

Internal Memo

Comhairle Chondae
Chill Dara

Transportation Department
Aras Chill Dara,
Naas.



Date: 22nd July 2021

Re: Traffic Modelling – Proposed Material Alteration Data Centre Newhall / Jigginstown, Naas

Introduction:

Subsequent to the delivery of the attached Traffic Modelling memo dated 20th April 2021 it was requested that the Transportation Section in Kildare County Council investigate the traffic impacts of increasing the area of land zoned for a Data Centre at Jigginstown from 106 acres to 133 acres (54 hectares). Figure 1.0 below outlines the proposed material alternation:

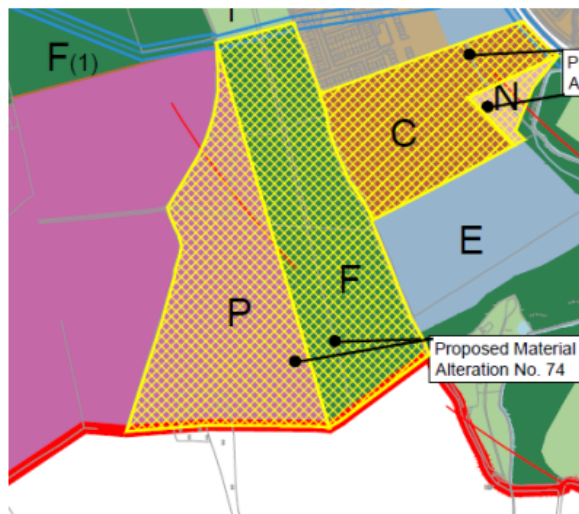


Figure 1: Proposed increase in area of land zoned for Data Centre at Jigginstown, Naas, Co. Kildare

Staff Number Increase:

The increase in land zoned for a data centre would result in a potential 25% increase in staff employed at such a facility. In line with the previously outlined staff numbers this would increase staff number at the facility for 151 to 189. Staggered over three shifts per day this would result in a maximum of 63 departures and arrivals in the AM and PM peak hours.

The previous modelling exercise had examined the impacts of the 50 departures and arrivals in the AM and PM peak hours (151 employees / 3 shifts per day).

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Traffic Modelling Impacts:

Given the minor increase in AM and PM peak departures that would be generated by the proposed material alteration, the Transportation Section are comfortable that the previous traffic modelling exercise is sufficient and that re-running the model with such low increases in trips generated by the development will not result in any significant changes in the VISUM traffic modelling output.

Conclusion:

The proposed material alteration results in a small increase in staff numbers employed at the proposed developed and this would have a negligible impact in terms of traffic impacts.

The results of the previously modelling exercise remain valid and the data centre is likely to generate minor impacts on the road network compared to the do-minimum model in both the 2023 and 2030 models.

The queue length plots, from the previous modelling exercise, indicate that, from a traffic perspective the Newhall Industrial Estate access point is preferable to the Devoy Link road access point.



Jonathan Hennessy

Executive Engineer

Internal Memo

Comhairle Chondae
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Transportation Department
Aras Chill Dara,
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To: Jonathan Hennessy

Date: 20th April 2021

Re: Traffic Modelling – Proposed Data Centre Newhall / Jigginstown, Naas

Introduction:

Recently, the Transport Department in Kildare County Council completed the Naas / Sallins Transport Strategy. This transport strategy was developed to create a holistic transport plan for Naas and Sallins over the next two decades. One aspect of this transport strategy was to link future town development and land use zoning with transport considerations. This is to ensure that any future land use zonings do not negatively impact on the functioning of the transport network in Naas and Sallins. This is particularly important given the close proximity of the M7 and the M7 junctions, 9, 9A and 10 to Naas.

Following the completion of the Naas / Sallins Transport Strategy, the Planning Department requested that the Transport Department conduct additional traffic modelling to gauge the impacts of a proposed data centre on a site in Newhall / Jigginstown, Naas. The location of this proposed data centre is shown in Figure 1 below. The site is approximately 106 acres. This data centre was not originally included in the strategic traffic model (using PTV VISUM software) developed for the Naas / Sallins Transport Strategy.

The purpose of this modelling exercise was to understand the impacts of additional trips generated by a data centre at this location on the surrounding road network.

Two options were modelled in terms of access to the site:

1. Access at Newhall Industrial Estate
2. Access at Devoy Link Road

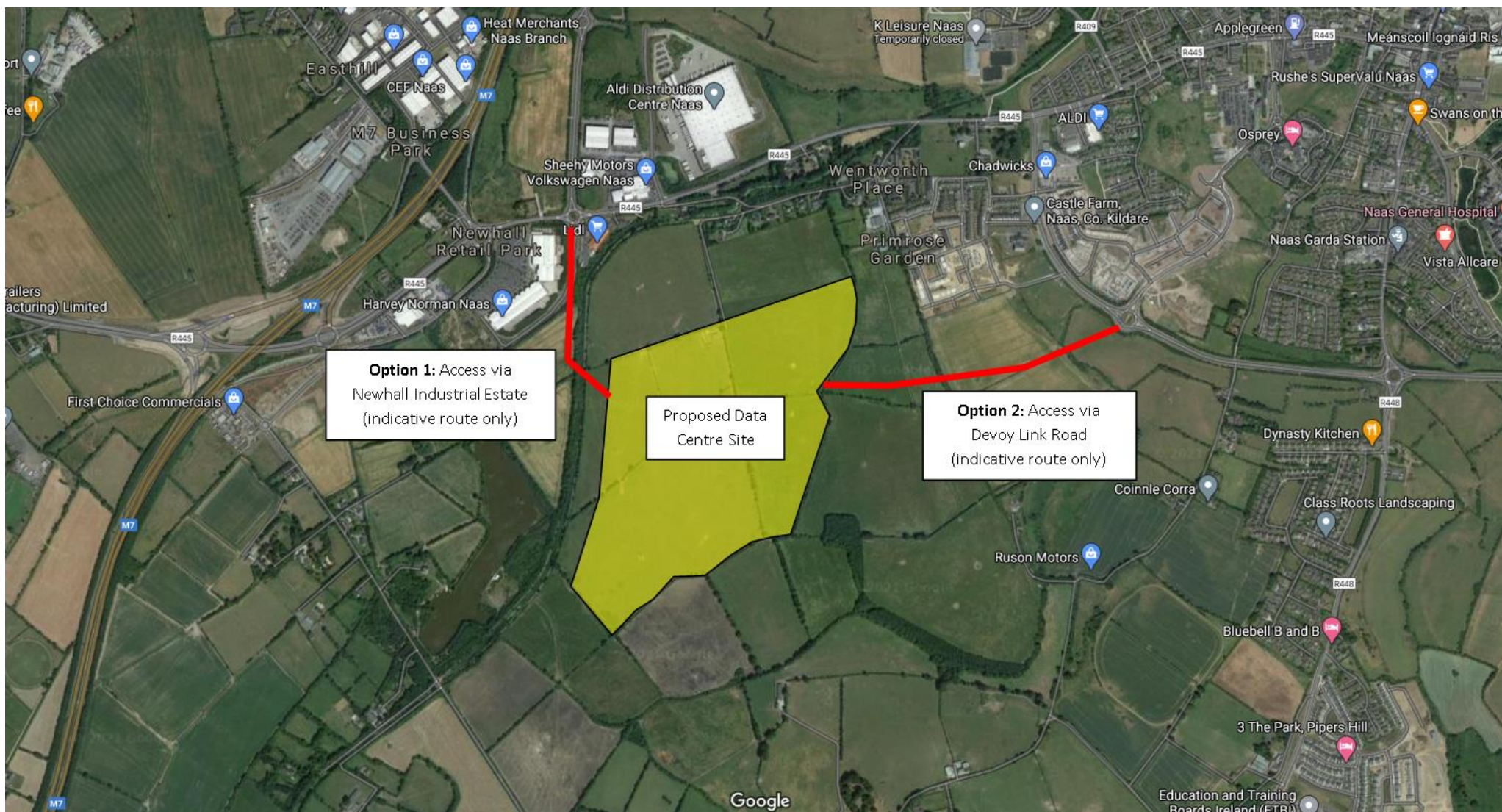


Figure 1: Location of Proposed Data Centre at Newhall / Jigginstown, Naas, Co. Kildare

Details of Traffic Modelling:

The new traffic modelling scenario was run by Consultants AECOM in the Naas VISUM model for the AM and PM peak hours in the future years 2023 and 2030. Both access options to the data centre site were modelled separately so that they could be directly compared and to inform the selection of the preferred access point.

The proposed location of the data centre was not originally represented by a specific zone in the Naas VISUM traffic model, so for the purposes of this exercise a new zone was created, and the traffic demand adjusted in the traffic model to reflect this.

It was assumed that the data centre would generate a worst-case scenario of 50 departures and arrivals in the AM and PM peak hours (151 employees / 3 shifts per day).

The outputs of the traffic model included the following:

- Updated traffic models (2023/2030 AM & PM Do-Min and Do-Something);
- Difference plots (vehicle flows);
- Volume/Capacity Ratios;
- Queue lengths; and
- Network Statistics.

These outputs allowed for the analysis of the impact of the data centre proposal, particularly on key junctions in the vicinity of the proposed development such as the M7 junction 10.

Traffic Modelling Results:

This section presents the outputs of the traffic modelling and discusses the impact of the data centre on the road network, compared to the do-minimum scenario. It also addresses the question as to which access point is preferable from a traffic perspective.

Difference Plots

Figures 2 and 3 below illustrate the difference plots resulting from the inclusion of the data centre in the 2023 AM peak hour model. These difference plots show the increase or decrease in traffic on the network as a result of the new data centre, with traffic increases shown in **red** and traffic decreases shown in **blue**. These increases and decreases in traffic are in comparison to the do-minimum traffic model, where there is no data centre included.

These difference plots show that both access options result in minor increases in traffic along the main routes into Naas, including the M7, the Naas ring roads and the Newbridge Road. The Devoy Link Road access option results in slightly more traffic being drawn onto the Devoy Link Road and the Newbridge Road, as would be expected.

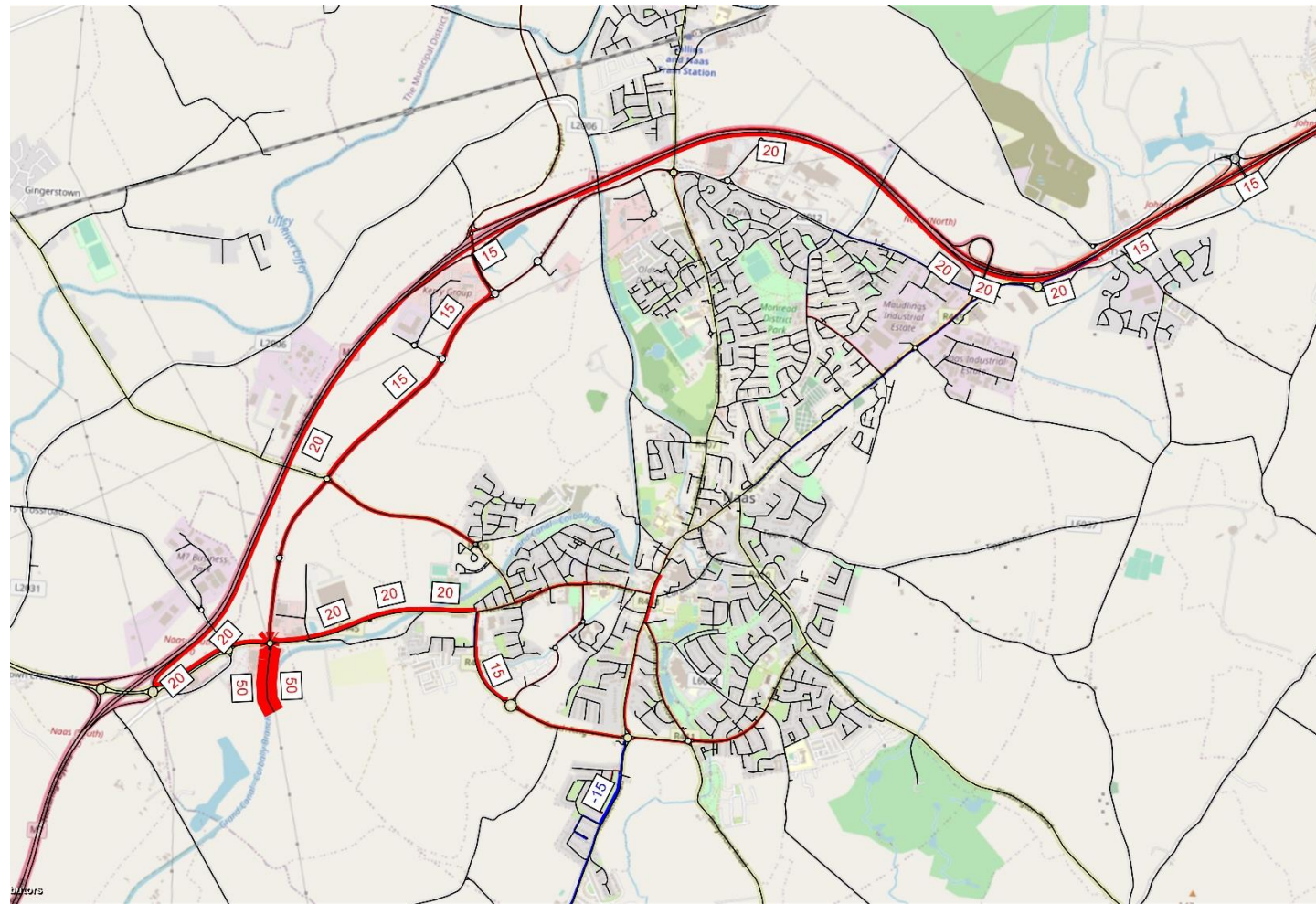


Figure 2: 2023 AM Peak Difference Plot – Newhall Industrial Estate Access Option



Figure 3: 2023 AM Peak Difference Plot – Devoy Link Road Access Option

Volume/Capacity Ratios

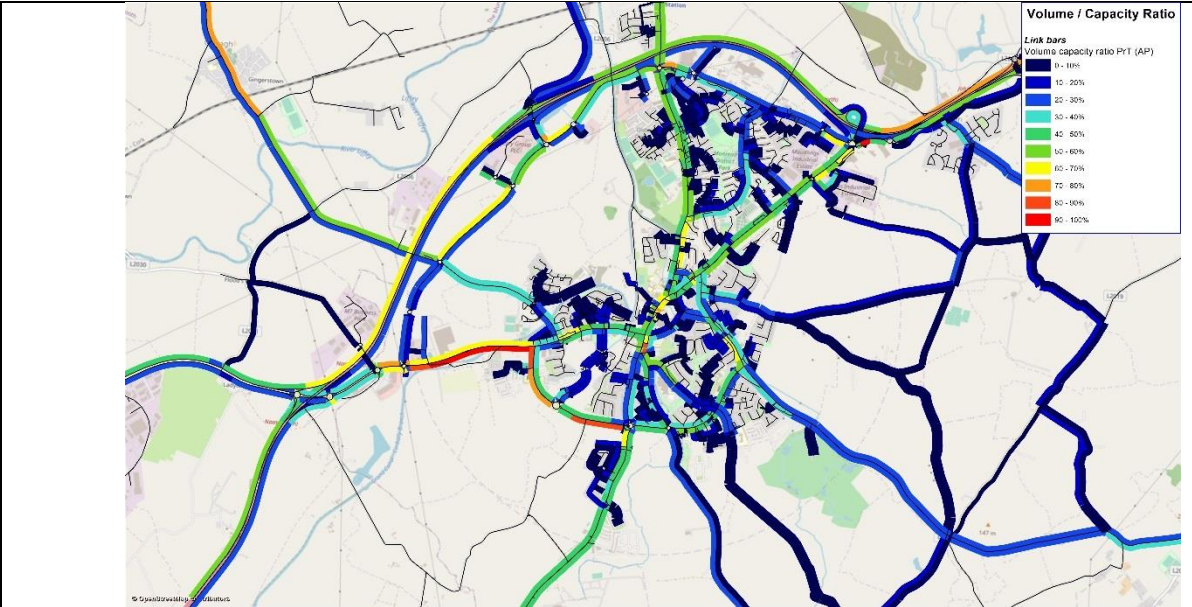


Figure 4: 2023 AM Peak Volume/Capacity Plot – Do-Minimum

Volume/capacity ratios give a measure of the remaining capacity along a link in the traffic network. The higher the volume/capacity is to 100%, the less capacity is available on the road.

Figures 4 – 6 show the volume/capacity ratios for the Naas road network in the 2023 AM peak models for the following scenarios:

1. Do-minimum
2. Data centre with access from Newhall Industrial Estate
3. Data centre with access from Devoy Link Road

There are no differences between the volume/capacity ratio figures. This suggests that the data centre would have a negligible impact on the road network in the future year 2023.

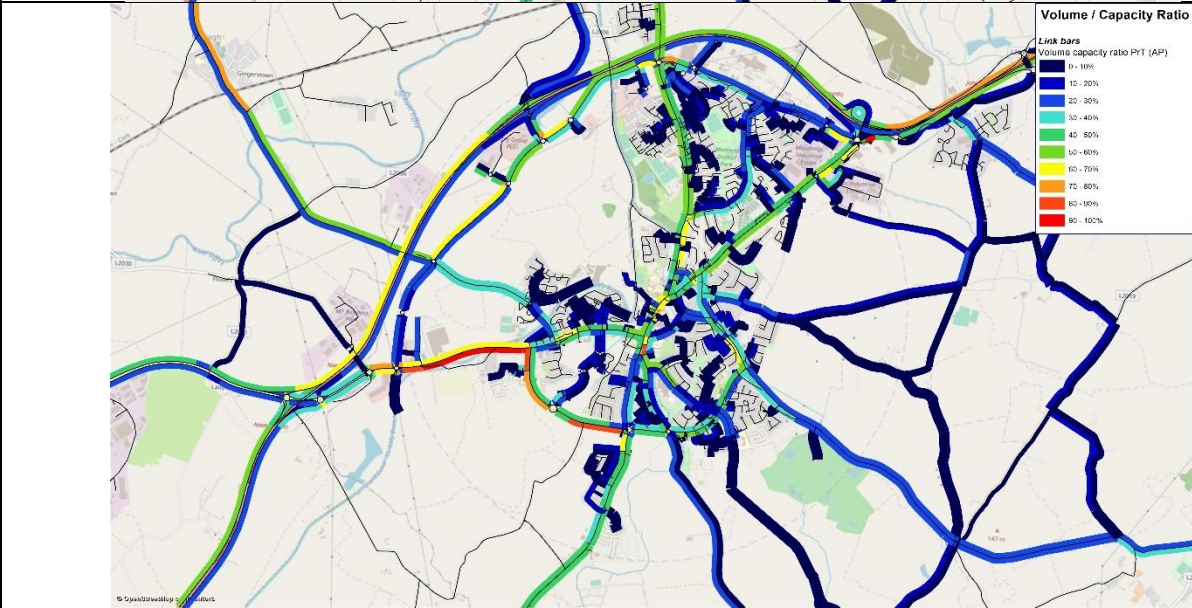


Figure 5: 2023 AM Peak Volume/Capacity Plot – **Newhall Industrial Estate Access Option**

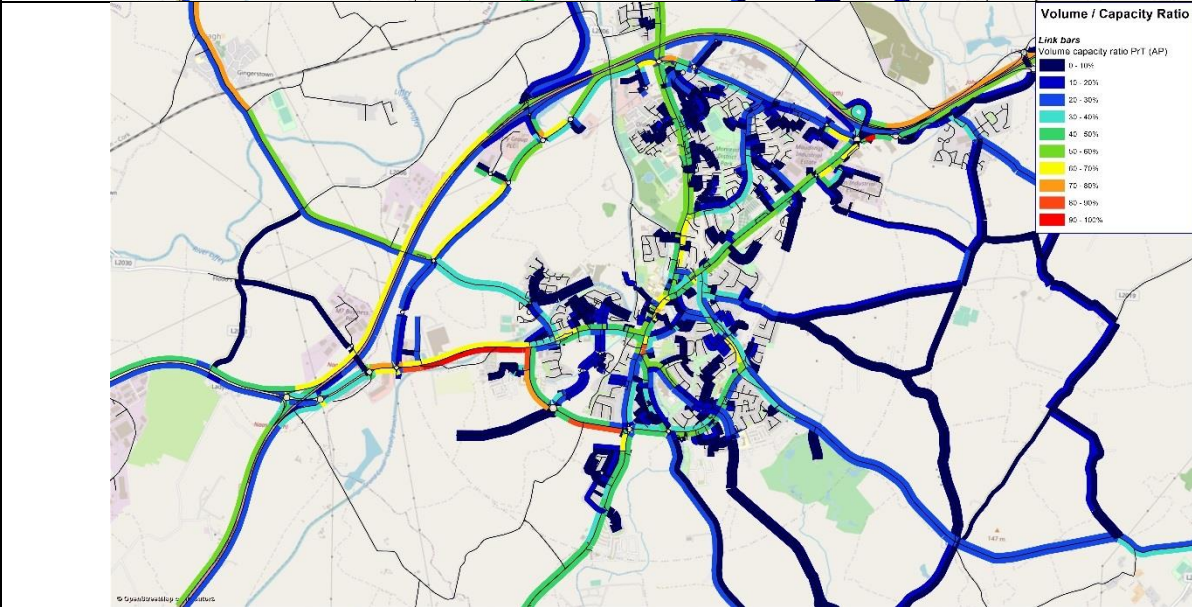


Figure 6: 2023 AM Peak Volume/Capacity Plot – **Devoy Link Road Access Option**

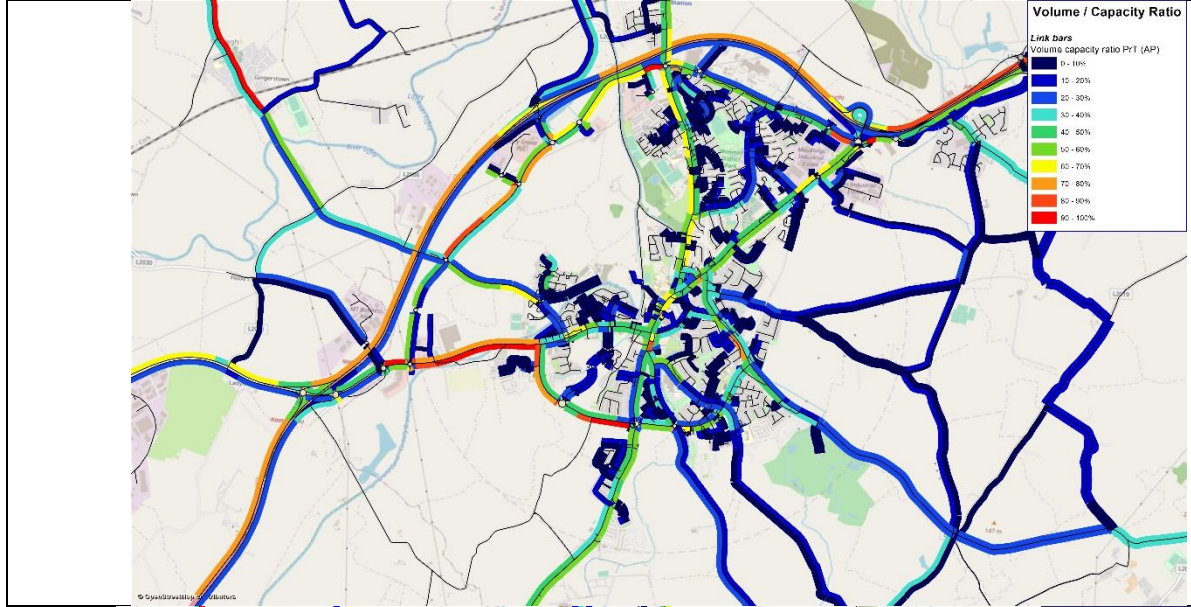


Figure 7: 2030 AM Peak Volume/Capacity Plot – Do-Minimum

Figures 7 – 9 show the volume/capacity ratios for the Naas road network in the 2030 AM peak models for same scenarios.

The results show that the scenario where the new data centre is accessed from the Newhall Industrial Estate has a very minor negative impact on one road link on the Naas ring road, where the scenario where the data centre is accessed from the Devoy Link road has a slight negative impact on two road links in 2030. These are circled in red in Figure 9.

These impacts are very minor.

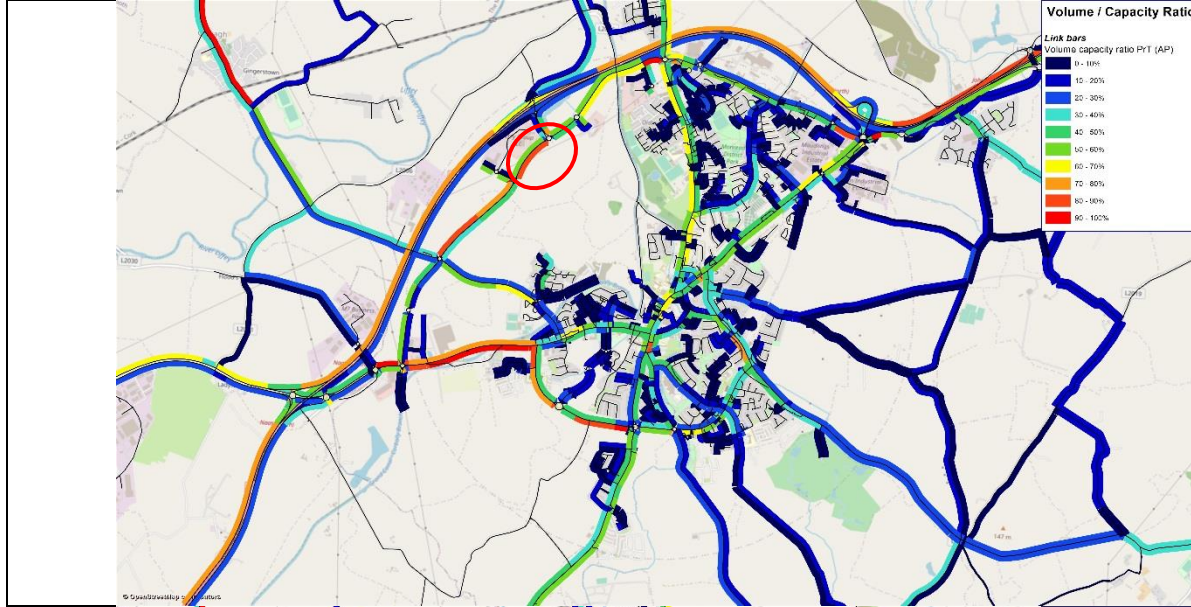


Figure 8: 2030 AM Peak Volume/Capacity Plot – **Newhall Industrial Estate Access Option**

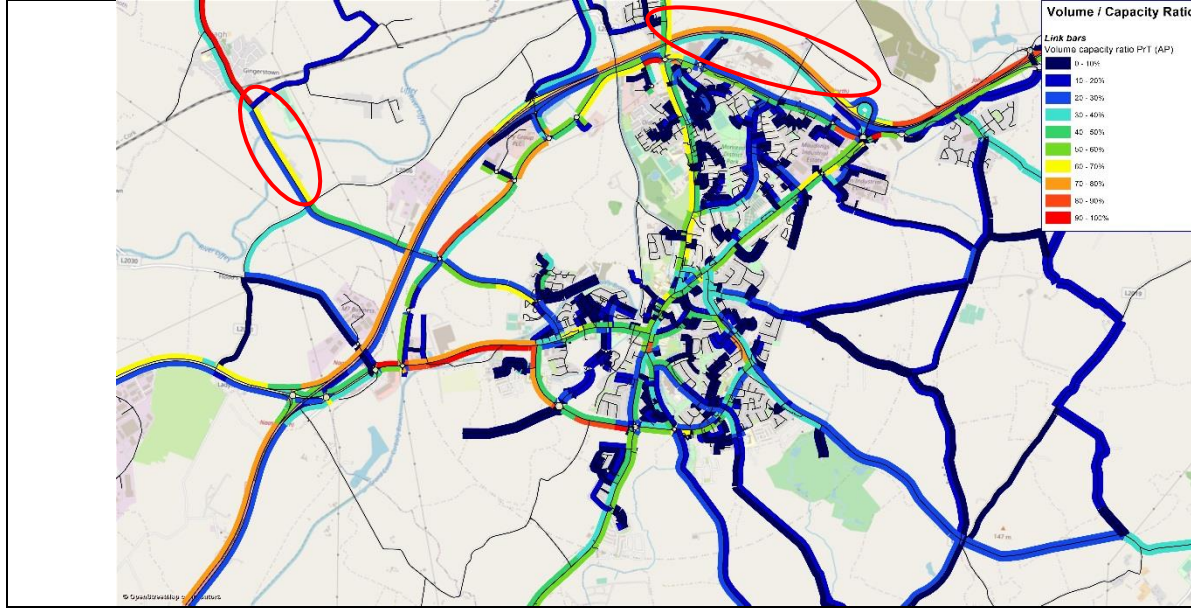


Figure 9: 2030 AM Peak Volume/Capacity Plot – **Devoy Link Road Access Option**

Queue Lengths

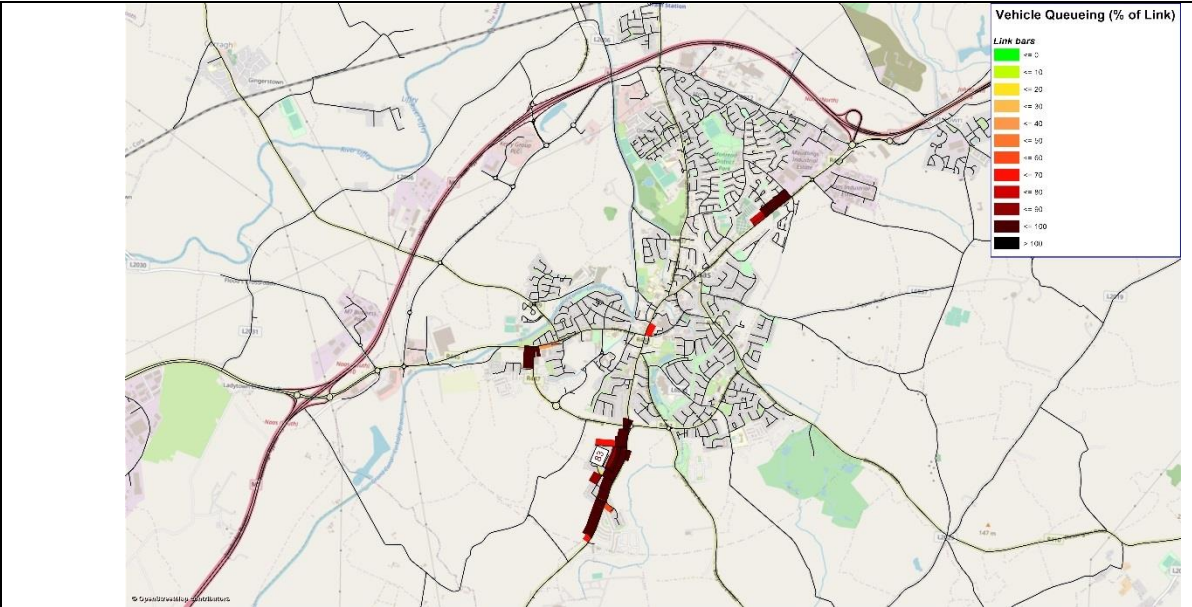


Figure 10: 2023 AM Peak Queue Lengths – Do-Minimum

Queue length plots show the percentage of a particular link which has queuing during a given model run. In the case of Figures 10 – 13, the model is the 2023 AM peak. Three scenarios are shown as follows:

1. Do-minimum
2. Data centre with access from Newhall Industrial Estate
3. Data centre with access from Devoy Link Road

The figures show that there is minimal change to the queue length plots for either of the data centre scenarios compared to the do-minimum scenario in 2023. This suggests negligible impact of the data centre on queuing in the road network in the 2023 model, for either access option.

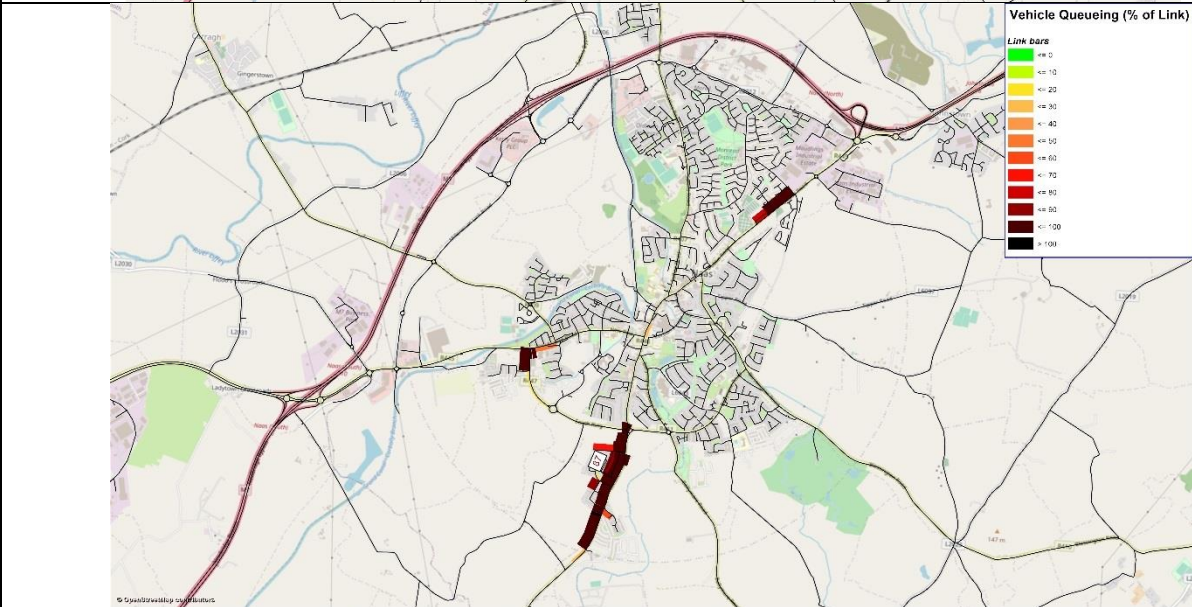


Figure 11: 2023 AM Peak Queue Lengths – Newhall Industrial Estate Access Option

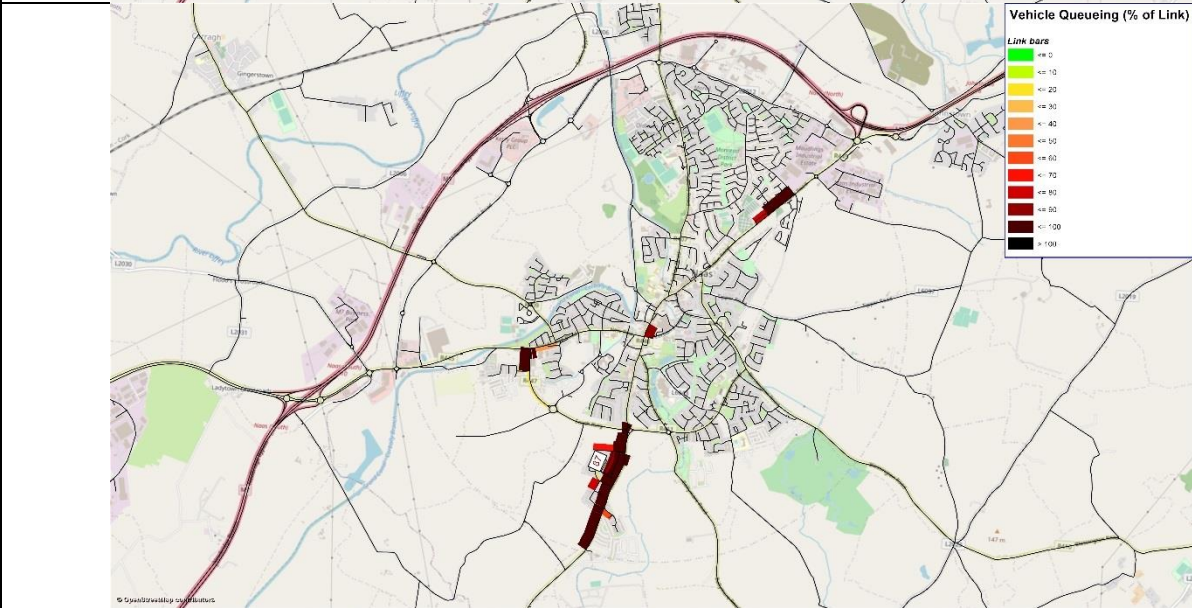


Figure 12: 2023 AM Peak Queue Lengths – Devoy Link Road Access Option

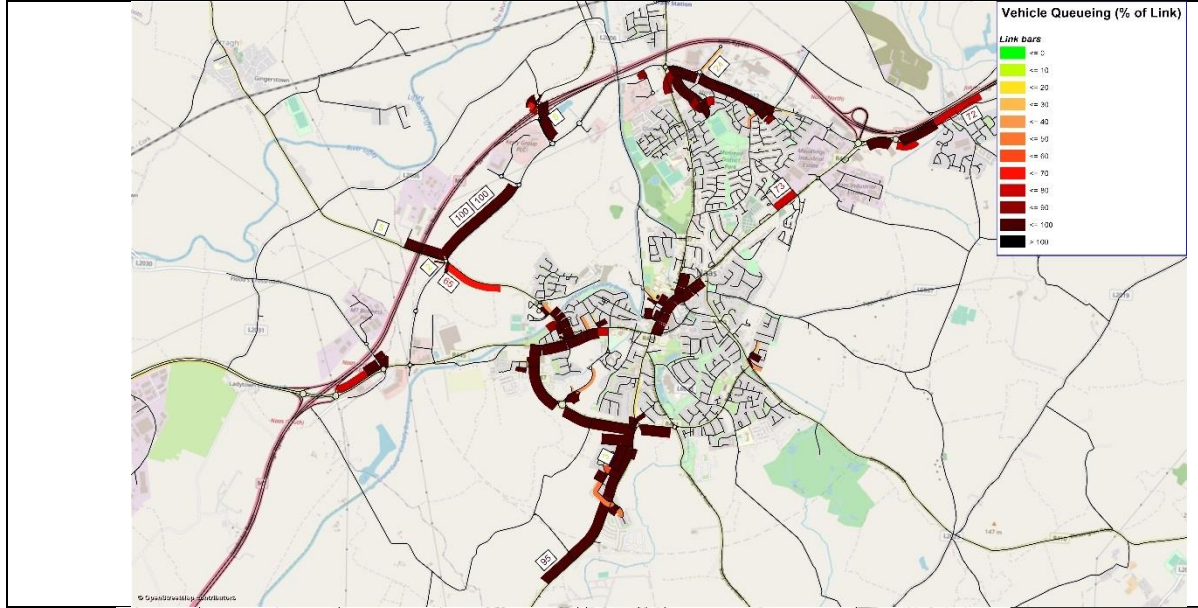


Figure 13: 2030 AM Peak Queue Lengths – Do-Minimum

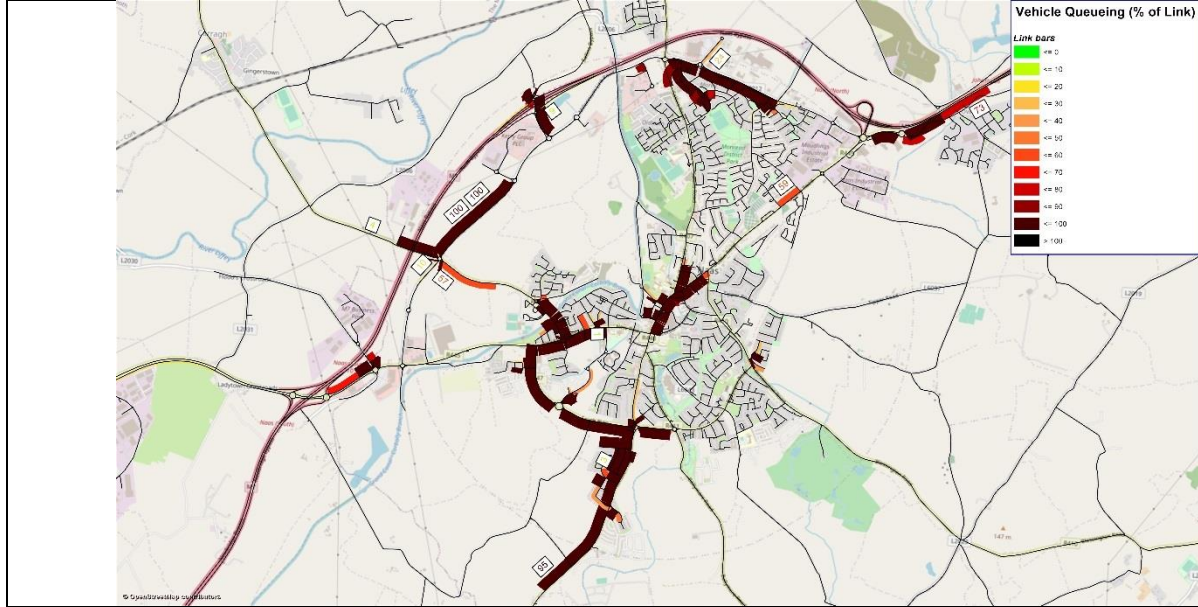


Figure 14: 2030 AM Peak Queue Lengths – Newhall Industrial Estate Access Option

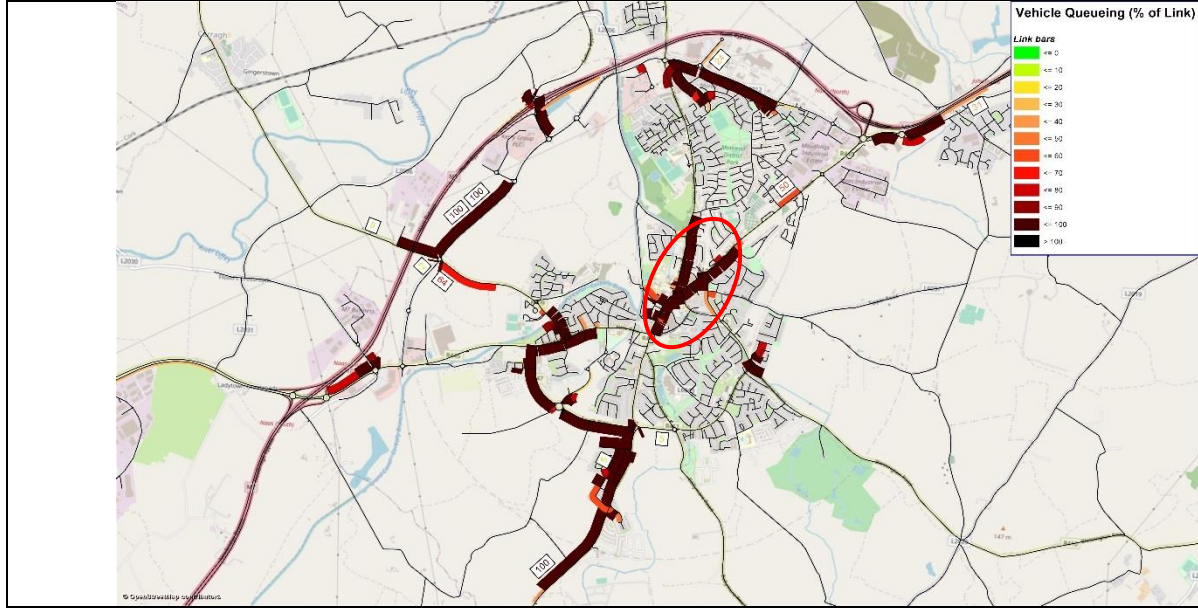


Figure 15: 2030 AM Peak Queue Lengths – Devoy Link Road Access Option

Figures 13 – 16 show the queue length plots for the 2030 AM peak model, with the same three scenarios as discussed previously.

The figures show significant queuing on the road network in 2030, even in the do minimum model. The data centre scenario where there is access off the Newhall industrial estate shows no noticeable difference from the do-minimum model. However, the data centre scenario which is accessed from the Devoy Link road shows an exasperation of queuing in Naas Town Centre. This is shown in Figure 15, circled in red.

Network Statistics

Network statistics from across the traffic model network are presented in the tables below. The main points to note are as follows:

- Overall, the impact of the data centre is relatively minor in terms of increase in vehicle-kilometers and travel time
- The data centre scenario which is accessed via the Devoy link road performs slightly worse than the alternative access point via the Newhall Industrial Estate
- This suggests that the access via the Newhall Industrial Estate is preferable from a traffic perspective

Demand	Do Min	Data Centre Newhall Access	Data Centre Devoy Access
2023 AM	20,515	20,615	20,615
2023 PM	18,223	18,323	18,323
2030 AM	24,239	24,339	24,339
2030 PM	21,644	21,744	21,744

Difference	Data Centre Newhall Access	Data Centre Devoy Access
2023 AM	100	100
2023 PM	100	100
2030 AM	100	100
2030 PM	100	100

% Difference	Data Centre Newhall Access	Data Centre Devoy Access
2023 AM	+ 0.5%	+0.5%
2023 PM	+ 0.5%	+ 0.5%
2030 AM	+ 0.4%	+ 0.4%
2030 PM	+ 0.5%	+ 0.5%

Vehicle-kilometers	DM	Data Centre Newhall Access	Data Centre Devoy Access
2023 AM	198,624	199,502	199,557
2023 PM	181,804	182,628	182,689
2030 AM	242,037	242,875	242,575
2030 PM	221,341	222,208	222,314

Difference	Data Centre Newhall Access	Data Centre Devoy Access
2023 AM	877	933
2023 PM	825	886
2030 AM	838	538
2030 PM	867	973

% Difference	Data Centre Newhall Access	Data Centre Devoy Access
2023 AM	+0.4%	+ 0.5%
2023 PM	+0.5%	+ 0.5%
2030 AM	+0.3%	+ 0.2%
2030 PM	+0.4%	+ 0.4%

Travel Time (hrs)	DM	Data Centre Newhall Access	Data Centre Devoy Access
2023 AM	4,560	4,604	4621
2023 PM	3,514	3,544	3548
2030 AM	7,245	7,320	7358
2030 PM	5,256	5,328	5307

Difference	Data Centre Newhall Access	Data Centre Devoy Access
2023 AM	44	61
2023 PM	30	34
2030 AM	75	114
2030 PM	72	51

% Difference	Data Centre Newhall Access	Data Centre Devoy Access
2023 AM	+ 1.0%	+ 1.3%
2023 PM	+ 0.9%	+1.0%
2030 AM	+ 1.0%	+ 1.6%
2030 PM	+ 1.4%	+ 1.0%

Conclusion:

Traffic modelling of a data centre at New/hall / Jigginstown has been completed using the Naas VISUM model. Two access points were modelled, one via the Devoy link road and the other via the Newhall Industrial Estate.

The traffic modelling outputs showed very minor impacts of the data centre on the road network compared to the do-minimum model in both the 2023 and 2030 models.

However, the queue length plots indicate that, from a traffic perspective the Newhall Industrial Estate access point is preferable to the Devoy Link road access point.



Lisa Kirwan

Assistant Engineer