

DD23

A453 Widening M1 Junction 24 to A52 Nottingham

SUMMARY PROOF OF EVIDENCE HIGHWAY DESIGN

BY

Charles William Howarth
BSc. (Hons), CEng, MICE, MIHT

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1. INTRODUCTION

Personal Details

- 1.1 My name is Charles William Howarth. I am a Chartered Engineer and a member of the Institution of Civil Engineers and the Institution of Highways and Transportation. I have a Bachelor of Science Honours degree in Civil Engineering and over 30 years of experience in the design and development of highway schemes. I am the Design Manager for the A453 Widening scheme.

Scope of Evidence

- 1.2 The object of my evidence is to demonstrate that engineering issues have been fully considered and taken into account in publishing the Draft Orders for the Scheme.

2. THE EXISTING SITUATION

Introduction

- 2.1 The A453 Trunk Road east of the M1 Motorway is a major route between Nottingham and the M1. It forms part of the national strategic road network and provides links to East Midlands Airport, Parkway Station, the proposed NET and the A50 as well as the wider network.
- 2.2 The road is a single carriageway and currently carries between 23,000 and 30,000 vehicles per day.
- 2.3 It is severely congested at peak hours with unreliable journey times and a poor safety record and it is difficult to maintain safely.
- 2.4 From the M1 to the western end of Clifton, a distance of 9 km, the road passes through an essentially rural area.
- 2.5 The remaining 2.5km through Clifton is essentially urban.

Highway layout

Rural Section

- 2.6 In the rural section, the road is a single 7.3 m carriageway with verge widths varying between 1.5 m and 3 m.
- 2.7 The horizontal alignment of the A453 is poor with long, medium to large radius curves limiting forward visibility and creating unsafe overtaking conditions. This, together with poor 'at grade' junction layouts, contributes to a poor safety record.
- 2.8 The national speed limit of 60 mph applies except through the new Kegworth Road/Parkway Access Road where a 30 mph limit applies.
- 2.9 There is no street lighting in the rural section.

Urban Section

- 2.10 From the western end of Clifton to Crusader Roundabout, the road passes through a relatively wide highway corridor with properties to the south of the A453 set back 10 to 20 m from the edge of the carriageway, whilst those to the north of the A453 are shielded from the road by earth mounds and planting.
- 2.11 East of Crusader Roundabout the A453 passes through a grassed and tree lined Conservation Area which contains a registered Village Green, known as Clifton Green, and a number of listed buildings. North-east of Clifton Green the existing road borders the Nottingham Trent University Clifton Campus which lies behind an established hedge line on the highway boundary. On the opposite side of the road, residential properties are set back approximately 30m from the Trunk Road behind a 10 to 20 m wide belt of trees.
- 2.12 The horizontal alignment is of an essentially urban standard with some small radius curves which, together with the rolling vertical alignment, reduces forward visibility and offers only limited overtaking opportunities.
- 2.13 A 40 mph speed limit applies throughout the urban section from the outskirts of Clifton.
- 2.14 The urban section has road lighting throughout.

Junctions

- 2.15 Between the M1 and the A52 there are six major junctions providing access to the A453. In addition, there are three accesses to the University and six minor junctions onto the existing road. There are also four demand activated pedestrian crossings.
- 2.16 An Esso filling station, including a Tesco Express and the Man of Trent Public House/restaurant also have direct accesses onto the A453 between Crusader Roundabout and Clifton Green.

Facilities for Pedestrians, Cyclists and Equestrians (Non-Motorised Users (NMUs))

- 2.17 There is a shared footway/cycleway adjacent to the eastbound carriageway of the A453 from Clifton Green to the A52 and there are numerous footpaths and bridleways crossing and adjacent to the A453 including some long distance routes, notably the Trent Valley Way and the Midshires Way.

Other Highway Features

- 2.18 There are eleven existing structures along the A453 which would be affected by the widening proposals.
- 2.19 Parts of the A453 cross the flood plains of the River Soar and River Trent.
- 2.20 There are a number of strategic public utilities located within the A453 corridor, including a significant number of overhead and underground high voltage electricity cables and associated apparatus relating to the Ratcliffe on Soar Power Station.

3. SCHEME OBJECTIVES

- 3.1 The main scheme objectives are to reduce congestion and improve safety for motorists and non-motorised users (pedestrians, cyclists and horse riders) in the area.

4. SCHEME PROPOSALS

Highway Layout

Rural Section

- 4.1 The 9 km rural section of the Scheme from the M1 to the proposed Mill Hill roundabout would be a dual two lane carriageway 21.1 m wide.
- 4.2 Widening would follow the horizontal alignment of the existing A453 between M1 and Manor Road, at Barton in Fabis, with a second carriageway being built on the south side of the existing road.
- 4.3 Between Manor Road and Mill Hill Roundabout a dual carriageway would be built off line to the south of the existing road. This alignment has been chosen to overcome a number of problems with an online route, chiefly: excessive earthworks, buildability issues, accessibility for Barton in Fabis and Thrumpton and future access to the proposed NET Park and Ride .
- 4.4 The resulting redundant sections of the A453 would be de-trunked and become a local road connecting the new West Leake Junction with Mill Hill Roundabout providing Barton and Thrumpton with indirect access to the A453 and the wider network.
- 4.5 New grade separated junctions would be provided at Kegworth Road/Parkway Station access road and at West Leake Lane.
- 4.6 The Eon main access would be retained for occasional use by very large vehicles only, and access to the main site would be via an improved access within the Parkway junction. HGVs would continue to use the West Leake junction.

Urban Section

- 4.7 A 4-lane single carriageway, generally 15.05 m wide, is proposed for the urban section between Mill Hill Roundabout and Farnborough Road Junction, which is approximately 2.5 km long.
- 4.8 Widening between the western boundary of Clifton and Farnborough Road Junction would generally follow the horizontal alignment of the existing A453 with widening mainly to the north.
- 4.9 Signal controlled roundabouts at the major junctions would be provided with crossing facilities for cyclists and pedestrians. An additional cycle/pedestrian crossing would be provided opposite the Man of Trent public house. Apart from the signal controlled right turn into NTU, right turns would not be permitted anywhere.

Highway Standards

- 4.10 The design of the highway layout has been in accordance with the Design Manual for Road and Bridges (DMRB) (DD176) and in particular Volume 6: Geometric Design.
- 4.11 24 Departures from Standard have been formally reviewed and approved by the Highways Agency to ensure that there are no adverse impacts on highway safety.

Facilities for Pedestrians, Cyclists and Equestrians

- 4.12 A continuous route for NMUs would be provided between Clifton and Long Lane linking nearby residential areas to key destinations such as the Parkway Station, the power station and the proposed NET Park and Ride. The scheme also incorporates safe and convenient grade separated crossing points along the rural section where Public Rights of Way cross the A453 as well as providing additional controlled crossing points and additional pedestrian and cycle facilities in the urban section.

Drainage

- 4.13 Drainage would be via a combination of open surface water channels, combined kerb drainage systems and filter drains for the main A453 carriageway, with a combination of filter drains, kerbs and gullies for the side roads. Five balancing ponds and extensive lengths of highway drainage ditches would attenuate and clean storm water runoff prior to discharge at the rural outfalls. The balancing ponds would also have secondary functions to enhance ecological habitat and provide visual amenity for travellers.

Road Pavement

- 4.14 The pavement has been designed for a 40 year design life and low noise surfacing would be used throughout except at approaches to junctions where high friction surfacing would be provided.
- 4.15 As much as possible of the existing carriageway has been incorporated into the scheme. Where full reconstruction cannot be avoided, existing materials would be recycled.
- 4.16 Where possible we would use stabilisation techniques to improve the pavement foundations rather than importing granular material from offsite.

Road Lighting

- 4.17 The rural section would be unlit except for the junctions. Lighting would comprise 10 m or 12 m high columns designed to minimise light spillage. The urban section would be lit throughout.

Structures

- 4.18 The westbound carriageway of the A453 would be carried on new structures which would be separate from but generally replicate the form, if appropriate, of the existing structures. Exceptions to this are:
- 4.19 Long Lane Bridge and Thrumpton Accommodation bridge– to be extended as intended in the original design
- 4.20 Ash Bridge – to be replaced by a new structure for both carriageways
- 4.21 Ratcliffe Underbridge at West Leake – which was built to allow for widening so no further construction is required.
- 4.22 Barton Lane Underpass – a new structure for both carriageways is required.

Accommodation Works

- 4.23 Negotiations have taken place and are on-going with all affected parties to agree accommodation works to ensure that existing facilities are maintained or suitable replacements provided.

5. CONCLUSIONS

- 5.1 The main benefits of the proposed Scheme may be summarised as follows:
- a. The Scheme would relieve congestion, improve journey times and improve safety;
 - b. It would improve facilities and safety for non-motorised users such as pedestrians, cyclists and horse riders in the area;
 - c. The safety of the route would be further improved by removing uncontrolled direct accesses onto the trunk road;
 - d. The provision of new facilities for pedestrians, cyclists and equestrians would promote walking, cycling and equestrian activity;

In my opinion, the proposed scheme meets the objectives and is an effective solution to the problems associated with the current A453.