Planning Department   11 April 2014
Harrogate Borough Council
Knapping Mount   ian.ladbrooke@sandersonassociates.co.uk
West Grove Road   By Email only
Harrogate
HG1 2AE
                                                    Our ref : 6127-001-04
                                                    Your ref : 14/00128/OUTMAJ

For the attention of Mr Mike Parkes

Dear Sir

Planning Application 14/00128/OUTMAJ; Outline application for residential development with access and scale considered. Kingsley Farm, Kingsley Road, Harrogate HG1 4RF.

Addendum to Transport Statement Report reference 6127/SB/001/03 dated May 2013.

This addendum provides additional highway information in support of the above planning application and should be read in conjunction with the planning application Transport Statement Report.

Transport Statement Summary

The key findings of the planning application transport statement are re-iterated:

The site is identified as a preferred options site for residential development as part of the Harrogate District Local Development Framework.

The site is a brown field site with a recent history of significant traffic generation associated with the sites former use as Chippindale Foods egg packing and distribution facility. It must be recognised that the site has an existing lawful use and traffic generation potential which could be revived without the need for further planning consent.

Traffic surveys of the former use show that the <u>average</u> weekday traffic flow associated the egg packing and distribution facility was 174 vehicles (two way) over 24 hours. The daily HGV activity associated with the former use typically varied between 5 and 10 HGV movements per day (two way) with an average of 7 movements

These vehicles were occurring on Kingsley Road, Kingsley Drive and Bogs Lane. This traffic has now been removed from this local network with the relocation of the egg packing and distribution facility to Flaxby. The removal of HGV traffic from Kingsley Road is a significant benefit to residential amenity.

The redevelopment of the site for residential use is predicted to generate approximately 27 additional two way trips in the AM peak hour and 28 additional two way trips in the PM peak hour when compared to the former use on the site. This level of additional traffic generated by the development proposal is modest and unlikely to have an adverse effect on the local highway network.

The impact of the development on the local highway network has been assessed. The operation of Kingsley Road / Knaresborough Road / Wedderburn Avenue priority junction has been modelled with predicted worst case peak hour traffic generations from the development. The base capacity model has been validated against existing queuing and delay observations. The results predict that the junction will not experience any adverse queuing or capacity problems as a result of the development and the junction will remain within capacity.

A qualitative assessment of the development peak hour traffic impact on Kingsley Drive and Bogs Lane has demonstrated that the development is unlikely to have an adverse material impact on these alternative access routes.

The Transport Statement has demonstrated that the residual cumulative impacts of the development are not severe and therefore this development should not be refused on transport grounds.

Kingsley Road Traffic Speeds

As part of the automatic traffic counts (ATC) undertaken on Kingsley Road, traffic speeds were recorded. The Traffic speed results are presented at Appendix B within the transport statement and can be summarised:

Location of ATC: Kingsley Road between Chippindale Foods access and Kingsley Drive.

	Vehicle speeds collected over 7 consecutive days		
	Northbound	Southbound	Both Directions
Mean Speed (mph)	23.9	22.6	23.3
85%ile Speed (mph)	29.5	28.2	28.9

The speed results show that traffic speeds on Kingsley Road are within the speed limit and there is not a traffic speeding problem on Kingsley Road. The development will generate residential traffic similar to that already occurring on Kingsley Road and therefore development traffic could be expected to exhibit similar driving patterns and is unlikely to exacerbate this situation.

Accident History

The transport statement identified that there is not a personal injury accident history problem on Kingsley Road, Kingsley Drive, Bogs Lane or at the Kingsley Road / A59 Junction, with the details of the accident search provided at Appendix C of the transport statement.

The website www.crashmap.co.uk has been interrogated to review highway accident data for the most recent period available within the vicinity of the site, following the assessment undertaken within the transport statement.

The updated assessment has shown that there has not been any further significant accident history on this network.

Committed Development Traffic

Development traffic flows for the consented Bogs Lane residential development for Miller Homes have been obtained from the transport assessment report submitted with that application.

The Miller Homes transport assessment shows traffic flow increases on Kingsley Road which can be summarised:

	Miller Homes Traffic Increases on Kingsley Road		
	Northbound	Southbound	Both Directions
AM Peak Hour	4	19	23
PM Peak Hour	23	7	30

A worst case capacity assumption is that all this traffic uses the Kingsley Road / A59 Knaresborough Road junction.

The worst case capacity model for this junction within the transport statement has been tested with the additional Miller Homes traffic identified above. The traffic has been assigned at the junction based on exiting turning proportions.

The model assesses traffic conditions at 2018, with network traffic growth included plus 85th%ile residential traffic generations from the Chippindale Foods site and committed development traffic from the Miller Homes Bogs Lane site.

The PICADY results are contained at Appendix A to this addendum and can be summarised:

      Arm A – A59 Knaresborough Road (eastbound)
      Arm B – Wedderburn Avenue
      Arm C – A59 Knaresborough Road (westbound)
      Arm D – Kingsley Road

	Weekday AM Peak 08:00-09:00		Weekday PM Peak 16:45-17:45	
	RFC	Queue	RFC	Queue
B – C	0.112	0.13	0.184	0.22
B – AC	0.124	0.14	0.187	0.23
A – BCD	0.119	0.13	0.202	0.25
D – ABC	0.641	1.70	0.470	0.86
C – B	0.181	0.22	0.145	0.17

2018 Base + Boggs Lane Resdential + Development 85th %ile

From the results of this worst case sensitivity assessment it can be seen that there are no adverse queuing or capacity problems at the priority junction with the ratio of flow to capacity (RFC) remaining below 0.85 in all scenarios.

Automatic Number Plate Recognition (ANPR) Survey – Bogs Lane / Kingsley Road

North Yorkshire County Council Highways have provided details of an ANPR survey undertaken as part of the Miller Homes Bogs Lane development, which was submitted to the Council in support of that application. Additional traffic investigations are provided within the Miller Homes information which considered traffic flows between Bogs Lane and Kingsley Road.

Details of the ANPR and surveys and Miller Homes traffic consultant's conclusions are contained at Appendix B to this addendum.

The Miller Homes traffic consultants concluded from the traffic surveys undertaken that

'a relatively modest volume of traffic is using this link as a through route during the morning peak period, to avoid congestion heading in to Harrogate town centre. It is considered that, whilst Bogs Lane may once have been an attractive alternative route for westbound commuter traffic on the A59, the introduction of traffic calming features may be acting as a disincentive to its use by traffic other than those trips associated with Granby High School/existing residential development served off Kingsley Road/Kingsley Drive.'

The redevelopment of the Chippindale foods site for residential use will introduce legitimate residential traffic onto the local highway network as a means of travelling to and from the site. It will not exacerbate traffic flows linking through the local highway network to avoid peak hour commuter congestion on the A59.

Consultation with North Yorkshire County Council Highways

Following submission of the planning application consultation with North Yorkshire County Council (NYCC) Highways has taken place on 31st March 2014 relating to the submitted transport statement and planning application.

The Highway Authority have verbally confirmed that they are in the process of formulating a planning application highway consultation response and that this will not raise objections to the development subject to conditions, which may include:

1. Upgrade the footway on the west side of Kingsley Road between Kingsley Drive and the site access to provide a full kerb height.

The reason given by NYCC for this is to improve pedestrian amenity and to discourage vehicles from parking on the footway.

2. The developer to fund additional traffic calming measures on Kingsley Road from the site access to Kingsley Drive and for the length of Kingsley Drive.

The reason given by NYCC for this is to extend the traffic calming measures already provided on Bogs Lane to strengthen the deterrent for non-local traffic using this link as a through route. NYCC have stated that the detail of any traffic calming measures can be agreed at reserved matters application stage.

The applicant accepts the principle of the highway improvement measures identified by NYCC and agrees that they could form part of appropriately worded planning conditions.

Summary

This addendum has provided additional information relating to traffic and transportation matters concerning the planning application

In accordance with the National Planning Policy Framework this addendum, in conjunction with the planning application transport statement, has demonstrated that the residual cumulative impacts of the development are not severe and therefore this development should not be refused on transport grounds.

Yours faithfully

Ian Ladbrooke

Enc   Appendix A – PICADY Results
                Appendix B – ANPR Survey and Conclusions

APPENDIX A

PICADY Results

                            TRL LIMITED

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   CAPACITIES, QUEUES, AND DELAYS AT 3 OR 4-ARM MAJOR/MINOR PRIORITY JUNCTIONS

                      PICADY 5.1 ANALYSIS PROGRAM
                        RELEASE 5.0 (JUNE 2010)

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 Run with file:-
 "J:\6000\6100\6127_ChippendaleFoo\Engineering\Traffic\Picady\2013 and 2018 Picady Assessment\
  A59 Knaresborough Road- Wedderburn Avenue- Kingsley Road.vpi"
(drive-on-the-left) at 16:25:33 on Thursday, 10 April 2014

 RUN INFORMATION
 ****

 RUN TITLE   : Knaresborough Road- Kingsley Road - Wedderburn Av
 LOCATION   :
 DATE   : 08/07/11
 CLIENT   :
 ENUMERATOR   : ashley.armitage [PC104]
 JOB NUMBER   : 6127
 STATUS   :
 DESCRIPTION   :

 MAJOR/MINOR JUNCTION CAPACITY AND DELAY
  ****

   INPUT DATA

                                            MINOR ROAD (ARM D)
                                                   I
                                                   I
                                                   I
                                                   I
                                                   I
                                                   I
                     MAJOR ROAD (ARM C) --------------------- MAJOR ROAD (ARM A)
                                            I
                                            I
                                            I
                                            I
                                            I
                                            I
                                     MINOR ROAD (ARM B)
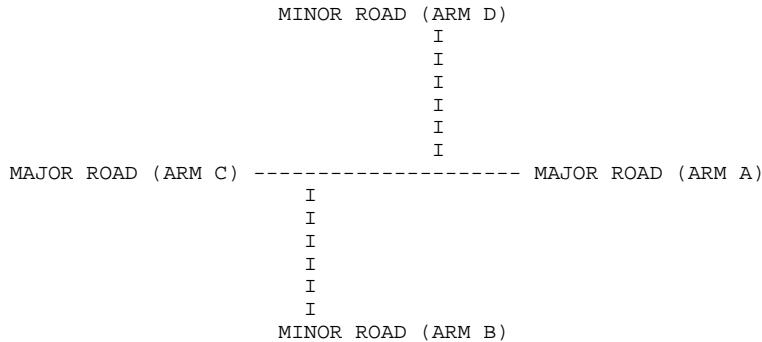
 ARM A IS A59 Knaresborough Road (eastbound)
 ARM B IS Wedderburn Aveune
 ARM C IS A59 Knaresborough Road (westbound)
 ARM D IS Kingsley Road

 STREAM LABELLING CONVENTION

         STREAM A-B CONTAINS TRAFFIC GOING FROM ARM A TO ARM B
         STREAM B-AC CONTAINS TRAFFIC GOING FROM ARM B TO ARM A AND TO ARM C
         ETC.

```
 GEOMETRIC DATA
 --------------
 ----------------------------------------------------------------------------------------------------
 I                   DATA ITEM                           I    MINOR ROAD B    I    MINOR ROAD D    I
 ----------------------------------------------------------------------------------------------------
 I  TOTAL MAJOR ROAD CARRIAGEWAY WIDTH                   I ( W  )  6.00 M.    I ( W  )  6.00 M.    I
 I  CENTRAL RESERVE WIDTH                                I (WCR )  0.00 M.    I (WCR )  0.00 M.    I
 I                                                       I                    I                    I
 I  MAJOR ROAD RIGHT  TURN - WIDTH                       I (WC-B)  2.30 M.    I (WA-D)  2.40 M.    I
 I                         - VISIBILITY                  I (VC-B)250.00 M.    I (VA-D)250.00 M.    I
 I                         - BLOCKS TRAFFIC (SPACES)     I         NO  ( 0) I          YES  ( 3) I
 I                                                       I                    I                    I
 I  MINOR ROAD - VISIBILITY TO LEFT                      I (VB-C)  16.0 M.    I (VD-A)  11.0 M.    I
 I            - VISIBILITY TO RIGHT                      I (VB-A)  17.0 M.    I (VD-C)   9.0 M.    I
 I            - LANE 1 WIDTH                             I (WB-C)    -        I (WD-A)  2.50 M.    I
 I            - LANE 2 WIDTH                             I (WB-A)    -        I (WD-C)  0.00 M.    I
 I            WIDTH AT  0 M FROM JUNCTION                I       10.00 M.    I            -       I
 I            WIDTH AT  5 M FROM JUNCTION                I        5.30 M.    I            -       I
 I            WIDTH AT 10 M FROM JUNCTION                I        4.20 M.    I            -       I
 I            WIDTH AT 15 M FROM JUNCTION                I        3.90 M.    I            -       I
 I            WIDTH AT 20 M FROM JUNCTION                I        3.60 M.    I            -       I
 I            - LENGTH OF FLARED SECTION                 I DERIVED:   1 PCU I            -       I
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 .SLOPES AND INTERCEPT
  --------------------
  (NB:Streams may be combined, in which case capacity will be adjusted)

 B-C Stream
 ----------------------------------------------------------------------------------------------------
 I Intercept For Slope For Opposing   Slope For Opposing   Slope For Opposing   Slope For OpposingI
 I STREAM B-C    STREAM  A-C          STREAM D-C           STREAM  A-B          STREAM  D-B      I
 ----------------------------------------------------------------------------------------------------
 I     0.00          0.00                 0.00                 0.00                 0.00         I
 ----------------------------------------------------------------------------------------------------

* Due to the presence of a flare, data is not available

 B-AD Stream
 ----------------------------------------------------------------------------------------------------
 I Intercept For Slope For Opposing   Slope For Opposing   Slope For Opposing   Slope For OpposingI
 I STREAM B-AD   STREAM  A-C          STREAM A-D           STREAM  D-A          STREAM  D-B      I
 ----------------------------------------------------------------------------------------------------
 I     0.00          0.00                 0.00                 0.00                 0.00         I
 ----------------------------------------------------------------------------------------------------

* Due to the presence of a flare, data is not available
 ----------------------------------------------------------------------------------------------------
 I             Slope For Opposing   Slope For Opposing   Slope For Opposing   Slope For OpposingI
 I             STREAM  C-A          STREAM C-B           STREAM  C-D                            I
 ----------------------------------------------------------------------------------------------------
 I                 0.00                 0.00                 0.00                                I
 ----------------------------------------------------------------------------------------------------

* Due to the presence of a flare, data is not available

 D-A Stream
 ----------------------------------------------------------------------------------------------------
 I Intercept For Slope For Opposing   Slope For Opposing   Slope For Opposing   Slope For OpposingI
 I STREAM D-A    STREAM  C-A          STREAM D-C           STREAM  A-B          STREAM  D-B      I
 ----------------------------------------------------------------------------------------------------
 I   598.09          0.23                 0.23                 0.09                 0.09         I
 ----------------------------------------------------------------------------------------------------


 D-BC Stream
 ----------------------------------------------------------------------------------------------------
 I Intercept For Slope For Opposing   Slope For Opposing   Slope For Opposing   Slope For OpposingI
 I STREAM D-BC   STREAM  C-A          STREAM B-A           STREAM  C-D          STREAM  B-D      I
 ----------------------------------------------------------------------------------------------------
 I   461.38          0.21                 0.21                 0.08                 0.08         I
 ----------------------------------------------------------------------------------------------------


 ----------------------------------------------------------------------------------------------------
 I             Slope For Opposing   Slope For Opposing   Slope For Opposing   Slope For OpposingI
 I             STREAM  A-C          STREAM A-B           STREAM  A-D                            I

 ----------------------------------------------------------------------------------------------------
 I                 0.13                 0.13                 0.30                                I
 ----------------------------------------------------------------------------------------------------


 C-B Stream
```

```
--------------------------------------------------------------------------------
TRL            TRL Viewer   3.2 AG J:\.. \2013 and 2018 Picady Assessment\A59 Knaresborough Road- Wedderburn Avenue- Kingsley
--------------------------------------------------------------------------------

I Intercept For Slope For Opposing   Slope For Opposing   Slope For Opposing   Slope For OpposingI
I STREAM C-B    STREAM A-C           STREAM A-B           STREAM D-C           STREAM D-B       I
------------------------------------------------------------------------------------------------
I    726.56          0.28                 0.28                 0.28                 0.28        I
------------------------------------------------------------------------------------------------


A-D Stream
------------------------------------------------------------------------------------------------
I Intercept For Slope For Opposing   Slope For Opposing   Slope For Opposing   Slope For OpposingI
I STREAM A-D    STREAM C-A           STREAM C-D           STREAM B-A           STREAM B-D       I
------------------------------------------------------------------------------------------------
I    726.56          0.28                 0.28                 0.28                 0.28        I
------------------------------------------------------------------------------------------------


TRAFFIC DEMAND DATA
-------------------
-----------------------
I ARM I FLOW SCALE(%) I
-----------------------
I A   I     100     I
I B   I     100     I
I C   I     100     I
I D   I     100     I
-----------------------


Demand set:        2018 AM Base


TIME PERIOD BEGINS 07.45 AND ENDS  09.15

LENGTH OF TIME PERIOD  -   90 MIN.
LENGTH OF TIME SEGMENT -   15 MIN.


DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

-------------------------------------------------------------------------------------------
I          I   NUMBER OF MINUTES FROM START WHEN    I   RATE OF FLOW (VEH/MIN)       I
I   ARM    I FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP  I AFTER       I
I          I  TO RISE    I  IS REACHED I FALLING    I  PEAK  I OF PEAK I PEAK        I
I          I             I             I            I        I         I             I
-------------------------------------------------------------------------------------------
I ARM  A I     15.00   I     45.00   I     75.00   I 7.86  I 11.79  I 7.86        I
I ARM  B I     15.00   I     45.00   I     75.00   I 0.90  I  1.35  I 0.90        I
I ARM  C I     15.00   I     45.00   I     75.00   I 8.90  I 13.35  I 8.90        I
I ARM  D I     15.00   I     45.00   I     75.00   I 1.40  I  2.10  I 1.40        I
-------------------------------------------------------------------------------------------

Demand set:      AM Proposed 85th %ile


TIME PERIOD BEGINS 07.45 AND ENDS  09.15

LENGTH OF TIME PERIOD  -   90 MIN.
LENGTH OF TIME SEGMENT -   15 MIN.


DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

-------------------------------------------------------------------------------------------
I          I   NUMBER OF MINUTES FROM START WHEN    I   RATE OF FLOW (VEH/MIN)       I
I   ARM    I FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP  I AFTER       I
I          I  TO RISE    I  IS REACHED I FALLING    I  PEAK  I OF PEAK I PEAK        I
I          I             I             I            I        I         I             I
-------------------------------------------------------------------------------------------
I ARM  A I     15.00   I     45.00   I     75.00   I 0.06  I  0.09  I 0.06        I
I ARM  B I     15.00   I     45.00   I     75.00   I 0.00  I  0.00  I 0.00        I
I ARM  C I     15.00   I     45.00   I     75.00   I 0.05  I  0.08  I 0.05        I
I ARM  D I     15.00   I     45.00   I     75.00   I 0.38  I  0.56  I 0.38        I
-------------------------------------------------------------------------------------------

Demand set:      AM Comm Boggs Lane Resi


TIME PERIOD BEGINS 07.45 AND ENDS  09.15

LENGTH OF TIME PERIOD  -   90 MIN.
LENGTH OF TIME SEGMENT -   15 MIN.
```

```
--------------------------------------------------------------------------------
TRL            TRL Viewer   3.2 AG J:\.. \2013 and 2018 Picady Assessment\A59 Knaresborough Road- Wedderburn Avenue- Kingsley
--------------------------------------------------------------------------------

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

----------------------------------------------------------------------------------
I        I   NUMBER OF MINUTES FROM START WHEN    I    RATE OF FLOW (VEH/MIN)       I
I  ARM   I FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP  I AFTER        I
I        I   TO RISE   I  IS REACHED I FALLING    I  PEAK  I OF PEAK I PEAK         I
I        I            I            I            I        I         I              I
----------------------------------------------------------------------------------
I ARM  A I    15.00   I    45.00   I    75.00   I  0.03  I   0.04  I  0.03        I
I ARM  B I    15.00   I    45.00   I    75.00   I  0.00  I   0.00  I  0.00        I
I ARM  C I    15.00   I    45.00   I    75.00   I  0.03  I   0.04  I  0.03        I
I ARM  D I    15.00   I    45.00   I    75.00   I  0.24  I   0.36  I  0.24        I
----------------------------------------------------------------------------------


Demand set:        2018 AM Base
--------------------------------------------------------------------------
I          I               TURNING PROPORTIONS                 I
I          I               TURNING COUNTS                       I
I          I              (PERCENTAGE OF H.V.S)                 I
I          I    --------------------------------------------------
I    TIME  I FROM/TO I ARM  A I ARM  B I ARM  C I ARM  D I
--------------------------------------------------------------------------
I  07.45 - 09.15   I        I        I        I        I        I
I          I ARM  A I  0.000 I  0.046 I  0.884 I  0.070 I
I          I        I    0.0 I   29.0 I  556.0 I   44.0 I
I          I        I (  0.0)I (  0.0)I (  6.9)I (  9.5)I
I          I        I        I        I        I        I
I          I ARM  B I  0.236 I  0.000 I  0.694 I  0.069 I
I          I        I   17.0 I    0.0 I   50.0 I    5.0 I
I          I        I (  0.0)I (  0.0)I (  2.1)I (  0.0)I
I          I        I        I        I        I        I
I          I ARM  C I  0.834 I  0.118 I  0.000 I  0.048 I
I          I        I  594.0 I   84.0 I    0.0 I   34.0 I
I          I        I (  9.1)I (  0.0)I (  0.0)I (  6.1)I
I          I        I        I        I        I        I
I          I ARM  D I  0.598 I  0.161 I  0.241 I  0.000 I
I          I        I   67.0 I   18.0 I   27.0 I    0.0 I
I          I        I (  6.3)I (  0.0)I (  3.8)I (  0.0)I
I          I        I        I        I        I        I
--------------------------------------------------------------------------
TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

Demand set:        AM Proposed 85th %ile
--------------------------------------------------------------------------
I          I               TURNING PROPORTIONS                 I
I          I               TURNING COUNTS                       I
I          I              (PERCENTAGE OF H.V.S)                 I
I          I    --------------------------------------------------
I    TIME  I FROM/TO I ARM  A I ARM  B I ARM  C I ARM  D I
--------------------------------------------------------------------------
I  07.45 - 09.15   I        I        I        I        I        I
I          I ARM  A I  0.000 I  0.000 I  0.000 I  1.000 I
I          I        I    0.0 I    0.0 I    0.0 I    5.0 I
I          I        I (  0.0)I (  0.0)I (  0.0)I (  0.0)I
I          I        I        I        I        I        I
I          I ARM  B I  0.000 I  0.000 I  0.000 I  0.000 I
I          I        I    0.0 I    0.0 I    0.0 I    0.0 I
I          I        I (  0.0)I (  0.0)I (  0.0)I (  0.0)I
I          I        I        I        I        I        I
I          I ARM  C I  0.000 I  0.000 I  0.000 I  1.000 I
I          I        I    0.0 I    0.0 I    0.0 I    4.0 I
I          I        I (  0.0)I (  0.0)I (  0.0)I (  0.0)I
I          I        I        I        I        I        I
I          I ARM  D I  0.600 I  0.167 I  0.233 I  0.000 I
I          I        I   18.0 I    5.0 I    7.0 I    0.0 I
I          I        I (  0.0)I (  0.0)I (  0.0)I (  0.0)I
I          I        I        I        I        I        I
--------------------------------------------------------------------------
TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS
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Demand set: AM Comm Boggs Lane Resi

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-------------------------------------------------------------------
I                  I           TURNING PROPORTIONS          I
I                  I           TURNING COUNTS               I
I                  I         (PERCENTAGE OF H.V.S)          I
I                  I-------------------------------------------------
I      TIME        I FROM/TO I ARM  A I ARM  B I ARM  C I ARM  D I
-------------------------------------------------------------------
I  07.45 - 09.15   I         I        I        I        I        I
I                  I ARM  A  I  0.000 I  0.000 I  0.000 I  1.000 I
I                  I         I    0.0 I    0.0 I    0.0 I    2.0 I
I                  I         I (  0.0)I (  0.0)I (  0.0)I (  0.0)I
I                  I         I        I        I        I        I
I                  I ARM  B  I  0.000 I  0.000 I  0.000 I  0.000 I
I                  I         I    0.0 I    0.0 I    0.0 I    0.0 I
I                  I         I (  0.0)I (  0.0)I (  0.0)I (  0.0)I
I                  I         I        I        I        I        I
I                  I ARM  C  I  0.000 I  0.000 I  0.000 I  1.000 I
I                  I         I    0.0 I    0.0 I    0.0 I    2.0 I
I                  I         I (  0.0)I (  0.0)I (  0.0)I (  0.0)I
I                  I         I        I        I        I        I
I                  I ARM  D  I  0.579 I  0.158 I  0.263 I  0.000 I
I                  I         I   11.0 I    3.0 I    5.0 I    0.0 I
I                  I         I (  0.0)I (  0.0)I (  0.0)I (  0.0)I
I                  I         I        I        I        I        I
-------------------------------------------------------------------
```

TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

           QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT

            FOR COMBINED DEMAND SETS
            AND FOR TIME PERIOD   1

```
----------------------------------------------------------------------------------------------------------
I TIME        DEMAND  CAPACITY  DEMAND/   PEDESTRIAN   START   END     DELAY       GEOMETRIC DELAY   AVERAGE DELAY I
I            (VEH/MIN)(VEH/MIN) CAPACITY    FLOW       QUEUE   QUEUE  (VEH.MIN/      (VEH.MIN/        PER ARRIVING  I
I                                (RFC)    (PEDS/MIN)  (VEHS)  (VEHS) TIME SEGMENT)  TIME SEGMENT)   VEHICLE (MIN) I
I 07.45-08.00                                                                                                     I
I   B-C        0.63     9.37     0.067                  0.00    0.07     1.0                              0.11     I
I   B-AD       0.28     4.90     0.056                  0.00    0.06     0.8                              0.22     I
I   A-BCD      0.64     8.96     0.071                  0.00    0.08     1.1                              0.12     I
I   D-ABC      2.02     5.99     0.337                  0.00    0.50     6.9                              0.25     I
I   C-D        0.50                                                                                               I
I   C-A        7.45                                                                                               I
I   C-B        1.05     9.67     0.109                  0.00    0.12     1.8                              0.12     I
I                                                                                                                 I

----------------------------------------------------------------------------------------------------------


----------------------------------------------------------------------------------------------------------
I TIME        DEMAND  CAPACITY  DEMAND/   PEDESTRIAN   START   END     DELAY       GEOMETRIC DELAY   AVERAGE DELAY I
I            (VEH/MIN)(VEH/MIN) CAPACITY    FLOW       QUEUE   QUEUE  (VEH.MIN/      (VEH.MIN/        PER ARRIVING  I
I                                (RFC)    (PEDS/MIN)  (VEHS)  (VEHS) TIME SEGMENT)  TIME SEGMENT)   VEHICLE (MIN) I
I 08.00-08.15                                                                                                     I
I   B-C        0.75     8.88     0.084                  0.07    0.09     1.3                              0.12     I
I   B-AD       0.33     4.21     0.078                  0.06    0.08     1.2                              0.26     I
I   A-BCD      0.76     8.51     0.090                  0.08    0.10     1.5                              0.13     I
I   D-ABC      2.41     5.43     0.444                  0.50    0.77    10.9                              0.33     I
I   C-D        0.60                                                                                               I
I   C-A        8.90                                                                                               I
I   C-B        1.26     9.20     0.137                  0.12    0.16     2.3                              0.13     I
I                                                                                                                 I

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I TIME        DEMAND  CAPACITY  DEMAND/   PEDESTRIAN   START   END     DELAY       GEOMETRIC DELAY   AVERAGE DELAY I
I            (VEH/MIN)(VEH/MIN) CAPACITY    FLOW       QUEUE   QUEUE  (VEH.MIN/      (VEH.MIN/        PER ARRIVING  I
I                                (RFC)    (PEDS/MIN)  (VEHS)  (VEHS) TIME SEGMENT)  TIME SEGMENT)   VEHICLE (MIN) I
I 08.15-08.30                                                                                                     I
I   B-C        0.92     8.19     0.112                  0.09    0.12     1.8                              0.14     I
I   B-AD       0.40     3.25     0.124                  0.08    0.14     2.0                              0.35     I
I   A-BCD      0.94     7.87     0.119                  0.10    0.13     2.0                              0.14     I
I   D-ABC      2.95     4.61     0.641                  0.77    1.62    21.6                              0.57     I
I   C-D        0.73                                                                                               I
I   C-A       10.90                                                                                               I
I   C-B        1.54     8.54     0.180                  0.16    0.22     3.2                              0.14     I
I                                                                                                                 I

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TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.30-08.45									
B-C	0.92	8.18	0.112		0.12	0.13	1.9		0.14
B-AD	0.40	3.24	0.124		0.14	0.14	2.1		0.35
A-BCD	0.94	7.87	0.119		0.13	0.13	2.0		0.14
D-ABC	2.95	4.61	0.641		1.62	1.70	25.0		0.60
C-D	0.73								
C-A	10.90								
C-B	1.54	8.54	0.181		0.22	0.22	3.3		0.14

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
08.45-09.00									
B-C	0.75	8.87	0.084		0.13	0.09	1.4		0.12
B-AD	0.33	4.20	0.079		0.14	0.09	1.4		0.26
A-BCD	0.76	8.50	0.090		0.13	0.10	1.5		0.13
D-ABC	2.41	5.43	0.444		1.70	0.83	13.5		0.34
C-D	0.60								
C-A	8.90								
C-B	1.26	9.19	0.137		0.22	0.16	2.5		0.13

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
09.00-09.15									
B-C	0.63	9.36	0.067		0.09	0.07	1.1		0.11
B-AD	0.28	4.89	0.056		0.09	0.06	0.9		0.22
A-BCD	0.64	8.96	0.071		0.10	0.08	1.2		0.12
D-ABC	2.02	5.99	0.337		0.83	0.52	8.3		0.25
C-D	0.50								
C-A	7.45								
C-B	1.05	9.67	0.109		0.16	0.12	1.9		0.12

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM   B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.1
08.30	0.1
08.45	0.1
09.00	0.1
09.15	0.1

QUEUE FOR STREAM   B-AD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
08.00	0.1
08.15	0.1
08.30	0.1
08.45	0.1
09.00	0.1
09.15	0.1

 QUEUE FOR STREAM   A-BCD

 TIME   NO. OF
 SEGMENT   VEHICLES
 ENDING   IN QUEUE
  08.00   0.1
  08.15   0.1
  08.30   0.1
  08.45   0.1
  09.00   0.1
  09.15   0.1

 QUEUE FOR STREAM   D-ABC

 TIME   NO. OF
 SEGMENT   VEHICLES
 ENDING   IN QUEUE
  08.00   0.5
  08.15   0.8   *
  08.30   1.6   **
  08.45   1.7   **
  09.00   0.8   *
  09.15   0.5   *

 QUEUE FOR STREAM   C-B

 TIME   NO. OF
 SEGMENT   VEHICLES
 ENDING   IN QUEUE
  08.00   0.1
  08.15   0.2
  08.30   0.2
  08.45   0.2
  09.00   0.2
  09.15   0.1

```
                QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
                --------------------------------------------
--------------------------------------------------------------------------------
I STREAM I   TOTAL DEMAND  I  * QUEUEING *     I * INCLUSIVE QUEUEING * I
I        I                 I    * DELAY *      I       * DELAY *       I
I        I-----------------I-----------------------------------------------I
I        I (VEH)  (VEH/H) I (MIN)    (MIN/VEH) I   (MIN)     (MIN/VEH)  I
--------------------------------------------------------------------------------
I  B-C   I   68.8 I   45.9 I    8.6 I    0.13   I     8.6 I    0.13    I
I  B-AD  I   30.3 I   20.2 I    8.4 I    0.28   I     8.4 I    0.28    I
I  A-BCD I   70.2 I   46.8 I    9.3 I    0.13   I     9.3 I    0.13    I
I  D-ABC I  221.6 I  147.7 I   86.2 I    0.39   I    86.2 I    0.39    I
I  C-D   I   55.1 I   36.7 I        I           I         I           I
I  C-A   I  817.6 I  545.1 I        I           I         I           I
I  C-B   I  115.6 I   77.1 I   14.9 I    0.13   I    14.9 I    0.13    I
--------------------------------------------------------------------------------
I  ALL   I 2184.4 I 1456.3 I  127.4 I    0.06   I   127.4 I    0.06    I
--------------------------------------------------------------------------------
* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES
WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS
 A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

*******END OF RUN*******
```

.SLOPES AND INTERCEPT

  (NB:Streams may be combined, in which case capacity will be adjusted)

B-C Stream

| Intercept For Slope For Opposing | Slope For Opposing | Slope For Opposing | Slope For Opposing |
STREAM B-C STREAM A-C	STREAM D-C	STREAM A-B	STREAM D-B
0.00 0.00	0.00	0.00	0.00

* Due to the presence of a flare, data is not available

B-AD Stream

| Intercept For Slope For Opposing | Slope For Opposing | Slope For Opposing | Slope For Opposing |
STREAM B-AD STREAM A-C	STREAM A-D	STREAM D-A	STREAM D-B
0.00 0.00	0.00	0.00	0.00

* Due to the presence of a flare, data is not available

| | Slope For Opposing | Slope For Opposing | Slope For Opposing | Slope For Opposing |
	STREAM C-A	STREAM C-B	STREAM C-D	
	0.00	0.00	0.00	

* Due to the presence of a flare, data is not available

D-A Stream

| Intercept For Slope For Opposing | Slope For Opposing | Slope For Opposing | Slope For Opposing |
STREAM D-A STREAM C-A	STREAM D-C	STREAM A-B	STREAM D-B
598.09 0.23	0.23	0.09	0.09

D-BC Stream

| Intercept For Slope For Opposing | Slope For Opposing | Slope For Opposing | Slope For Opposing |
STREAM D-BC STREAM C-A	STREAM B-A	STREAM C-D	STREAM B-D
461.38 0.21	0.21	0.08	0.08

| | Slope For Opposing | Slope For Opposing | Slope For Opposing | Slope For Opposing |
	STREAM A-C	STREAM A-B	STREAM A-D	
	0.13	0.13	0.30	

C-B Stream

I Intercept For Slope For Opposing Slope For Opposing Slope For Opposing Slope For OpposingI
I STREAM C-B   STREAM A-C   STREAM A-B   STREAM D-C   STREAM D-B   I

I   726.56   0.28   0.28   0.28   0.28   I

A-D Stream

I Intercept For Slope For Opposing Slope For Opposing Slope For Opposing Slope For OpposingI
I STREAM A-D   STREAM C-A   STREAM C-D   STREAM B-A   STREAM B-D   I

I   726.56   0.28   0.28   0.28   0.28   I

TRAFFIC DEMAND DATA

I ARM I FLOW SCALE(%) I

I A   I   100   I
I B   I   100   I
I C   I   100   I
I D   I   100   I

Demand set: 2018 PM Base

TIME PERIOD BEGINS 16.30 AND ENDS 18.00

LENGTH OF TIME PERIOD -   90 MIN.
LENGTH OF TIME SEGMENT -   15 MIN.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

I   I   NUMBER OF MINUTES FROM START WHEN   I   RATE OF FLOW (VEH/MIN)   I
I ARM   I FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AFTER   I
I   I TO RISE   I IS REACHED I FALLING   I PEAK I OF PEAK I PEAK   I
I   I   I   I   I   I   I   I

I ARM A I   15.00   I   45.00   I   75.00   I 9.32   I 13.99   I 9.32   I
I ARM B I   15.00   I   45.00   I   75.00   I 1.27   I 1.91   I 1.27   I
I ARM C I   15.00   I   45.00   I   75.00   I 10.25 I 15.38   I 10.25   I
I ARM D I   15.00   I   45.00   I   75.00   I 0.91   I 1.37   I 0.91   I

Demand set: PM Proposed 85th %ile

TIME PERIOD BEGINS 16.30 AND ENDS 18.00

LENGTH OF TIME PERIOD -   90 MIN.
LENGTH OF TIME SEGMENT -   15 MIN.

DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

I   I   NUMBER OF MINUTES FROM START WHEN   I   RATE OF FLOW (VEH/MIN)   I
I ARM   I FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP I AFTER   I
I   I TO RISE   I IS REACHED I FALLING   I PEAK I OF PEAK I PEAK   I
I   I   I   I   I   I   I   I

I ARM A I   15.00   I   45.00   I   75.00   I 0.17   I 0.26   I 0.17   I
I ARM B I   15.00   I   45.00   I   75.00   I 0.03   I 0.04   I 0.03   I
I ARM C I   15.00   I   45.00   I   75.00   I 0.15   I 0.23   I 0.15   I
I ARM D I   15.00   I   45.00   I   75.00   I 0.14   I 0.21   I 0.14   I

Demand set: PM Comm Boggs Lane Resi

TIME PERIOD BEGINS 16.30 AND ENDS 18.00

LENGTH OF TIME PERIOD -   90 MIN.
LENGTH OF TIME SEGMENT -   15 MIN.

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TRL             TRL Viewer    3.2 AG J:\.. \2013 and 2018 Picady Assessment\A59 Knaresborough Road- Wedderburn Avenue- Kingsley
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DEMAND FLOW PROFILES ARE SYNTHESISED FROM TURNING COUNT DATA

-------------------------------------------------------------------------------
I        I   NUMBER OF MINUTES FROM START WHEN    I   RATE OF FLOW (VEH/MIN)      I
I  ARM   I FLOW STARTS I TOP OF PEAK I FLOW STOPS I BEFORE I AT TOP  I AFTER      I
I        I   TO RISE   I  IS REACHED I FALLING    I  PEAK  I OF PEAK I PEAK       I
I        I            I             I            I        I         I            I
-------------------------------------------------------------------------------
I ARM  A I    15.00    I   45.00     I   75.00    I  0.14  I   0.21  I  0.14      I
I ARM  B I    15.00    I   45.00     I   75.00    I  0.03  I   0.04  I  0.03      I
I ARM  C I    15.00    I   45.00     I   75.00    I  0.13  I   0.19  I  0.13      I
I ARM  D I    15.00    I   45.00     I   75.00    I  0.09  I   0.13  I  0.09      I
-------------------------------------------------------------------------------


Demand set:        2018 PM Base
--------------------------------------------------------------------
I                  I         TURNING PROPORTIONS                 I
I                  I         TURNING COUNTS                      I
I                  I        (PERCENTAGE OF H.V.S)                I
I                  ---------------------------------------------
I       TIME       I FROM/TO I ARM  A I ARM  B I ARM  C I ARM  D I
--------------------------------------------------------------------
I   16.30 - 18.00  I         I        I        I        I        I
I                  I ARM  A  I  0.000 I  0.043 I  0.874 I  0.083 I
I                  I         I    0.0 I   32.0 I  652.0 I   62.0 I
I                  I         I (  0.0)I (  3.2)I (  2.6)I (  0.0)I
I                  I         I        I        I        I        I
I                  I ARM  B  I  0.167 I  0.000 I  0.765 I  0.069 I
I                  I         I   17.0 I    0.0 I   78.0 I    7.0 I
I                  I         I (  0.0)I (  0.0)I (  2.7)I (  0.0)I
I                  I         I        I        I        I        I
I                  I ARM  C  I  0.854 I  0.079 I  0.000 I  0.067 I
I                  I         I  700.0 I   65.0 I    0.0 I   55.0 I
I                  I         I (  2.7)I (  0.0)I (  0.0)I (  3.8)I
I                  I         I        I        I        I        I
I                  I ARM  D  I  0.493 I  0.137 I  0.370 I  0.000 I
I                  I         I   36.0 I   10.0 I   27.0 I    0.0 I
I                  I         I (  0.0)I (  0.0)I (  0.0)I (  0.0)I
I                  I         I        I        I        I        I
--------------------------------------------------------------------
TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS

Demand set:        PM Proposed 85th %ile
--------------------------------------------------------------------
I                  I         TURNING PROPORTIONS                 I
I                  I         TURNING COUNTS                      I
I                  I        (PERCENTAGE OF H.V.S)                I
I                  ---------------------------------------------
I       TIME       I FROM/TO I ARM  A I ARM  B I ARM  C I ARM  D I
--------------------------------------------------------------------
I   16.30 - 18.00  I         I        I        I        I        I
I                  I ARM  A  I  0.000 I  0.000 I  0.000 I  1.000 I
I                  I         I    0.0 I    0.0 I    0.0 I   14.0 I
I                  I         I (  0.0)I (  0.0)I (  0.0)I (  0.0)I
I                  I         I        I        I        I        I
I                  I ARM  B  I  0.000 I  0.000 I  0.000 I  1.000 I
I                  I         I    0.0 I    0.0 I    0.0 I    2.0 I
I                  I         I (  0.0)I (  0.0)I (  0.0)I (  0.0)I
I                  I         I        I        I        I        I
I                  I ARM  C  I  0.000 I  0.000 I  0.000 I  1.000 I
I                  I         I    0.0 I    0.0 I    0.0 I   12.0 I
I                  I         I (  0.0)I (  0.0)I (  0.0)I (  0.0)I
I                  I         I        I        I        I        I
I                  I ARM  D  I  0.455 I  0.182 I  0.364 I  0.000 I
I                  I         I    5.0 I    2.0 I    4.0 I    0.0 I
I                  I         I (  0.0)I (  0.0)I (  0.0)I (  0.0)I
I                  I         I        I        I        I        I
--------------------------------------------------------------------
TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS
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Demand set:     PM Comm Boggs Lane Resi
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		TURNING PROPORTIONS			
		TURNING COUNTS			
		(PERCENTAGE OF H.V.S)			
TIME	FROM/TO	ARM A	ARM B	ARM C	ARM D
16.30 - 18.00					
	ARM A	0.000	0.000	0.000	1.000
		0.0	0.0	0.0	11.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM B	0.000	0.000	0.000	1.000
		0.0	0.0	0.0	2.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM C	0.000	0.000	0.000	1.000
		0.0	0.0	0.0	10.0
		(0.0)	(0.0)	(0.0)	(0.0)
	ARM D	0.429	0.143	0.429	0.000
		3.0	1.0	3.0	0.0
		(0.0)	(0.0)	(0.0)	(0.0)

```
TURNING PROPORTIONS ARE CALCULATED FROM TURNING COUNT DATA
THE PERCENTAGE OF HEAVY VEHICLES VARIES OVER TURNING MOVEMENTS


            QUEUE AND DELAY INFORMATION FOR EACH 15 MIN TIME SEGMENT
            -------------------------------------------------------
             FOR COMBINED DEMAND SETS
             AND FOR TIME PERIOD       2
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TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
16.30-16.45									
B-C	0.98	9.13	0.107		0.00	0.12	1.7		0.12
B-AD	0.35	4.54	0.077		0.00	0.08	1.2		0.24
A-BCD	1.09	9.29	0.117		0.00	0.13	2.0		0.12
D-ABC	1.14	5.32	0.214		0.00	0.27	3.8		0.24
C-D	0.97								
C-A	8.78								
C-B	0.82	9.46	0.086		0.00	0.09	1.4		0.12

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
16.45-17.00									
B-C	1.17	8.57	0.136		0.12	0.16	2.3		0.13
B-AD	0.42	3.79	0.111		0.08	0.12	1.7		0.30
A-BCD	1.30	8.72	0.150		0.13	0.17	2.6		0.13
D-ABC	1.36	4.61	0.296		0.27	0.41	5.8		0.31
C-D	1.15								
C-A	10.49								
C-B	0.97	8.95	0.109		0.09	0.12	1.8		0.13

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.00-17.15									
B-C	1.43	7.78	0.184		0.16	0.22	3.2		0.16
B-AD	0.51	2.75	0.187		0.12	0.22	3.1		0.44
A-BCD	1.60	7.92	0.201		0.17	0.25	3.8		0.16
D-ABC	1.67	3.56	0.470		0.41	0.83	11.4		0.51
C-D	1.41								
C-A	12.85								
C-B	1.19	8.24	0.145		0.12	0.17	2.4		0.14

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.15-17.30									
B-C	1.43	7.76	0.184		0.22	0.22	3.4		0.16
B-AD	0.51	2.75	0.187		0.22	0.23	3.4		0.45
A-BCD	1.60	7.92	0.202		0.25	0.25	3.8		0.16
D-ABC	1.67	3.55	0.470		0.83	0.86	12.7		0.53
C-D	1.41								
C-A	12.85								
C-B	1.19	8.23	0.145		0.17	0.17	2.5		0.14

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.30-17.45									
B-C	1.17	8.56	0.137		0.22	0.16	2.5		0.14
B-AD	0.42	3.79	0.111		0.23	0.13	2.0		0.30
A-BCD	1.30	8.71	0.150		0.25	0.18	2.7		0.14
D-ABC	1.36	4.61	0.296		0.86	0.43	6.9		0.31
C-D	1.15								
C-A	10.49								
C-B	0.97	8.94	0.109		0.17	0.12	1.9		0.13

TIME	DEMAND (VEH/MIN)	CAPACITY (VEH/MIN)	DEMAND/ CAPACITY (RFC)	PEDESTRIAN FLOW (PEDS/MIN)	START QUEUE (VEHS)	END QUEUE (VEHS)	DELAY (VEH.MIN/ TIME SEGMENT)	GEOMETRIC DELAY (VEH.MIN/ TIME SEGMENT)	AVERAGE DELAY PER ARRIVING VEHICLE (MIN)
17.45-18.00									
B-C	0.98	9.12	0.107		0.16	0.12	1.9		0.12
B-AD	0.35	4.53	0.078		0.13	0.09	1.3		0.24
A-BCD	1.09	9.29	0.118		0.18	0.13	2.0		0.12
D-ABC	1.14	5.32	0.215		0.43	0.28	4.4		0.24
C-D	0.97								
C-A	8.78								
C-B	0.82	9.46	0.086		0.12	0.10	1.5		0.12

WARNING NO MARGINAL ANALYSIS OF CAPACITIES AS MAJOR ROAD BLOCKING MAY OCCUR

QUEUE FOR STREAM   B-C

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.45	0.1
17.00	0.2
17.15	0.2
17.30	0.2
17.45	0.2
18.00	0.1

QUEUE FOR STREAM   B-AD

TIME SEGMENT ENDING	NO. OF VEHICLES IN QUEUE
16.45	0.1
17.00	0.1
17.15	0.2
17.30	0.2
17.45	0.1
18.00	0.1

```
--------------------------------------------------------------------------------
TRL            TRL Viewer   3.2 AG J:\.. \2013 and 2018 Picady Assessment\A59 Knaresborough Road- Wedderburn Avenue- Kingsley
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  QUEUE FOR STREAM    A-BCD
  ------------------------
  TIME           NO. OF
  SEGMENT        VEHICLES
  ENDING         IN QUEUE
   16.45           0.1
   17.00           0.2
   17.15           0.3
   17.30           0.3
   17.45           0.2
   18.00           0.1


  QUEUE FOR STREAM    D-ABC
  ------------------------
  TIME           NO. OF
  SEGMENT        VEHICLES
  ENDING         IN QUEUE
   16.45           0.3
   17.00           0.4
   17.15           0.8    *
   17.30           0.9    *
   17.45           0.4
   18.00           0.3


  QUEUE FOR STREAM    C-B
  ------------------------
  TIME           NO. OF
  SEGMENT        VEHICLES
  ENDING         IN QUEUE
   16.45           0.1
   17.00           0.1
   17.15           0.2
   17.30           0.2
   17.45           0.1
   18.00           0.1


            QUEUEING DELAY INFORMATION OVER WHOLE PERIOD
            --------------------------------------------
--------------------------------------------------------------------------------
I STREAM I   TOTAL DEMAND  I  * QUEUEING *    I * INCLUSIVE QUEUEING * I
I        I                 I   * DELAY *      I      * DELAY *        I
I        I----------------------------------------------------------------I
I        I (VEH)  (VEH/H) I (MIN)   (MIN/VEH) I   (MIN)     (MIN/VEH) I
--------------------------------------------------------------------------------
I  B-C  I 107.4 I   71.6 I   14.9 I   0.14   I    14.9 I    0.14   I
I  B-AD I  38.5 I   25.7 I   12.7 I   0.33   I    12.7 I    0.33   I
I  A-BCD I 119.7 I   79.8 I   16.9 I   0.14   I    16.9 I    0.14   I
I  D-ABC I 125.3 I   83.5 I   45.0 I   0.36   I    45.1 I    0.36   I
I  C-D  I 106.0 I   70.7 I        I          I         I           I
I  C-A  I 963.5 I  642.3 I        I          I         I           I
I  C-B  I  89.5 I   59.6 I   11.5 I   0.13   I    11.5 I    0.13   I
--------------------------------------------------------------------------------
I  ALL  I 2491.3 I 1660.9 I  101.1 I   0.04   I   101.1 I    0.04   I
--------------------------------------------------------------------------------
* DELAY IS THAT OCCURRING ONLY WITHIN THE TIME PERIOD
* INCLUSIVE DELAY INCLUDES DELAY SUFFERED BY VEHICLES
 WHICH ARE STILL QUEUEING AFTER THE END OF THE TIME PERIOD
* THESE WILL ONLY BE SIGNIFICANTLY DIFFERENT IF THERE IS
 A LARGE QUEUE REMAINING AT THE END OF THE TIME PERIOD.

*******END OF RUN*******


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APPENDIX B

ANPR Survey and Conclusions

An Automatic Number Plate Recognition (ANPR) survey was conducted on Tuesday 28th June 2011 at the southern ends of Bogs Lane and Kingsley Road in order to establish the volume of traffic using this route in order to avoid congestion on the A59. The Table below illustrates the total number of vehicles entering and departing from the two respective links between the identified peak hours of 8:00-9:00am and 5:00-6:00pm

	Total Vehicles Entering Receptor	Number Plate Matches Exiting	Total Vehicles Entering Receptor	Number Plate Matches Exiting
	AM Peak		PM Peak	
Bogs Lane to Kingsley Road	321	6	129	2
Kingsley Road to Bogs Lane	70	5	144	0

During the morning peak hour, typically one vehicle every 10 minutes was observed to be travelling between Bogs Lane and Kingsley Road, with approximately one vehicle every 12 minutes travelling in the opposite direction. During the evening peak hour, typically one vehicle every 30 minutes was observed to be travelling between Bogs Lane and Kingsley Road, with no vehicles observed travelling in the opposite direction.

The Local Highway Authority have recently installed a traffic calming feature on Kingsley Road (approximately 120 metres south of the active railway bridge) in the form of a signal controlled chicane arrangement, which effectively limits vehicle flow to one-way at any time. In order to further establish the levels of traffic using Bogs Lane and Kingsley Road as a through route, a two-way traffic survey was conducted at these signals on Tuesday 19 June 2012 by Road Data Services and compared against the surveyed traffic flows from 2008.

The results of this 2012 traffic survey indicate that during the morning peak period of 8:00-9:00am some 68 vehicles were recorded travelling through the signals in an eastbound direction (from Kingsley Road towards Bogs Lane) and 266 travelling in a westbound direction (from Bogs Lane towards Kingsley Road). During the evening peak period of 5:00-6:00pm some 96 vehicles were recorded travelling through the signals in an eastbound direction and 101 travelling in a westbound direction.

A comparison of the figures recorded during the turning counts conducted at the access junction of Henshaws College in June 2008, illustrates that during the corresponding morning peak period of 8:00-9:00 am some 69 vehicles were recorded travelling in an eastbound direction and 332 travelling in a westbound direction. During the evening peak period of 5:00-6:00 pm some 107 vehicles were recorded travelling in an eastbound direction and 113 travelling in a westbound direction.

It is evident that the recent introduction of traffic calming features on this link have resulted in a 20% reduction in traffic using Bogs Lane to access Kingsley Road/Kingsley Drive during the morning peak period, whilst vehicles travelling in the opposite direction have remained broadly similar.

An examination of the corresponding data for the evening peak period indicates that a 10% reduction in traffic using Bogs Lane to access Kingsley Road/Kingsley Drive (and vice versa) has occurred between 2008 and 2012.

It is, therefore, concluded that a relatively modest volume of traffic is using this link as a through route during the morning peak period, to avoid congestion heading in to Harrogate town centre. It is considered that, whilst Bogs Lane may once have been an attractive alternative route for westbound commuter traffic on the A59, the introduction of traffic calming features may be acting as a disincentive to its use by traffic other than those trips associated with Granby High School/existing residential development served off Kingsley Road/Kingsley Drive.