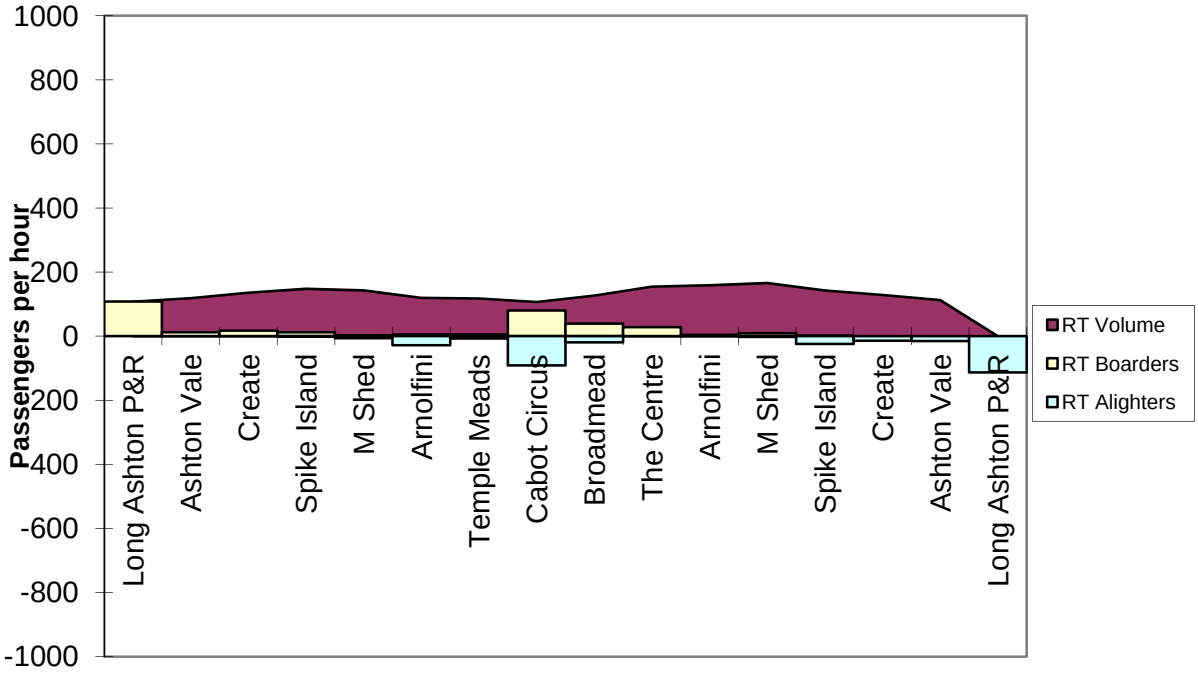
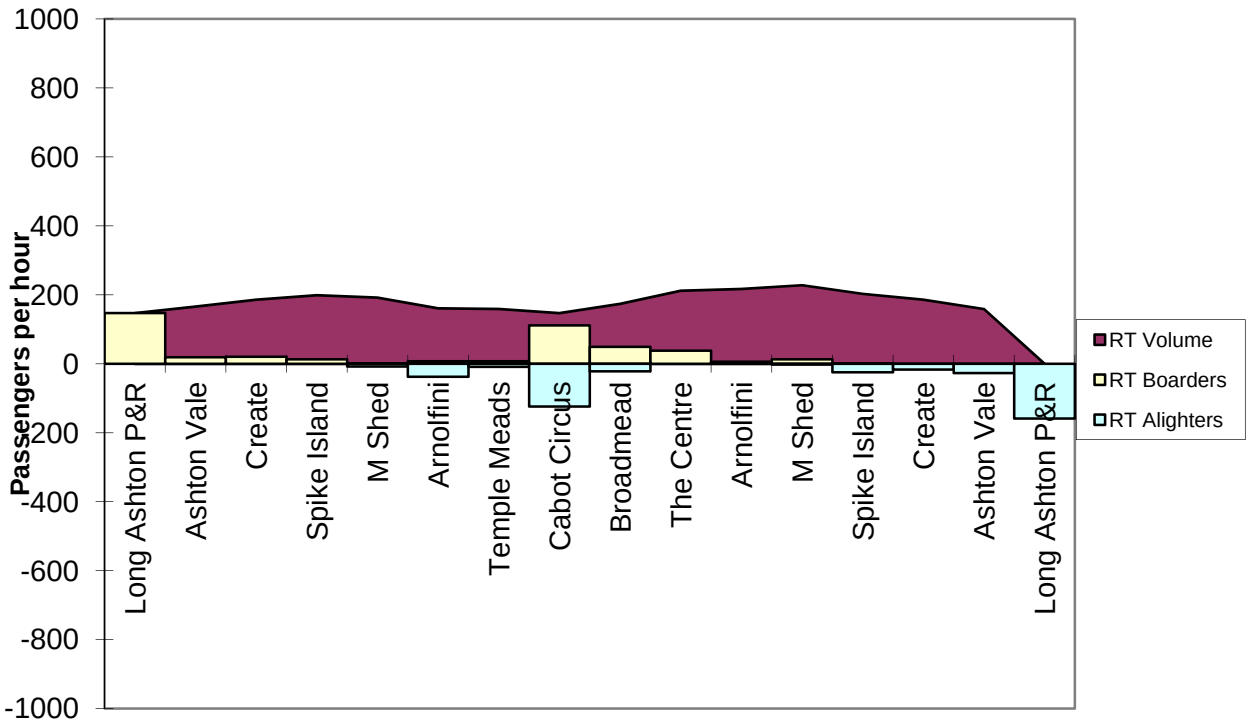


Figure 13. Original Alignment – 2031 Boarding/Alighting Profile IP Hour



Just like the AM peak hour, in the IP there is a decrease in flow over the Cumberland Basin with the cause being capacity constraints due to the signals (and bus gate) in the northbound direction and the lane removal in the southbound direction creating sufficient delay to cause congestion and re-routing; the extent however is lower than the AM due to the traffic levels being lower during this period.

Figure 14. 2016 IP Flow Difference (Hotwell Road alignment – Do Minimum)

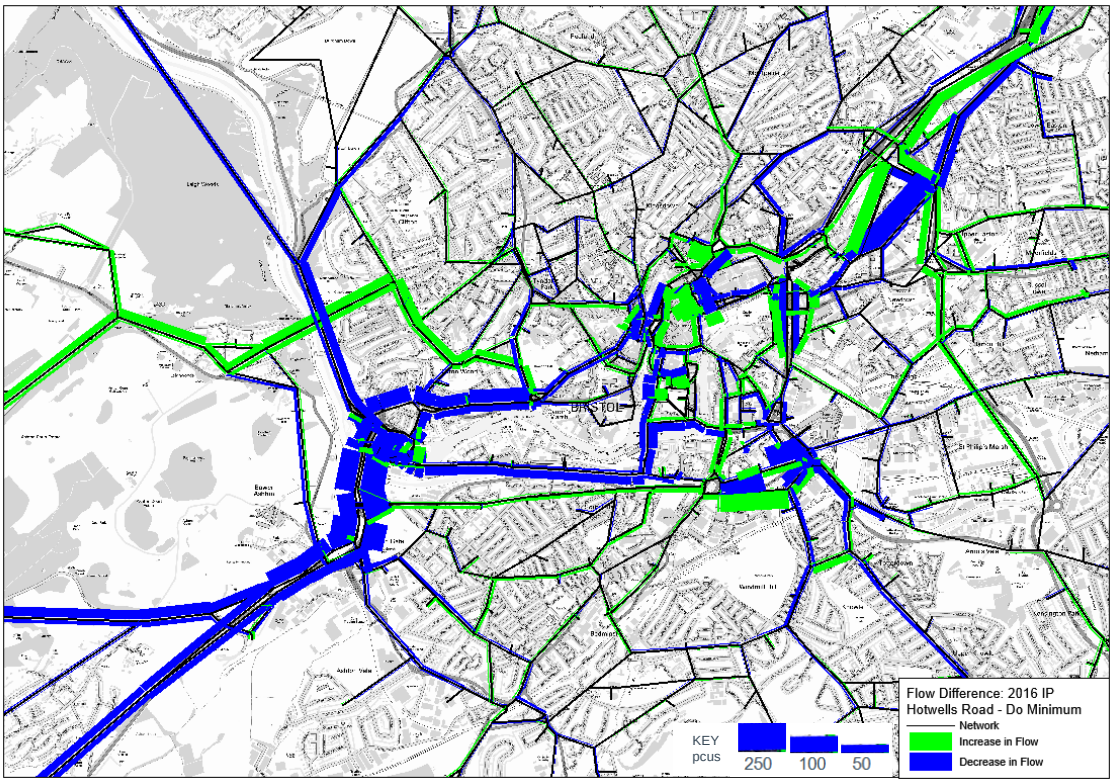


Figure 15. 2016 IP Delay Difference (Hotwell Road alignment – Do Minimum)

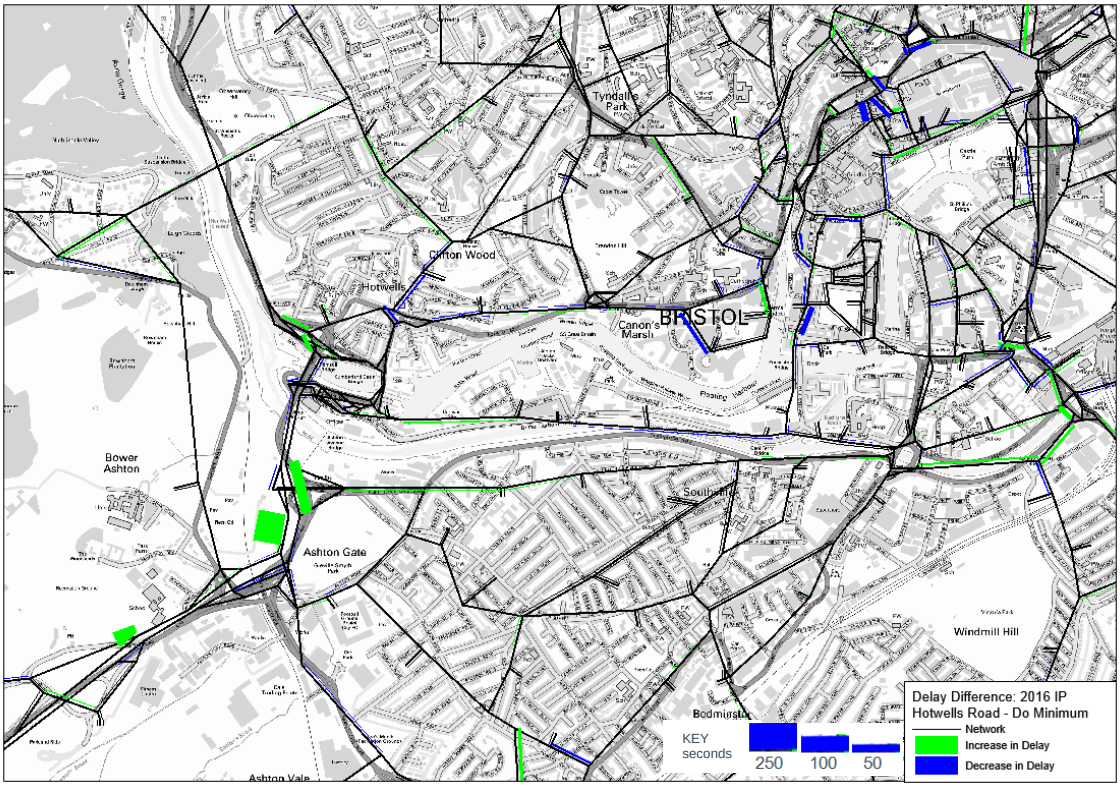


Figure 16. 2031 IP Flow Difference (Hotwell Road alignment – Do Minimum)

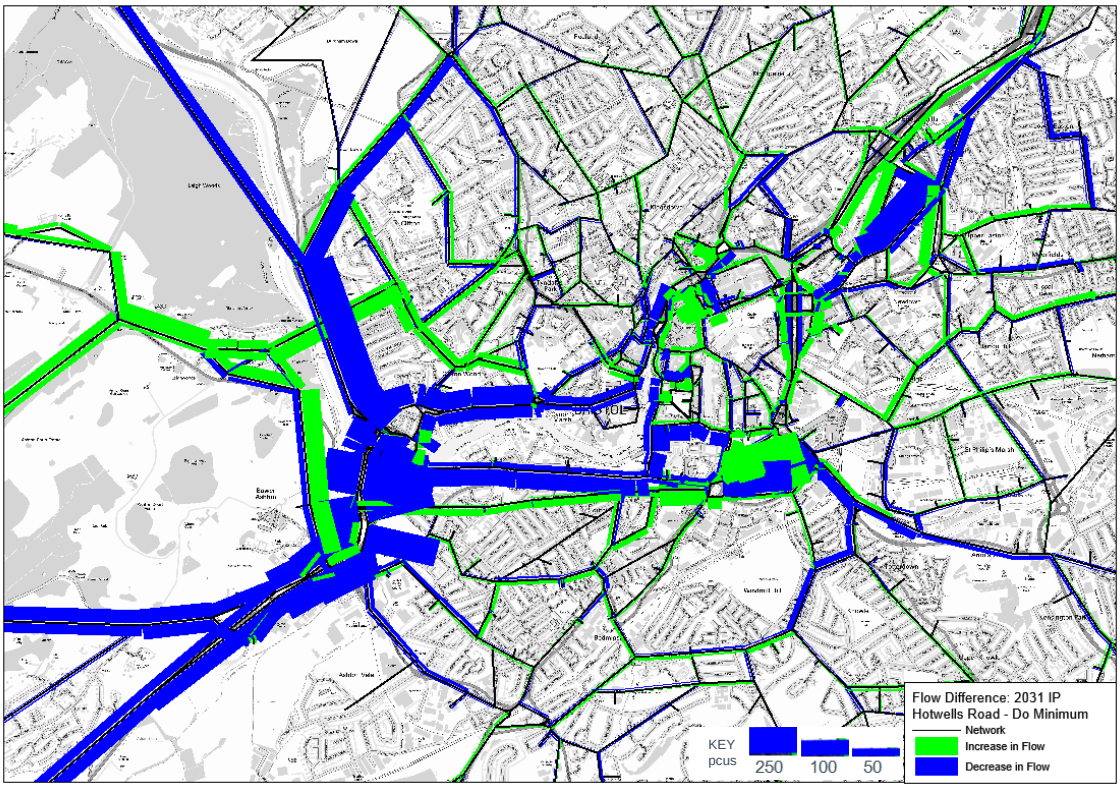
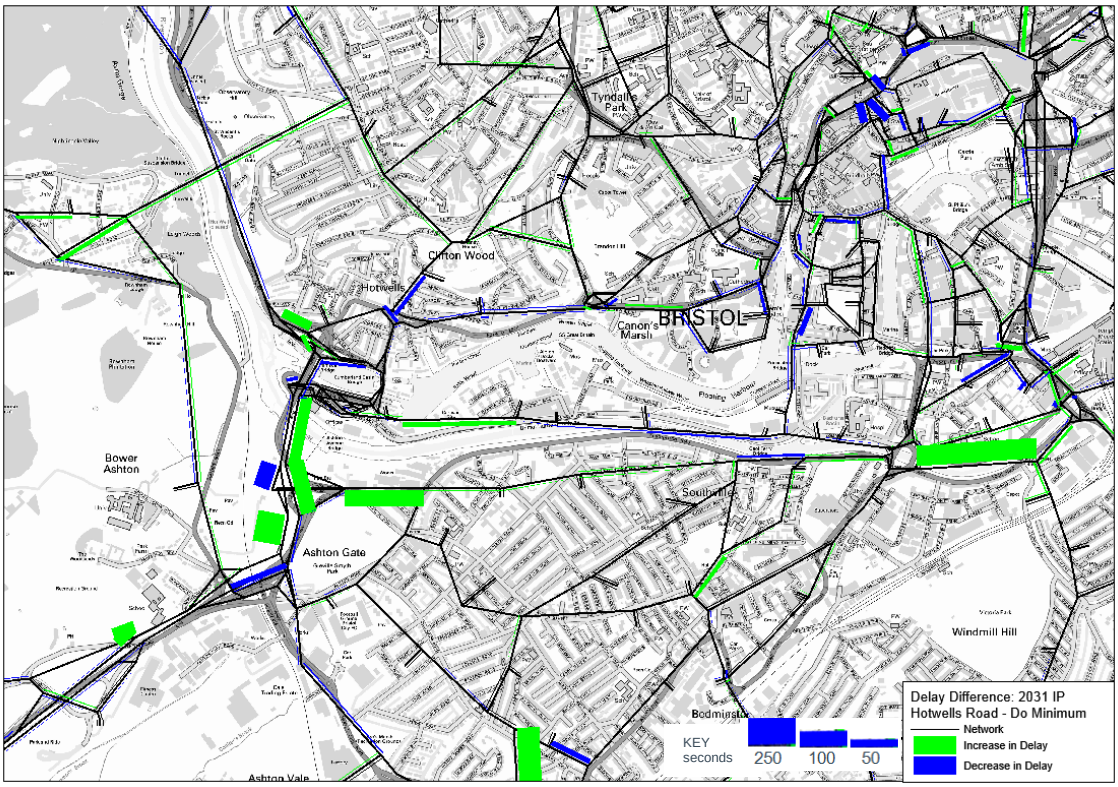


Figure 17. 2031 IP Delay Difference (Hotwell Road alignment – Do Minimum)



1.3.3. PM Peak Hour

Table 9. 2016/31 PM Peak hour Highway Statistics (Simulation area only)

	Do Minimum		Hotwell Road Alignment		Public Inquiry Alignment	
Mode	**2016**	**2031**	**2016**	**2031**	**2016**	**2031**
Vehicle kms	5,366,000	6,433,000	5,366,000	6,428,000	5,364,000	6,429,000
Free Flow Travel Time (hrs)	68,523	83,750	68,470	83,600	68,500	83,710
Congested Travel Time (hrs)	83,710	112,530	83,780	112,570	83,590	112,300
Average Speed (kph)	64	57	64	57	64	57
Congestion Index (delay in mins per veh km)	0.57	0.85	0.57	0.86	0.56	0.85

Overall model mode split is shown in Table 10.

Table 10. 2016/31 PM Peak hour Mode share

	Do Minimum		Hotwell Road Alignment		Public Inquiry Alignment	
Mode	**2016**	**2031**	**2016**	**2031**	**2016**	**2031**
Car	90.9%	91.2%	90.8%	91.1%	90.7%	91.0%
Bus	6.1%	5.9%	6.1%	5.9%	6.0%	5.8%
Rail	2.7%	2.6%	2.7%	2.6%	2.7%	2.6%
BRT	0.0%	0.0%	0.0%	0.0%	0.1%	0.1%
P&R	0.3%	0.3%	0.4%	0.4%	0.4%	0.5%
Total	100%	100%	100%	100%	100%	100%

There is a marginally lower P&R and BRT mode share with the Hotwell Road alignment, with the increase being seen in the car mode.

Rapid Transit Statistics

The total patronage for the PM peak hour RT service and North Somerset buses using the AVTM alignment is shown in Table 11.

Table 11. 2016/31 PM Peak Hour Patronage

		Do Minimum		Hotwell Road Alignment		PI Alignment	
Service No.	**Description**	**2016**	**2031**	**2016**	**2031**	**2016**	**2031**
X47	Ashton Vale to Temple Meads RT	300	380	270	330	510	690
354 Nbnd	Nailsea to Bristol	10	10	20	30	20	20
354 Sbnd	Bristol to Nailsea	20	20	40	40	70	80
X1 Nbnd	Weston-super-Mare to Bristol	60	70	70	90	70	90
X1 Sbnd	Bristol to Weston-super-Mare	90	100	90	110	130	170
361 Nbnd	Clevedon to Bristol	10	10	10	10	10	10
361 Sbnd	Bristol to Clevedon	10	10	10	10	30	30

The Hotwell Road alignment has fewer passengers on all RT services than the original AVTM alignment and the Park and Ride service sees a decrease compared to the existing equivalent service. This is due to the longer journey times of the service when it is routed along Hotwell Road, shown in Table 12.

Table 12. 2016/31 PM Peak Hour Journey Times

Time in Minutes	**2016**	**2031**
Original PI Inbound	17	18
Original PI Outbound	15	16
Original Total	**33**	**34**
Hotwell Road Inbound	28	30
Hotwell Road Outbound	19	22
Hotwell Road Total	**48**	**52**

Figures 18 to 19 show the boarding and alighting patterns on the RT for the Hotwell Road alignment for 2016/31 PM peak hours and Figures 20 to 21 show the same for the original alignment.

Figure 18. Hotwell Road Alignment - 2016 Boarding/Alighting Profile PM Peak Hour

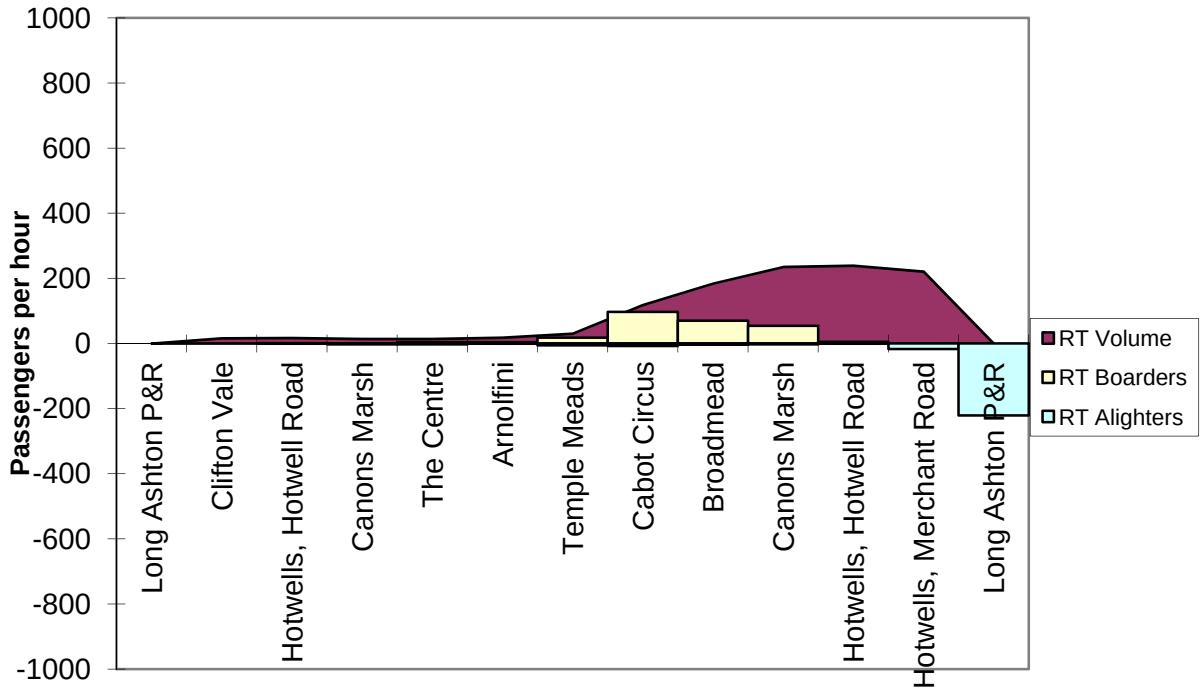


Figure 19. Hotwell Road Alignment - 2031 Boarding/Alighting Profile PM Peak Hour

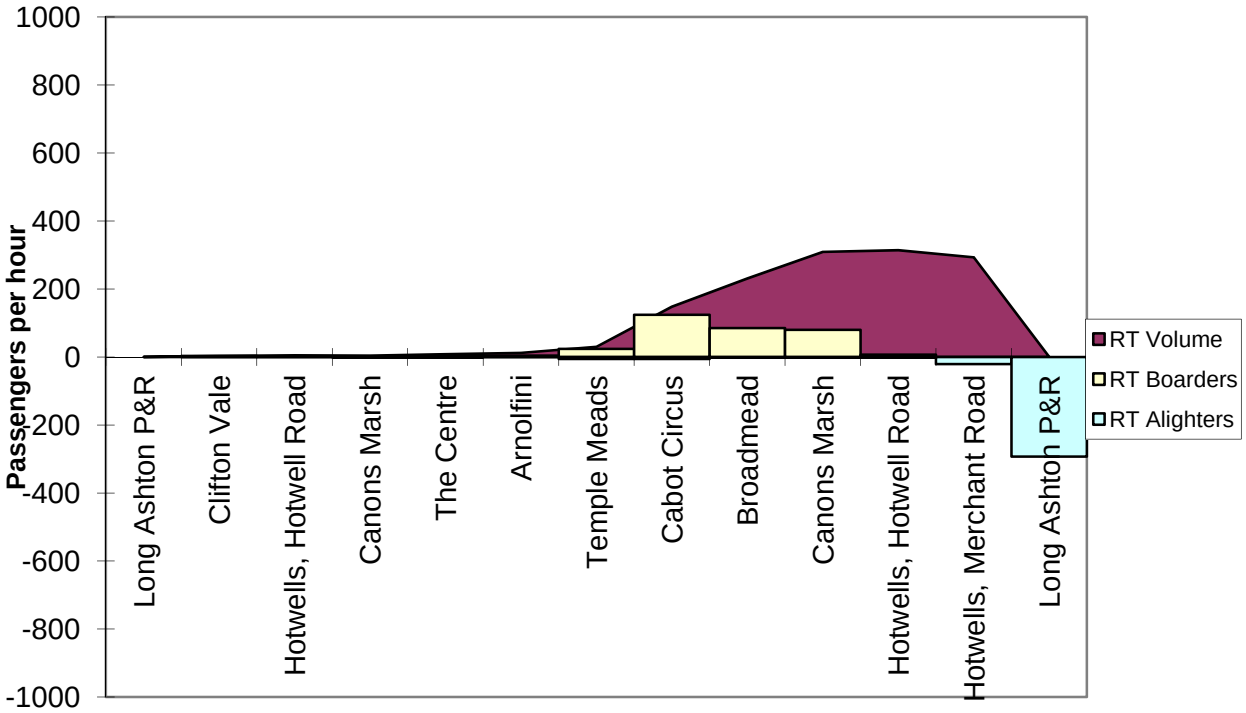


Figure 20. Original Alignment – 2016 Boarding/Alighting Profile PM Peak Hour

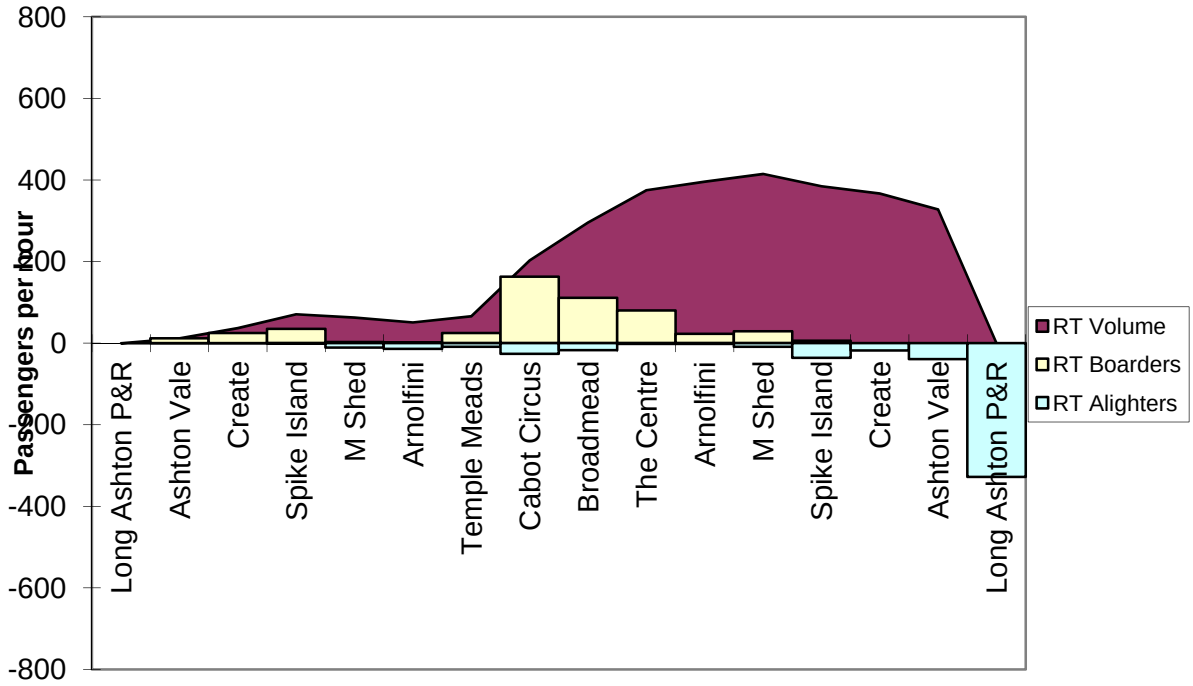
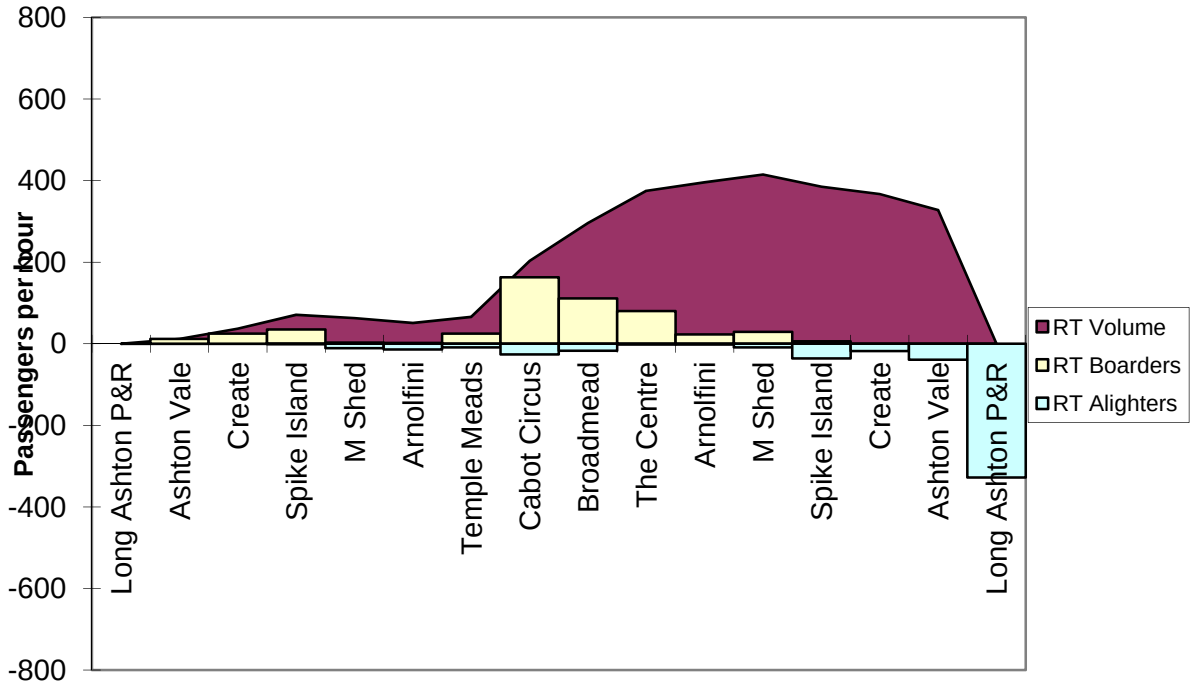


Figure 21. Original Alignment – 2031 Boarding/Alighting Profile PM Peak Hour



Again, traffic flow decreases over the Cumberland basin in the PM peak hour particularly in the southbound direction. This traffic queues and re-routes using alternative routes out of the city centre and Clifton Suspension Bridge to access the A370 at the Long Ashton junction. The following figures show the flow and delay differences for the PM peak hour for both 2016 and 2031.

Figure 22. 2016 PM Flow Difference (Hotwell Road alignment – Do Minimum)

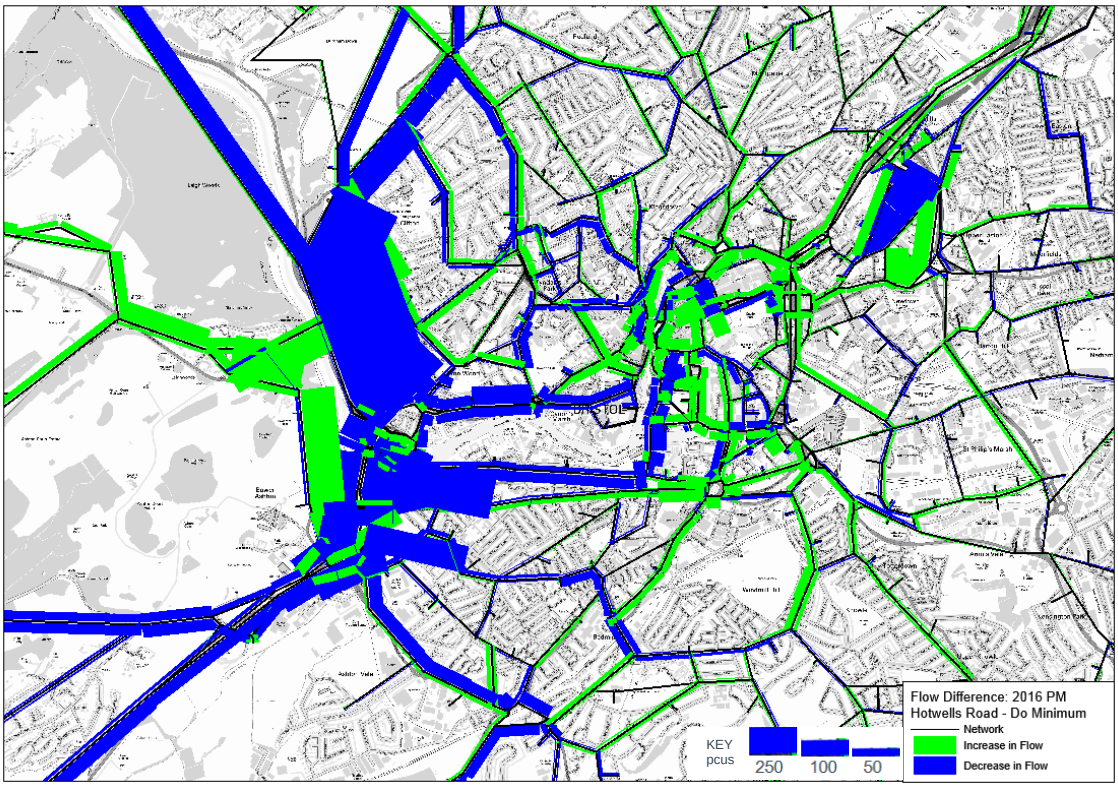


Figure 23. 2016 PM Delay Difference (Hotwell Road alignment – Do Minimum)

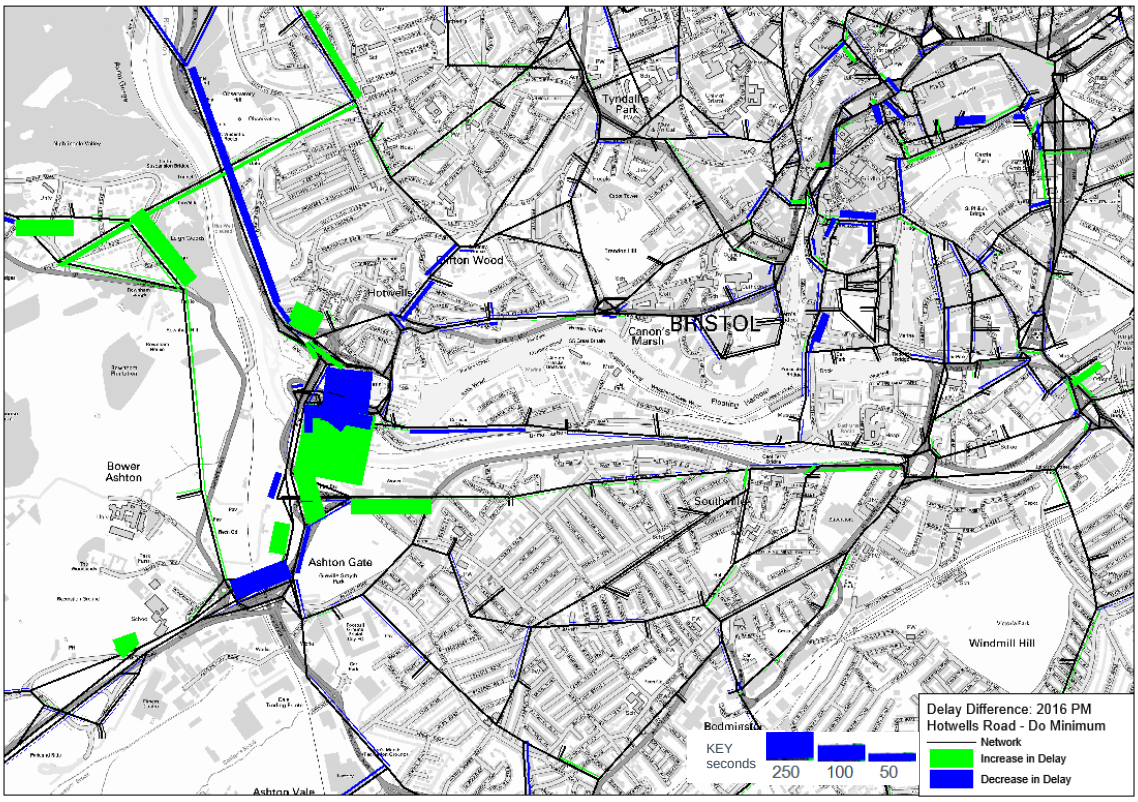


Figure 24. 2031 PM Flow Difference (Hotwell Road alignment – Do Minimum)

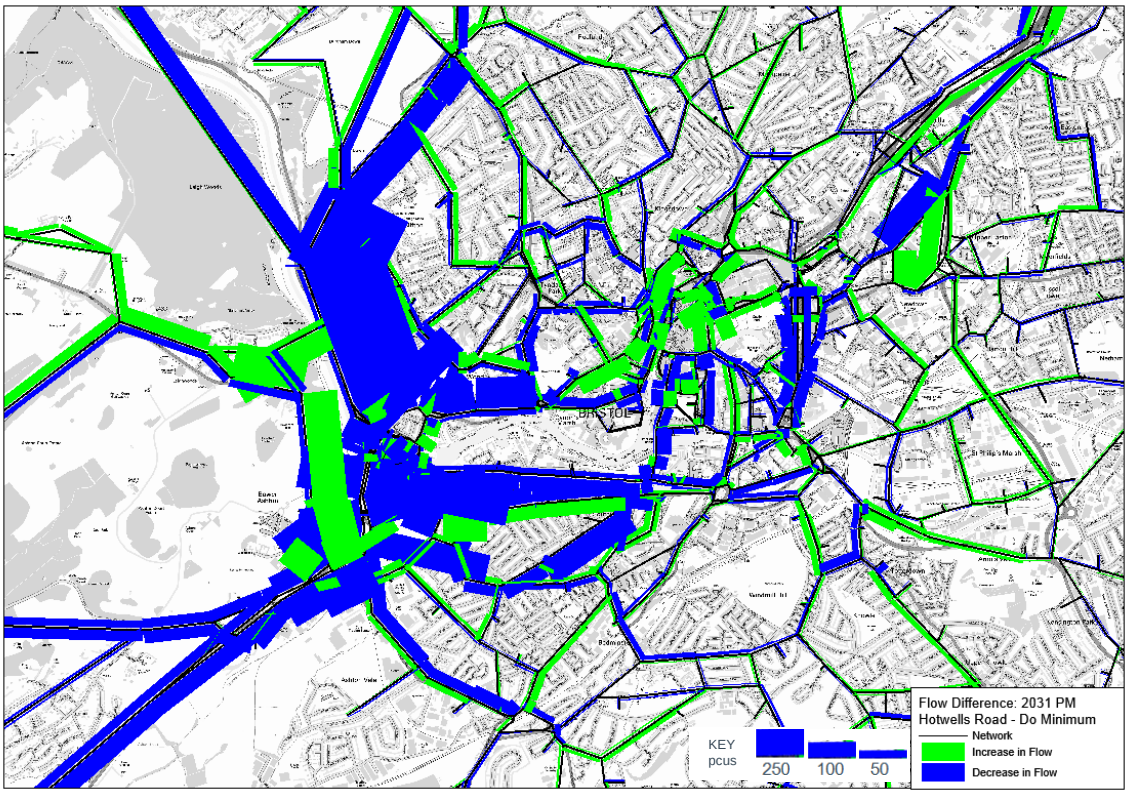
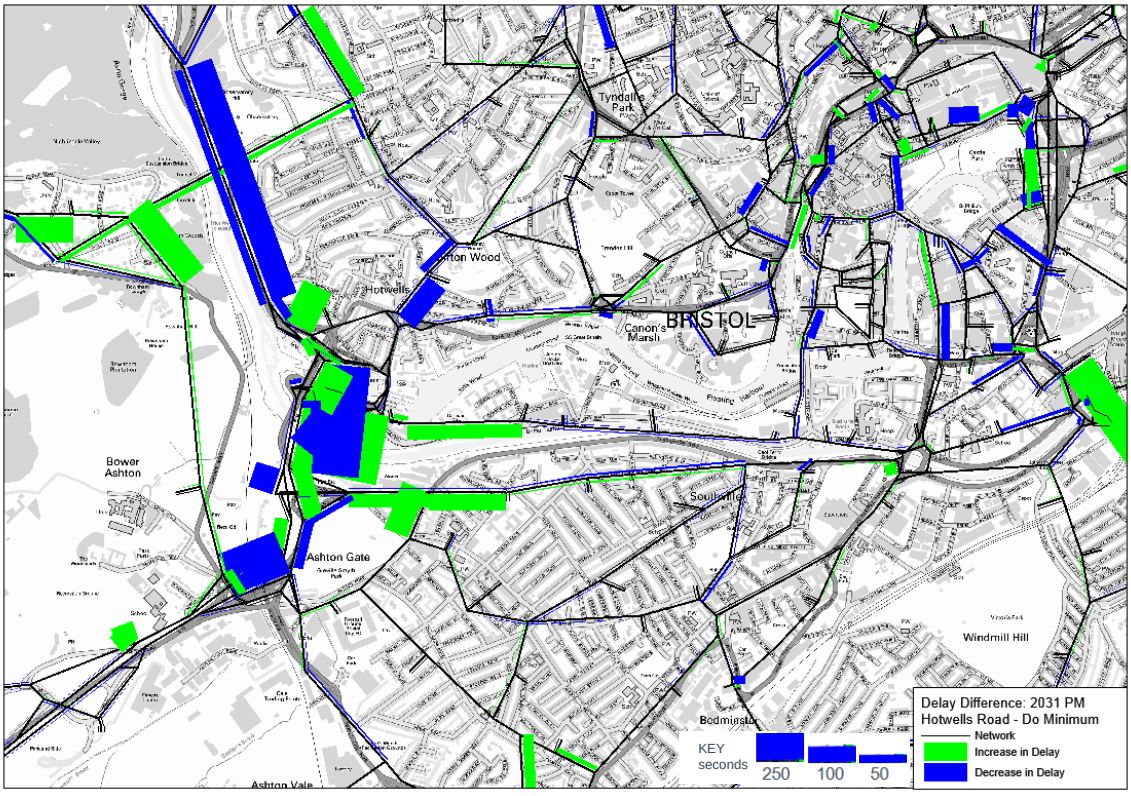


Figure 25. 2031 PM Delay Difference (Hotwell Road alignment – Do Minimum)



1.4. Value for Money

1.4.1. Hotwell Road Alignment TEE

The TEE summary is shown in Table 13 for the Hotwell Road alignment of the AVTM scheme. The scheme achieves reasonable benefits to public transport passengers, although at £83.9m the volume is less than the level generated by the AVTM PI scheme of £168.8m. The main difference between the two schemes is the very high volume of disbenefits on the highway network. The AVTM PI scheme shows negligible change to delays on the highway network. However, with the Hotwell Road option, due to the reductions in the highway capacity in order to provide the necessary priority for the on-road scheme, there are significant additional delays on the network which are reflected in the high disbenefits. As a result, the highway disbenefits outweigh the public transport benefits, producing net disbenefits of £24.9m. Although the Hotwell Road option is less expensive than the PI scheme, the magnitude of the disbenefits results is a significantly poorer economic performance with the Hotwell Road scheme.

Table 13. Hotwell Road Alignment TEE (£m 2002 prices)

Greenhouse Gases	-281
Highway Economic Efficiency: Consumer Users	-48,332
Highway Economic Efficiency: Business Users and Providers	-57,909
Total Highway	-106,241
Public Transport Economic Efficiency: Consumer Users	64,958
Public Transport Economic Efficiency: Business Users and Providers	18,922
Total Public Transport	83,880
Wider Public Finances (Indirect Taxation Revenues)	-2,288
Present Value of Benefits (PVB)	**-24,930**
Broad Transport Budget	14,309
Present Value of Costs (PVC)	**14,309**
OVERALL IMPACTS	
Net Present Value (NPV)	**-39,239**
Benefit to Cost Ratio (BCR)	**-1.74**

1.4.2. Public Inquiry Alignment TEE

The TEE summary is shown in Table 14 for the original alignment of the AVTM scheme.

Table 14. Public Inquiry Alignment TEE(£m 2002 prices)

Greenhouse Gases	
Highway Economic Efficiency: Consumer Users	-9,296
Highway Economic Efficiency: Business Users and Providers	10,250
Total Highway	954
Public Transport Economic Efficiency: Consumer Users	131,362

Public Transport Economic Efficiency: Business Users and Providers	37,396
Total Public Transport	168,758
Wider Public Finances (Indirect Taxation Revenues)	-9036
Present Value of Benefits (PVB)	**160,676**
Broad Transport Budget	42,351
Present Value of Costs (PVC)	**42,351**
OVERALL IMPACTS **Net Present Value (NPV)** **Benefit to Cost Ratio (BCR)**	 **118,325** **3.79**

1.4.3. Hotwell Road Bus/BRT Benefits

Sector to sector public transport benefits for the Hotwell Road alignment are shown in Figures 14 to 16. The keys sectors that benefit are sector 4 (South Bristol) and those sectors surrounding the city centre. This is due to the increased frequency of the Rapid Transit service compared with the Do Minimum 903 P&R bus. The benefits are not as great as they are for the existing Public Inquiry scheme.

Figure 26. AM Bus/BRT Benefits

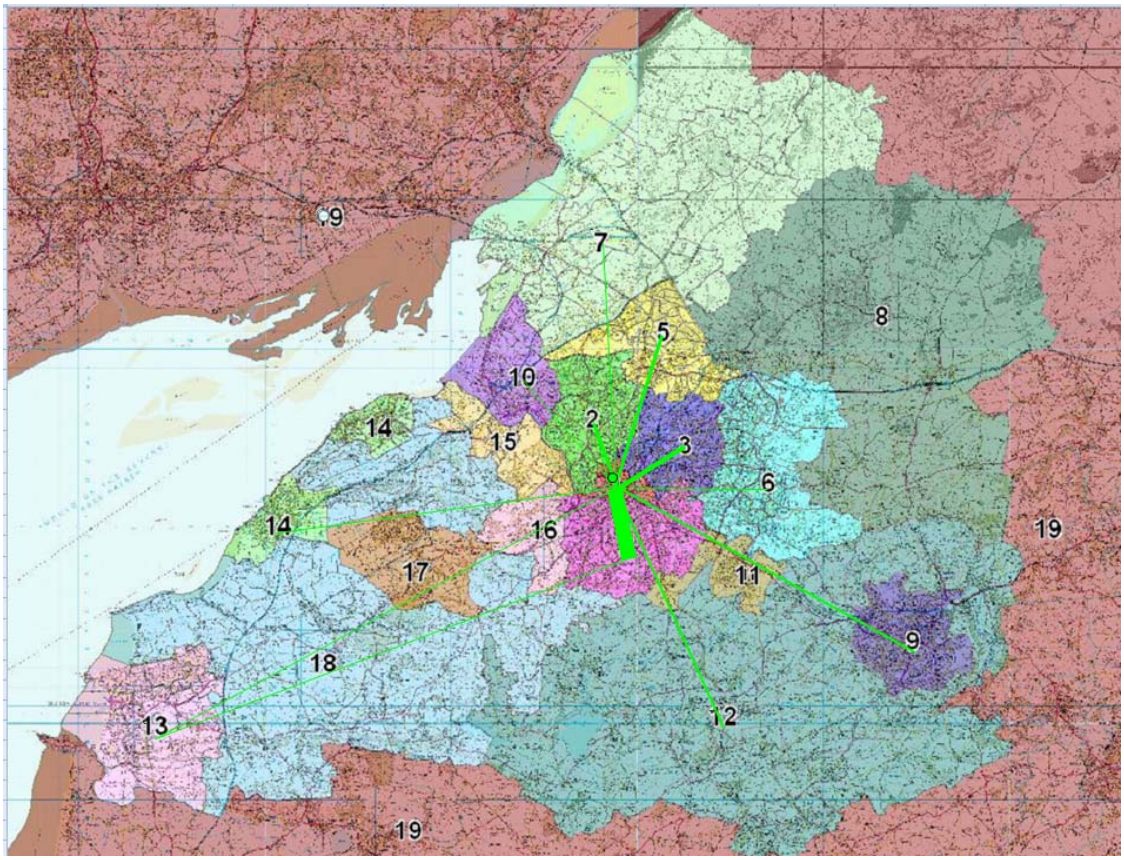


Figure 27. IP Bus/BRT Benefits

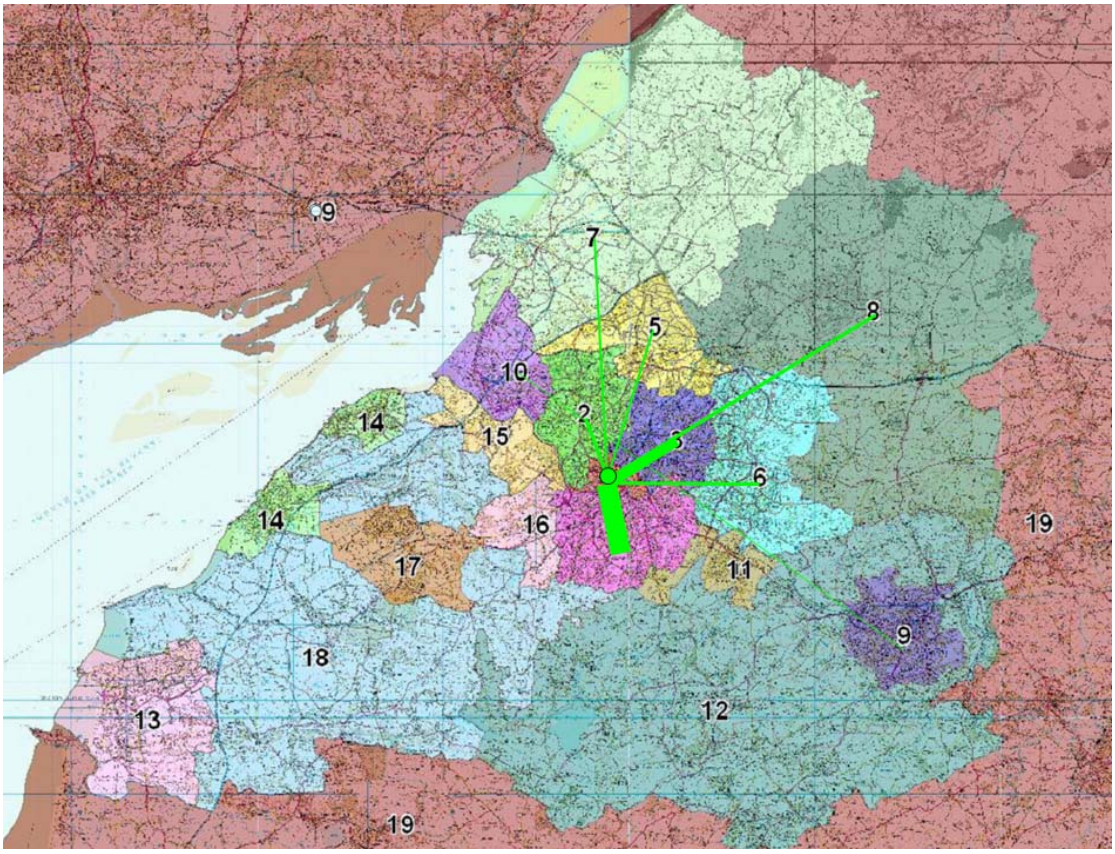
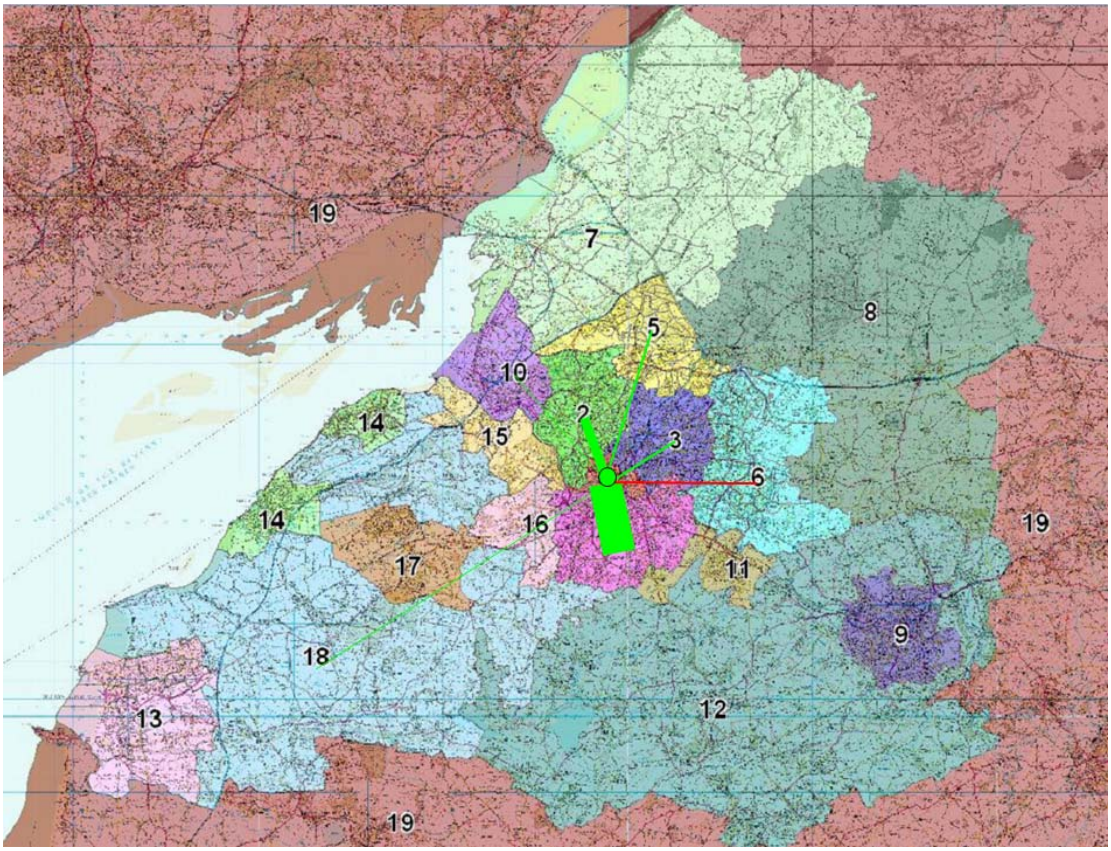


Figure 28. PM Bus/BRT Benefits



The highway benefits with the Hotwell Road alignment are negative due to the additional delay created by the introduction of signalised junctions and bus gates northbound on the A370 and due to the removal of a lane southbound. The flow difference and delay plots shown earlier explain why there are dis-benefits across much of the study area. The sector break down shown in Figure 29 is for the total highway benefits and Figures 30 to 32 show the breakdown by peak hour. The distribution of disbenefits demonstrates a wide variety of origins and destination which are impacted by the additional delays through the Cumberland Basin. The AM peak hour is the largest contributor to the total disbenefits due to the congestion over the basin and for the PM the movement across the city centre to south Bristol is distinctively the worst accountable by the capacity reduction over the basin.

Figure 29. Total Highway Disbenefits

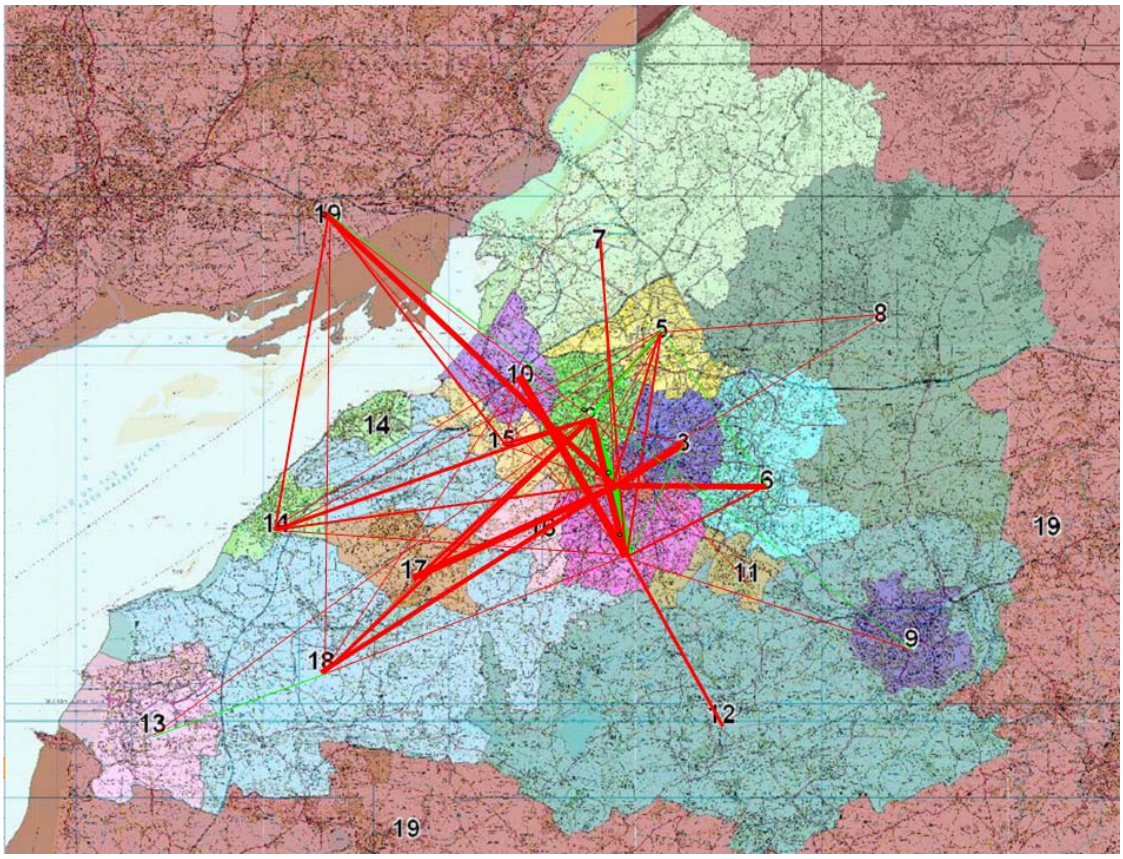


Figure 30. AM Highway Disbenefits

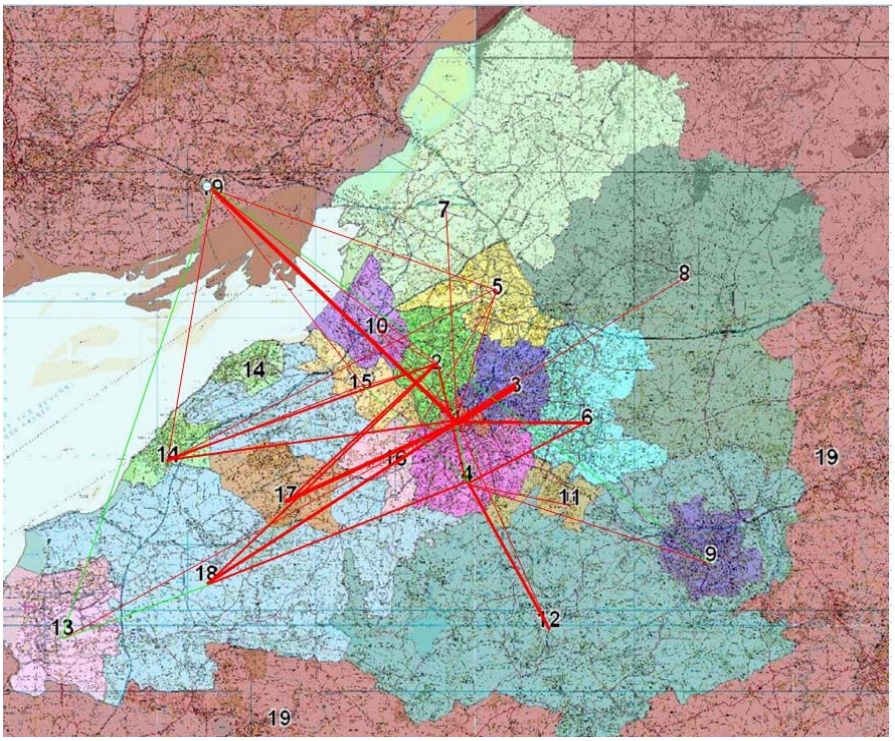


Figure 31. IP Highway Disbenefits

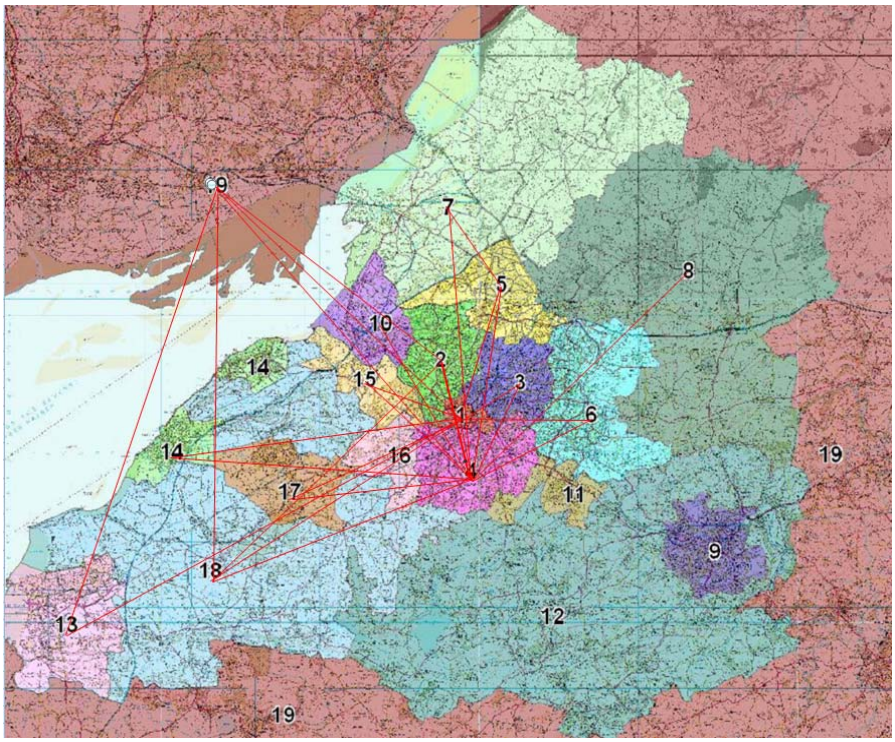
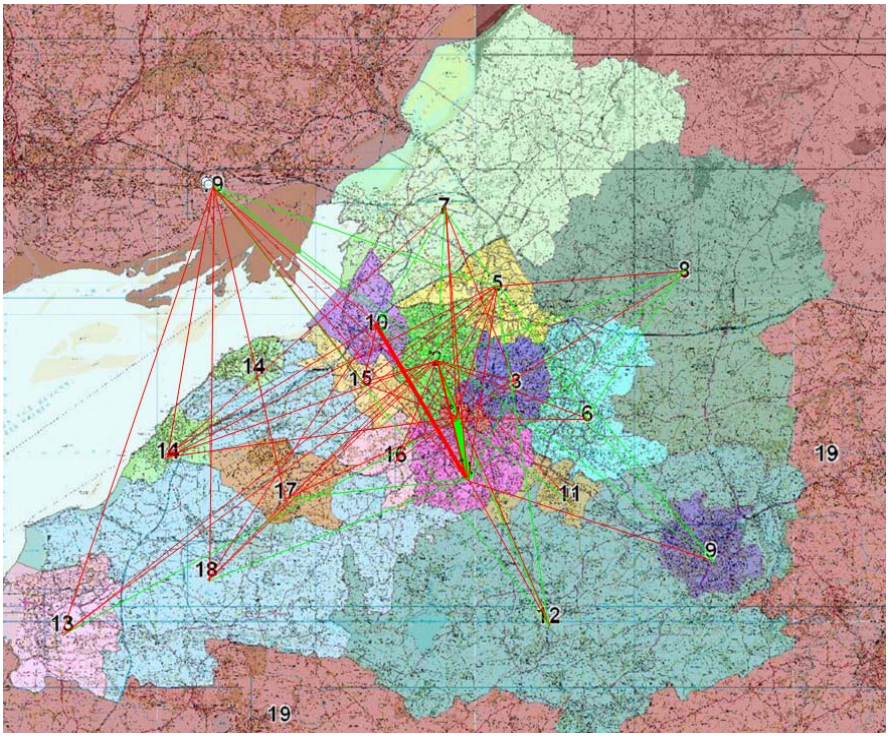


Figure 32. PM Highway Disbenefits



1.5. Revenue and Operating Costs

Taking the forecast patronage into consideration, emerging conclusions are such that the AVTM Hotwell Road option will generate fare-box revenues of approximately £0.6 million per year (2010 prices). With the operation of the service with standard single decked vehicles the annual operating is estimated to be at least £1.1 million. This means that the bus service alone would require an annual subsidy which is estimated to be in the region of £0.5 million.

For the Hotwell Road option, the forecast increase in traffic delay along Hotwell Road and therefore the reduced attractiveness of the bus service is considered to be the primary cause of the relatively low forecast fare revenue and high subsidy requirement. Furthermore, increased traffic delay would also be likely to lead to reliability concerns and potentially higher than estimated operating costs incurred by the operator in order to ensure that the scheduled service headway is met.

appendix C
Eco Impact assessment
from July 21st 2011
Cabinet Report

Eco Impact Checklist

Title of report: Ashton Vale to Temple Meads and Bristol City Centre Rapid Transit				
Report author: Carolyn Francis				
Anticipated date of key decision:				
Summary of proposals:				
Will the proposal impact on...	Yes/ No	+ive or -ive	If yes...	
			Briefly describe impact	Briefly describe Mitigation measures
Emission of Climate Changing Gases?	No		In the long term, the scheme itself is predicted to result in CO_2 benefits generated through modal shift. .	High performance, low emission vehicles to be used. Use of alternative fuels is being explored.
	Yes	-ive	In the short term, construction will require use of energy and material resource	Sea/river transport of materials to site will be used where practicable to reduce emissions compared to use of HGVs. Scope for recycling of materials, e.g. black top recycling during road re-alignments
Bristol's vulnerability to the effects of climate change?	Yes	Neutral overall	In the short to medium term, the scheme will not increase the risk of flooding and is considered to provide some flood alleviation benefit to local areas. Avon Crescent, Cumberland Road and Cumberland Road Bridge underpass are vulnerable to tidal flooding.	Much of the scheme has a good level of flood protection to 1:100 year flood elevation between Aston Vale Park and Ride and Ashton Avenue Bridge and in the city centre. At Avon Crescent and Cumberland Road, the scheme improves the level of protection from annual to 1:5 years currently and provides

			In the long term: - sections of the scheme are located in the flood plain and may be at risk to flooding without additional protection as no part is higher than approximately 10m above sea level	further protection to 1:200 years, taking account of sea level rise to year 2070. Alleviation of flooding at Cumberland Road Bridge Underpass is provided by a trough with raised edges which will improve the current level of protection against flooding through the underpass and provide the potential for further protection to 1:200 years, taking account of sea level rise to year 2070. In the city centre, as no additional impermeable area is proposed, drainage is to the existing city centre network. Elsewhere, sustainable drainage works include attenuation ponds to restrict discharge rates to current levels before outfalling to existing watercourses, and filter drains and grass swales with discharge to groundwater. The design will include allowances for increased storm intensity and depth expected from climate change.
Consumption of non-renewable resources?	Yes	-ve	In the short-term, there will be a requirement for fossil fuels and other non-renewable materials & products for the construction of infrastructure & vehicle provision.	Consider environmental performance of design and materials, e.g. procurement of sustainable products, product life cycle analysis.

		+ve	In the long term, it is anticipated that the modal shift from the private car to public transport should reduce the consumption of fossil fuels for the movement of the same number of travellers, although this is not quantifiable at this stage.	The environmental performance of the construction contractor, including accreditation to ISO14001 will be considered during the tendering process.
Production, recycling or disposal of waste	Yes	-ve	In the short term, waste will be generated from the demolition & construction works.	Construction contractors will be legally obliged to prepare a Site Waste Management Plan (SWMP) for projects over £300k, which detail how waste will be minimised, and recycling promoted. Secondary aggregates and recycled materials should be prioritised for usage in construction. A Code of Construction Practice (CoCP) has been drafted in consultation with the relevant authorities, and would be included in the construction contract. The CoCP includes guidelines for the handling and disposal of contaminated materials and other waste streams generated. The Construction Environmental Management Plan (CEMP) and Materials Management Plan (MMP) will also describe sustainable

				construction requirements, including waste minimisation and recycling.
The appearance of the city?	Yes	-ve	Effect on urban edge with impact on open field at Ashton Gate.	Planting to provide visual screening and landscape integration.
		-ve	Visual impact at properties in Ashton Vale	Planting to provide visual screening
		-ve	Impact of new large scale railway over-bridge at Winterstoke Road.	Quality of design and appearance of the bridge structure.
		Neutral	Route alongside Brunel Way well screened.	Appropriate planting.
		+ve	Ashton Gate Swing Bridge.	Refurbishment of historic structure.
		-ve	New signalised junction at Avon Crescent	None.
		-ve	Impact on character of Cumberland Basin through introduction of new structures	Design of busway in character using appropriate materials, retention of stone walls and replacement of important railings.
		-ve	Effects on heritage railway and character of dockside	Relocation of railway lines and other railway features and use of materials in keeping with existing character.
		+ve	Prince Street Bridge	Removal of existing signage and other street clutter
Pollution to land, water, or air?	Yes	-ve	Demolition & construction works may cause accidental pollution to land.	Contractors performance in this area will be considered during the tendering process.
		-ve	Demolition & construction works	The selected contractor(s) must work

			may cause accidental contamination of local watercourses and surface water drains.	in accordance with guidance issued in all relevant Environment Agency Pollution Prevention Guidelines (PPGs). Implementation of best practice site investigation ground protection measures. Implementation of MMP and CEMP. The CEMP will specify measures to reduce pollution risk – for example, by specifying that waste will be stored in designated areas and isolated from surface drains through appropriate bunding if required.
		-ve	Demolition and construction works will produce dust and combustion emissions from plant.	The CEMP will include measures to control dust and emissions during the works.
		-ive / +ive	On opening of the scheme there will be improvements in local air quality in some sections and deterioration in others, but overall the balance in changes in air quality is not considered significant.	
		-ive	Demolition and construction works likely to cause major noise impact for properties in close proximity to the scheme.	CEMP will include measures to control noise.
		-ive	In the longer term, there will be a slight increase in noise due	

			to general increase in traffic levels.	
		-ive	Major noise increase for small number of dwellings by Ashton Vale and Landmark Court and some properties on Cumberland Road by the Floating Harbour.	2m high acoustic barrier at Ashton Vale. The back of the houses on Cumberland Road are shielded from noise attenuation due to their elevated position and walls to end of some gardens. No mitigation possible for Landmark Court due to proximity of the scheme.
Wildlife and habitats?	Yes	-ve	Scenarios I, II, and III – loss of 1.1ha and fragmentation of Bower Ashton Mineral Railway SNCI.	CEMP to minimise damage to habitats, disturbance to fauna and accidental spillages.
		-ve	Scenario II – loss of 0.55ha of Ashton Vale Fields SNCI. Loss of foraging / commuting lines for bats.	Destructive searches and translocation of reptiles
		-ve	All scenarios – potential construction impacts from disturbance, dust, and in the event of accidental spillages.	New linear planting along sections of the route. Potential for habitat enhancement along Colliter's Brook.
		-ve	All scenarios – loss of small areas of Biodiversity Action Plan priority habitat such as marshy grassland.	Improved management of key remaining habitats.
		+ve	Protected species in the vicinity of the scheme: bats, otter, water vole, nesting birds and reptiles.	Protected species mitigation: replace hedgerows to maintain bats flight paths, remove one bat roost, lighting to reduce disturbance to bats; mammal ledges under bridges.
			Mitigation measures offer scope for enhancements.	
Consulted with:				

Summary of impacts and Mitigation

The benefits of the scheme are...

- Improve journey times and reliability from the south west of the sub-region to Bristol City Centre and to Bristol Temple Meads Railway Station
- Opportunity to improve connectivity with Bristol International Airport
- Provision of a high quality, more sustainable choice of travel by rapid transit, cycling or walking
- Shift of journeys to more environmentally sustainable transport modes
- Shift of journeys to a safer transport mode
- Improving physical activity and quality of life by encouraging walking and cycling
- Better use of an under-used existing transport corridor and retaining road network capacity
- Refurbishment of historic Ashton Gate Swing Bridge and improvement of appearance of Prince Street Bridge

The significant adverse impacts of this proposal are....

- Adverse impacts on the appearance of the city, the heritage railway and dockside
- Slight changes in local air quality, both positive and negative, along the route
- Slight increase in noise due to general increase in traffic, and major impacts at two locations Ashton Vale and the Floating Harbour
- Construction-related nuisances to people due to noise and air quality
- Construction-related impacts on habitats, flora, and fauna, including small areas of land-take, severance of habitats of local/Country value, disturbance to protected species
- Risk of pollution during construction
- Consumption of raw materials during construction
- Generation of wastes during construction
- No significant impact on climate changing gases
- Neutral impact on flood risk after mitigation

The proposals include the following measures to mitigate the impacts ...

- Mitigation to control the nuisances and risk of accidents during construction through implementation of a Construction Environmental Management Plan
- Mitigation to reduce the vulnerability of transport infrastructure from flooding under present conditions and in the face of increased flooding due to climate change
- Mitigation to address changes in the appearance of the city
- Mitigation to address the risk of land, air, water, and noise pollution
- Mitigation to address impact on protection sites, habitats, and protected species

The net effects of the proposals are positive.

The proposal provides a more sustainable mode of transport, with the overall impact dependent on levels of usage

Checklist completed by:

Name:	Tim Morris
Dept.:	CD – Major Projects
Extension:	9037122
Date:	22 June 2011
Verified by Sustainable City Group	Steve Ransom

Appendix D
Equalities Impact Assement
for July 21st 2011 Cabinet
Report

BRISTOL CITY COUNCIL

Ashton Vale to Temple Meads and Bristol City Centre Rapid Transit

Equality Impact Assessment – Part One - Screening

Part one of an EqIA – the screening – should be carried out at the planning and development stage of a policy, project, service, contract or strategy. This form should be used in conjunction with the guidance and as the first part of a full EqIA.

Name of policy, project, service, contract or strategy being assessed	Ashton Vale to Temple Meads and Bristol City Centre Rapid Transit
Directorate and Service	City Development
Names and roles of officers completing the assessment	Bob Fowler, Major Transport (AVTM Senior Responsible Owner)
Main contact telephone number	(0117) 603 6579
Date	Completed - 19th October 2009 Reviewed - 15th June 2011

1. Identify the aims of the policy, project, service, contract or strategy and how it is implemented

	Key Questions	Notes / Answers	Any actions needed? By whom?
1.1	Is this a new policy, project, service, contract or strategy or a review of an existing one?	New project/service – new rapid transit services from North Somerset and Long Ashton Park and Ride to Bristol Temple Meads and the City Centre with a parallel pedestrian link and cyclising facility between Long Ashton Park and Ride and the Museum of Bristol.	
1.2	What is the main purpose of the policy, project, service, contract or strategy?	Introduction of new rapid transit public transport services from 2015 / 2016.	
1.3	What are the main activities of the policy, project, service, contract or strategy?	**Project development stage:** • Preparation and submission of planning applications and associated consents. • Procurement / tendering of construction and operating companies. • Monitoring construction contract. **Implementation stage:** • Provision of rapid transit public transport services	

1.4	Who are the main beneficiaries? Whose needs is it designed to meet?	Implementation stage: • General public, public transport users and pedestrians / cyclists.	
1.5	Which staff carry out the policy, project, service, contract or strategy?	Project development stage: • Transport projects staff Implementation stage: • Services will be run by private operators. • Traffic management will be involved in monitoring usage of the bus way. • Potentially revenue protection and maintenance staff.	
1.6	Are there areas of the policy or function that could be governed by an officer's judgement? e.g. home visits "where appropriate". If so, is there guidance on how to exercise this to prevent any possible bias/prejudice creeping in?	Yes Elements of the project / service rely on an officer's judgement, however key decisions are subject to members (Cabinet approval) and Department for Transport decisions.	
1.7	Is the Council working in Partnership with other organisations to implement this policy or function?	Yes. The project is a sub-regional transport project established through the West of England Partnership Office. The project is	

	Should this be taken into consideration? e.g. Agree equalities monitoring categories Should the partnership arrangements have an EqIA?	jointly promoted and funded by BCC and North Somerset Council.	
1.8	Taking the six strands of equalities, do you have any initial thoughts that any of the six equalities strands have particular needs relevant to the policy or function? Or is there anything in the policy, project, service, contract or strategy that you can think of at this stage that could discriminate or disadvantage any groups of people? ie.	**General points.** All existing BCC policies will apply to the new rapid transit services. New infrastructure to follow accessibility legislation and be fully compliant and in line with the Equality Act 2010 (previously known as the DDA) Concessionary fare scheme will apply to services. Ongoing engagement with representative groups to be undertaken throughout scheme development process. **All Groups** Alternative bus routes could be affected which could mean less choice for individuals. As the fares in Bristol are high this could have an effect on individuals from under-represented groups that may be on a low	

		income.	
	Gender (include Transgender)	**See all groups** No specific response received to date from the Women's Forum.	
	Disability	**See all groups** Will there be enough provision for wheelchair users or will the numbers be restricted. Will there be level access or will it be ramped, as there are current issues around drivers refusing wheelchair users access even though the spaces are available. BSL Forum would like a clear communication strategy to be considered, using not just audio announcements but also by using visual announcement systems so that the Deaf can be made aware if for example there are problems with the transit, timings and for other notification purposes. BSL forum would like basic deaf awareness training made available for all transit staff BSL Forum would request that all drivers have visual maps of all stops so that Deaf	

		customers can point the location they want to get off. BSL Forum have requested that consideration is given to make sure that the bus transit and transit stops are well-lit at night so that Deaf people are still able to communicate with their friends. BPAC would ask that consideration is given with reference to disability / equalities training and that it is made available for all front line staff. BPAC asked if the routes to be established are along fair socio-economic determinants as well as by other influencing factors, which means that routes do not avoid deprived sections of the population.	
	Age	**See all groups** Many older people with mobility difficulties continue to be discouraged from using Bristol's buses for fear that they will not be able to get to a seat before the bus moves off. Concern raised by BOPF as they felt that the Rapid transit' may imply fewer stops, which in turn would mean that older people	

		would have to travel further to get to them and that the off-road routing would mean that the stops created may be less convenient for older users. Other than park and riders, older people felt that it was difficult to see how they would be able to access this system conveniently.	
	Race	**See all groups** No specific response received to date from the Race Forum.	
	Sexual Orientation	**See all groups** No specific response received to date from the LGB Forum	
	Faith / Belief	**See all groups** No specific response received to date from the Faith Forum	
	Do any other specific groups have particular needs relevant to the policy, project, service, contract or strategy?	**See all groups**	
1.9	Did you use any data to inform your initial thoughts above? What data do you already have?	The scheme is derived from the 2005 Joint Local Transport Plan (JLTP), which assessed the current, and forecast transport needs for the sub-region and identified the	

		rapid transit scheme as part of the solution for those issues. The JLTP was based on consultation and analysis of user needs and demands for the transport system this included information about existing public transport services and equalities data as well as social inclusion and accessibility data (amongst others).	
1.10	Are there gaps in the data that require you to do further work? What are these gaps?	As the project progresses further feedback / involvement to help inform the design of the scheme / proposals will be needed from equalities stakeholders / groups.	

If the result of the screening process is that there is the potential for a significant impact on any equality group or if any equality group has significantly different needs, then a full equality impact assessment must be carried out. If you are unsure please seek advice from a directorate or corporate equalities officer.

Additional comments / recommendations

The draft screening Equalities Impact Assessment for the Ashton Vale to Temple Meads and Bristol City Centre Rapid Transit – Preparation of Major Scheme Business Case has been signed off at this stage as it is being presented to Cabinet in July 2011.

Recommendations

Although there has been some equalities stakeholder involvement previously through a consultation process further equalities work with stakeholders will still need to be progressed as the project moves forward and a full equalities impact assessment will need to be completed.

As this project links into other major transport schemes in the Joint Local Transport Plan (JLTP) attention will need to be given to the following key projects so that issues / concerns that overlap are identified and considered.

- South Bristol Link
- Cycling City
- North Fringe to Hengrove Package

The signing of this screening form has been agreed on the basis of the above recommendation.

Signed: Bob Fowler	Signed: Jane Hamill
Manager Major Projects - Team 1	Directorate Equalities Adviser:
Date: 5th July 2011	Date: 5th July 2011