

# A1(M) Junction 47 Study – Stage 4 Report

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## Introduction

CH2M have been commissioned by Highways England to undertake a study at Junction 47 of the A1(M) [Jn 47] which is a four-arm grade separated roundabout that connects the Strategic Road Network [SRN] with the primary road network, in the form of the A59, approximately seven miles east of Harrogate. Jn 47 has been identified through planning applications, Harrogate District Local Plan [HDLP] assessment work and the Local Enterprise Partnership [LEP] as a significant constraint to development in the area. The junction already exhibits peak hour queues and delays.

North Yorkshire County Council [NYCC] supported by the LEP successfully bid through the Local Growth Fund for money to implement a junction improvement at Jn 47. The scheme includes:

- Traffic signals on all approaches to Jn 47 of the A1(M);
- Widening on all approaches in order to accommodate left turn flares on both diverge slips, and to increase the length of both right turn flares on the A59 approaches; and
- Three lane circulatory carriageway at both the north-east and south-west corners of the junction, in order to reduce conflict between exiting and queueing vehicles. Widening is needed to accommodate the introduction of a third lane.

In addition, NYCC are proposing to fund:

- The introduction of traffic signals on the A59 at the junction with the A168 Link Road including islands which are proposed to house the required signal infrastructure. Minimal kerblines changes are required at this junction.

For the remainder of this note the above schemes will be referred to as the LEP scheme.

## Purpose of this Study

A joint working partnership between Highways England, NYCC, Harrogate Borough Council [HBC] and the LEP has undertaken a study to determine:

- how much capacity will be provided by the LEP scheme and when further improvements are likely to be required; and
- Interim and final solutions for junction improvements to accommodate future likely traffic levels.

This will help with the evidence base for the Local Plan, help determine the viability of the Local Plan, help determine a consistent approach to planning applications and secure appropriate contributions or junction improvements which are consistent with the long term vision for the junction.

The CH2M study is to be undertaken in four discrete stages. The remainder of this technical note presents an update to the findings of Stage 4 of the study, the primary objective of which is to establish the approximate cost of improvement measures which are required at Jn 47 to adequately mitigate for the expected growth in traffic through the junction in the 2035 future year.

The findings of Stage 1 of the study were reported in the October 2016 technical note *A1(M) Junction 47 Study – Stage 1* (Document Ref 679066.AF.16.13 TN002). The Stage 2 findings were reported in the December 2016 technical note *A1(M) Junction 47 Study – Stage 2* (Document Ref 679066.AF.16.19 TN003). The Stage 3 findings were first reported in the April 2017 technical note *A1(M) Junction 47 Study – Stage 3* (Document Ref 679066.AF.16.27 TN004) and then in an amended version which took into account the updated proposed allocations *A1(M) Junction 47 Study – Stage 3 Amendment* (Document Ref 679066.AF.16.27 TN005) dated July 2017.

Planning permission has been agreed in principle on the Flaxby Green Park employment site (subject to the signing of the S106 agreement) and mitigation has been agreed for the impact of this site. This mitigation includes:

- widening to two lanes between the access roundabout on the A59 to the A1(M) roundabout;
- widening to three lanes on the A59 eastbound entry to Jn 47, with a second approach lane commencing at the Flaxby roundabout;
- widening of the north-west circulatory carriageway to three lanes between the A59 eastbound entry and northern circulatory bridge;
- provision of a two-lane exit from Jn 47 towards the A1(M) southbound carriageway;
- widening of the north-east circulatory carriageway to provide three traffic lanes;
- widening of the south-east circulatory carriageway to provide three traffic lanes; and
- widening the southbound off slip to three lanes on the approach to and at Jn 47.

This scheme will be referred to as the LEP+ scheme for the remainder of this report.

## Stage 4

Stage 4 of the study is to provide an estimated indicative cost for scheme that works in capacity terms and can be delivered in land requirement terms.

## Improvement Costing

### Principle of costing

A high level costing exercise has been carried out based upon experience of costs of other projects, with a relevant uplift for inflation. This is based upon typical unit costs for various elements of pavement works, earthworks, bridgeworks, drainage and traffic signals. The cost estimate does not include for any works to statutory undertakers equipment.

Once a cost estimate for the civils works had been established this was uplifted to allow for traffic management (15%), contractors' expenses including preliminaries and site compound (10%) and design and supervision costs (15%). This provided an overall cost for the works.

Given the level of uncertainty around the works at this early preliminary stage of design, an additional allowance of 10% was made for contingencies and then in line with the H M Treasury Green Book an optimum bias was applied (44%) to allow for actual cost overruns which include, disputes and claims, unknown site specific characteristics, early level of concept design, high level costing and project and management risk.

## Improvement option costed

The costing for the Local Plan junction improvement has been based upon the assumption that the LEP and the LEP+ schemes will be delivered through the existing successful local growth fund bid and by the developer of the Flaxby Green Park employment site.

The cost provided below only considers the additional cost of providing the Local Plan scheme above the LEP+ scheme.

## Cost summary

The high level costing exercise has estimated the approximate cost of the works as follows:

- Civils works £4M
- Bridge works £5M

Giving a total cost of £9M. Once the traffic management, constructors preliminaries / site compound and design and supervision costs are included, this gives a cost of around £13M.

As set out above this cost does not include for any contingences, estimates at this early stage of design, site specific characteristics and other risks. Therefore, at this stage of the design an allowance for contingencies and optimum bias must be applied. This gives a cost of £20.5M.

## Cost sense check

In order to ensure that the cost estimate is reasonable, consideration has been given to the level of works compared to the works associated with the funded LEP scheme.

The tendered cost for the LEP scheme was £3.6M. The level of works associated with the LEP scheme and the level of works associated with the Local Plan scheme (which is over and above that committed within the LEP+ scheme), is similar in terms of the level of civils works which are required with the exception of the bridge. It is therefore concluded that the £4M estimate for the Local Plan costed scheme with respect to the civils works is reasonable and in the correct order of magnitude.

## Conclusions

A high level costing exercise has been undertaken to establish the cost of the proposed Local Plan junction improvement solution to Junction 47 of A1(M) which had been designed to accommodate the traffic likely to be generated by all of the Local Plan allocated sites.

The improvement costed assumes that the LEP scheme and the LEP+ scheme (associated with the Flaxby Green Park development) is delivered and therefore only includes for the cost of works above these two schemes.

This shows that the scheme is likely to cost around £13M, however, given the uncertainties at this time, an allowance for contingencies and optimum bias is required. Therefore, provision should be made for £20.5M to allow for greater certainty in the deliverability of the scheme. The Local Plan Infrastructure Study will need to allow for this and demonstrate that funding can be achieved to deliver the necessary improvements, without affecting the viability of the Local Plan.