

PART 2 : ALTERNATIVES CONSIDERED

2.1 Introduction

- 2.1.1 As mentioned in Section 1 Part 2 there have been various schemes to improve the A453 between the M1 motorway and Nottingham since proposals were added to the National Trunk programme in 1983. Prior to the Multi-Modal Study (MMS) undertaken between 1997 – 2002, several routes had been assessed including bypass options to the north and south of Clifton. At the start of the MMS the preferred route was online widening to dual carriageway standard including the urban section through Clifton.
- 2.1.2 The recommendation within the Multi Modal Study was for essentially an on-line dual carriageway improvement (but with a slight off-line deviation to the south between Thrumpton and Barton in Fabis to straighten out the existing bend in the road) and with a single 4-lane carriageway with an anticipated 30mph speed limit through Clifton from Crusader Roundabout to Farnborough Road Junction.
- 2.1.3 During preliminary scheme design in 2006, traffic modelling and environmental assessment was undertaken which led to the consideration of a number of options for the layout of junctions and the route of the new road, in particular in relation to the section between Barton Lane and Crusader Roundabout.

2.2 Development and Assessment of the Offline Route

- 2.2.1 As the road design developed during 2006 and 2007 a number of design difficulties became apparent, in particular in the section between Barton Lane and Crusader Roundabout. These are summarised below:
- There would be a considerable excess of material (up to 150,000m³) that would require removal to another part of the scheme or away from the scheme entirely, thus increasing lorry movements (up to an additional 10,000 Heavy Goods Vehicle movements);
 - Access to Fox Covert Lane (serving Burrows Farm, 20 other properties and a hydro-electric power station) was problematic, mainly on safety grounds in that access would be on to a dual carriageway;
 - The method of building this section of road, including impact on road users and phasing of the Works was problematic due to the need to cross over from widening on the south side to the north side (topography and levels difference between the existing and new roads meant this could only occur near Barton Lodge or Clifton, both locations with environmental impacts). Widening to the north would mean additional land take of up to 55m, whilst diversion to Crusader Roundabout via Barton Lane and Clifton Lane would require the upgrading of Barton Lane and would create environmental

impacts during construction, in particular increased traffic noise and air pollution;

- The dual carriageway approach to Crusader Roundabout would require the removal of the existing noise mound and vegetation on the northern side of the A453, opening up noise and views of the road to properties on Thymus Walk, Linden Avenue, Arbutus Close and Pieris Drive in particular.;
- Although the speed limit on the dual carriageway approach to Crusader Roundabout could be reduced to 40mph it is anticipated that this may not be observed at the end of a long unimpeded 70mph section of dual carriageway, and would be difficult to police;
- Initial proposals for the Barton Lane junction had adverse environmental implications, in particular the demolition of Keepers Cottage, impact on protected species and loss of mature vegetation within a Mature Landscape Area (Burrows Farm MLA, a local County Council landscape designation);
- Access to Barton in Fabis was problematic due to the lack of slip roads from the proposed diverted Barton Lane beneath the A453, and the consequence that most traffic into / out of the village would travel through Thrumpton;
- Future provision of access to the proposed NET Park & Ride Site south of Clifton was problematic due to the need to allow appropriate visibility at a junction with the A453, limiting acceptable locations each with environmental and buildability concerns;
- Provision of a continuous route for cyclists and pedestrians from Clifton to Kegworth, to meet the scheme brief, was problematic, in that the often competing expectations of different non-motorised user groups would be difficult to meet with on-line widening;
- The traffic forecasts (later revised – see Section 2.3) indicated that there would be significant capacity problems at the A453/Green Lane junction in Clifton during the morning and evening peak hours, unless a right turn was provided before Crusader Roundabout;
- A significant oak tree immediately north of the existing A453 carriageway between Barton Lane and Fox Covert Lane, the focus of campaigns against earlier road improvement schemes, would be put at risk of damage or removal by the need to widen on the north side. The tree is protected with a Tree Preservation Order (TPO).

2.2.2 As a result of the difficulties identified with the scheme proposals, a decision was made in January 2007 to consider in detail an offline route between Thrumpton and Clifton. Further value engineering was undertaken which included consideration of the following issues:

- Scheme cost (including consideration of scheme budget, cost of diverting utilities such as electricity cables, and cost of land);
- Impact on the Government's five key objectives for transport (environment, safety, economy, accessibility and integration, taking into consideration scheme objectives);
- Whole life cost (including costs of maintenance over the life of a structure);
- Defects (the impact / likelihood of defects during construction and operation);
- Programme (issues that may affect the timing of the Works and the overall programme);
- Service (impact on interested parties / stakeholders and consideration of best practice, creativity and innovation, buildability, short-term environmental impact, quality and standards);
- Safety (to the public and operatives, taking into account best practice to reduce road traffic accidents and environmental incidents);
- Risk / Opportunity (consideration of whether risks or opportunities would be improved or reduced, for example environmental opportunities).

2.2.3 With regard to the environmental status / sensitivity of this section of the route, the following factors were taken into account:

- Any offline route would pass through the Nottingham – Derby Green Belt;
- Any works at the Barton Lane junction are likely to affect the Burrows Farm Mature Landscape Area;
- The mature oak tree immediately north of the existing A453 carriageway between Barton Lane and Fox Covert Lane is protected by a Tree Preservation Order and is locally important. An arboricultural survey of the tree in November 2006 confirmed its health and stability and recommended a protection area around the tree of approximately 11m – 14m;
- The landscape comprises relatively large arable fields with few landscape features other than remnant hedgerows and occasional copses (e.g. Drift Lane Plantation and Heart Lees). This area was once divided into smaller fields and enclosed with hedges and trees in the 1900's. These have since been removed to allow modern farming techniques which has created the open landscape of today and which acts as a backdrop to and provides the setting for the wider and flatter alluvial levels including Clifton Pasture and Barton Moor to the east;

- The area around Barton Lane junction is ecologically valuable due to the presence of protected species and mature habitat. Elsewhere the area between Barton Lane and Clifton has little ecological value other than as a habitat for common ground-nesting birds and brown hares;
- Cropmark enclosures and archaeological finds in the area between Barton Lane and Clifton suggest late Iron Age – Romano-British enclosures and possibly pre-historic settlement.

2.2.4 Four options were considered for the section of the A453 between Thrumpton and Clifton, which are shown in Figures 3.2.1 – 3.2.4 in the ES Volume 2 Figures. The four options and a summary of the advantages and disadvantages of each are given below:

Option 1 – Baseline (with Climbing Lane)

Description

2.2.5 The preliminary design inherited at the start of the Early Contractor Involvement (ECI) contract in March 2006, with minor amendment. This route widens the existing road as much as possible, with a small section offline between Thrumpton and Barton Lane to straighten out the bend in the existing road. The existing road is widened to the north and the dual carriageway extends to Crusader Roundabout. A climbing lane is added on the east-bound carriageway between Barton Lane and Brands Hill.

2.2.6 Barton Lane is diverted beneath the improved A453 to the south of Keepers Cottage, which remains. A sliproad allows local traffic to move between the A453 and diverted Barton Lane / New Road. There are new accommodation access tracks from the diverted Barton Lane to Glebe Farm and to farmland on the northern side of the A453. Fox Covert Lane has a left-in / left-out access onto the dual carriageway.

Advantages

2.2.7 Main advantages are:

- Follows existing road as much as possible, with minimal land take;
- Retains a right turn at Barton Lane.

Disadvantages

2.2.8 Main disadvantages are:

- Telecommunications equipment in the north verge require diversion and a telephone mast requires relocation;

- No direct access to A453 for Barton in Fabis traffic except via West Leake Junction or a low capacity left-in / left-out junction at Thrumpton;
- Access track and climbing lane necessitate changing the horizontal alignment if the oak tree is to be retained;
- Fox Covert Lane joins to the dual carriageway via a left-in / left-out junction. There would be possible safety implications as a 200tonne crane uses Fox Covert Lane on a regular basis (Hydro-electric power station);
- Below desirable minimum vertical curve to reduce cutting depth to 3.5m and reduce earthworks. Barton Lane underbridge would increase imbalance of earthworks materials;
- The contract requirement to provide for a future access to the NET Park & Ride Site would only be achievable at two locations due to reduced visibility; at the top of the hill (with a perched roundabout design) or at the edge of Clifton;
- Dual carriageway down to Crusader Roundabout causes significant environmental impact due to loss of existing noise mound and tree screening close to residential properties;
- Increased traffic flows close to Keepers Cottage and Barton Lodge due to on-line dualling would increase noise, air pollution and visual impact on these properties;
- Protected species near Drift Lane Plantation would be affected;
- Severed land due to the Barton Lane diversion;
- Site of Bronze Age / crop mark enclosure may be affected at Barton in Fabis;
- Removal of existing roadside vegetation.

Option 2 – Online (no Climbing Lane)

Description

2.2.9 This option is similar to Option 1 but without the climbing lane. Furthermore the road is lowered through Brands Hill.

Advantages

2.2.10 The main advantages are the same as Option 1 but also:

- The requirement to provide for a future access to the NET Park & Ride Site would be achievable in the most appropriate location.

Disadvantages

2.2.11 The main disadvantages with Option 2 are similar to those with Option 1, namely:

- Telecommunications equipment in the north verge require diversion and two telephone masts require relocation;
- No direct access to A453 for Barton in Fabis traffic except via West Leake Junction or a low capacity left-in / left-out junction at Thrumpton;
- Access track adjacent to dual carriageway may necessitate a new horizontal alignment if the Oak Tree is to be retained;
- Fox Covert Lane joins to the dual carriageway via a left-in / left-out junction. There were possible safety implications as a 200tonne crane uses Fox Covert Lane on a regular basis (Hydro-electric power station);
- The vertical curve over Brands Hill to maintain the forward visibility that is required for a possible NET roundabout creates a large amount of excess cut volume that would have to be disposed of off-site. Barton Lane underbridge would increase imbalance of earthworks materials;
- Accommodation tracks would be required to farmland on the north side and Glebe Farm on the south side;
- Dual carriageway down to Crusader Roundabout causes significant environmental impact due to loss of existing noise mound and tree screening close to properties;
- Increased traffic flows close to Keepers Cottage and Barton Lodge due to on-line dualling would increase noise, air pollution and visual impact on these properties;
- Protected species near Drift Lane Plantation would be affected;
- Severed land due to the Barton Lane diversion;
- Site of Bronze Age / crop mark enclosure may be affected at Barton in Fabis;
- Removal of existing roadside vegetation.

Option 3 – Offline Through-Route

Description

2.2.12 The route of the dual carriageway is offline to the south of the existing A453 from Thrumpton to the southern outskirts of Clifton. The dual carriageway then continues to Crusader Roundabout by widening the existing road.

2.2.13 The junction layout at Barton Lane is the same as that in Options 1 and 2.

2.2.14 The redundant A453 between Barton in Fabis and Clifton would be returned to agriculture. An accommodation access track would be provided to farmland on the northern side of the A453 from Barton Lane. On the southern side an accommodation track would link Glebe Farm and neighbouring farmland to Barton Lane / New Lane. Fox Covert Lane access remains as left-in / left-out onto the dual carriageway as with Options 1 and 2.

Advantages

2.2.15 The main advantages of Option 3 are:

- Reduced area of road in cutting and thus a better earthworks balance;
- Less disruption to the travelling public during construction;
- Safer to construct due to the separation of work from live traffic;
- Retains right turn at Barton Lane;
- Traffic on this alignment would be hidden from the Trent valley and conurbations to the north by the hill and will be further down the slope, off the ridgeline, thus reducing visual impact in views from the east / south;
- The protected oak tree would be preserved;
- Retention of existing roadside vegetation;
- New roadside hedges and trees would connect to existing vegetation and help to recreate the enclosed pattern of the 1900's;
- Works around Keepers Cottage and the bat roost would be minimised;
- The requirement to provide for a future access to the NET Park & Ride Site would be achievable in the most appropriate location;
- Reduced impact on Top Farm Cottage on New Lane compared with Options 1 & 2.

Disadvantages

2.2.16 The main disadvantages of Option 3 are:

- Change to previously published alignment (2004);
- Telecommunications equipment in north verge requires diversion;
- Dual carriageway down to Crusader Roundabout causes significant environmental impact due to loss of existing noise mound and tree screening;
- No direct access to A453 for Barton in Fabis traffic except via West Leake Junction or a low capacity left-in / left-out junction at Thrumpton;
- Fox Covert Lane joins to the dual carriageway via a left-in / left-out junction. There were possible safety implications as a 200tonne crane uses Fox Covert Lane on a regular basis (Hydro-electric power station);
- Alignment is close to a main badger sett which may require relocation and a badger tunnel to be built;
- Some of the trees within Drift Lane Plantation would be removed;
- Alignment crosses crop mark enclosures near the plantation and otherwise crosses an area where little is known about the archaeology - additional time needed in the programme to fully record anything found;
- Creates a new road corridor through Green Belt and the south Nottinghamshire farmland;
- Severs farmland, but this is considered to remain viable for agriculture.

Option 4 – Offline Route with Roundabout at Mill Hill

Description

2.2.17 The route of the dual carriageway is offline to the south of the existing A453 from Thrumpton to a new roundabout at Mill Hill, where the existing and new roads meet. The existing A453 would be de-trunked. From the new Mill Hill Roundabout the road continues to Crusader Roundabout as a 4-lane single carriageway (as throughout the rest of the urban section through Clifton).

2.2.18 Consideration of the forecast congestion at Green Lane resulted in the provision of a new link road to connect the Mill Hill Roundabout to a new T junction on the existing Clifton Lane / Nottingham Road. The link road would also enable access to the NET Park & Ride Site.

2.2.19 Barton Lane is severed from the A453 and re-connected as an accommodation underpass for local farmers and non-motorised users (NMUs). As with Option 3, an earlier assessment of Barton Lane Options in which Barton Lane was severed by the A453 and re-connected via the old A453 to the west with an overbridge or underbridge to a new route linking New Lane to Glebe Farm, had been rejected due to visual impact on Barton in Fabis and the excessive land take at this junction.

2.2.20 Fox Covert Lane access would be via a link road to the existing A453 and new Mill Hill Roundabout.

Advantages

2.2.21 The main advantages of Option 4 are:

- Reduced area of road in cutting and thus a better earthworks balance;
- Mill Hill Roundabout junction allows the change in carriageway standard from dual 4 lane to single 4 lane carriageway in a better location than Option 3 i.e. on the edge of the urban area;
- Significant environmental benefits due to the retention of the existing noise mound and tree screening along the edge of Clifton down to Crusader Roundabout;
- The greater flexibility in horizontal and vertical alignment of a 40mph single carriageway results in greater re-use of existing carriageway;
- Less disruption to the travelling public during construction;
- Safer to construct;
- 40 mph speed limit from the new roundabout at Mill Hill to Crusader would improve safety;
- Existing A453 retained as 'collector / distributor road' for Thrumpton / Barton in Fabis;
- Provides a direct NMU route between Clifton, Barton and Thrumpton using the existing A453 which would be de-trunked. In addition to other NMU proposals south of Thrumpton as part of the scheme design, this provides a continuous route from Clifton to Kegworth and thus meets the scheme brief;
- Significant utilities' diversions savings due to retention of old carriageway ;
- Better access to Fox Covert Lane and hydro-electric power station via a link road to an all movements junction;

- Traffic on this alignment is hidden from the north by the hill and will be further down the slope, off the ridgeline, thus reducing visual impact in views from the east / south;
- Replacement of the Barton Lane diversion in Options 1, 2 & 3 with an NMU underpass, reducing land take and environmental impact around the junction since works around Keepers Cottage and the bat roost would be minimised;
- Land around the NMU underpass could be planted up to enhance nature conservation (e.g. bat habitat);
- The oak tree would remain in the same setting as now;
- Retention of existing roadside vegetation;
- New roadside hedges and trees would connect to existing vegetation and help to recreate the enclosed pattern of the 1900's;
- The majority of farmers accesses and the current road network would remain the same;
- Mill Hill Roundabout would allow for future access to the NET development (should it be approved), thus removing the uncertainty of enabling access to the Park & Ride Site with the other three options.

Disadvantages

2.2.22 The main disadvantages of Option 4 are:

- Change to previously published alignment (2004);
- Severance of Barton Lane by the A453 thus preventing direct access between Barton in Fabis and Gotham. Local traffic between villages would be re-routed via the Mill Hill link road;
- Greater night time visual impact resulting from lighting at the Mill Hill Roundabout (however modern lanterns and siting the junction in cutting will help reduce impact);
- Alignment is close to a main badger sett which may require a licence to undertake works likely to cause disturbance. A wildlife underpass and roadside fencing will be required to keep animals off the trunk road;
- Some of the trees within Drift Lane Plantation would be removed;

- Alignment crosses crop mark enclosures near the plantation and otherwise crosses an area where little is known about the archaeology – additional time needed in the programme to fully record anything found;
- Creates a new road corridor through Green Belt and the south Nottinghamshire farmland;
- Severs farmland, but this is considered to remain viable for agriculture.

Assessment of Options and Recommendation

2.2.23 On environmental grounds, the online Options 1 and 2 have the same advantages (i.e. smallest footprint) and disadvantages (i.e. principally impacts at Barton Lane, loss of roadside vegetation including existing noise mounding close to residential properties). The biggest advantages of Option 3 over the first two options are its improved earthworks balance and reduced visual impact. However it still retains all the same disadvantages and others, in particular loss of vegetation and noise mounding, impact on agricultural land, Green Belt and unknown archaeology. Option 4 has the same advantages as Option 3 plus less impact at Barton Lane and significant benefits with the retention of mounding and vegetation between Mill Hill and Crusader roundabouts. These more than outweigh the disadvantages that it has in common with Option 3. In environmental terms Option 4 is the preferred option.

2.2.24 In purely economic terms, the offline routes are preferable to the online options with Option 4 as a clear favourite. For buildability, Option 4 is also the favourite as the Mill Hill Roundabout provides a natural cross-over at the boundary between widening to the south and widening to the north and space for temporary diversions of traffic during construction.

2.2.25 The Mill Hill Roundabout in Option 4 also provides an opportunity for a break in standards from dual carriageway to single 4 lane carriageway. This has positive safety benefits due to the speed reduction on the approach to Crusader Roundabout. A further benefit of the roundabout in Option 4 is that it provides greater flexibility to connect other roads to the A453, leading to the development of the old A453 as a distributor road and the provision of Mill Hill link road as a replacement for the right turn at Barton Lane.

2.2.26 For all these reasons Option 4 was taken forward as the preferred route.

2.3 Further Design Development and Assessment of Alternatives

2.3.1 A public consultation exercise was held in June 2007 to describe and invite comments on Option 4. A number of representations were received from the

general public and interested parties, including Gotham Parish Council and Barton in Fabis Parish Council, expressing concerns in relation to the offline section of the A453 Widening proposals and in particular the Mill Hill link road.

2.3.2 During further scheme design in 2007 the traffic modelling; validation and forecasting were reworked to provide robust traffic forecast figures. The re-forecasting work, completed in March 2008, showed that forecast flows are lower than those previously predicted. Consequently the scheme design was reviewed using the reduced flows, which showed that the Mill Hill link road was no longer required to relieve congestion at Green Lane.

2.3.3 The main consequence of the removal of the link road is considered to be the impact on local village traffic wishing to travel between Barton in Fabis/ Thrumpton and Gotham. Initial traffic counts undertaken in 2006 were supplemented with further counts in May 2008. These show that a very small number of vehicles make this trip using Barton Lane. On average 12 vehicles in both directions were observed per hour for the periods surveyed. With the provision of the link road in Option 4 considered above, these vehicles would have to make a detour via the link road with an increased journey of approximately 2 kilometres. With the deletion of the link road the increase in journey is extended to 4 kilometres as traffic would need to travel to Crusader Roundabout or via West Leake Junction. Given the low numbers of vehicles involved, provision of the link road cannot be justified.

2.3.4 The Mill Hill link road was therefore removed from the scheme proposals.