

Managing Keynsham's Future Growth

Task 8: Charlton Road: Ashton Way to St Ladoc Road Options Study

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1.0 Introduction

1.1 Background

This study follows a Road Safety Note produced by Bath and North East Somerset Council on Charlton Road. This note was produced following concerns raised by members of the public and concluded that a feasibility study should be undertaken to assess possible solutions to the road safety concerns raised and to evaluate the impact of these options. As such, the scope of this study was to review road safety issues and traffic flows through the narrow section of Charlton Road between Ashton Way and St Ladoc Road, and to identify potential options to improve pedestrian safety without impacting on journey time or creating congestion. The options were to include the viability of making part of Charlton Road one-way westbound.

1.2 Structure of this Technical Note

The structure of this Technical Note is as follows

- Section 2: Existing Situation;
- Section 3: Review of Safety Issues;
- Section 4: Review of Traffic Data;
- Section 5: Improvement Options;
- Section 6: Modelling of Options: Keynsham S-Paramics model; and
- Section 7: Conclusions and Recommendations

The study area is illustrated in **Figure 1** below.

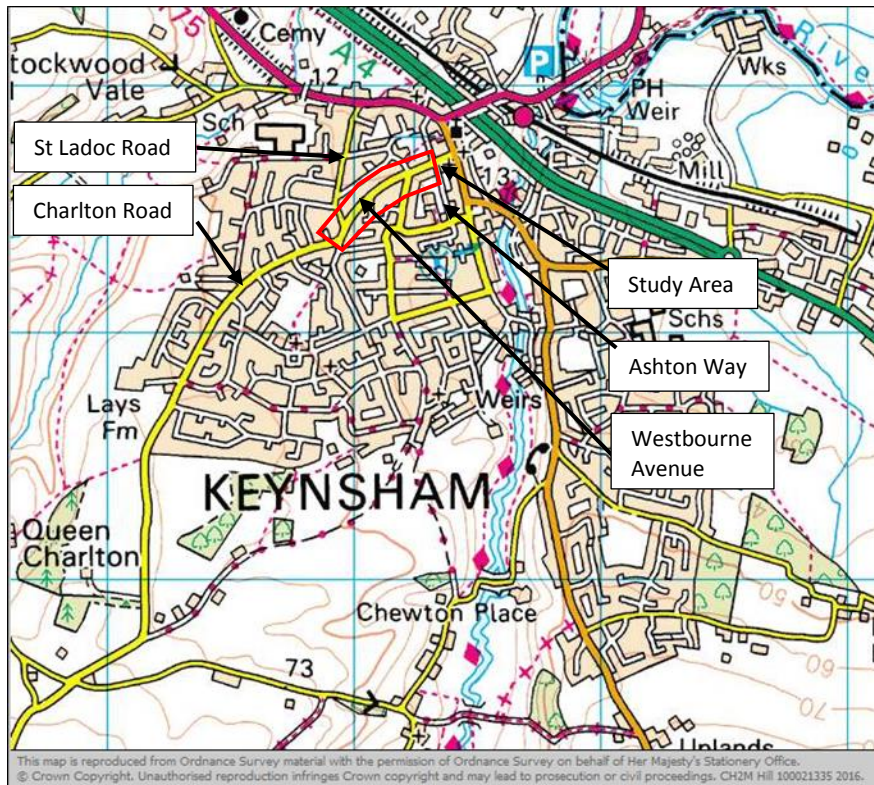


Figure 1: Study Area

2.0 Existing Situation

Charlton Road is a local distributor serving residential areas on the west side of Keynsham and a linkage to the A37 at Whitchurch via Woollard Lane. At its eastern end Charlton Road has a junction with the High Street, and as such is used to access a number of Town Centre amenities, including those on the High Street, a supermarket and town centre parking.

Within the section of interest Charlton Road is a two way single carriageway road which is street lit and subject to a 20mph speed limit. Residential properties with both pedestrian and vehicle driveway accesses front directly onto this part of Charlton Road. There are parking restrictions on both sides of the carriageway from Ashton Way to a point approximately 15m west of Westbourne Avenue, with bus services operating in both directions. The width of the carriageway along Charlton Road varies from 6.5m to 4.4m at its narrowest point. The latter coincides with a left hand bend immediately east of Westbourne Avenue.

Pedestrian footways are located on both sides of the carriageway through this length of Charlton Road, although these vary in width. The footway on the north side of the carriageway has a typical width of around 1.4m. This is circa 1.0m on the south side, although this narrows to below 0.8m where the carriageway is at its narrowest creating a localised 'pinch-point'. This is shown on **Figure 2**.

Road safety concerns have been identified at this pinch point on Charlton Road. A video survey carried out by B&NES at the 'pinch-point' identified vehicles mounting the pavement in order to pass opposing vehicles, creating a risk of pedestrian injury. Observations made during a site visit to Charlton Road on Tuesday 5th July 2016 confirmed that an unofficial priority working system operates at the 'pinch-point' when large vehicles and buses are opposed by other traffic. Pedestrians were also observed utilising the footways on both sides of the carriageway, albeit the narrow width available on the south side.

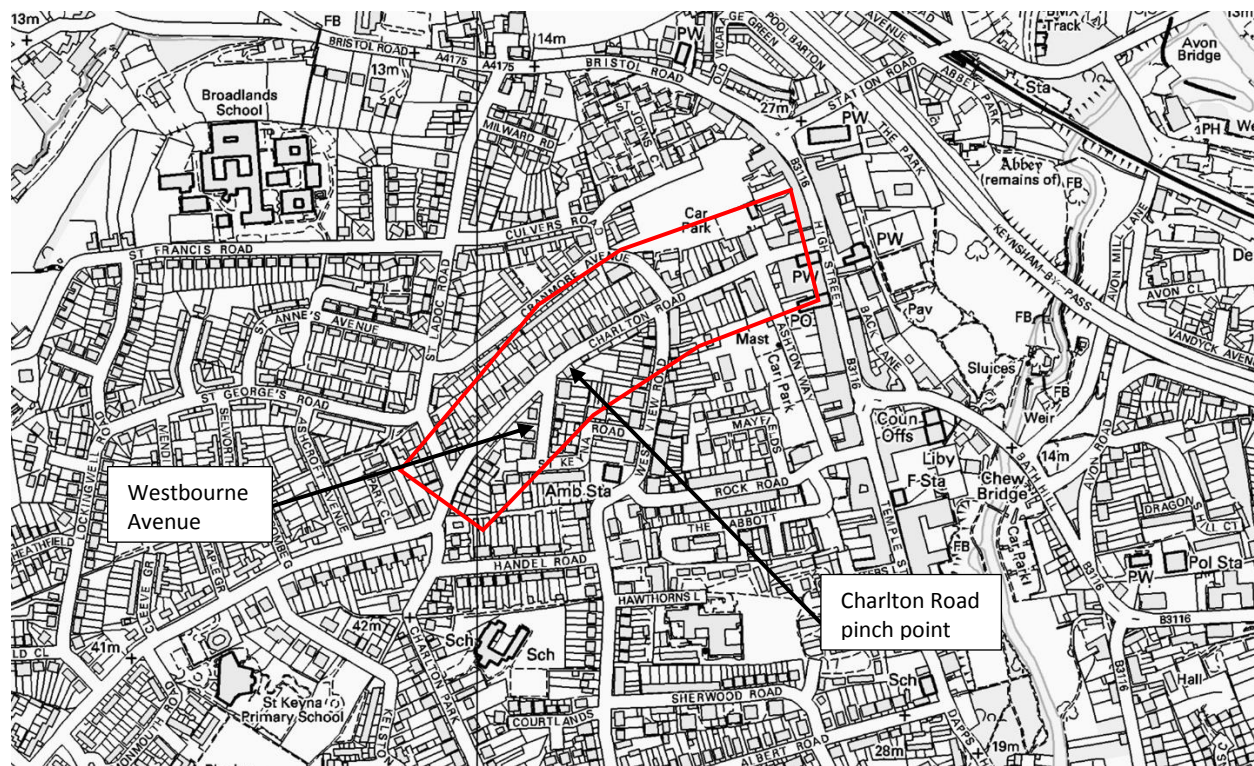


Figure 2: Charlton Road - showing the location of the 'pinch-point'

3.0 Safety Issues

3.1 General

This section includes the analysis of historical Personnel Injury Collision (PIC) data and details operational observations made during the site visit on Tuesday 5th July 2016.

3.2 Personal Injury Collision (PIC) Data

PIC data has been supplied by B&NES and covers a five year period from 1st March 2011 to 29th February 2016. Data was requested for the cordon area shown in **Figure 3**. This area was requested in order that the study area was covered, as well as roads that may be affected by identified options.

Twenty collisions were recorded within the study area over the five year period as shown in **Figure 4**, an average of four collisions per year. Sixteen were classified as slight (80%) and four as serious (20%) resulting in a KSI (killed/seriously injured) ratio of 20%. This is higher than the KSI rate for all urban roads of 13%. (Reference RSA10002 Road Casualties Great Britain 2014.)

During the whole of this five year period only one PIC has been recorded on Charlton Road between Ashton Way and St Ladoc Road. The collision was recorded in 2011, classified as slight and occurred at the junction with St Ladoc Road. A car emerged from St Ladoc Road into the path of a moped rider in favourable driving conditions. The collision occurred when this section of Charlton Road was subject to a 30mph speed limit. So, despite the perceived risks associated with narrow footways along this part of Charlton Road, and potential vehicle encroachment, there have been no injury accidents involving pedestrians in the last five years

The full collision data, as supplied by B&NES is shown in **Appendix A**.

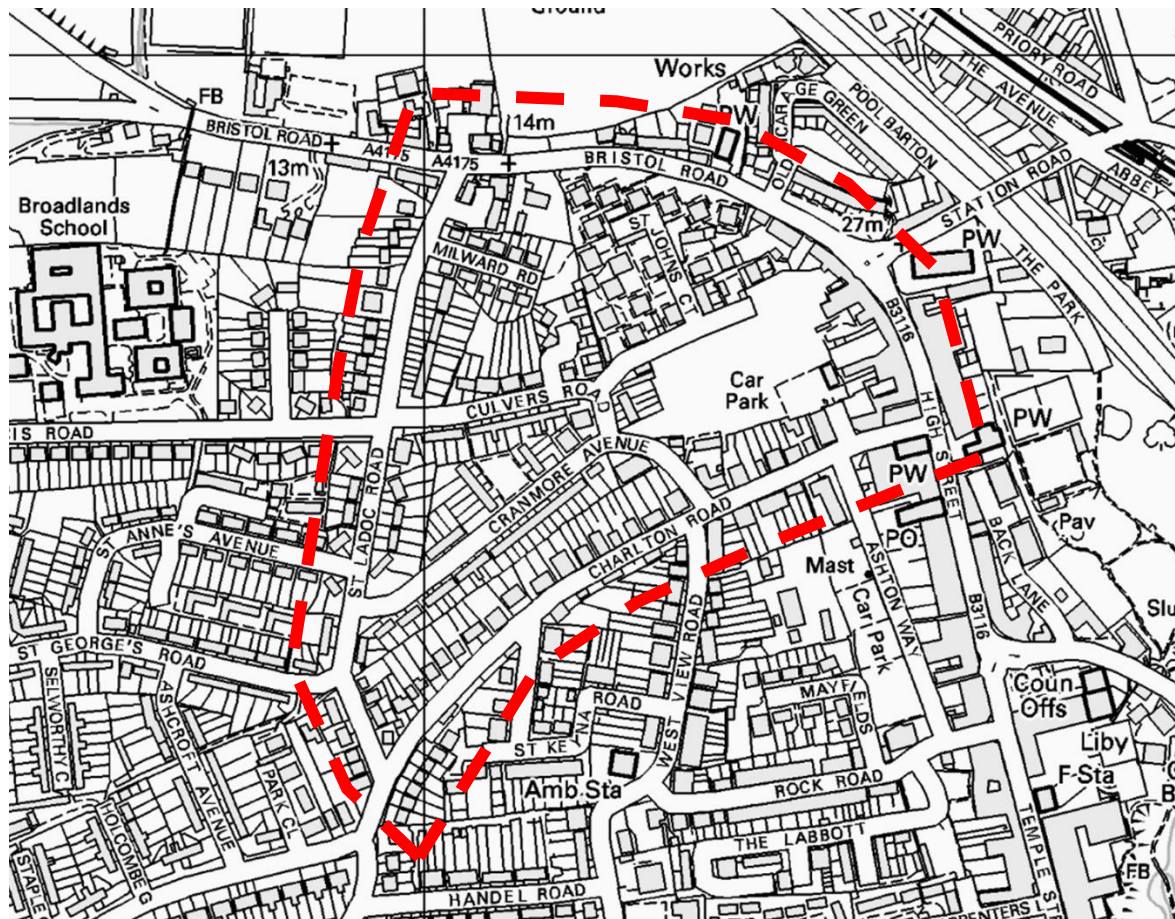


Figure 3: PIC data cordon

Figure 4 shows that 16 of the 20 collisions were clustered at the following three junctions:

- High Street/Station Road roundabout junction;
- High Street/Charlton Road junction; and
- St Ladoc Road/Bristol Road mini-roundabout junction.

A brief analysis of the accidents occurring at these junctions is provided below.

High Street/Station Road

Seven collisions were recorded at this junction during the five year period, with one classified as serious and six slight. All of the collisions occurred during the daytime and on a dry road surface.

Six (86%) of the collisions at this location involved two wheeled vehicles (one motorcycle, five pedal cycle), all of which were travelling southbound from Bristol Road to the High Street. All of the pedal cycle collisions occurred as a result of vehicles failing to give-way from Station Road.

High Street/Charlton Road

Six collisions were recorded at this junction during the five year period, with all classified as slight. Half of the collisions involved pedestrians. The types of collisions, direction of travel and movements were varied, resulting in little commonality.

St Ladoc Road/Bristol Road

Three collisions were recorded in the vicinity of this junction over the five year period, with one classified as serious and two slight. The serious collision involved a motorcycle losing control in dark and wet conditions. The slight collisions involved rear shunts.

3.3 Site observations

3.3.1 Charlton Road

During the site visit carriageway and footway widths were measured at 20m intervals along Charlton Road between the junctions with Ashton Road and Westbourne Avenue. At the narrowest point the carriageway measured 4.4m, this coinciding with a slight bend immediately east of Westbourne Avenue. At this 'pinch-point' there is just sufficient width for two cars to pass each other (**Photo 1**) but it is very tight for a car to pass a goods vehicle or bus. Figure 7.1 in Manual for Streets (MfS) shows that an absolute minimum carriageway width of 4.1m is needed for two cars to pass, but 4.8m is needed to allow free passage of a large vehicle and a car. In view of this drivers of large goods vehicles and buses were observed waiting until the 'pinch-point' was clear before proceeding, operating an informal priority working arrangement.

The footway on the south side of Charlton Road through the narrow section is generally less than 1.0m wide and measured 0.78m at its narrowest, which is too narrow to accommodate a wheelchair user or mobility scooter (**Photo 2**). Footways less than 1.2m wide make it difficult for an adult and child to walk next to each other and may make passing other pedestrians difficult. This can lead to pedestrians having to walk in the carriageway in order to pass each other.

When using the footway during the site visit vehicle wing mirrors routinely extended over the footway increasing the risk of pedestrian strikes and injury. The vertical profile of the footway varies considerably, particularly at vehicular crossovers to properties. Pushchairs, wheelchairs and mobility scooters could be destabilised and tip towards the carriageway. In comparison the footway on the north side of Charlton Road is consistently 1.4m wide enabling two pedestrians to walk side by side.

There are a number of obsolete dropped kerbs along Charlton Road which may result in pedestrians crossing at locations that are unsuitable in terms of footway width, visibility and connectivity to other dropped kerbs.



Photo 1: Charlton Road at pinch point



Photo 2: Eastbound along Charlton Road

3.3.2 Other Issues

Visibility from St Ladoc Road westbound along Charlton Road is restricted by the horizontal alignment of the carriageway.

St Ladoc Road is relatively wide, which may result in vehicle speeds exceeding the 20mph limit. The 20mph limit is being reviewed as part of a separate speed limit review. Since the site visit took place traffic calming measures have been installed on St Ladoc Road, which may help to regulate vehicle speeds.

The existing road markings and high friction surfacing on the approaches to the St Ladoc Road/Bristol Road mini roundabout are worn.

4.0 Review of Traffic Data

A review of traffic volume information has been undertaken using existing data available. This data was collected during historical modelling work, with the traffic survey undertaken on Wednesday 13th June 2012. The survey recorded turning counts at the Charlton Rd/St Ladoc junction. This data has been interpreted in order to provide a traffic count for the section of Charlton Road between St Ladoc Road and West View Road where the 'pinch-point' and narrowest footway exists.

The survey recorded a flow of circa 7,800 vehicles two-way during the 12 hour (07:00-19:00) period. These movements were split 47% northeast bound heading into Keynsham and 53% southwest bound heading out of Keynsham. The peak hours recorded during the survey were 08:00-09:00 and 17:00-18:00. During the AM peak hour a 768 two-way flow was recorded, split between 442 (58%) travelling into Keynsham and 326 (42%) routing out of Keynsham. During the PM peak hour a two-way flow of 878 vehicles was surveyed, with 361 (31%) routing into Keynsham and 517 (59%) leaving the Town Centre. This indicates 'tidal' peak hour vehicle movements. The number of vehicles per hour, split by direction of travel, is shown in **Figure 5** below.

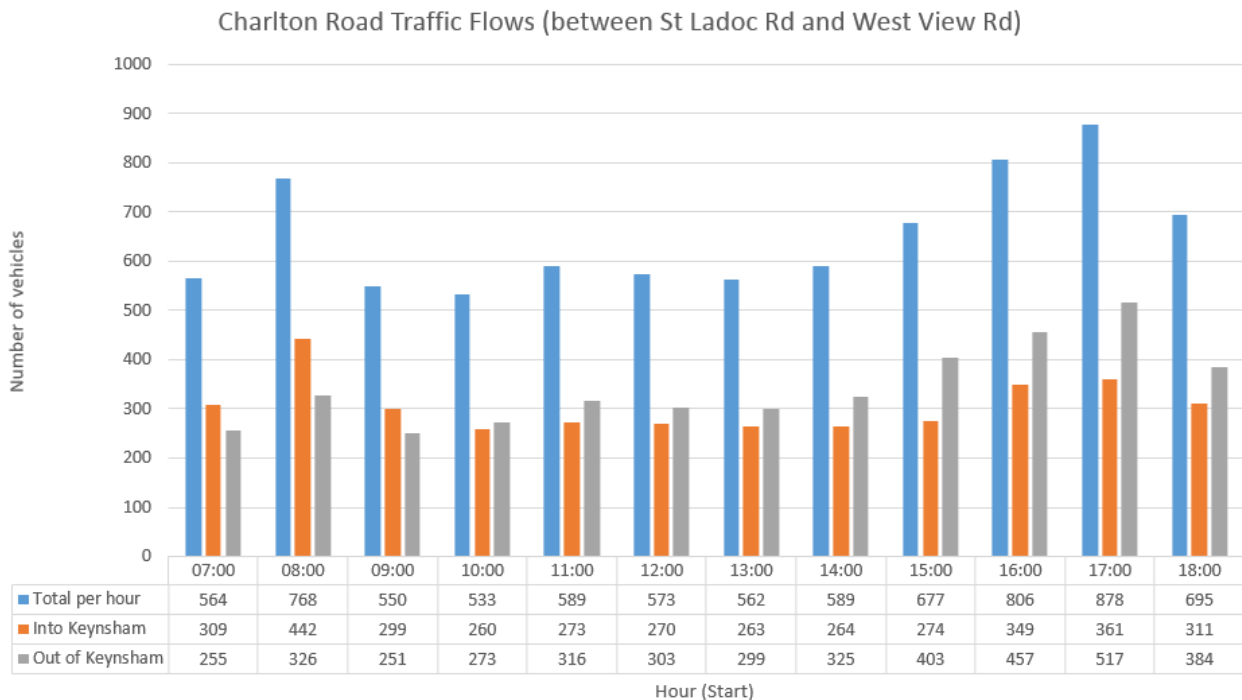


Figure 5: Charlton Road Traffic Flows – Split by hour

Over the survey period the vehicle types recorded were 81% ‘cars and taxis’, 14% Light Goods Vehicles and 1% each for Medium Goods Vehicles, Heavy Goods Vehicles (2 axle rigid), Buses and Coaches, Motorcycles and Pedal Cycles.

5.0 Improvement Options

5.1 Objectives

Whilst the PIC data does not support the concerns relating to pedestrian safety through the narrow section of Charlton Road, observations of driver behaviour and existing pedestrian movements and facilities do raise safety concerns. Any option to improve pedestrian facilities along Charlton Road should aim to address the following:

- The constrained carriageway width at the narrowest point and the knock-on effects with respect to vehicles encroaching onto the pavement and delays due to the informal priority working arrangement; and
- The width and profile of the footways to aid pedestrian and other Non-Motorised User (NMU) movements.

5.2 Option Identification

The following options have been considered, with a summary of the benefits and dis-benefits for each of the options shown in Table 1.

5.2.1 Option 1: Footway on one side of Charlton Road (North side)

The removal of the footway on the south side of Charlton Road was considered to enable the width of the carriageway through the ‘pinch-point’ to be increased, potentially reducing the occurrence of vehicles mounting the footway or encroaching over it. To do this the carriageway would need to be widened to 5.5m, the minimum needed for two large goods vehicle to pass each other (MfS).

However, to prevent vehicles damaging properties on the south side of Charlton Road a minimum clearance of 450mm between the edge of carriageway and the properties would be necessary. This would enable the carriageway width to be increased by between 0.28 and 0.5m, so not enough to achieve a consistent 5.5m carriageway width.

The removal of the footway on the south side of Charlton Road would also result in pedestrian accesses from properties on this side of the carriageway emerging directly onto the carriageway and the possibility that some pedestrians might continue to use the 450mm kerbed clearance margin as a footway.

In view of the above this is not an option worthy of pursuit as it would achieve little in promoting improved two-way vehicle flow and could actually increase risk to pedestrians, particularly the affected frontage occupiers on the south side.

5.2.2 Option 2: Informal carriageway narrowing

As a balance between maintaining two way vehicle movements and improving pedestrian facilities, an informal carriageway narrowing was considered. This would involve variable widening of the southern footway (1.2m at its narrowest), resulting in a constant carriageway width of 4.1m for approximately 70m in length. **Drawing CR004 in Appendix B** illustrates this option.

This arrangement does not allocate vehicle priority to a specific direction of travel through appropriate regulatory signing to TSRGD, but drivers are warned that the carriageway narrows. Whilst this option would provide a clear benefit to pedestrians there are concerns about the following:

- The residual carriageway width of 4.1m through the whole of the narrowed length is the absolute minimum needed for two cars to pass (MfS). There is thus a risk that a lot of car drivers may elect to yield rather than force 'tight' passage, leading to an effective priority narrowing with a long clearance length. This would create a significant reduction in capacity and potentially severe operating consequences. The vehicle flows show that the 'peak' existing weekday volume is circa 880vph between 5:00-6:00pm, with circa 520 or 8-9 vehicles/min routing out of the Town Centre. Any tendency for this arrangement to be treated as an informal 'priority' system could make it very difficult for opposing drivers to gain a right of way once a flow of this level became established in one direction given the narrowed length and vehicle headways;
- Potential poor inter-visibility between opposing drivers arriving at each end of the narrowing; and
- Inappropriate driver approach speeds to establish position in the narrowing, and the potential for vehicles to mount the footway (utilising private property access dropped kerbs) to maintain two way running and/or to avoid a collision, potentially in conflict with a pedestrian.

5.2.3 Option 3: Priority build out

This is a variation on Option 2 using a localised priority narrowing at the 'pinch-point' to formalise the informal priority working arrangement observed during the site visit. Priority would need to be given to outbound traffic to avoid any queuing backing up to Ashton Way and the High Street. This would result in a build-out being located on the north side of the Charlton Road where driveways not only restrict the location (due to the necessity to retain private vehicle accesses), but also minimise the length and opportunity to introduce localised footway widening. **Drawing CR001 in Appendix B** illustrates the layout and the limited benefits gained by pedestrians.

The significant disadvantage of this arrangement is that it would enforce priority or shuttle working on all traffic, so not just when necessary to achieve passage of a large vehicle and a car as now. As noted above, the outbound flow rate from the Town Centre in the weekday PM peak hour is 8-9 vehicles/min, so a vehicle arrival every 7 seconds on average. This is likely to make it very difficult for drivers required to yield to establish passage, even though in this case the restricted width length past the build-out is short.

5.2.4 Option 4: Signalised one-way working

The use of 'shuttle working' traffic signals to control movements through a 'pinch-point' length shown in Drawing CR004 would enable the footway to be widened between the signal stop-lines in a similar way to Option 3. However, there would also be the issue of dealing with any vehicular accesses to properties located between the traffic signals, with potential safety issues for drivers emerging without being able to determine the current direction having a right-of-way. A significant length of 'shuttle working' would

also require long inter-green clearance periods to ensure safe passage of the last vehicle through the conflict area on termination of the green signal. This will have capacity implications and result in queuing (notably at the Town Centre end) and increased journey times.

5.2.5 Option 5: Carriageway and footway widening

The only way to widen both the footway and carriageway through the narrowed section would be to acquire third party land outside the control of B&NES. To do this, the land on the south side of Charlton Road would need to be purchased affecting four properties (nos. 17, 19, 21 and 23 Charlton Road), at considerable cost. **Drawing CR002** in **Appendix B** illustrates the extent of the land-take which would be required to enable a significant length of footway and carriageway widening to improve both pedestrian connectivity and vehicle passage. However, it can be seen that the land necessary would involve property demolition, not just land purchase from the curtilage.

5.2.6 Option 6: Creation of one-way section: Ashton Way to St Ladoc Road

The closure of Charlton Road to traffic heading into Keynsham (St Ladoc Road to Ashton Way) would enable the existing footway provision to be widened while maintaining a minimum carriageway width of 4.1m which enables two cars to pass each other in the event of a breakdown. The width of Charlton Road (including footways) at its narrowest is approximately 6.7m over a 20m length. Footway widening could be on the south side achieving a 1.2m facility at its narrowest or on the north side achieving a standard 2.0m provision. **Drawing CR003** in **Appendix B** illustrates the widening on the north side.

By creating a one-way section between Ashton Way and St Ladoc Road the displaced eastbound traffic would have to be rerouted onto St Ladoc Road and then onto the A4175 Bristol Road. However, as the subsequent S-Paramics modelling works shows, there are other diversionary routes which drivers could use. The priority at the Charlton Road/St Ladoc Road junction would ideally need to change, with westbound vehicles on Charlton Road giving way to movements between Charlton Road and St Ladoc Road. Drivers currently using West View Road as a route to the High Street or Culvers Road would be affected by this change, with greater use of Rock Road a likely consequence. This could result in delays and congestion in this area, particularly as vehicle movements on Rock Road are affected by on-street parking.

Vehicular access for residents in Westbourne Avenue and St Keyna Road would be similarly affected. The use of residential roads including Charlton Park and Handel Road as a diversionary route through to Rock Road from Charlton Road is likely to be a more attractive route for many drivers than St Ladoc Road.

5.2.7 Option 7: Extended one-way sections including St Ladoc Road

This option considered the closure of Charlton Road eastbound from St Ladoc Road to Ashton Way as before but, in addition, would include a northbound one-way section on St Ladoc Road at its junction with the A4175 Bristol Road. It is envisaged the one-way section on St Ladoc Road could be extended to Millward Road as a minimum to avoid unnecessary access impacts to the residents along this road. Creating this one-way section would enable the existing mini-roundabout at the Bristol Road/St Ladoc Road junction to be changed to a signal controlled junction by taking out the need for accommodating a right turn from Bristol Road. This would simplify the Method of Control otherwise necessary and so maximise capacity. The downside of this arrangement would be that all eastbound traffic on the A4174 Bristol Road currently turning right into St Ladoc Road would be forced to re-route via the Town Centre, notably the northern section of the High Street. The left turn into St Ladoc Road would be similarly affected although this turning flow is generally less than the right turn from Bristol Road.

5.2.1 Option 8: Flexible marker posts within footway

This option considered the provision of flexible type marker posts within the footway on the north side of Charlton Road to prevent vehicles from mounting the footway and emphasise the narrowing of the carriageway.

Table 1: Potential Options SUMMARY

Option	Benefits	Dis-Benefits
Option 1: Remove length of southern footway to increase carriageway width locally	<ul style="list-style-type: none"> Improves carriageway width marginally, but the need to maintain a 500mm wide clearance between the kerb edge and boundary walls limits benefit. 	<ul style="list-style-type: none"> Footway is lost, but the reduced margin strip may still be used as such by pedestrians increasing risk. Pedestrian accesses on the affected south side would emerge onto a narrowed strip retained to maintain highway clearance. Visibility distances from driveways would be reduced.
Option 2: Informal carriageway narrowing	<ul style="list-style-type: none"> Provides an opportunity for footway widening over a significant length Maintains private accesses A 4.1m carriageway width is maintained, which is just sufficient for two cars to pass. The current minimum width at the 'pinch-point' is 4.4m 	<ul style="list-style-type: none"> The carriageway width is the absolute minimum for two cars to pass. As such there is a high risk that many drivers choose to yield rather than force 'tight' passage. Effective 'priority' conditions created over a 70m narrowed section would have a high impact on vehicle flows (increased congestion/queuing) Potential inter-visibility issues for opposing drivers approaching the narrowed section Compliance issues Inappropriate approach speeds due to drivers 'racing' to establish position in the narrowing
Option 3: Priority build out	<ul style="list-style-type: none"> Formalises one-way vehicle movements through the narrowest section Provides localised footway widening Maintains private accesses Reduces likelihood of vehicle overhang/overrun through narrowest section 	<ul style="list-style-type: none"> High potential to increase congestion and queuing as this would introduce necessary priority working for all traffic. High two-way flows make highly variable delays for non-priority drivers very likely Potential footway widening improvement is minimal and very localised
Option 4: Signalised one-way working	<ul style="list-style-type: none"> Controlled one-way vehicle movements through narrowest section Could facilitate footway widening through the controlled section Reduces likelihood of vehicle overhang/overrun through narrowest section 	<ul style="list-style-type: none"> High potential to increase congestion and queuing. Unlikely to cope with existing 'peak' flows Multiple private accesses between the signals in the narrowing would not be under signal control. Potential safety issues
Option 5: Carriageway and footway widening	<ul style="list-style-type: none"> Would facilitate two way vehicle movements on a wider carriageway Improves pedestrian facilities and connectivity Footway widening (2.0-2.5m) could be achieved on both sides of the carriageway 	<ul style="list-style-type: none"> Would require third party land out of the control of B&NES High cost given benefits achieved Likely to be unpopular locally
Option 6: One way	<ul style="list-style-type: none"> Would enable footway widening to be 	<ul style="list-style-type: none"> Increased journey times for residents

Option	Benefits	Dis-Benefits
working between St Ladoc Road and Ashton Way	<p>achieved on either side of the carriageway over a significant length - potential for a 1.2m facility at its narrowest on the south side and a standard 2m provision on the north side</p> <ul style="list-style-type: none"> Improves pedestrian connectivity along Charlton Road One-way working removes vehicle conflicts within narrowest section 	<p>who access properties from/via Charlton Road</p> <ul style="list-style-type: none"> May increase congestion and delays on the local network Increase in 'rat running' Requires alteration to adjacent junctions
Option 7: Extended one way working	<ul style="list-style-type: none"> Would enable footway widening to be achieved on either side of the carriageway over a significant length (as detailed above) Improves pedestrian connectivity along Charlton Road One-way working removes vehicle conflicts within narrowest section 	<ul style="list-style-type: none"> Increased journey times for residents who access properties from/via Charlton Road and St Ladoc Road May increase traffic volume, congestion and delays on the local network, including: St George's Rd, Lockingwell Rd, Ashcroft Ave, St Anne's Ave, St Francis Rd and Cranmore Ave. Increase in 'rat running'- potentially to a greater extent than the above one-way working option Impacts access to Broadlands Academy Secondary School Requires alteration to adjacent junctions
Option 8: Marker posts in the footway	<ul style="list-style-type: none"> Would discourage vehicles from mounting the footway on the north side of the carriageway reducing conflict with pedestrians Low cost option Maintains private accesses 	<ul style="list-style-type: none"> Reduces available footway width on the north side of Charlton Road to between 0.8 and 1.0m wide. This is below the minimum required for wheelchair users (0.9m). Decreases pedestrian connectivity. May encourage vehicles to mount the pavement on the south side of Charlton Road. Maintenance liability.

Of the eight options considered Option 1 does little to improve pedestrian safety on Charlton Road. Options 2-4 all seek to achieve a reallocation of road space to improve footway width and pedestrian safety by reducing the width of the carriageway. However, the use of a formal priority narrowing (Option 3) or a signalled 'shuttle working' arrangement (Option 4) would both introduce forced one-way working along this part of Charlton Road where two-way flows in the weekday peak periods are high. This would inevitably create delays to traffic, particularly with Option 4, whilst Option 3 would offer limited potential for footway improvement with only a point restriction. The informal narrowing option (Option 2) retains a 4.1m carriageway, but this is the absolute minimum width for two cars to pass. In view of this there remains a high risk that this would be treated by many drivers as a priority arrangement but with no signed priority in either direction. As such, there is still considered to be a high risk of vehicle delay and congestion when compared with the present situation, and also footway over-run. Option 8 does not improve pedestrian connectivity and may result in vehicles mounting the footway on the opposite side of the carriageway.

The remaining three options do provide an opportunity for tangible benefits to the pedestrian environment/safety in this location, although the likely cost associated with Option 5 is likely to be prohibitive. The options are:

- Option 5: Carriageway and footway widening;
- Option 6: One-way working between Ashton Way and St Ladoc Road; and
- Option 7: Extended one-way working to include the north end of St Ladoc Road (NB only).

The following section describes the specific modelling assessment undertaken for Options 6 and 7, both of which would introduce forced re-routing effects. Diversionary effects could of course be introduced by implementing Options 2-5 as a result of driver delays created in this part of Charlton Road. However, two-way operation would not be prohibited as with Options 6 and 7

6.0 Modelling

6.1 Modelling Methodology

6.1.1 Scenarios Assessed

This section presents the results of S-Paramics modelling of Options 6 and 7 to make Charlton Road one-way westbound from Ashton Way to St Ladoc Road. The modelling work assessed the following:

- **Reference Case (Do Nothing)** - Base year 2012 traffic flows with the existing highway network, with the latter updated to include the recent town centre works and the new mini-roundabout and adjacent crossing at the Bath Road/Chandag Road junction. This was used to assess the comparative effect in respect of subsequent traffic flow and operating conditions changes with the two options;
- **Charlton Road Option 6** - Closure of Charlton Road eastbound between St Ladoc Road and Ashton Way; and
- **Charlton Road Option 7** - closure of Charlton Road eastbound between St Ladoc Road and Ashton Way, with a further one-way northbound only section on St Ladoc Road between Millmead Road and the A4175 Bristol Road mini-roundabout junction. Replacement signal controlled junction at the intersection between the A4175 Bristol Road and St Ladoc Road.

6.1.2 Modelling Approach

The assessment has been carried out using the Keynsham S-Paramics micro-simulation traffic model. This model covers the main routes within the town centre, as well as the main radial routes into the town and the A4 Keynsham bypass from the A4/A4174 Avon Ring Road ('Hicks Gate') roundabout to the A4/Broadmead Lane roundabout.

The model is based to 2012 and is configured to simulate weekday morning (7:00-10:00am) and evening (3:00-7:00pm) peak periods. Details of the model calibration and validation can be found in the Local Model Validation Report (revision 1.2) dated 22nd April 2013.

The proposed options were coded into the network using the reference case network as a template. For Option 6 this was a simple case of instigating a lane closure on the section of Charlton Road eastbound between St Ladoc's Road and Ashton Way.

For Option 7 the northern section of St Ladoc's Road was re-coded as a one-way link from Millmead Road (NB only) and the mini-roundabout at the A4175 Bristol Road junction altered to a traffic signal layout. The AM and PM signal timings for the new signals were derived from a LinSig model which used the predicted turning movements at the junction from the Option 6 model runs. The signal operation assumed a three stage Method of Control: (1) Bristol Road (both arms), (2) all-red to traffic pedestrian crossing stage, and (3) St Ladoc's Road.

For each scenario 10 'seed' runs, or iterations, were undertaken for the two model periods (weekday morning between 7:00 and 10:00am and weekday evening between 3:00 and 7:00pm) for the scenarios

set out above. Outputs collected comprised network performance and mean journey times, traffic flows and route-based journey times.

6.2 Modelling Results

6.2.1 Global Network Outputs

Table 2 below compares the global network statistics for each scenario in each time period modelled. The results show that during the weekday AM peak period Option 6 results in a deterioration in network operating conditions with an increase in mean delay and a slight drop in mean speed. However, the results for Option 7 suggest that the proposed change to St Ladoc Road and the introduction of traffic signals at the junction with Bristol Road would be partially successful in mitigating the impact of the westbound only section on Charlton Road, by better accommodating the increased northbound traffic on St Ladoc Road.

Table 2: S-Paramics Network Performance Statistics

Scenario	AM Peak Period (7:00-10:00am)			PM Peak Period (5:00-6:00pm)		
	Delay (s)	Speed (mph)	%Dem Accommodated	Delay (s)	Speed (mph)	%Dem Accommodated
Ref Case	272	23	99.5%	247	25	99.6%
Option 6	314	21	98.2%	421	18	92.9%
Option 7	286	22	99.5%	541	12	92.3%

However, during the weekday PM peak period both options result in a significant deterioration in network operating conditions with network indicators showing much worse conditions with Option 7. Notably, the 'percent demand accommodated' also shows a large drop from circa 100% to around 92%, indicating that the network would be unable to service existing network demand (2012) with this change. This ignores the added traffic effects expected with the on-going Somerdale development and consented housing sites at K2B, K2A sites and KE4 in the future.

6.2.2 Network Travel Time

Figures 6 and 7 compare the mean network travel times for each scenario during each half-hour interval in the 7:00-10:00am and 3:00-7:00pm periods modelled. For the AM period, **Figure 6** confirms the results from the network performance statistics, namely that Options 6 and 7 yield similar travel time throughout the period. At worst mean travel times are expected to increase by around 25 seconds at the 'peak' interval between 8:30 and 9:00am.

During the PM peak period, the graphs show a notable increase in mean travel times once traffic flows in the network reach their peak between 5:00 and 6:00pm. The worst case increase under Option 6 is around a 70 second increase in travel time. For Option 7 the graph shows significant increases in travel times throughout the peak hour and into the shoulder period. Worst case increases are in the order of three times reference case travel times.

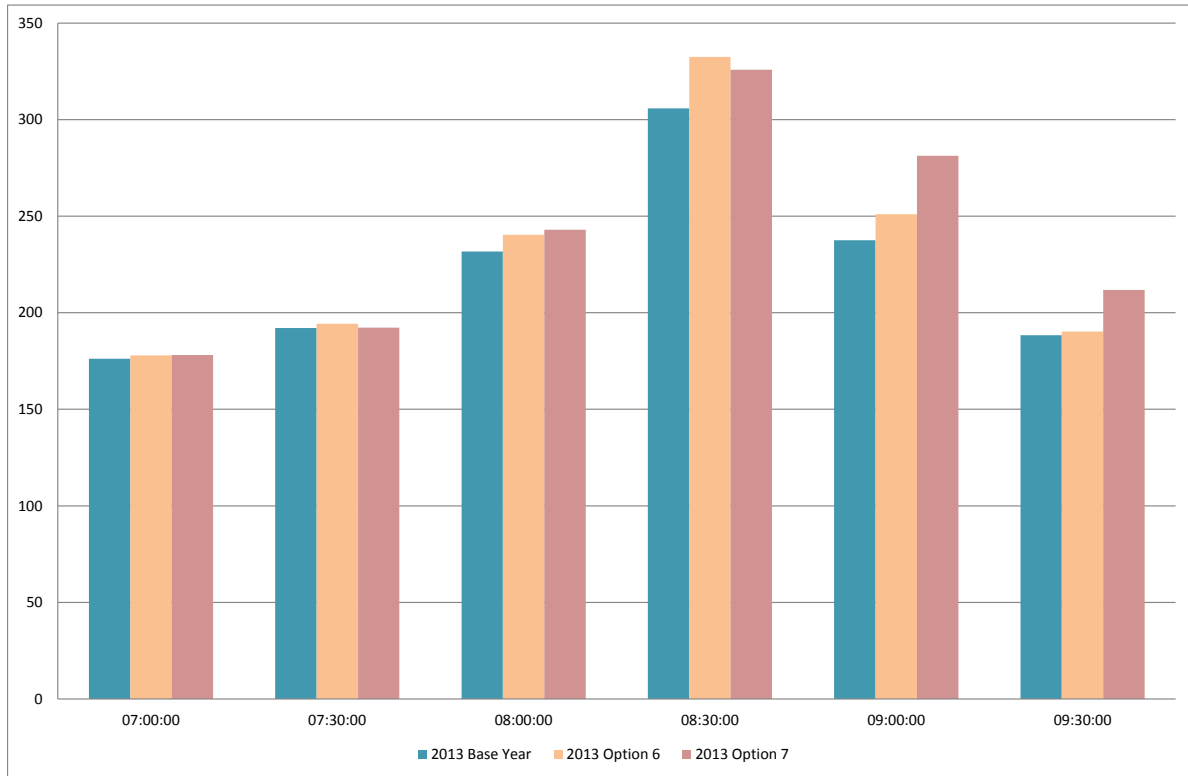


Figure 6: Mean Network Travel Time Profile Comparison, AM Peak Period (7:00-10:00am)

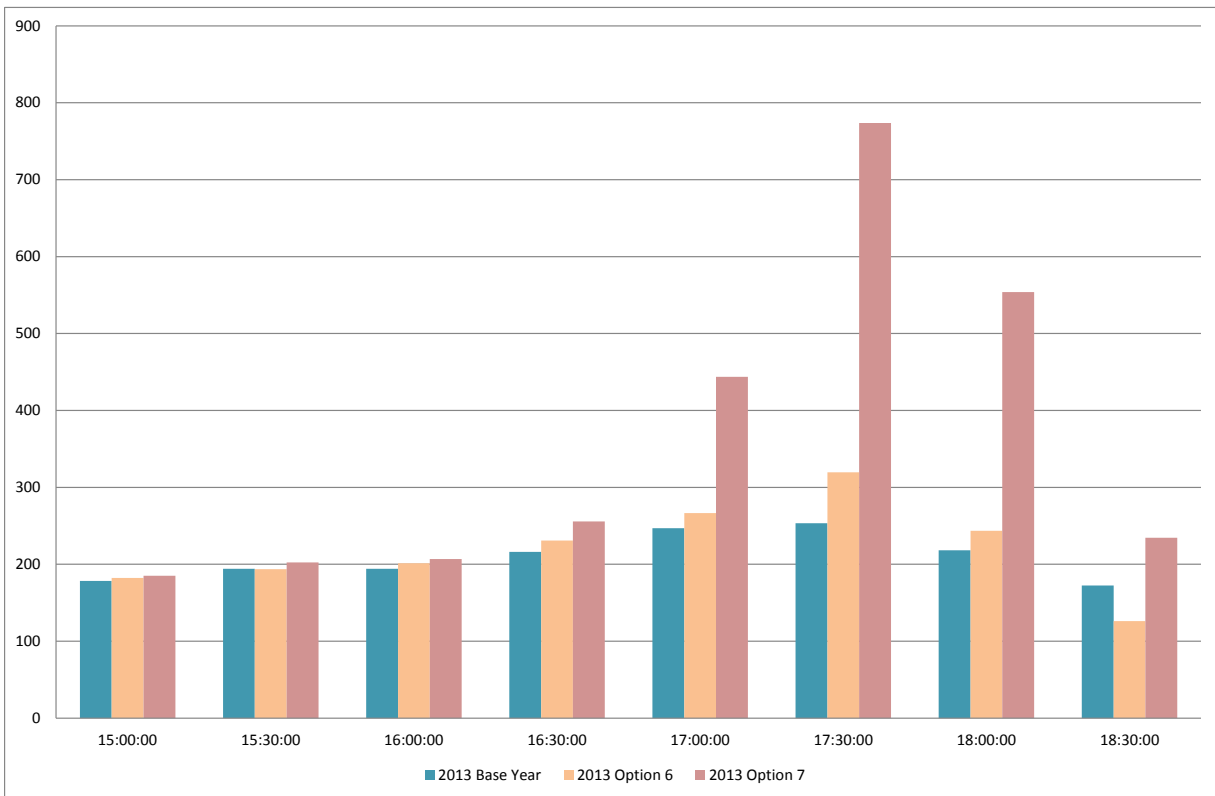


Figure 7: Mean Network Travel Time Profile Comparison, PM Peak Period (3:00-7:00pm)

6.2.3 Traffic Flow Changes

The modelled actual traffic flow changes from the reference case scenario are shown in Tables 3-6 below for Options 6 and 7 in the weekday AM peak period (7:00-10:00am and the evening peak period (4:00-7:00pm).

Table 3: Modelled Traffic Volumes (Two-Way): Reference Case Flows and Option 6 Changes (7:00-10:00am)

Location	Reference Case			Option 6 (Traffic Change)		
	7-8am	8-9pm	9-10am	7-8am	8-9am	9-10am
Charlton Road: High Street to Ashton Way	505	760	759	-154	-100	-100
Charlton Road: Ashton Way to St Ladoc Road	522	740	598	-304	-450	-339
St Ladoc Road: St Francis Road to A4175 Bristol Road	473	624	489	165	127	113
A4175 Bristol Road: West of St Ladoc Road	950	1313	1242	3	-31	-93
A4175 Bristol Road: St Ladoc Road to High Street	685	1010	986	194	188	138
High Street: Station Road to Charlton Road	973	1386	1182	-91	-105	-75
High Street: Temple Street to Charlton Road	679	878	762	80	84	61
Ashton Way: near Charlton Road	251	448	576	-112	-117	-212
Ashton Way: near Rock Road	183	346	402	-106	-97	-167
Rock Road: Park Road to Ashton	144	242	164	118	226	110
Temple Street: High Street to Rock Road	643	937	864	13	-9	-99

Table 4: Modelled Traffic Volumes (Two-Way): Reference Case Flows and Option 6 Changes (4:00-7:00pm)

Location	Reference Case			Option 6 (Traffic Change)		
	4-5pm	5-6pm	6-7pm	4-5pm	5-6pm	6-7pm
Charlton Road: High Street to Ashton Way	728	831	658	-88	-184	-243
Charlton Road: Ashton Way to St Ladoc Road	730	795	624	-327	-401	-361
St Ladoc Road: St Francis Road to A4175 Bristol Road	581	703	536	165	43	-23
A4175 Bristol Road: West of St Ladoc Road	1450	1560	1361	-52	-278	-405
A4175 Bristol Road: St Ladoc Road to High Street	1071	1104	995	203	44	-168
High Street: Station Road to Charlton Road	1292	1438	1224	-52	-245	-407

Table 4: Modelled Traffic Volumes (Two-Way): Reference Case Flows and Option 6 Changes (4:00-7:00pm)

Location	Reference Case			Option 6 (Traffic Change)		
	7-8am	8-9pm	9-10am	7-8am	8-9am	9-10am
High Street: Temple Street to Charlton Road	880	904	865	77	-3	-189
Ashton Way: near Charlton Road	371	411	290	-104	-132	-120
Ashton Way: near Rock Road	310	374	277	-36	-81	-96
Rock Road: Park Road to Ashton Way	189	266	182	110	73	28
Temple Street: High Street to Rock Road	1044	1136	969	-13	-135	-270

Table 5: Modelled Traffic Volumes (Two-Way): Reference Case Flows and Option 7 Changes (7:00-10:00am)

Location	Reference Case			Option 7 (Traffic Change)		
	7-8am	8-9pm	9-10am	7-8am	8-9am	9-10am
Charlton Road: High Street to Ashton Way	505	760	759	-37	28	61
Charlton Road: Ashton Way to St Ladoc Road	522	740	598	-229	-317	-229
St Ladoc Road: St Francis Road to A4175 Bristol Road	473	624	489	57	16	-4
A4175 Bristol Road: West of St Ladoc Road	950	1313	1242	-15	3	-21
A4175 Bristol Road: St Ladoc Road to High Street	685	1010	986	254	393	319
High Street: Station Road to Charlton Road	973	1386	1182	-23	30	124
High Street: Temple Street to Charlton Road	679	878	762	34	40	84
Ashton Way: near Charlton Road	251	448	576	-112	-138	-149
Ashton Way: near Rock Road	183	346	402	-107	-124	-121
Rock Road: Park Road to Ashton Way	144	242	164	110	146	126
Temple Street: High Street to Rock Road	643	937	864	14	18	20

Table 6: Modelled Traffic Volumes (Two-Way): Reference Case Flows and Option 7 Changes (4:00-7:00pm)

Location	Reference Case			Option 7 (Traffic Change)		
	4-5pm	5-6pm	6-7pm	4-5pm	5-6pm	6-7pm
Charlton Road: High Street to Ashton Way	728	831	658	150	-12	36

Table 6: Modelled Traffic Volumes (Two-Way): Reference Case Flows and Option 7 Changes (4:00-7:00pm)

Location	Reference Case			Option 7 (Traffic Change)		
Charlton Road: Ashton Way to St Ladoc Road	730	795	624	-113	-258	-218
St Ladoc Road: St Francis Road to A4175 Bristol Road	581	703	536	-124	-258	-264
A4175 Bristol Road: West of St Ladoc Road	1450	1560	1361	-11	-337	-367
A4175 Bristol Road: St Ladoc Road to High Street	1071	1104	995	480	125	39
High Street: Station Road to Charlton Road	1292	1438	1224	156	-52	-6
High Street: Temple Street to Charlton Road	880	904	865	-3	-27	-101
Ashton Way: near Charlton Road	371	411	290	-86	-74	52
Ashton Way: near Rock Road	310	374	277	-21	-20	82
Rock Road: Park Road to Ashton Way	189	266	182	142	128	212
Temple Street: High Street to Rock Road	1044	1136	969	35	-52	-74

The tables highlight the following notable points:

- The implementation of Option 6 would reduce the flow along the section of Charlton Road between Ashton Way and St Ladoc Road by around 450 vehicles in the AM peak hour (Table 3). This would displace some 130 vehicles in the same period to St Ladoc Road and increase the traffic flow on Bristol Road to the east of the St Ladoc Road junction by a net 190vph. It is noticeable that some inbound traffic on the A4175 Bristol Road to the west is displaced because of the additional delay at both the St Ladoc mini-roundabout and the Station Road junction. A significant impact is the potential for traffic rat-running via the residential streets to the south of Charlton Road. Only the Park Road/Rock Road route is included in the S-Paramics model (via Charlton Park/Handel Road), whereas some traffic could re-route via Queens Road/Albert Road/Temple Street to the south end of the High Street. The modelled increase through Rock Road between 8:00-9:00am is circa 230 vehicles, so around half of the existing eastbound traffic removed from the section of Charlton Road between St Ladoc and Ashton Way;
- In the PM peak period (Table 4), the effect of Option 6 has a noticeable impact on the operation of the A4175 Bristol Road/St Ladoc Road mini-roundabout, to the extent that the two-way flow on Bristol Road to the west is reduced by circa 300 vehicles between 5:00-6:00pm and nearly 400vph in the following hour. The actual net traffic flow change on the St Ladoc Road approach to this junction is quite small due to the congestion effects at the mini-roundabout in preventing vehicle movement. The overall reduction in traffic on the section of Charlton Road made one-way is nearly 400 vehicles between 5:00-6:00pm, but can again be expected to result in displacement to residential roads to the south of Charlton Road;
- Option 7 which attempts to reduce and manage conflict at the A4175 Bristol Road/St Ladoc has the effect of increasing eastbound routing along Bristol Road/High Street to Charlton Road. The results for the AM peak period (Table 5) shows that the net reduction along the section of

Charlton Road made one-way is reduced compared to Option 3, with the change falling from -450 vehicles to circa -300 vehicles between 8:00-9:00am. The net change in flow using St Ladoc Road is much smaller than Option 6, as the increase in the northbound flow towards Bristol Road is largely cancelled out by the reduction in the southbound flow due to the one-way section introduced. Displacement to the streets south of Charlton Road is still seen to occur, with the increase in traffic using Rock Road predicted to be nearly 150 vehicles between 8:00-9:00am;

- The effect of introducing Option 7, like Option 6, is shown to have quite significant flow change effects due to additional network congestion in the PM peak period (Table 6). There is again a significant reduction in the flow accommodated on Bristol Road to the west of St Ladoc Road between 5:00-7:00pm. There is actually more predicted displacement to the Park Road/Rock Road route than Option 6, whilst examination of the models suggests that greater congestion along the A4175 Bristol Road is likely to encourage some re-routing via the Keynsham Bypass and the B3116 Bath Road to avoid it; and
- In summary, both options result in widespread reductions in achievable traffic flow throughout the network during the PM peak hour. The network performance statistics and mean travel times for the two options suggest that acute network congestion during this period has a key effect on the 'actual' flows which the network is able to pass, which are the model outputs reported in Tables 4 and 6.

6.2.4 Route Travel Time

Table 7 compares the AM peak hour travel times for each scenario modelled on selected routes through Keynsham town centre, and along the A4 Bath Road/Keynsham Bypass. The results show that there is little notable change on route travel times in the AM peak. The only significant increase is on Route 1 which increases by 80 seconds compared to the reference case with Option 6. This travel time increase is mitigated under Option 7 with the proposed northbound one-way section and signals at the Bristol Road/St Ladoc Road junction, which assists in accommodating traffic along the diversionary route.

Table 7: Route Travel Time Comparison, AM Peak Hour (8:00-9:00am)

Route	Ref Case	Option 6	Option 7
1. Charlton Road to Hicks Gate: via St Ladoc Road	258	338	251
2. Hicks Gate to Charlton Road: via St Ladoc Road	178	184	n/a
3. Charlton Road to A4175/A431 Mini-Roundabout	356	n/a	n/a
4. A431/A4175 Mini-Roundabout to Charlton Road	312	327	385
5. Charlton Road to A4 Broadmead Rbt: via Ashton Way	335	n/a	n/a
6. A4 Broadmead Rbt to Charlton Road: via High Street	368	382	399
7. A4: Pixash Lane to Hicks Gate Rbt - via Bypass	361	337	356
8. A4: Hick Gate Rbt to Pixash Lane - via Bypass	206	197	197

Table 8 compares the PM peak hour travel times for each scenario modelled on the same selected routes through the network. The results highlight large increases in travel time under both options on a number of routes. Under Option 6, there is a significant increase in inbound travel times from Hicks Gate to Charlton Road, as well as Broadmead roundabout to Charlton Road. Under Option 7 there is a very high increase in travel time between the A431/A4175 roundabout and Charlton Road. This is because the restriction at the northern end of St Ladoc Road forces all eastbound traffic on Bristol Road to route via the High Street, so introducing higher opposing traffic conflict to drivers on Station Road. In the PM peak hour there is a very high volume of right turning traffic into St Ladoc Road, which would be

duly displaced into the Town Centre. In summary, both options indicate that a worsening of congestion in the Town Centre in the PM peak hour, with Option 7 particularly severe when compared with the base-line case.

Table 8: Route Travel Time Comparison, PM Peak Hour (5:00-6:00pm)

Route	Ref Case	Option 6	Option 7
1. Charlton Road to Hicks Gate: via St Ladoc Road	217	281	292
2. Hicks Gate to Charlton Road: via St Ladoc Road	204	530	n/a
3. Charlton Road to A4175/A431 Mini-Roundabout	387	n/a	n/a
4. A431/A4175 Mini-Roundabout to Charlton Road	329	363	1462
5. Charlton Road to A4 Broadmead Rbt: via Ashton Way	386	n/a	n/a
6. A4 Broadmead Rbt to Charlton Road: via High Street	369	512	672
7. A4: Pixash Lane to Hicks Gate Rbt - via Bypass	272	279	404
8. A4: Hick Gate Rbt to Pixash Lane - via Bypass	171	178	258

7.0 Conclusions

7.1 Option Identification and Overview

The purpose of this study was to review road safety issues and traffic flows through the narrow section of Charlton Road between Ashton Way and St Ladoc Road, and specifically to identify potential options to improve pedestrian safety without impacting on journey times or creating congestion. The options were to include the viability of making this part of Charlton Road one way westbound.

No personal injury collisions have been recorded within this section of Charlton Road over the past five year period, just one failure to give-way collision at the St Ladoc Road junction. Notwithstanding this, site observations have identified risk issues associated with narrow footways, particularly on the south side of Charlton Road. Carriageway width is also restricted to 4.4m at a 'pinch-point' just east of Westbourne Avenue, requiring large vehicles to adopt an informal priority working arrangement when faced by an opposing vehicle within the narrowed section.

Eight options were considered which focused on the reallocation of highway space, measures to discourage vehicles from mounting the footways, highway widening or changing this part of Charlton Road to one-way operation. Options requiring forced priority working with two-way flow maintained were dismissed early on because of congestion/delay concerns given the high level of flow in this part of Charlton Road, which is circa 880vph in the weekday 5:00-6:00pm period. The implementation of marker posts within the footway, option 8, were also dismissed due to the limited residual width of the footway and the impact on pedestrian connectivity. Only four options were carried forward from this initial assessment as follows:

- Option 2: Informal carriageway narrowing - no formal regulatory priority signing to TSRGD - Drawing CR004;
- Option 5: Carriageway and footway widening - Drawing CR002;
- Option 6: Making Charlton Road one-way in the westbound direction between Ashton Way and St Ladoc Road - Drawing CR003; and
- Option 7: Making Charlton one-way between Ashton Way and St Ladoc Road as above, and additionally making a section of St Ladoc Road on the approach to the A4175 Bristol Road one-way only in the northbound direction.

The main constraint to widening the existing footways through the narrow section is the restricted carriageway width. An informal carriageway narrowing option (Option 2) was examined as a balance between maintaining two way vehicle movements and improving pedestrian facilities. However, this option retains only a 4.1m carriageway in the narrowed section to maximise the widening possible to the footways, but this is the absolute minimum width for two cars to pass (MfS - Figure 7.1). In view of this there remains a high risk that this would be treated by many drivers as a priority arrangement but with no signed priority in either direction. As such, it is considered there would remain a high risk of vehicle delay and congestion when compared with the present situation. There is a risk of vehicle over-run to the footways as some drivers seek a greater comfort factor in passage. The slight bend in the carriageway just east of Westbourne Avenue could also present some inter-visibility issues for opposing drivers given the length of the restricted width section shown on Drawing CR004.

Option 5 requires third party land and the demolition of a number of dwellings to enable the widening of Charlton Road through the narrow section and the delivery of improvements to the footways. This is the 'ideal' highway solution but is likely to be very unpopular locally, whilst the costs and challenges associated with the delivery of this option are likely to be prohibitive.

Option 6 considered the effect of making Charlton Road one way in operation between Ashton Way and St Ladoc Road, with Option 7 extending this to include a northbound one-way section in St Ladoc Road on the approach to the A4175 Bristol Road junction. The addition of the latter was to try to reduce conflict at this key junction by taking out the right turn from Bristol Road to St Ladoc Road, enabling a traffic signal controlled junction to replace the mini-roundabout. However, prohibiting this right turn would require re-routing of this traffic via the northern end of the High Street to get to Charlton Road, so increasing conflict in the Town Centre. This would reduce the capacity of the Station Road approach to the roundabout junction with High Road and also the northbound High Street (give-way) approach to the junction with Charlton Road.

The modelling assessment has shown that during the weekday AM peak period the network could accommodate the proposed changes, albeit with potential increases in delay inbound on Bristol Road under Option 6. This impact could be mitigated under Option 7, although delay problems could then be transferred to the A4175 Station Road, due to the additional conflicting volume increase on the inbound Bristol Road entry to the High Street/A4175 roundabout. It should be noted that the effect of either option is likely to lead to much greater use of residential roads to the south of Charlton Road as drivers seek to use either Rock Road or Albert Road/Temple Street to get to town centre car parks or the High Street/Temple Street junction for on-ward journeys to East Keynsham or beyond. In other words, only a proportion of the inbound traffic displaced from Charlton Road would find St Ladoc Road an attractive re-routing alternative.

During the PM peak period, the modelling shows that the impact of the proposed changes on network operation is much more severe, especially under Option 7, with network performance statistics such as mean delay and mean speed showing a significant deterioration compared to the reference case. This is partially due to the higher inbound volumes on the main radial routes into the town centre, including Bristol Road, which carries much of the traffic displaced from Charlton Road eastbound under Option 3 and traffic reassigning from Charlton Road and St Ladoc Road under Option 4.

7.2 Recommendations

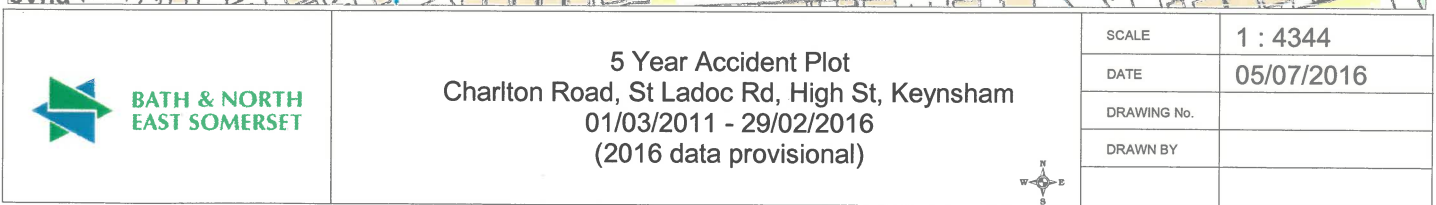
The overall conclusion arising from this work is that third party land would be required to achieve any significant improvement in pedestrian provision through the narrow section on Charlton Road without compromising network capacity (Option 5).

The modelling results obtained from examining options making Charlton Road westbound show significant delay and re-routing impacts, so further consideration is not recommended. Implementing Option 6 or 7 would compromise what resilience is left in the Keynsham town centre network, and would therefore serve no benefit in accommodating Keynsham's future growth. It would in effect make likely network operating conditions worse in the future. It should be noted that this assessment has

been carried out with base-line 2012 flows, whereas traffic within Keynsham Town Centre will experience growth in the coming years due to the build-out of committed and on-going development. Such growth would mean that the impact of the proposed Option 6 and Option 7 changes could be much more severe in future.

Option 2 which examined an informal narrowing of the carriageway to achieve a meaningful length of footway improvement is a best compromise solution deliverable within highway whilst 'just' maintaining passage capability for two cars (4.1m). However, this is the absolute minimum passage width necessary for two cars and there is thus real concern that many car drivers will treat it as a priority 'give-way' arrangement or in some cases seek to 'ride' the footways to pass with a greater level of perceived comfort. The narrowed section shown in Drawing CR004 is quite long in order to deliver a meaningful improvement to the south footway. If this was effectively treated by many drivers as a priority system, this length of restriction would be highly damaging in capacity terms given the two-way existing flows on Charlton which reach 880vph in the weekday evening peak hour. This is not compatible with accommodating Keynsham's future growth, whilst the current accident record does not in our view justify the possible adverse highway operational risk of implementing this option.

Appendix A: Personal Injury Collision Data



Details of Personal Injury Accidents for Period - 01/03/2011 to 29/02/2016 (60) months

Selection: Notes:

Selected using Build Query :

Police Ref.	Day	Location Description	Vehicles				Casualties		
			Veh No	Type	Manv	Dir	Class	Sex	Age / Sev
Road No.	Date								
Grid Ref.	Time								
	D/L								
	R.S.C								
	Weather								
	Speed								
	Account of Accident								

111104755 Friday HIGH STREET AT JUNCTION WITH
05/08/2011 CHARLTON ROAD, KEYNSHAM,
U 1515hrs BRISTOL
(Pre-2011) Daylight: no street lighting
E 365,416 Dry
N 168,707 Fine without high winds
30 mph

VEH1 WAS TRAVELLING SOUTH ALONG KEYNSHAM HIGH STREET WHEN VEH2, TRAVELLING BEHIND VEH1, STRUCK VEH1 IN THE REAR AND THE LEFT THE SCENE FAILING TO STOP.

111105057 Friday CHARLTON ROAD AT JUNCTION
19/08/2011 WITH ST LADOC ROAD, KEYNSHAM,
U 1050hrs BRISTOL
(Pre-2011) Daylight:street lights present
E 364,969 Dry
N 168,411 Fine without high winds
30 mph

V1 TRAVELLING ALONG CHARLTON ROAD HEADING IN THE DIRECTION OF B3116. AS HE WAS PASSING THE JUNCTION TO ST LADOC ROAD V2 PULLED OUT FRONT THE JUNCTION AND HIT THE V2 RIDER OFF HIS MOPED.

111106601 Wednesday B3116 HIGH ST AT JUNCTION WITH
19/10/2011 CHARLTON ROAD, KEYNSHAM,
B 3116 1030hrs BRISTOL
(Pre-2011) Daylight:street lights present
E 365,397 Dry
N 168,698 Fine without high winds
30 mph

V1 TRAVELLING ALONG CHARLTON ROAD TOWARDS THE B3116 HIGH STREET APPEARED TO SLOW OR STOP AT ZEBRA CROSSING AND WHEN IT MOVED AWAY STRUCK PEDESTRIAN WHO HAD WALKED ONTO CROSSING

121201265 Saturday B3116 HIGH ST JUNCTION WITH
25/02/2012 A4175 STATION ROAD, KEYNSHAM,
B 3116 1435hrs BRISTOL
(Pre-2011) Daylight:street lights present
E 365,367 Dry
N 168,838 Fine without high winds
30 mph

CYCLIST V2 WAS TRAVELLING FROM BRISTOL TOWARDS HIGH STREET, KEYNSHAM. AS HE CYCLED ACROSS ROUNDABOUT HE WAS HIT BY V1 CAUSING HIM TO FALL OFF HIS BIKE AS HE LEFT THE ROUNDABOUT.

Details of Personal Injury Accidents for Period - 01/03/2011 to 29/02/2016 (60) months

Selection: Notes:
Selected using Build Query :

Police Ref.	Day	Location Description	Vehicles				Casualties			
			Veh No / Type / Manv / Dir / Class				Sex / Age / Sev			
Road No.	Date									
Grid Ref.	Time									
	D/L									
	R.S.C									
	Weather									
	Speed									
	Account of Accident									

121201299 Wednesday HIGH STREET, KEYNSHAM, BRISTOL Veh 1 Car Turning left S to W Ped F 23 Slight
U 29/02/2012
 1650hrs
 (Pre-2011) Daylight: no street lighting
E 365,415 Dry
N 168,693 Fine without high winds
 30 mph

CASUALTY WAS WALKING ALONG THE PAVEMENT. V1 HAS TURNED LEFT, OFF OF THE HIGH STREET, AND BACK END HAS MOUNTED THE PAVEMENT SLIGHTLY. V1 HAS BRIEFLY MADE CONTACT WITH THE PEDESTRIAN, ALTHOUGH IT IS NOT KNOWN IF THE DRIVER WOULD HAVE BEEN AWARE OF THI
 S. V1 HAS THEN DRIVEN ON.

121206481 Thursday B3116 HIGH STREET, KEYNSHAM, Veh 2 Car Going ahead S to N
B 3116 27/09/2012 BRISTOL Veh 1 Pedal cycle Going ahead N to S Dri M 41 Slight
 0804hrs
 (Pre-2011) Daylight:street lights present
E 365,366 Dry
N 168,835 Fine without high winds
 30 mph

V1 TRAVELLING BRISTOL ROAD, KEYNSHAM TOWARDS HIGH STREET, KEYNSHAM, GOES OVER MINI ROUNDABOUT AND IS STRUCK BY V2 COMING FROM STATION ROAD.

121207342 Thursday HIGH STREET, KEYNSHAM, BRISTOL Veh 1 Taxi Starting S to N Ped M 45 Slight
U 01/11/2012
 1505hrs
 (Pre-2011) Daylight:street lights present
E 365,421 Dry
N 168,662 Unknown
 30 mph

V1 (A TAXI) TRAVELLING IN HEAVY TRAFFIC WHEN HE MOVED FORWARD HE HIT CASUALTY WHO SAW A GAP IN TRAFFIC AND WAS CROSSING ROAD BELIEVING V1 HAD GIVEN A GAP TO CROSS. CASUALTY KNOCKED OVER BY TAXI.

131301320 Tuesday STATION ROAD JUCTION WITH Veh 1 Car Turning right E to N
U 19/02/2012 B3116 HIGH STREET, KEYNEHMA Veh 2 Pedal cycle Going ahead N to S Dri M 32 Slight
 1215hrs
 (Pre-2011) Daylight:street lights present
E 365,366 Dry
N 168,838 Fine without high winds
 30 mph

V1 ON STATION ROAD ABOUT TO GO RIGHT ONTHE ROUNDABOUT AT JUNCTION OF HIGH STREET. V2 WAS COMING FROM BRISTOL ROAD GOING STRAIGHT ON INTO HIGH STREET AND V1 HIT V2

Details of Personal Injury Accidents for Period - 01/03/2011 to 29/02/2016 (60) months

Selection:

Notes:

Selected using Build Query :

Police Ref.	Day	Location Description	Vehicles				Casualties			
			Veh No / Type / Manv / Dir / Class				Sex / Age / Sev			
Road No.	Date									
Grid Ref.	Time									
	D/L									
	R.S.C									
	Weather									
	Speed									
	Account of Accident									

131301975 Thursday A4715 BRISTOL ROAD, KEYNSHAM Veh 1 Car Going ahead W to E Dri M 54 Slight
21/03/2013 Veh 1 Car Going ahead W to E FSP F 63 Slight
A 4175 1305hrs Veh 3 Goods > 7.5t Going ahead E to W
(Pre-2011) Daylight:street lights present Veh 2 Car Going ahead W to E Dri M 35 Slight
E 365,072 Wet/Damp Veh 4 Car Going ahead E to W
N 168,911 Raining without high winds
30 mph

V1 JUMPED A RED LIGHT AND HIT REAR OF V2 IT HAS THEN OVERTAKEN V2 AND SPED UP AND DRIVEN OFF ON THE NEXT BEND IT WAS ON WRONG SIDE OF ROAD OVER DOUBLE WHITE LINE AND HIT THE FRONT OF V3. V1 HAS THEN CONTINUED PAST VEH 3 AND HIT V4.

131303110 Monday B3116 HIGH STREET (OUTSIDE Veh 1 M/C > 125 cc Going ahead N to S Dri M 20 Slight
29/04/2013 KEYNSHAM BAPTIST CHURCH)
B 3116 0715hrs JUNCTION WITH A4175 BRISTOL
(Pre-2011) Daylight:street lights present
E 365,371 Dry
N 168,829 Fine without high winds
30 mph

DUE TO LACK OF EXPERIENCE THE MOTORCYCLE RIDER AS HE APPROACHED STATIC TRAFFIC AND HAS FALLEN OFF HIS BIKE IN DOING SO HE HAS HURT HIS ANKLE.

131305872 Saturday ST. LADOC ROAD AT JUNCTION Veh 1 Car Going ahead S to N FSP M 47 Slight
20/07/2013 WITH ST GEORGE ROAD, Veh 1 Car Going ahead S to N Dri F 60 Serious
U 2018hrs KEYNSHAM, BRISTOL Veh 2 Car Going ahead N to S Dri M 26 Slight
(Pre-2011) Daylight:street lights present
E 364,931 Dry
N 168,500 Fine without high winds
30 mph

V1 IS GOING ALONG ST LADOC ROAD FROM CHARLTON ROAD INTENDING TO TURN LEFT INTO ST GEORGE ROAD. V2 IS TRAVELLING UP ST LADOC ROAD AND FAILS TO NEGOTIATE LEFT HAND BEND AND COLLIDES HEAD ON INTO V1.

131305981 Friday STATION ROAD, AT JUNCTION WITH Veh 1 Car Turning right E to N Dri F 60 Slight
06/09/2013 B3116 BRISTOL ROAD, KEYNSHAM, Veh 1 Car Turning right E to N FSP F 66 Slight
U 1702hrs BRISTOL
(Pre-2011) Daylight: street lighting unknown
E 365,365 Dry
N 168,839 Fine without high winds
30 mph

V1 WAS ON STATION ROAD, KEYNSHAM, TRAVELLING TOWARDS THE ROUNDABOUT AS THE DRIVER PULLED AWAY WAS BLINDED BY THE SUN CAUSING V1 TO COLLIDE WITH THE ROUNDABOUT CAUSING DAMAGE TO THE VEHICLE

Details of Personal Injury Accidents for Period - 01/03/2011 to 29/02/2016 (60) months

Selection: Notes:

Selected using Build Query :

Police Ref.	Day	Location Description	Vehicles				Casualties			
	Date		Veh No	Type	Manv	Dir	Class	Sex	Age	Sev
Road No.	Time									
Grid Ref.	D/L									
	R.S.C									
	Weather									
	Speed									
	Account of Accident									

141402883 Tuesday CULVERS CLOSE OUTSIDE/BY NO.5 Veh 1 Car Reversing N to S Ped M 7 Slight
25/02/2014 OF , KEYNSHAM, BRISTOL
U 2003hrs
Darkness: street lighting unknown
E 365,115 Dry
N 168,781 Fine without high winds
20 mph

V1 REVERSED OUT OF DRIVE OVER CASUALTIES RIGHT ANKLE. MINOR INJURY ONLY

141406345 Thursday ASHTON WAY JUNCTION WITH Veh 1 Car Going ahead SW to NE Ped M 85 Serious
14/08/2014 ASHTON WAY, KEYNSHAM,
U 1233hrs BRISTOL
(Pre-2011) Daylight:street lights present
E 365,343 Wet/Damp
N 168,693 Raining without high winds
20 mph

V1 TURNING RIGHT OUT OF TESCO ENTRANCE ONTO CHARLTON ROAD JUST PRIOR TO THE ROUNDABOUT AT THE JUNCTION WITH ASHTON WAY. INJURED PEDESTRIAN WAS ON THE KERB ON THE TESCO SIDE OF THE ROAD USING AN UMBRELLA DUE TO RAIN FALL. INJURED PARTY HAS STEPPED OUT INTO PATH OF V1 AND COLLIDING

151501255 Monday HIGH STHIGH STREET KEYNSHAM, Veh 1 Car Wait go ahead held W to E Dri F 37 Slight
16/02/2015 BRISTOL Veh 2 Car Going ahead W to E
U 1325hrs
(Pre-2011) Daylight: no street lighting
E 365,413 Wet/Damp
N 168,702 Fine without high winds
30 mph

V1 STOPPED AT THE PEDESTRIAN CROSSING AT THE BOTTOM OF CHARLTON ROAD WITH THE HIGH STREET KEYNSHAM. V1 WAS ALLOWING PEOPLE TO CROSS WHEN V 2 HIT V1 FROM BEHIND.

151501649 Sunday A4175 BRISTOL ROAD, KEYNSHAM, Veh 1 M/C > 125 cc Going ahead W to E Dri M 27 Serious
08/02/2015 BRISTOL Veh 1 M/C > 125 cc Going ahead W to E F 21 Serious
U 0600hrs
Darkness: street lights present and lit
E 365,033 Wet/Damp
N 168,910 Other
30 mph

V1 TRAVELLING ALONG A4175 BRISTOL ROAD FROM DIRECTION OF HICKS GATE ROUNDABOUT. AT ROUNDABOUT V1 LOSES CONTROL AND COLLIDES WITH WALL OF MILWARD LODGE

Details of Personal Injury Accidents for Period - 01/03/2011 to 29/02/2016 (60) months

Selection:

Notes:

Selected using Build Query :

Police Ref.	Day	Location Description	Vehicles				Casualties			
			Veh No	Type	Manv	Dir	Class	Sex	Age	Sev
Road No.	Date									
Grid Ref.	Time									
	D/L									
	R.S.C									
	Weather									
	Speed									
	Account of Accident									

151505045 Thursday B3116 HIGH STREET AT JUNCTION WITH A4175 STATION ROAD, KEYNSHAM, BRISTOL (Pre-2011) Daylight:street lights present
B 3116 25/06/2015 1840hrs
E 365,371 Dry
N 168,832 Fine without high winds
 20 mph

Veh 2 Pedal cycle Going ahead NWto SE Dri M 41 Serious
 Veh 1 Car Starting NE to SW

V1 WAS AT THE JUNCTION WAITING TO PULL OFF. AS ANOTHER VEHICLE WAS COMING AROUND THE ROUNDABOUT SHE PULLED AWAY. AS SHE DID THIS THE CYCLIST V2 CAME ACROSS THE ROUNDABOUT AND COLLIDED WITH THE FRONT OF V1.

151505100 Monday BRISTOL ROAD, KEYNSHAM
U 22/06/2015 1900hrs
E 365,072 Dry
N 168,911 Fine without high winds
 40 mph

Veh 2 Car Stopping W to E Dri M 43 Slight
 Veh 3 Car Stopping W to E FSP F 23 Slight
 Veh 1 Car Stopping W to E

ALL 3 VEHICLES WERE TRAVELLING FROM HICKS GATE ROUNDABOUT TOWARDS KEYNSHAM TOWN CENTRE. V1 SUDDENLY STOPPED DUE TO DRIVER HAVING CRAMP. V2 MANAGED TO STOP WITHOUT IMPACT. V3 IMPACTED WITH REAR OF V2 CAUSING IT TO IMPACT WITH REAR OF V1

151505862 Friday STATION ROAD AT JUNCTION WITH BRISTOL ROAD, KEYNSHAM
U 19/06/2015 0709hrs
E 365,371 Dry
N 168,830 Fine without high winds
 30 mph

Veh 1 Car Turning left E to S
 Veh 2 Pedal cycle Turning right NWto S Dri M 58 Slight

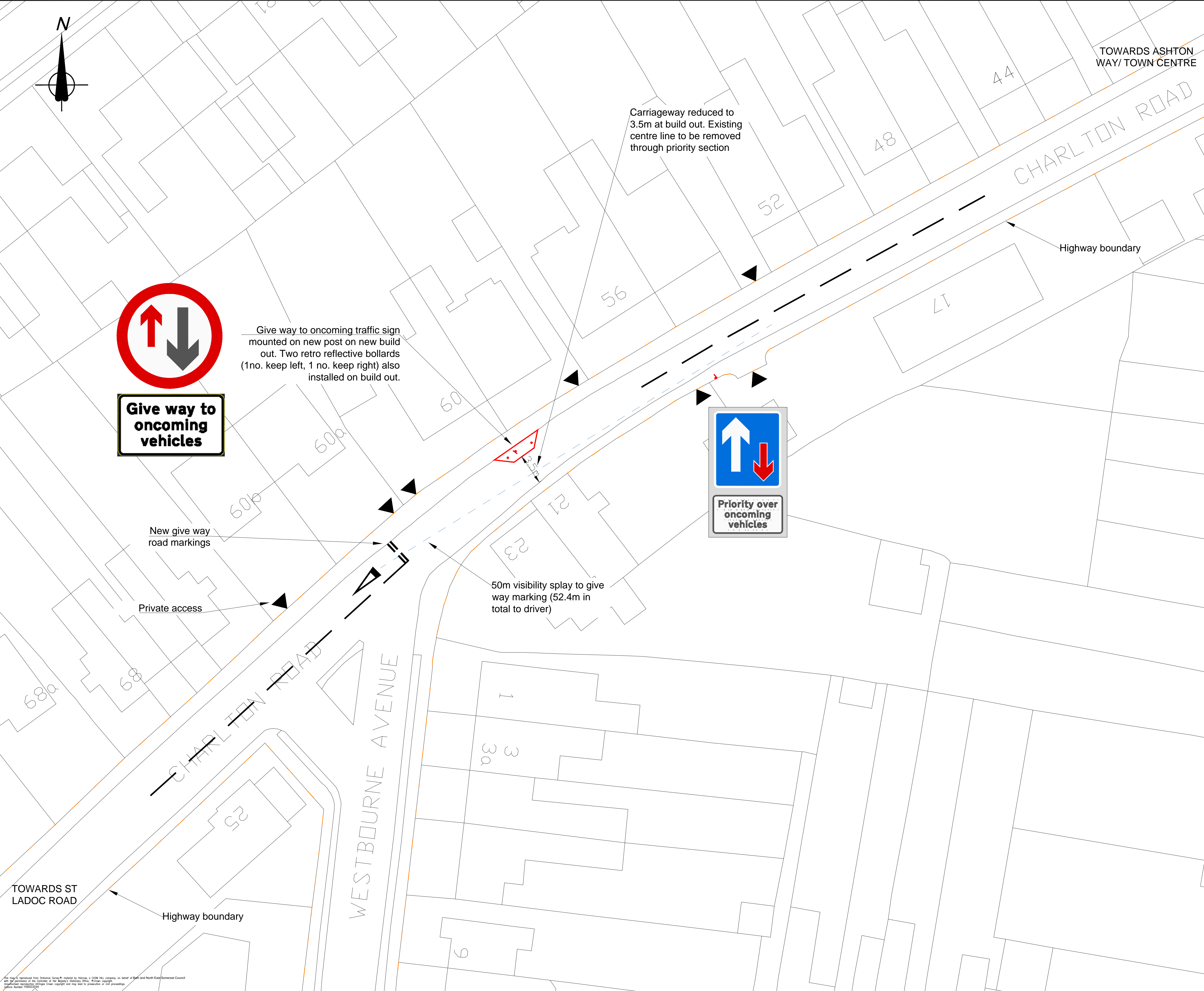
V1 WAS TRAVELLING ALONG STATION ROAD IN THE DIRECTION OF BRISTOL ROAD. AS V1 APPROACHED THE RAB LEADING TO THE HIGH STREET & BRISTOL ROAD, V1 FAILED TO GIVE WAY AND COLLIDED WITH V2 (BIKE).

161600807 Wednesday CHARLTON RD AT JUNCTION WITH , KEYNSHAM, BRISTOL
U 03/02/2016 0740hrs
E 365,413 Dry
N 168,698 Fine without high winds
 20 mph

Veh 2 Car Going ahead W to N
 Veh 1 Pedal cycle Going ahead N to W Dri M 29 Slight

V1 GOING TOWARDS KEYNSHAM HIGH STREET, V2 HIT V1 STRAIGHT ON. V2 COMING FROM BITTON DIRECTION.

Appendix B: Concept Scheme Option Drawings



- Notes
1. All road markings, kerb lines etc. are indicative
 2. Additional gully may be required upstream of new build out
 3. Existing accesses to be maintained

CONCEPT

Rev	By	Chkd	Appvd	Date	Description
-----	----	------	-------	------	-------------

Client

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CH2M
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ch2m.

Project

**Keynsham - Task 8
Charlton Road:
Ashton Way to St Ladoc Road Section**

Drawing

**Option 1
Priority working**

Drawn by : DH Date : 28.07.16

Checked by : AF Date : 29.07.16

Approved by : AF Date : 29.07.16

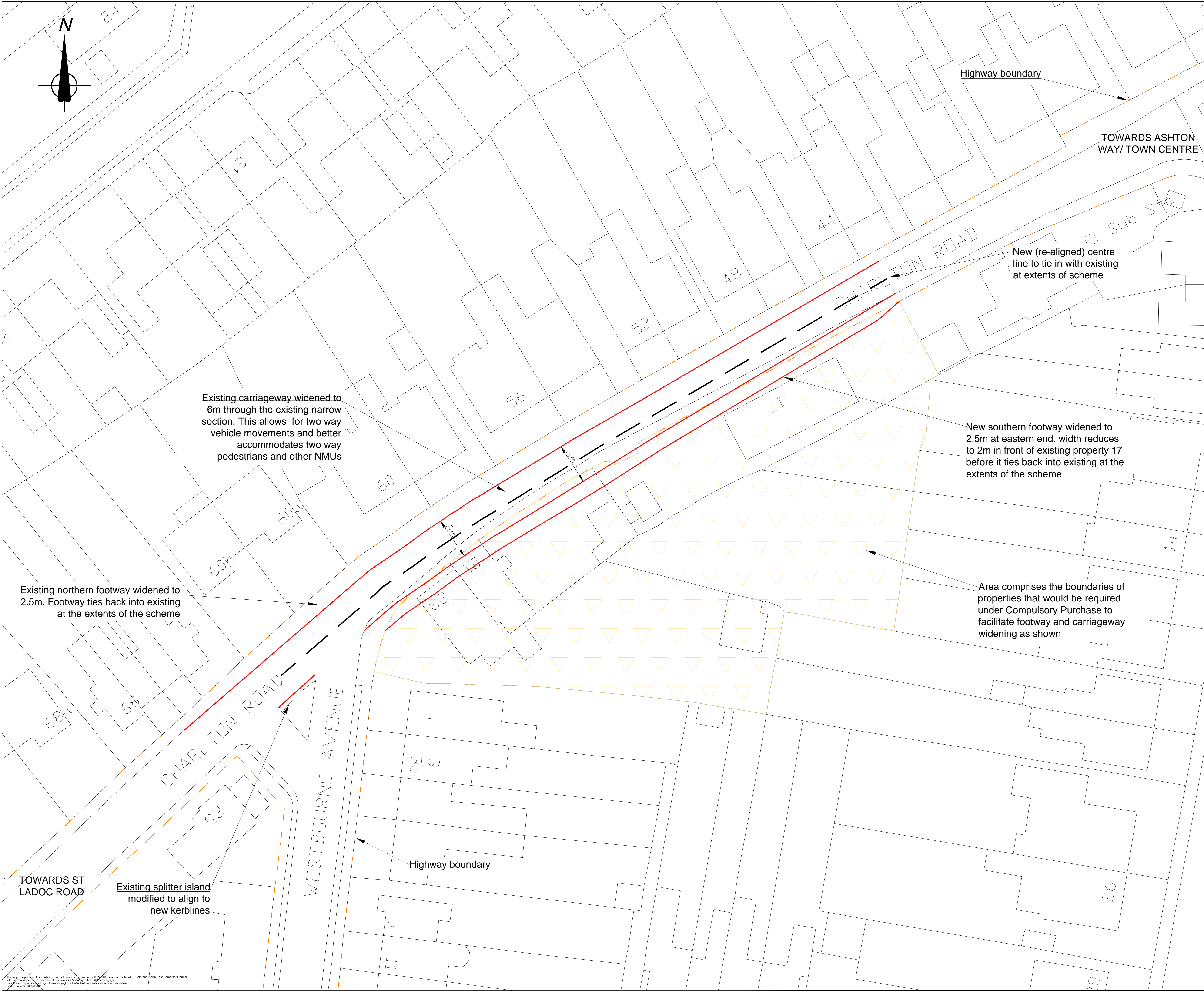
Drawing No.

CR-001

Revision

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Drawing Scale : 1:200 @ A1



- Notes
1. All road markings, kerb lines etc. are indicative
 2. Existing gullies to be relocated to edge of new kerb faces
 3. Existing utility provision to be investigated. Existing utilities in the southern footway may require relocation
 4. Compulsory purchase may result in land remaining behind the proposed carriageway/footway extension.
 5. Existing street lighting provision south of the carriageway to be relocated to rear of new footway
 6. Pedestrian movements could be investigated to aid location of a new dropped kerb/tactile crossing provision at a suitable location. This could potentially increase use of the wider, northern footway, outside this scheme

CONCEPT

Rev	By	Chkd	Apprd	Date	Description
-----	----	------	-------	------	-------------

Client

CH2M
Burdens Park Swindon Wiltshire SN4 0DD
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Project

Keynsham - Task 8
Charlton Road:
Ashton Way to St Ladoc Road Section

Drawing

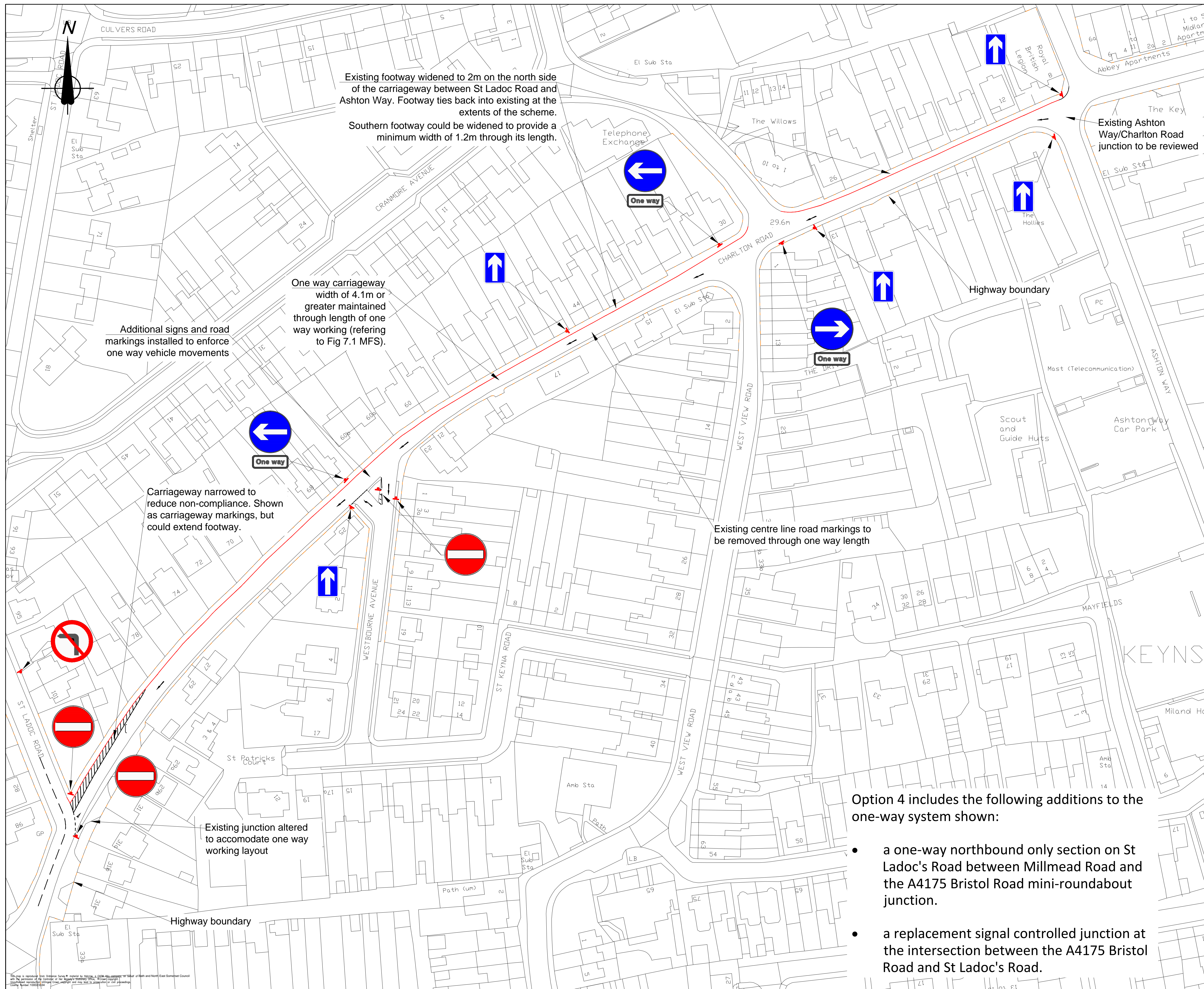
Option 2
Carriageway and Footway Widening
through Compulsory Purchase

Drawn by :	DH	Date :	28.07.16
Checked by :	AF	Date :	29.07.16
Approved by :	AF	Date :	29.07.16

Drawing No.	Revision
CR-002	--

Drawing Scale : 1:250 @ A1

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- Notes
1. All road markings, kerb lines etc. are indicative
 2. Existing gullies to be relocated to edge of new kerb faces
 3. Existing utility provision to be investigated.
 4. Pedestrian movements could be investigated to aid location of a new dropped kerb/tactile crossing provisions at a suitable location. This could potentially increase use of the wider, northern footway, outside this scheme
 5. Existing 'rogue' dropped kerbs to be returned to full height
 6. Existing accesses to be maintained
 7. Existing centre line road markings from Ashton Way to St Ladoc Road to be removed
 8. Existing parking restrictions/bus bays may require amending as part of a one way system

CONCEPT

- Option 4 includes the following additions to the one-way system shown:
- a one-way northbound only section on St Ladoc's Road between Millmead Road and the A4175 Bristol Road mini-roundabout junction.
 - a replacement signal controlled junction at the intersection between the A4175 Bristol Road and St Ladoc's Road.

Rev	By	Chkd	Apprd	Date	Description
Client					
<div><div></div><div>Bath & North East Somerset Council</div></div>					
<div>CH2M</div> <div>Burdenup Park Swindon Wiltshire SN4 0QD Tel +44 (0)1793 812479 Fax +44 (0)1793 812089 www.CH2M.com</div> <div>ch2m:</div>					
Project					
Keynsham - Task 8 Charlton Road: Ashton Way to St Ladoc Road Section					
Drawing					
Options 3 & 4 One way working westbound St Ladoc's Road to Ashton Way					
Drawn by : DH			Date : 28.07.16		
Checked by : DL			Date : 12.08.16		
Approved by : DL			Date : 12.08.16		
Drawing No.				Revision	
CR-003				--	
Drawing Scale : NTS					

