

# *Clowne Transport Study - Addendum*

*FINAL*

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*Prepared for:*

*Derbyshire County Council  
& Bolsover District Council*

*Town Centre  
Connectivity Options*

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## **Appendices**

Appendix A – Supplementary Scheme Design

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# 1 Introduction

This report has been prepared to examine the different options that have been put forward for improving connectivity to / from Clowne town centre and the A616. It is intended as an Addendum to the Clowne Transport Study (AECOM, October 2016).

## 2 Clowne Transport Study

The Clowne Transport Study provided estimates of future traffic flows by identifying the potential traffic generation of the Council's preferred site allocations within the emerging town and adding this to traffic surveys of key junctions. Although the main impact was on connections to / from the town and the M1, the study did find that the proposed new route into Clowne town centre improved highway conditions despite not resolving restricted footway widths on Station Road.

This Addendum builds on the Clowne Transport Study by examining the new link road from the A616 through the existing industrial property towards Clowne town centre in more detail.

## 3 Alternative Proposals Being Considered

An alternative to this new link road has been suggested to the Council through the consultation on the Consultation Draft Local Plan for Bolsover District, this alternative being known as the 'A616-North Road link road'. There is also a previously considered alternative that introduces one-way working on both Station Road and North Road which could be a viable alternative to both new link road schemes.

In addition to the above, an examination of potential supplementary improvements, including the potential to infill the railway cutting, was also requested by Bolsover District Council and this is included in this Addendum.

Figures of the competing schemes are shown later in this report.

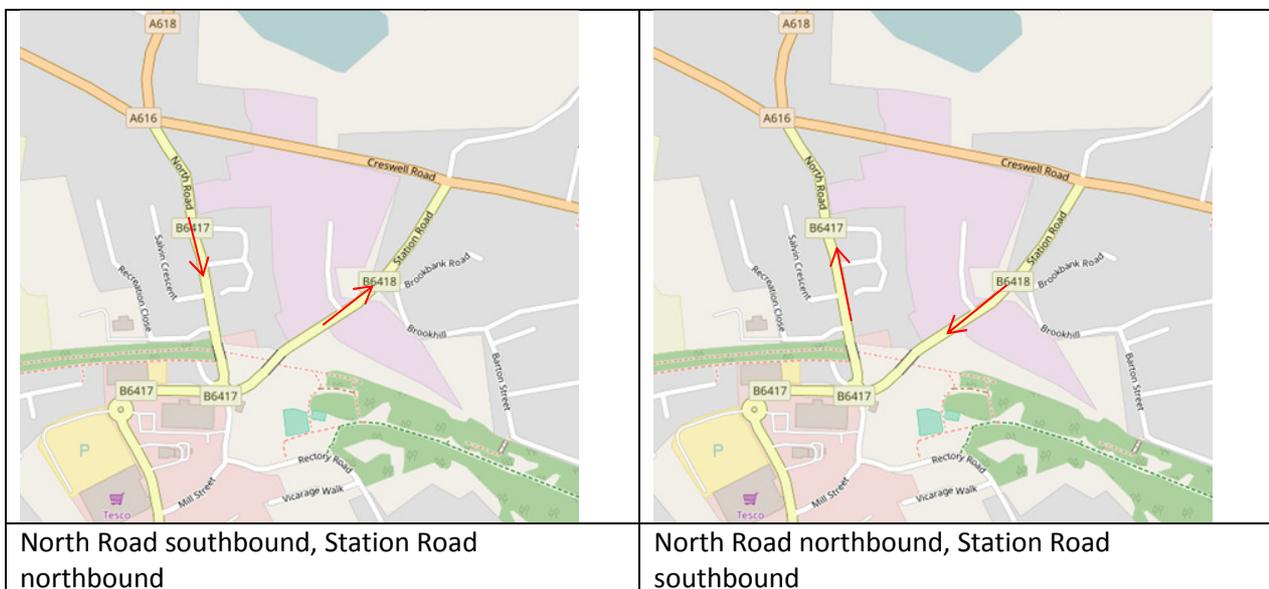
## 4 Schemes providing connection between A616 and Clowne Town Centre

The three competing schemes are:

- North Road – Station Road one-way system (i.e. altering the existing highway network);
- ‘A616 – Station Road Link Road’ scheme (providing a new road between the A616 and Station Road, known as the URS scheme); and
- ‘A616 – North Road Link Road’ scheme (providing a new road between A616 and North Road).

**North Road – Station Road one-way system:** Such a scheme could work in two ways, these being the different directions of traffic flow that could be imposed on North Road and Station Road.

**Figure 1:** Options for North Road – Station Road one-way system



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### Restrictions

North Road made southbound only, & Station Road made northbound only

### Summary of Impact

North Road made southbound only would reduce traffic entering the A616 / A618 / North Road junction. This traffic runs currently in the same stage as the A618, which carries less traffic, and therefore there would be a moderate saving in green time for at least one stage with this scheme.

More traffic would, however, be added onto the Station Road minor arm turning onto the A616. Visibility from this junction is poor, and additional traffic is likely to require a larger junction (and land acquisition).

There is industrial land served by Station Road – traffic from this land would be re-directed closer to the town centre with the scheme in place. More traffic would also be required to use the Station Road / North Road roundabout with this scheme.

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North Road made northbound only, &  
Station Road made southbound only

Some trips would be removed from A616 / A618 / North Road junction, being A616 traffic turning left into North Road, which would instead turn left at Station Road. However, this is already a very small movement as it is likely to be already occurring. Capacity impact is therefore negligible. (Note: traffic turning right onto North Road from A616 would still route through the junction – to Station Road) and therefore this restriction would not lead to any capacity improvement).

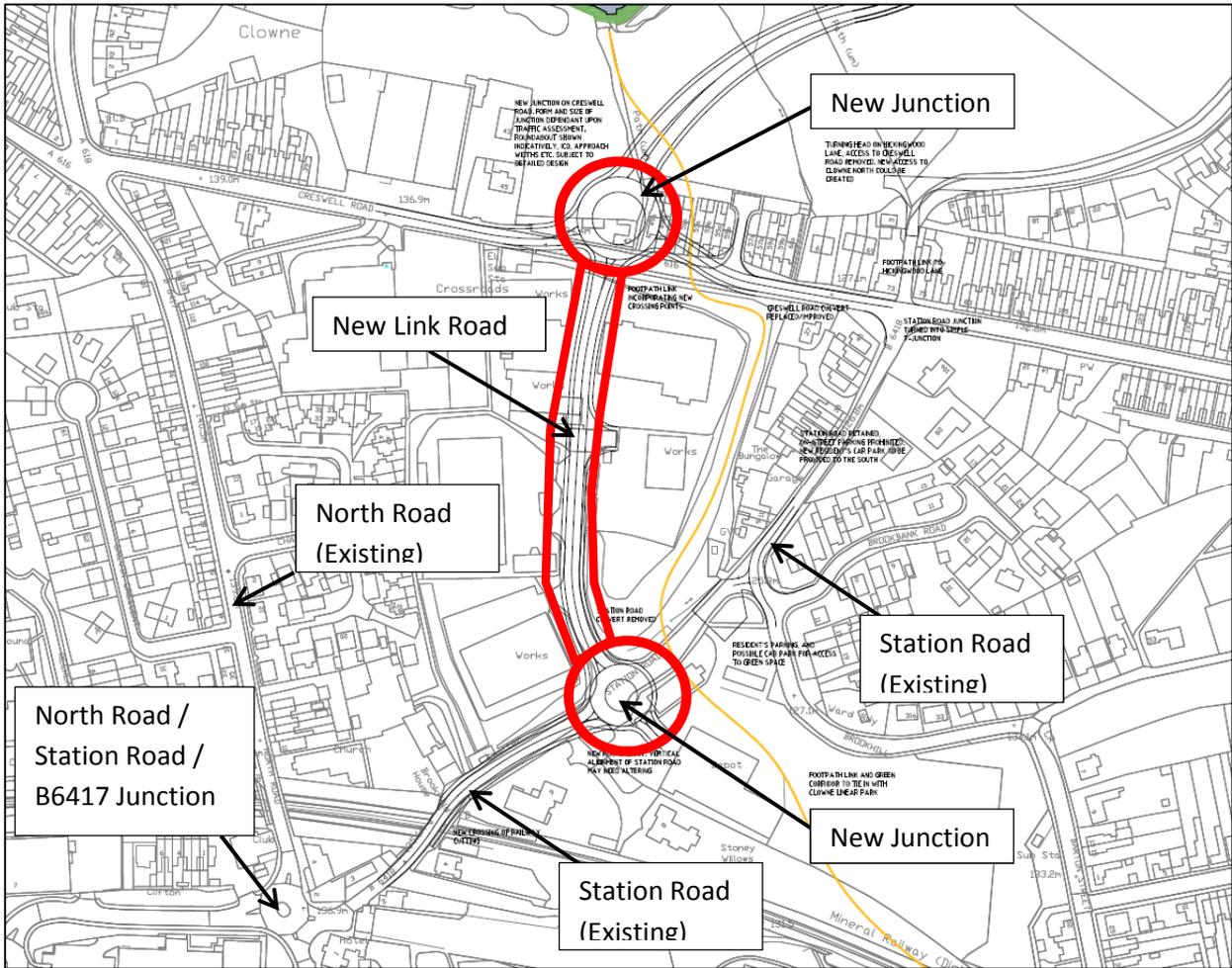
Increased traffic turning right into Station Road would likely lead to localised queuing as there is no right-turn harbourage on the A616 to accommodate this movement. A larger junction, involving land acquisition, would be required.

As already noted, there is industrial land served by Station Road – traffic from this land would be re-directed closer to the town centre with the scheme in place. More traffic would also be required to use the Station Road / North Road roundabout with this one-way scheme.

Given the above, it is not considered that a one-way system would be feasible, nor would it generate the capacity improvements required to create a high-quality link between the A616 and Clowne town centre, particularly given the forecast increase in traffic flow from proposed Local Plan development.

**A616 - Station Road Link Road (URS Scheme):** This scheme was prepared as part of the proposed Clowne Garden Village on behalf of the developer, Waystone, bearing in mind land constraints known at that time. It seeks to overcome the difficulties at the junctions of the A616 / North Road and A616 / Station Road by providing a new route from the proposed garden village development to the town centre, and involves the bisection of Station Road (so acting as an effective replacement of the northern section of North Road). The disadvantage is that it does not in itself provide improvements to footway widths south of the point where the route connects back onto Station Road (over the bridge).

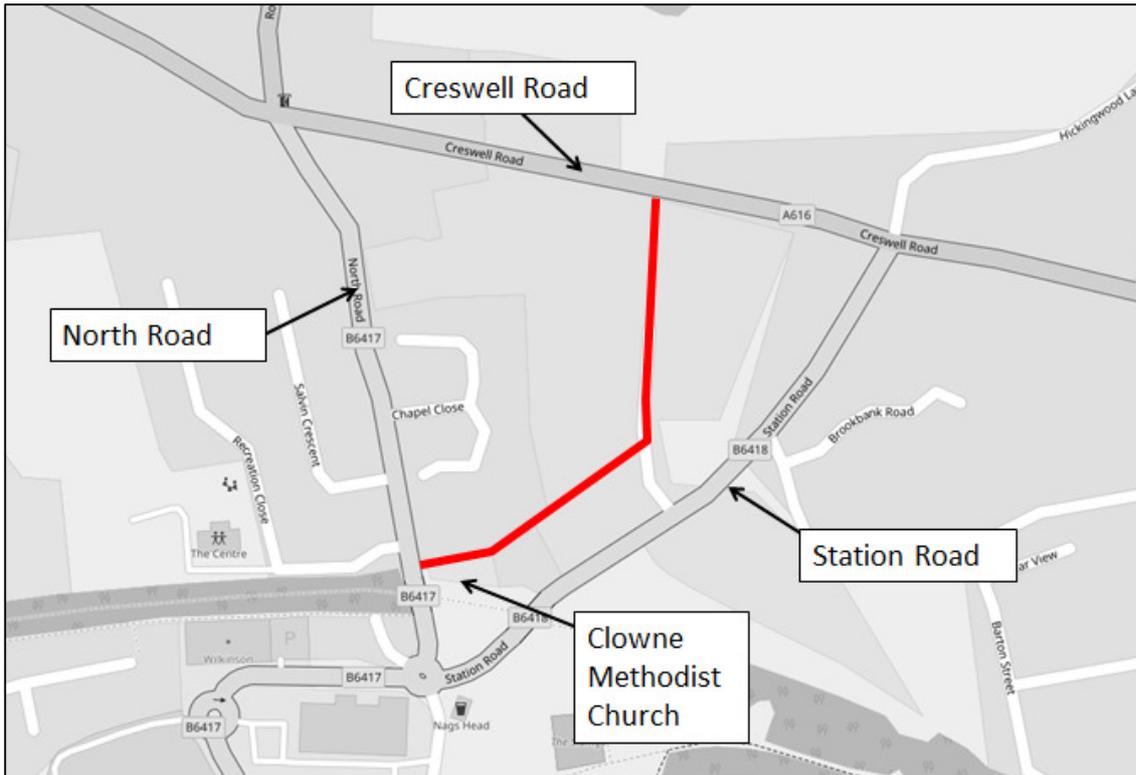
**Figure 2: URS Scheme (providing a new road between the A616 and Station Road)**



**A616 - North Road Link Road:** This link road would meet North Road at a priority junction to the north of the Clowne Methodist Church. The priority junction would lie approximately opposite the existing Recreation Close junction.

Comparison of the 'A616 – Station Road' and 'A616 – North Road' link roads are given below.

**Figure 3:** Proposed North Road link Road ('A616 – North Road' Scheme)



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**Comparison of the URS and 'A616 – North Road' Schemes:**

*Pedestrian Access:* The advantage of the 'A616 – North Road' Scheme is that it diverts pedestrians away from the pinch point at the Station Business Centre, Station Road. This pinch point forces pedestrians (particularly wheelchair users and those with pushchairs) to use the road and as such limits continued sustainable access to / from the town centre.

*Public Transport Access / Routeing:* North Road is a more established bus route than Station Road, with a greater number of services offering higher frequency. Both the URS and the 'A616 – North Road' scheme would allow the service 77 to divert from its current route, generating time savings.

*Junction analysis:* A Manual Classified Count (MCC) was conducted at the North Road / Station Road / B6417 junction on 4th July 2017. The turning count data was used to conduct an ARCADY analysis of the North Road / Station Road / B6417 junction.

The output of the ARCADY analysis is shown in Table 1, which includes traffic associated with the Clowne Garden Village development. Table 1 shows the output results for the worst arm of the junction only.

**Table 1:** ARCADY output – Station Road / North Road junction

Scenario	AM Peak (0800-0900)		PM Peak (1700-1800)	
	Worst RFC	2 <sup>nd</sup> Worst RFC	Worst RFC	2 <sup>nd</sup> Worst RFC
URS Scheme	0.92	0.69	1.12	0.92
A616 – North Road	0.92	0.73	1.12	1.08

ARCADY software is recommended by the Department for Transport (DfT) for the assessment of roundabout junctions. The ARCADY model has been run using a synthesised profile and provides outputs in the form of Ratios of Flow to Capacity (RFC) and queue length (Q). A synthesised profile includes a 12.5% mid-peak ‘surge’ to robustly test the performance of the junction. For a new roundabout, a worst-arm target RFC value of 0.85 during a single time segment is preferred as this minimises the chance that queuing will occur at a new junction on opening. For existing junctions, RFC values above 0.85 are likely to produce queues which increase slowly. Above an RFC value of 1.0, a junction is more than likely to be at capacity (with resulting larger increases in queue length).

Table 1 indicates minimal difference between the two schemes at the Station Road / North Road roundabout, albeit the URS scheme does operate more satisfactorily as a whole. Both tests indicate some mitigation is required at this junction.

The URS scheme includes for the bi-section of Station Road so that the existing Station Road effectively becomes a cul-de-sac. For the ‘A616 – North Road’ Scheme, the options could either be to provide a priority junction, or also to bisect North Road (in the same way as is proposed for Station Road). The disadvantage of bi-section is that it would transfer some traffic from the North Road arm (of the signalled junction with the A616) to the A616 (east) arm and, as the latter runs in its own stage this would increase the amount of green time required by this arm. As the North Road arm runs in the same stage at the A618, then this reduction of traffic would not lead to a significant reduction in its stage, thus likely decreasing the overall performance of the junction.

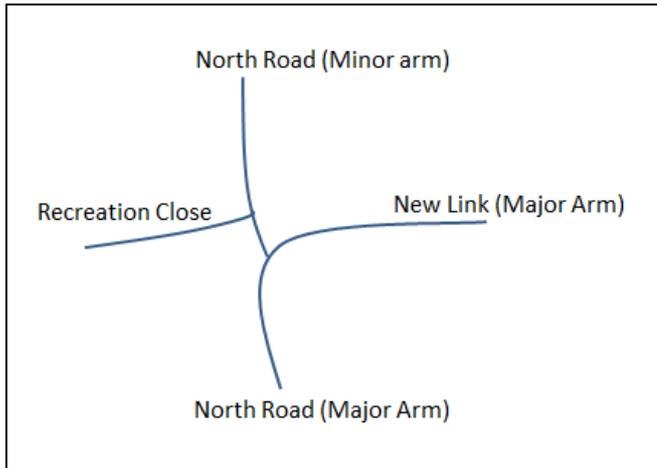
If North Road is not bi-sectioned, then a priority junction would be required. A PICADY model has been developed of the junction and it would operate as shown in Table 2. PICADY is software recommended by the DfT for the assessment of priority junctions, including priority T-junctions. The results of PICADY model are presented in the same way as ARCADY model outputs, described above.

**Table 2:** PICADY output – Station Road / North Road junction – Worst RFC Only

Scenario	AM Peak (0800-0900)		PM Peak (1700-1800)	
	RFC	Q	RFC	Q
A616 – North Road	0.23	0.30	0.27	0.37

From Table 2, the performance of the model is satisfactory, albeit there would be marginally more delay than the Station Road option given the introduction of the new junction. In highway design terms, it would also create a crossroads (or staggered crossroads) with Recreation Close. Current highway standards seek to discourage the creation of such crossroads on road safety grounds, although an alternative arrangement could perhaps be created whereby North Road (north of the new link) becomes the minor arm, with Recreation Close joining in as per Figure 4, subject to detailed design.

**Figure 4:** Potential Junction Arrangement at North Road (A616 – North Road link road scheme)



**Table 3:** Scheme Comparison

Component	URS Scheme	A616 – North Road
Pedestrian Access	Station Road constraints remain	Better route, if Station Road constraints cannot be overcome.
Public Transport Access	Equal	
Junction Performance	Marginally better performance	Marginally worse performance
Geometric Feasibility	Feasible, with designs available	To be determined

## 5 Supplementary Improvements

In addition to the above schemes providing connection between the A616 and Clowne town centre, the following areas of focus to highway safety and urban design improvement were also specified:

- Land around the North Road / Station Road junction;
- North Road footpaths;
- Station Road footpaths;
- A616 / Station Road link road; and
- Railway cutting between Station Road and North Road.

A site visit was conducted by AECOM staff in August 2017 which also identified a further scheme for consideration.

**Land around North Road / Station Road Junction:** The proposed link road follows the route of the existing Station Road terminating at the existing 4 arm roundabout at the intersection of the B6417 and North Road. The link is bounded by commercial properties to either side at this junction. Close to the junction the existing footways have pinchpoints restricted by existing property and kerbline positions, with widths down to 0.5m.

To the north side of the link is a café with evidence of on street seating, as the footway does not continue along Station Road, this does not currently cause an obstruction to pedestrian flow. The provision of existing properties currently makes provision of suitable shared footway/cycleway

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through this section impossible without realignment of the road and / or removal of existing properties.

At the junction, to the south of the link, an existing Public House may result in conflict between cyclists and pedestrians on a minimum width shared facility. The position of properties at the junction, combined with the current footway and carriageway alignment restricts visibility for pedestrians crossing the Station Road carriageway.

**North Road footpaths:** Moving north from the roundabout, North Road is, up to the point that it crosses the redundant railway cutting, bounded by both commercial and residential properties to the East and the Liberal Club to the West. Footway widths between the roundabout and the railway are narrow and any improvement in the widths that could be provided would be extremely limited.

**Station Road footpaths:** Moving East from the existing North Road/Station Road roundabout there is currently a narrow pinch-point in the carriageway, with footway widths down to 0.5m on the south side of the carriageway. To the north of the carriageway existing property boundary walls abut tight to the edge of carriageway with only a white line providing a 300mm stand-off between carriageway and boundary walls. There is no footway provision to the north side of the carriageway. The boundary walls to the north side of the road restrict forward visibility at a number of points along Station Road.

**A616 – Station Road Link Road:** This area of focus looks at the stretch of link road through the industrial estate. Whilst this is all new and so no site observations are possible, given the availability of land, such a link road should be able to be provided to local highway standards, including shared use footway / cycleway provision.

**Railway cutting between Station Road and North Road:** There were no levels available on the CAD drawings used for this Addendum but, from our site visit, the depth of the cutting seems to be around 6m. The construction would require site clearance and backfill. There are some unknowns – ground conditions, land ownership etc, – which would need to be assessed at the point of a detailed design. On the basis that trains ran along this section at one time, we would suggest that stability of the existing ground is fairly good. However, as there are properties to either side of the cutting, this would need to be confirmed by geotechnical testing and assessment, both for stability during excavation, and placement / compaction of backfill.

Access to the site is not ideal and may require restrictions on Station Road to allow access, but the area of land between numbers 2B and 4 Station Road already runs from road level down to the former railway level. Disruption to the existing road network during removal of the existing rail bridges and backfill and construction of the new carriageway are likely to require road closures for significant durations.

As such, to enable any infilling of the cutting:

- Geotechnical testing and assessment should be undertaken to determine the underlying ground conditions and stability.
- Access would appear to be possible between properties 2B and 4 Station Road, whilst this is not ideal, there does not appear to be an obvious viable alternative.
- There would be a significant number of vehicle movements required to both import backfill material and export waste from any clearance operations, so this could result in significant congestion and disruption around the North Road junction.
- Both North Road and Station Road would need to be closed at a point in the construction to allow demolition and backfill to road level.
- The area is currently vegetated along both cutting faces which would require clearance prior to backfilling of the cutting.
- The length of the link is around 90m, so allowing for verges and footways, we would initially assume an infill length of 100m, with ramps back down to the original track level.
- Allowing for a cutting width of 4m in the base and 12m at the crest, running between Station Road and North Road, and with 1:10 ramps at either end, it is assumed that a volume of around 8,000m<sup>3</sup> of backfill would be required.

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**Further scheme for consideration:** Drawing BCCL-AEC-XX-XX-DR-CE-02200 indicates the proposals described in Option 1 below.

Constraints to the existing highway boundary along Station Road result in there being insufficient width available to provide both carriageway and suitable footway/cycleway facilities, without the removal of a number of properties. Properties 2A & 2B Station Road, adjacent to the existing carriageway/footway pinch-point on the south side of the link are in the ownership of the Local Authority. It has been indicated by Bolsover Council that these properties could be removed, however a number of the other properties along Station Road appear to be in private ownership, limiting other options for improvements.

**Option 1 – One Way System:** Under this option it is proposed that the section of link road from the redundant railway to the North Road roundabout is made one-way in the westerly direction, allowing the provision of an adjacent shared 3m wide footway/ cycleway facilities in line with the 6C's design guide. The existing roundabout would be enlarged to improve the alignment from the link road onto the junction, with some hatching of the junction area, similar to the existing arrangement, to reduce the apparent carriageway width, and providing a swept path over-run for larger vehicles. Vehicles wishing to travel East along Station Road, would use the new link carriageway from North Road along the line of the former railway, to join the Station Road carriageway.

A new 'T' junction would be constructed at the point where the redundant railway crosses North Road. This would allow vehicles to travel from North Road to join Station Road at a point beyond the existing railway bridge position.

Properties 2A & 2B adjacent to the carriageway/footway pinch-point on the south side of the link are in the ownership of the Local Authority. It has been indicated that these could be removed to provide improved alignment for Station Road, and provide additional width for footway/cycleway facilities. Given that future proposed developments to the north of improvements in alignment and forward visibility would be beneficial.

The construction of the North Road – Station Road link and removal of the existing bridge over the former railway, would allow improvements to be made to both the horizontal and vertical alignment of the carriageway at this location. This will improve carriageway and pedestrian/cycle facility widths, and increase forward visibility along the link. With the one-way link into the existing North Road roundabout, the removal of the eastbound lane allows the Station Road link carriageway alignment to be improved within the extents of the existing highway. The re-alignment also allowing provision of shared pedestrian/cyclist facilities in line with 6C's design guidance. To the East of the redundant railway, the alignment would tie-in to that previously indicated under the URS Scheme.

The benefit of this proposal is that the carriageway alignment can be revised to improve forward visibility whilst providing pedestrian and cyclist facilities on the more direct route to the town centre.

**Option 1a** – Alternatively, Station Road could remain 'as is' and the raising of the cutting as described in Option 1 could be used to provide an alternative (albeit longer) pedestrian / cycle route to the town centre which avoids the narrow footways of Station Road.

**Option 2 – Footway/Cycleway Link:** Properties 2A & 2B in the ownership of the Local Authority, adjacent to the carriageway/footway pinchpoint on the south side of the link, would again be removed to provide improved alignment for the link road carriageway. Footway facilities between the redundant railway and the North Road junction are provided at minimum footway only width of 1.2m, primarily to serve the existing properties along this section of carriageway. No off-carriageway cycle facilities are proposed through this section. An 'at-grade' carriageway crossing would be provided on the line of the redundant railway, with a level footway/cycleway link between Station Road and North Road.

At-grade crossing points would be required at either end of the North Road/Station Road link, where it joins the existing carriageways. This would allow pedestrians and cyclists to safely cross North Road and Station Road.

With a continued two-way link into the existing North Road roundabout, only minor improvements to the carriageway alignment could be achieved along Station Road. To the East of the redundant railway, the alignment would tie-in to that previously indicated under the URS Scheme. The existing rail bridge and adjacent footway bridge would be removed, providing benefits to the horizontal and vertical alignment.

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The benefit of this proposal is that vehicular traffic is all taken via the existing roundabout location. The main footway/cycleway link would be via a proposed North Road/Station Road link, however as the existing footway facilities at North Road are fairly narrow and would not be suitable for providing shared footway/cycleway facilities linking back towards the town centre.

## 6 Conclusions

This Addendum has examined several options to better connect Clowne town centre to the A616, in particular by comparing a scheme designed by URS with an option provided by Bolsover District Council (known as the 'A616 – North Road link road' scheme). It is concluded that these two competing schemes are very similar, although the URS scheme has been design in more detail. In addition, further technical work has been conducted to examine the constraints imposed by highway widths, particularly on Station Road near the Station Road / North Road junction.

From the site visit, removal of the existing Local Authority owned properties 2A & 2B Station Road, would allow for improvement in the alignment of the carriageway, but would still not provide sufficient space for both carriageway and shared footway/cycleway facilities.

Option 1 would provide an additional carriageway link between North Road and Station Road to allow operation of a mini one-way system, and permit improvements in the alignment of both Station Road and the North Road roundabout junction. This option allows provision of acceptable standard footway/cycleway facilities on the 'desire line' route to the town centre and existing signalised pedestrian crossing on North Road. An alternative would be to raise the cutting but keep this for pedestrians / cyclists only – thereby providing a longer route but one to a much higher standard. This variant of Option 1 (Option 1a) would be less disruptive to traffic).

The Option 2 proposal, whilst feasible, is at odds with some of the guidance within the 6C's design guide. The guide indicates that footway/cycleway routes separate to carriageways are not normally encouraged, with the provision of a separate route being justified by only providing a more direct link to local facilities. Thus Option 2 provides a pedestrian/cycle link between Station Road and North Road which is not overlooked and does not provide a more direct link to facilities, and therefore does not meet the guidance and may become an area for crime and/ or anti-social behaviour. Footway widths on North Road and beyond are limited and would require additional land in order to provide an acceptable connection to existing facilities.

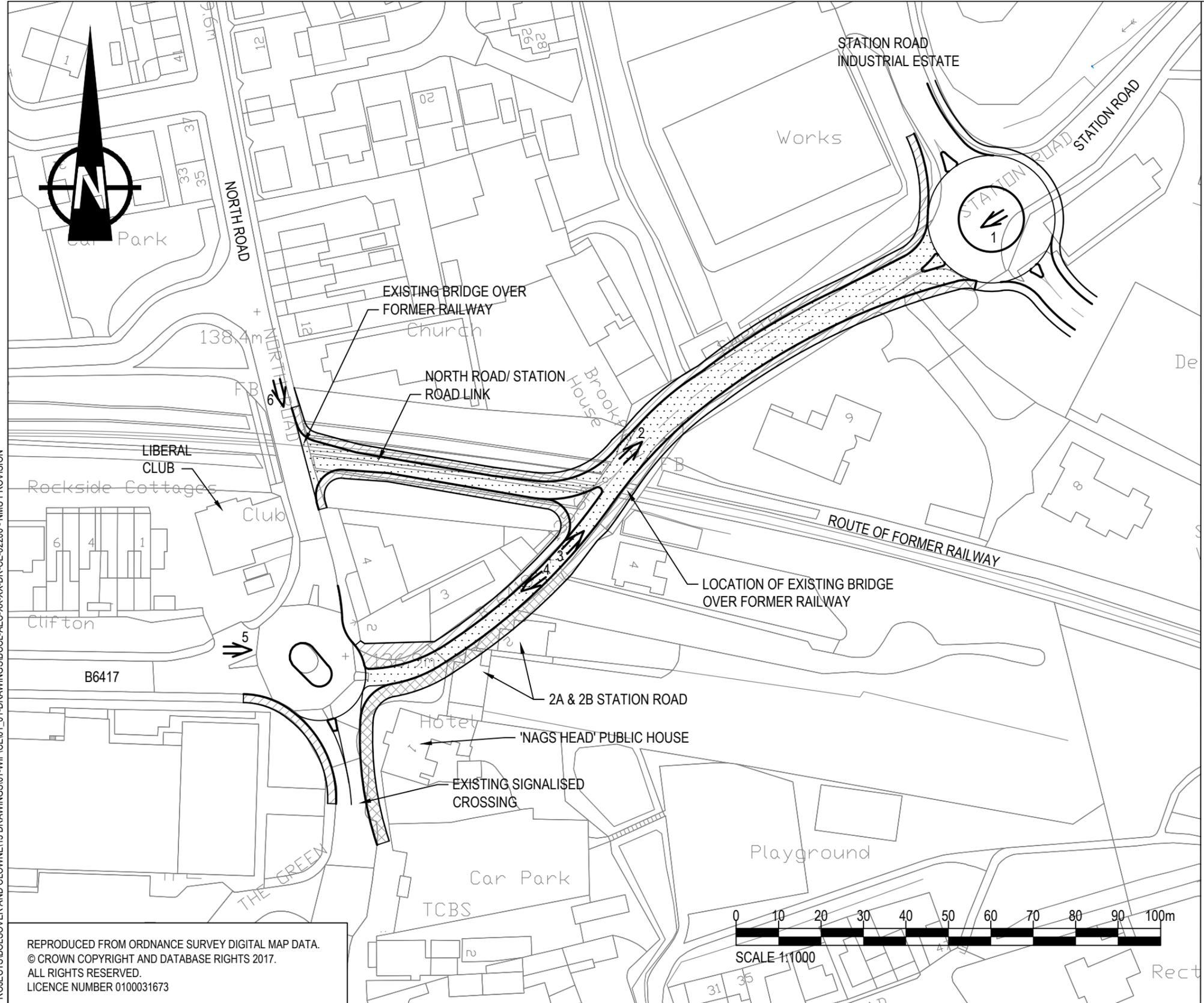
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APPENDICES

**Attachment A**

**Supplementary Scheme Design**

Plot Date : 31 August 2017 15:21:48  
 File Name : K:\PROMOTIONAL PROJECTS\BOLSOVER AND CLOWNE\13 DRAWINGS\01-WIP\CE01\_01-DRAWINGS\BCCL-AEC-XX-XX-DR-CE-02200 - NNU PROVISION



**NOTES**

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.
2. PROPOSED ALIGNMENT BASED SCOTT WILSON DRAWING D136060 - PLAN 3.
3. LAYOUT BASED ON ORDNANCE SURVEY DIGITAL MAP DATA.

**KEY**

- CARRIAGEWAY
- FOOTWAY
- COMBINED FOOTWAY/ CYCLEWAY
- LOCATION OF PHOTOGRAPHS

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<p>Project Title</p> <p style="text-align: center;"><b>CLOWNE IMPROVEMENTS</b></p>	<p>Drawing Title</p> <p style="text-align: center;"><b>CLOWNE TOWN CENTRE PROPOSED PEDESTRIAN AND CYCLIST IMPROVEMENTS</b></p>	<p>Purpose of issue</p> <p style="text-align: center;"><b>FOR COMMENT</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>Designed SS</td> <td>Drawn SS</td> <td>Checked GH</td> <td>Approved GH</td> <td>Date 31/08/17</td> </tr> <tr> <td colspan="2">AECOM Internal Project No. 60550192</td> <td colspan="3">Suitability -</td> </tr> <tr> <td colspan="2">Scale @ A3 1:1000</td> <td colspan="3">Zone / Mileage -</td> </tr> </table>	Designed SS	Drawn SS	Checked GH	Approved GH	Date 31/08/17	AECOM Internal Project No. 60550192		Suitability -			Scale @ A3 1:1000		Zone / Mileage -			<p>THIS DOCUMENT HAS BEEN PREPARED PURSUANT TO AND SUBJECT TO THE TERMS OF AECOM' APPOINTMENT BY ITS CLIENT. AECOM ACCEPTS NO LIABILITY FOR ANY USE OF THIS DOCUMENT OTHER THAN BY ITS ORIGINAL CLIENT OR FOLLOWING AECOM' EXPRESS AGREEMENT TO SUCH USE, AND ONLY FOR THE PURPOSES FOR WHICH IT WAS PREPARED AND PROVIDED.</p>	<p><b>AECOM</b>  <small>Royal Court, Basil Close          Chesterfield          Derbyshire. S41 7SL          Telephone: (01246) 209221          Fax: (01246) 209229          www.aecom.com</small></p>
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