

**Department for Regional Development – TransportNI**

**ANNAGHMORE ROAD / BELLSHILL ROAD  
JUNCTION**

**Public Inquiry**

**September 2015**

**Proof of Evidence  
(Summary)**

**Technical Submission**

**by**

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**Appendix A: Drawings**

Figure 3.1: The Study Area

Figure 3.2: The Study Area – Water & Soils

Figure 4.1: Preferred Scheme Option included in 2007 draft Orders

Figure 4.2: Bells Hill (east) Link Road presented at 2007 PLI (Option 4)

Figure 4.3: Developed Bells Hill (east) Link Road option following 2007 PLI

Figure 4.4: Preferred Scheme Option included in 2010 Planning Application & 2011 NIMVO

Figure 5.1: Scheme Layout included in 2013 Planning Application & NIMVO

*(Note: Figures 5.2 to 5.5 used in full Evidence only)*

Figure 5.6: Preliminary Flood Compensation Area and Drainage Design

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## **1 INTRODUCTION**

1.1 My name is Michael MacLean. I have a BEng (Hons) degree in Civil Engineering. I am a Chartered Engineer and a Member of the Institution of Civil Engineers, and I have over 29 years' experience in the Civil Engineering profession.

1.2 Between August 2003 and October 2012 I was Project Manager for the development of the A6 Toome to Castledawson upgrading scheme on behalf of TransportNI. I was responsible for co-ordinating the various teams involved in specialist aspects such as: roadworks design; structural design; geotechnical design; environmental assessment; and traffic and economic analysis.

### **Scope of Evidence**

1.3 My evidence is restricted to the engineering details of the Annaghmore Road/Bellshill Road Junction, subsequently referred to as the "Scheme". Specialist comment on other aspects of the Scheme, such as traffic and environmental issues, will be provided by Mr Russell Bissland and Mr Gareth Coughlin respectively. I will use drawings to assist with the explanation of some of the details, which will include:

- The background to the Scheme;
- A description of the existing conditions around Castledawson;
- The development of the layout, describing how the proposed Scheme was selected;
- A description of the proposed Scheme; and
- Any construction issues identified.

1.4 I will now summarise the background to the Scheme.

## **2 BACKGROUND TO THE SCHEME**

- 2.1 In March 2007 the Department for Regional Development published proposals to upgrade the A6 to dual carriageway standard, from the western end of the M22 Motorway at Randalstown to the Castledawson Roundabout.
- 2.2 The proposals for the western section, between Toome and Castledawson, included provision of an overbridge at Annaghmore Road, to connect land north and south of the proposed A6 dual carriageway, with left-in/left-out junctions connecting Bellshill Road with the A6 eastbound and westbound carriageways.
- 2.3 In November 2007 a Public Inquiry was held to examine the case for and against that section. In his report, the Inspector recommended that this connection should be included at an alternative location east of Bellshill Road, in farmland that forms part of the Moyola River floodplain.
- 2.4 Following an assessment of a number of options, including that recommended by the 2007 Inquiry Inspector, a Planning Application was submitted by the Department for Regional Development for an alternative alignment west of Bellshill Road, which avoided the Moyola River floodplain.
- 2.5 A Notice of Intention to Make a Vesting Order (NIMVO) for that scheme was published in January 2011 and a Public Inquiry was held in February 2012. In his report, the Inspector again recommended that the connection should be located east of Bellshill Road and within in the Moyola River floodplain.
- 2.6 I will now summarise the existing conditions within the study area.

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### 3 EXISTING CONDITIONS

- 3.1 The existing single carriageway Castledawson Bypass, between Castledawson Roundabout to the west and Hillhead Road Junction to the east, is shown in Figure 3.1.
- 3.2 The Castledawson Roundabout is a 100m diameter, 4-leg roundabout that forms the junction between the A54, A31 and the A6, linking Castledawson and Magherafelt with the strategic road network.
- 3.3 The Hillhead Road Junction is an at-grade priority junction linking the areas of Hillhead, Castledawson and Knockcloghrim with the A6.
- 3.4 Between Castledawson and Hillhead Road there are additional junctions and accesses connecting Brough Road and individual farms with the strategic road network.
- 3.5 Mid-way along the existing Castledawson Bypass there are two staggered at-grade priority junctions connecting Castledawson to the north and Annaghmore & Aughrim to the south with the A6.
- 3.6 Land to the south of the existing Castledawson Bypass is rural in nature with a limited number of residential properties and farm buildings. Land to the north is more urban, with dense housing along both the Annaghmore Road and Bellshill Road, with more recent housing development between both connector roads.
- 3.7 Numerous utility services traverse the study area, including those linking to individual commercial and residential properties.
- 3.8 Within the immediate study area there are numerous minor watercourses. To the north of the A6 are Bells Hill Drain and Bells Hill Drain Branch, and to the south of the A6 are Castle Hill Drain and Castle Hill Drain Branch, shown in Figure 3.2.
- 3.9 The Moyola River is approximately 43km long and drains a catchment area of approximately 313km<sup>2</sup>, before entering Lough Neagh at Moyola Water Foot. The Rivers Agency Strategic Flood Map for Northern Ireland shows that the Moyola River has associated floodplain east of Bellshill Road (N). It also shows that the Coppies Burn has associated floodplain in the vicinity of Bellshill Road (S).
- 3.10 I would now like to describe the process by which the various route options were developed and assessed, and how the proposed Scheme was identified.

## 4 DEVELOPMENT OF THE SCHEME

### Development and Assessment of Options

- 4.1 During the development of the A6 Toome to Castledawson dualling scheme, between 2003 and 2007, a number of layout options were considered for the Annaghmore Road/Bellshill Road Junction prior to the selection of the Department's preferred option at that time, which is shown in Figure 4.1.
- 4.2 In his report on the inquiry, the Inspector recommended that the proposed overbridge at Annaghmore Road should be replaced by an alternative crossing behind the Bellshill Terrace and Hillview Terrace. He also recommended that link roads be constructed north and south of the proposed dual carriageway to provide local access as shown in Figure 4.2.
- 4.3 Following the 2007 inquiry, the development of the Inspector's recommend option initially focussed on the alignment of its link roads north and south of the A6. Further consideration was also given to the mitigation of its impact on the Moyola River floodplain. The developed layout is shown in Figure 4.3.
- 4.4 Whilst some of the original impacts of this option could be eliminated, with modifications to the geometry of individual components, a number remained. One significant impact was that on the Rivers Agency designated Q100 Moyola River floodplain, which required approximately 9,700m<sup>3</sup> of compensatory volume to offset that lost beneath the footprint of the proposed link road and its associated compact connector.
- 4.5 Planning Policy FLD 1 is the main planning policy associated with Planning Policy Statement (PPS) 15 – "Planning and Flood Risk". It states that development within floodplains will not normally be permitted unless the proposed scheme is an exceptional case and/or it is of overriding regional importance.
- 4.6 Furthermore, HD 45/09 of the Design Manual for Roads & Bridges (DMRB) states that new roads or improvements should only be located within functional floodplains if there is no acceptable alternative, and they should be restricted to the shortest practical floodplain crossing.
- 4.7 Consultations with Planning NI on this issue concluded that any alignment that had a direct impact on the Moyola River floodplain would not be considered an exception to Planning Policy FLD1, as long as there was a viable alternative that had no impact on the floodplain.
- 4.8 A viable alternative linking Bellshill Road (N) with Annaghmore Road (S) was identified, which had no direct impact on the designated floodplain, as shown in Figure 4.4. The Department promoted this alternative option with a Planning Application and published a Notice of Intention to make a Vesting Order (NIMVO) in November 2010.



- 4.9 Objections were subsequently received to both, and a Public Inquiry was held in February 2012 to examine the NIMVO proposal. In his report, and following consultation with Rivers Agency, the Inspector again recommended that the connection should be located in the Moyola River floodplain and that the advice in the DMRB, in this instance, should be set aside.
- 4.10 The Inspector's recommended option was developed, in consultation with Rivers Agency and TransportNI, to minimise the impact on the floodplain. A detailed FRA was also carried out to ensure that the Scheme adequately compensated for the floodplain capacity lost as a consequence of the earthworks footprint.
- 4.11 During these consultations, safety concerns were expressed about the potential for the Scheme to add traffic onto the Bellshill Road, south of the proposed A6 dual carriageway, and through its existing junction with Aughrim Road. This junction has limited visibility due to a tight crest curve on Aughrim Road approximately 90m to the west.
- 4.12 Consequently, the link road south of the proposed A6 dual carriageway has its main connection with the Annaghmore Road (S) and a minor junction with Bellshill Road (S). This arrangement was developed to encourage traffic to use the higher standard Annaghmore Road/Aughrim Road junction, and limit the potential for increasing the traffic volume on the lower standard Bellshill Road/Aughrim Road junction.
- 4.13 I will now describe the proposed Scheme layout in more detail.

## 5 DESCRIPTION OF THE SCHEME

### General

- 5.1 The proposed Scheme, shown on Figure 5.1, comprises a compact grade-separated junction located in agricultural land east of the existing Bellshill Road and west of the Moyola River.
- 5.2 The layout of the proposed Scheme can be split into 5 separate elements, namely:
- The Bells Hill north/south link road;
  - A compact connector to the proposed A6 eastbound carriageway;
  - A compact connector to the proposed A6 westbound carriageway;
  - A north link road between Bellshill Rd (N) & Annaghmore Rd (N); and
  - A south link road between Bellshill Rd (S) & Annaghmore Rd (S).
- 5.3 The Bells Hill north/south link road comprises a 7.3m wide single carriageway approximately 850m long running in a north-south direction connecting Bellshill Road either side of the A6 dual carriageway.
- 5.4 From the roundabout, this link road incorporates a pedestrian footway on the west side and road lighting over its length. Immediately south of the proposed link road to Annaghmore Road, this link also incorporates a footway on its west side. The Design Speed is 85Bkph and it is proposed that the speed limit will be 30mph, consistent with the existing Bellshill Road.
- 5.5 In the immediate vicinity of the overbridge, the link road will be constructed on an earthwork embankment approximately 7.1m above original ground level (OGL) to achieve the 5.65m headroom required on the dual carriageway.
- 5.6 The roundabout located at the south end of the link road has four arms. Three of these serve: the Bellshill Road; the compact connector to the A6 westbound carriageway; and the south link road to Annaghmore Road. The fourth arm serves agricultural land, associated residential and farm buildings, as well as other land and property towards the Moyola River. The roundabout is approximately 6.9m above existing ground level and the proposed 6.0m wide access connects with the existing road over a length of 160m.
- 5.7 This junction itself comprises compact connectors of varying width connecting the Bellshill road link road with the proposed A6 eastbound and westbound carriageways. They will have Design Speeds of 30kph and will be lit over their full length.

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- 5.8 A single carriageway link road north of the proposed A6 connects the Bellshill Road (N) with Annaghmore Road (N). This 7.3m wide link incorporates pedestrian footways and road lighting over its full length. The Design Speed for this element is 85Bkph, however it is anticipated that the speed limit will be 30mph, consistent with other roads in the vicinity.
- 5.9 A single carriageway link road south of the proposed A6 connects the Bellshill Road (S) with Annaghmore Road (S). This 7.3m wide link incorporates soft verges and will be unlit over its full length. The Design Speed for this element is 85Bkph, it is anticipated that the speed limit will be 60mph, consistent with other roads in the vicinity.
- 5.10 An outline drainage design has been prepared for the Scheme, which is shown in Figure 5.6. On the proposed kerbed sections north of the A6, gullies will be used to collect the surface run-off, which will then run along drains within the proposed verges towards the outfall.
- 5.11 On the unkerbed sections south of the A6, an “over the edge” drainage system incorporating filter drains in the verge is proposed. The majority of run-off from this section will be taken to a SUDS detention pond adjacent to South link road, at a low point in vertical profile approximately 300m from its tie-in with Annaghmore Road (S). This pond will provide secondary treatment of the run-off before discharging, at a controlled rate, into the nearby Castle Hill Drain.
- 5.12 As the link road east of the existing Bellshill Road (N) is within the designated Q100 Moyola River floodplain, a full Flood Risk Assessment (FRA) was required. This identified that the proposed road junction resulted in a 15,600m<sup>3</sup> loss of floodplain volume.
- 5.13 Without mitigation flood levels at a number of receptors in the vicinity could be expected to increase by more than 100mm as a consequence. HD 45/09 defines the magnitude of this increase in flood level as “Major Adverse”.
- 5.14 As there are up to 100 residential properties within the vicinity of the Q100 floodplain, that would be affected without appropriate mitigation in the form of compensatory floodplain, HD 45/09 defines the importance of this flood risk as “High”.
- 5.15 Having assessed the importance and magnitude of the flood risk, their combined significance, without mitigation, is categorised as “Very Large Adverse”.
- 5.16 A number of areas were considered for the flood compensation area, and the optimum location is immediately east of the Bellshill Road link road and north of the proposed A6 dual carriageway.

- 5.17 An initial assessment identified that the compensatory area north of the proposed A6, and between the proposed Bellshill Road link road and the Moyola River, provided adequate compensatory volume at each contour up to 20.00m.
- 5.18 To mitigate the effect at the high 20.00m to 20.25m level, relief culverts are included below the proposed Bellshill Road link road, to re-introduce existing Q100 floodplain behind residential properties on Hillview Terrace. Additional culverts are also incorporated close to Annahorish Drain to the east, to ensure that appropriate provision is made for flood flow connectivity in this area.
- 5.19 The importance and magnitude of the flood risk for the Scheme, with the above mitigation in place, was subsequently assessed as “Negligible”.
- 5.20 It is expected that the detailed design will include for a boundary treatment of wooden post and wire fencing along all new and realigned roads with associated hedgerow planting. Additional measures, such as stock proofing and the maintenance of existing field lines will be developed during the detailed design stage and in consultation with affected landowners.
- 5.21 Safety fencing will be provided in accordance with the DMRB and will generally be installed on the approach to structures, where the embankment is high, or adjacent to particular safety hazards.
- 5.22 I would now like to consider some of the construction issues that could be associated with the Scheme.

## **6 CONSTRUCTION ISSUES**

- 6.1 It is anticipated that construction of the Scheme will be undertaken as part of the main dual carriageway works. The most significant impacts on access to Castledawson would be as a result of the construction of the A6, when right-turns to and from the existing Annaghmore and Bellshill Roads are likely to be prohibited, with local diversion routes put in place.
- 6.2 Traffic management related specifically to the Scheme is likely to be minimal, as it is mostly off-line from existing access routes. Some disruption is likely to be experienced during the construction of tie-ins to the existing Annaghmore & Bellshill Roads, both north and south of the proposed A6, where traffic lights with single-lane working would most likely be the traffic management layout adopted.
- 6.3 Construction traffic related specifically to the Scheme is likely to be confined to the vested footprint, with access taken from the A6 on the line of the proposed compact connectors. Some disruption on local roads will be unavoidable until haul routes within the vested footprint are constructed. The construction contract will require that these are established at the earliest opportunity.

## **7 CONCLUSION**

7.1 In my Evidence I have presented a background to the Scheme and described the existing road network in and around Castledawson. I have described how the proposed layout of the Scheme was identified and provided some detail of its main components, as well as providing comment on some of the issues anticipated during the construction process.

7.2 In conclusion, the proposed Scheme was developed in accordance with the requirements of TransportNI, resulting in a layout that:

- provides a high standard grade-separated junction with connections between the proposed A6 dual carriageway and the village of Castledawson and its surrounding rural hinterlands;
- provides a direct connection between the townlands of Castledawson and the rural hinterlands of Annaghmore and Aughrim;
- reduces the potential for additional traffic on Main Street and Chichester Avenue, which were local concerns raised about the option presented at the November 2007 PLI;
- reduces the concerns of local residents regarding the introduction of additional traffic into the residential area of Castle Oak;
- mitigates the impact on the designated Q100 floodplain of the Moyola River through the provision of compensatory flood capacity with good connectivity to the adjacent river; and
- mitigates its impact on the highest flood levels through the provision of flood relief culverts beneath the proposed Bellshill Road link road.

**APPENDIX A**  
Drawings