

## Transport Modelling



### The Groves, York - Traffic Flows Assessment

<b>DATE:</b>	02 April 2019	<b>CONFIDENTIALIT</b>	Confidential
<b>SUBJECT:</b>	Traffic Flows Assessment	<b>REFERENCE:</b>	v2
<b>PROJECT:</b>	70053766	<b>AUTHOR:</b>	Shannon Sweeney
<b>CHECKED:</b>	Narendra Sadhale	<b>APPROVED:</b>	Jon Phillip

#### Background

In February 2019, City of York Council (CoYC) commissioned WSP to undertake a review of the traffic effects of a number of potential traffic interventions in an area in York, the Groves, located immediately north of York City Centre. The review relates to work being undertaken to regenerate the Groves residential area.

The instruction from CoYC set out the tasks to be undertaken which comprised the following topics:-

- A. Vehicular Traffic Movements; and
- B. Non-vehicular Traffic Movements.

This note reports on Part A above and the associated traffic modelling and the initial analysis undertaken as part of the commission. Specifically, this report describes the impact of changes to the traffic flows on the local highway network and key junctions within the study area as a result of various potential highway interventions.

#### Study area and scope of the exercise

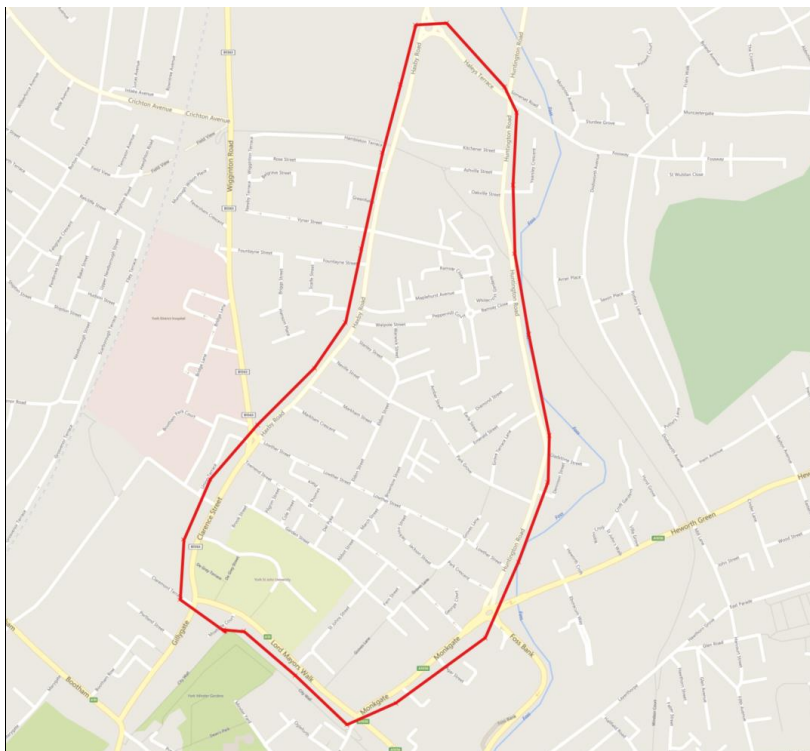
The study area, shown in **Figure 1** below, is bound by Haxby Road to the west, Lord Mayor's Walk to the south, Monkgate and Huntington Road to the east and Haley's Terrace to the north.

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*Figure 1 - Study Area*

Other key streets within The Groves are:

1. Lowther Street (one-way street eastbound); and
2. Penley's Grove Street (which becomes Townend Street, which is one-way westbound).

As part of the vehicular assessment exercise, the following scenarios have been modelled using the Council's 2016 SATURN model which CoYC granted permission to be used for this exercise.

1. **Scenario 1** – The closure of Lowther Street to through traffic;
2. **Scenario 2** – The closure of Penley's Grove to through traffic;

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3. **Scenario 3** – The closure of both Lowther Street and Penley’s Grove to through traffic; and
4. **Scenario 4** – As Scenario 3, but assuming there is a degree of non-compliance (I.e. ignoring TRO’s).

The impact of these closures in terms of changes in traffic flows during the peak hours have been reported for the following junctions within the study area.

1. Haley’s Terrace / Haxby Road;
2. Haley’s Terrace / Huntington Road / Fossway;
3. Fossway / Dodsworth Avenue;
4. Dodsworth Avenue / A1036;
5. Huntington Road / Lowther Street;
6. Huntington Road / Monkgate / A1036;
7. Monkgate / Lord Mayors Walk;
8. Lord Mayors Walk / Gillygate / Clarence Street;
9. Haxby Road / Wigginton Road / Lowther Street; and
10. Haxby Road / Townend Street

#### Methodology

As agreed with CoYC, base traffic data has been obtained from the City of York SATURN model, this avoided the need for new traffic surveys to be undertaken. The base year for the SATURN model is 2016 and the model has been updated relatively recently as part of the emerging York Local Plan process. The model covers all the major junctions of interest.

The SATURN model has been used to model and assess the broad impact of the above scenarios on the above junctions. Each scenario has been assessed for morning and evening peak hours (AM 0800-0900, PM 1700-1800). All scenarios are modelled in SATURN which reassigns traffic within the model to represent the impact of the closures.

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#### Results

The following section summarises the changes in traffic flows at the main junctions for each scenario against the base year model. The table below summarises the total change in the traffic flow through each junction for the various scenarios against the traffic flow observed in the base year.

**Table 1 - Percentage change in turning movements at each junction (compared with Base)**

	Junction Description	SC1 AM	SC1 PM	SC2 AM	SC2 PM	SC3 AM	SC3 PM	SC4 AM	SC4 PM
JC1	Haxby Road / Halsey's Terrace	4%	9%	11%	12%	7%	20%	10%	11%
JC2	Haley's Terrace / Huntington Rd / Fossway	4%	7%	11%	10%	15%	17%	13%	15%
JC3	Fossway / Dodsworth Avenue	9%	13%	28%	18%	37%	26%	31%	22%
JC4	Dodsworth Avenue / A1306	-1%	-4%	-3%	-5%	-3%	-7%	-4%	-7%
JC5	Huntington Road / Lowther Street	-29%	-30%	1%	5%	-28%	-21%	-26%	-22%
JC6	Huntington Road / Monkgate / A1306	-6%	-7%	-11%	-7%	-16%	-12%	-15%	-12%
JC7	Monkgate / Lord Mayors Walk	13%	12%	1%	1%	14%	13%	15%	13%
JC8	Lord Mayors Walk / Gillygate / Clarence Street	13%	14%	2%	3%	15%	16%	14%	16%
JC9	Haxby Road / Wigginton Road / Lowther Street	-3%	-1%	-3%	-4%	-4%	-3%	-5%	-5%
JC10	Haxby Road / Townsend Street	16%	16%	-18%	-21%	-1%	-3%	-2%	-4%

The above table summarises the change in total traffic flows through each junction. In order to better understand the impact of the interventions further analysis has been undertaken to summarise the impact each scenario on individual turning movements at each junction.

**Appendix A** contains Figures 1-26, showing for each scenario (AM and PM) base turning flow, turning flows for each scenario and a percentage change in turning flow for each turning movement. The traffic diagrams included within the following sections summarise the impact of the closures on the surrounding highway network.

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#### Scenario 1

This scenario models the complete closure of Lowther Street to through traffic (using traffic regulation orders and/or physical measures).

##### AM PEAK HOUR

**Figure 4** (attached in **Appendix A**) shows the change in the traffic flows in the study area between the Base Year 2016 and Scenario 1 for the AM peak hour.

According to the model, the closure of Lowther Street would result in a 155% increase in traffic turning left from Clarence Street to Lord Mayor's Walk with a 63% increase in vehicles turning left from Lord Mayor's Walk to Monkgate. An increase of 90% traffic for vehicles travelling straight ahead from Wigginton Road (southbound) to Haxby Road. The model presents the highest increase of 180% on Monkgate for traffic turning right onto Fossbank.

##### PM PEAK HOUR

**Figure 8** (attached in **Appendix A**) shows the change of turning movements in the study area between the Base Year 2016 and Scenario 1 for the PM peak hour.

The model results indicate an increase of 133% in traffic turning left from Clarence Street to Lord Mayor's Walk would occur in the evening peak with the closure of Lowther Street. Furthermore, a 61% increase is modelled turning left for Lord Mayor's Walk onto Monkgate. The highest increase from the results would occur on Monkgate, turning right on to Fossbank, which shows a 192% increase.

#### Scenario 2

This scenario models the closure of Penley's Grove Street to through traffic (using traffic regulation orders and/or physical measures).

##### AM PEAK HOUR

**Figure 11** (attached in **Appendix A**) shows the change of traffic flows in the study area between the Base Year 2016 and Scenario 2 for the AM peak hour.

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According to the model, the closure of Penley's Grove Street results in a 79% decrease in traffic turning left from Foss Bank on to Monkgate. Dodsworth Avenue results presents an increase of 57% for traffic turning left on to Fossway. Furthermore, the model output show a 67% increase in vehicles turning left from Heworth Green to Dodsworth Avenue.

#### PM PEAK HOUR

**Figure 14** (attached in **Appendix A**) shows the change of traffic flows in the study area between the Base Year 2016 and Scenario 2 for the PM peak hour.

The model indicates during the evening peak there is an increase of 89% in traffic turning right from Haxby Road (southbound) on to Wigginton Road (northbound). The results present a 54% increase on turn flows from Goodramgate, left on to Lord Mayor's Walk. Furthermore, the model presents a 46% increase on the right turn from Foss Bank to Huntington Road

#### Scenario 3

The scenario models the closure of both Lowther Street and Penley's Grove Street to through traffic (using traffic regulation orders and/or physical measures).

#### AM PEAK HOUR

**Figure 17** (attached in **Appendix A**) shows the change in the traffic flows in the study area between the Base Year 2016 and Scenario 3 and for the AM peak hour.

The model indicates a 148% increase in traffic turning left from Clarence Street to Lord Mayor's Walk. The results also show a 97% increase on the straight ahead movement from Wigginton Road (southbound) to Haxby Road. The right turn from Monkgate to Foss Bank model output shows an increase of 148% also. Furthermore, the results present a 59% increase in traffic turning left from Lord Mayor's Walk to Monkgate.

#### PM PEAK HOUR

**Figure 20** (attached in **Appendix A**) shows the change in the traffic flows in the study area between the Base Year 2016 and Scenario 3 for the PM peak hour.

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According to the model, an increase in 134% vehicles turning left from Clarence Street to Lord Mayor's Walk is presented in the results during the evening peak hours. The model output shows an increase of 171% traffic turning right from Monkgate to Foss Bank. A 140% increase is presented in the results in the straight ahead movement from Wigginton Road (Southbound) to Haxby Road with the closures of both Lowther Street and Penley's Grove Street.

#### Scenario 4

As Scenario 3 (the closure of both Lowther Street and Penley's Grove Street to through traffic), this scenario models these closure but assumes there is a degree of non-compliance and a proportion of vehicles (around 10%) would still use Lowther Street.

#### AM PEAK HOUR

**Figure 23** (attached in **Appendix A**) shows the change in the traffic flows in the study area between the Base Year 2016 and Scenario 4 for the AM peak hour.

The model indicates a 98% increase in traffic travelling straight ahead from Wigginton Road (southbound) to Haxby Road during the morning peak. The model results show an increase of 120% in traffic turning right from Monkgate to Foss Bank is observed. Furthermore, a 142% increase is presented in the results for turning left from Haxby Road to Lord Mayor's Walk.

#### PM PEAK HOUR

**Figure 26** (attached in **Appendix A**) shows the change in the traffic flows in the study area between the Base Year 2016 and Scenario 4 for the PM peak hour.

According to the model, an increase of 129% traffic turning left from Clarence Street to Lord Mayor's Walk is calculated during the evening peak hours. The model results show an increase of 151% in traffic turning right from Monkgate to Foss Bank, and 145% increase from the Wigginton Road movement southbound ahead into Haxby Road.

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#### Summary and Conclusions

This note presents Part A of the work, assessment of the impact of a number of potential traffic interventions for an area the Groves using the Council's SATURN model, and the potential changes in traffic flows as a consequence of these interventions. The traffic flows were reviewed and the changes in overall junction flows and specific turning movements have been reported. Four scenarios were explored:

1. **Scenario 1** – The closure of Lowther Street to through traffic;
2. **Scenario 2** – The closure of Penley's Grove Street to through traffic;
3. **Scenario 3** – The closure of both Lowther Street and Penley's Grove Street to through traffic; and
4. **Scenario 4** – As Scenario 3, but assuming there is a degree of non-compliance (i.e. around 10% ignoring TRO's).

Each scenario was modelled to predict the different impacts that may be found on each junction, for both AM and PM peak hours, and compared with the Base Year 2016 model, this was then presented as a percentage change in traffic flows.

**Scenario 1 AM and PM** model outputs states the highest increase in traffic increase in traffic turning right from Monkgate to Fossbank.

**Scenario 2 AM** model outputs show the highest increase in the right turn flows from Heworth Green to Dodsworth Avenue. **The PM peak** models Haxby Road (southbound) right turn to Wigginton Road (northbound) as the highest increase in turning flows.

**Scenario 3 AM and PM** model outputs both find the highest increase in the southbound straight ahead movement from Wigginton Road to Haxby Road.

**Scenario 4 AM** model output states the highest increase in turning flows is turning left from Haxby Road to Lord Mayor's Walk. **The PM peak** results show the highest increase turning right from Monkgate to Fossbank.

Subject to discussions with CoYC officers, it may be necessary to undertake some junction assessments to assess in detail the operational impact of one of more of the scenarios on the existing junctions.