



### Regent St Bridge Replacement – Impact on the CAZ

LCC is proposing the withdrawal of the planned Clean Air Zone. In order to ascertain the predicted impact in 2020 and 2021, additional modelling work is required to take account of the realised change in the vehicle fleet and subsequent impact on predicted NO<sub>2</sub>.

The 2021 situation is complicated by the Regent Street Bridge replacement which runs throughout the year. The bridge is a twin span running East-West carrying the A64(M) over Regent Street.

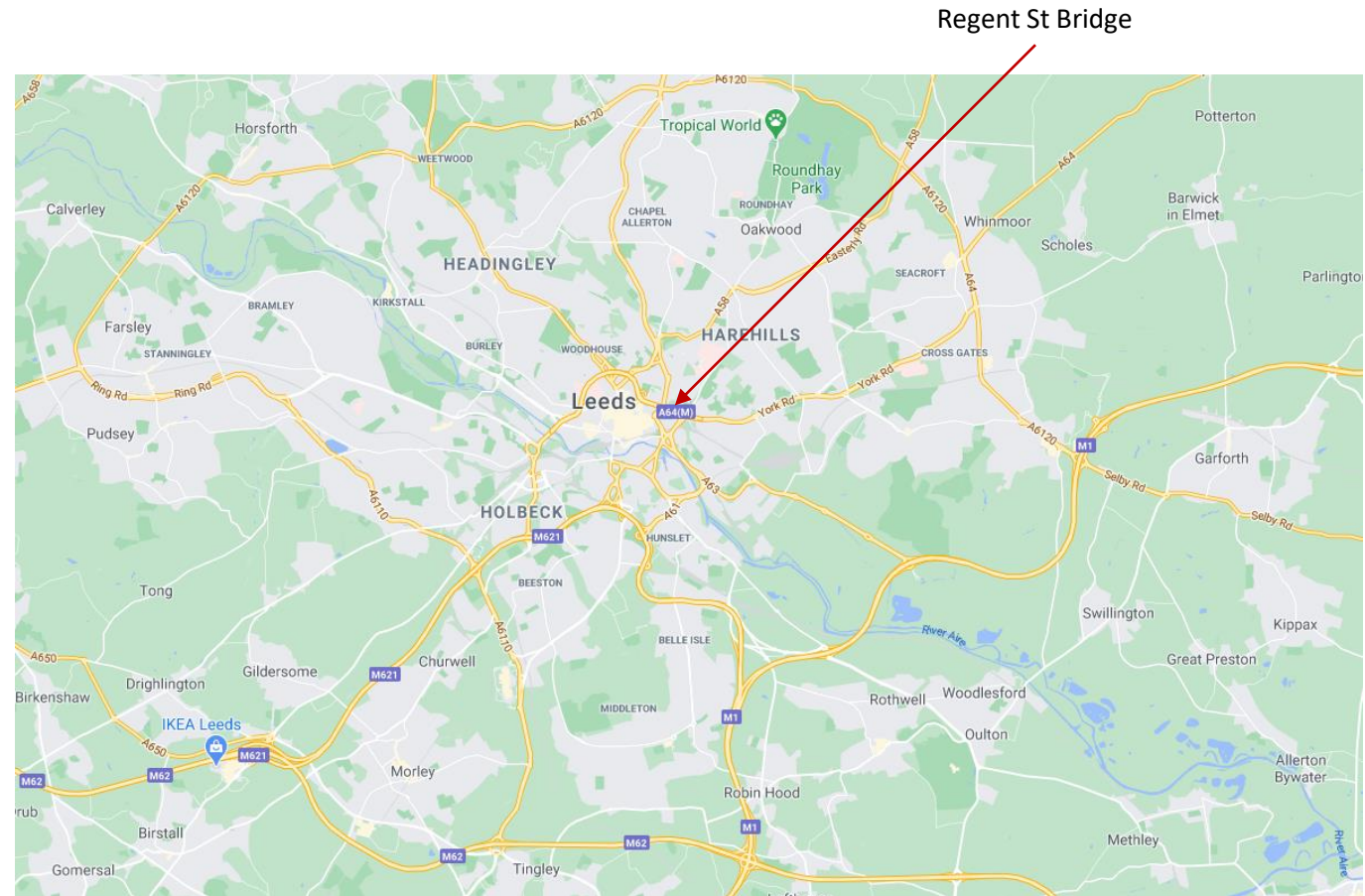
The works require replacing one deck span of the bridge whilst running a contraflow for traffic on the alternate span. Once complete the process switches to replace the other span.

Whilst the contraflow allows for continued through flow of all traffic, there is a reduction in capacity affecting peak traffic. Signage is in place on the outer ring road, motorway junctions and radial approaches to the city encouraging drivers to take alternate routes if possible.

The main impact is the closure of associated slip roads that cannot be accessed whilst in the contraflow, and the closure of the slip roads immediately under the bridge span. There are two diversion phases planned during the replacement of each span.

To model this in the Leeds Traffic Model, the relevant slip roads were closed to traffic and capacity reduced on the links representing the bridge.

The following pages detail each phase and the impact on traffic and resulting AQ results.



Googlemaps.com 2020

### Modelled Links

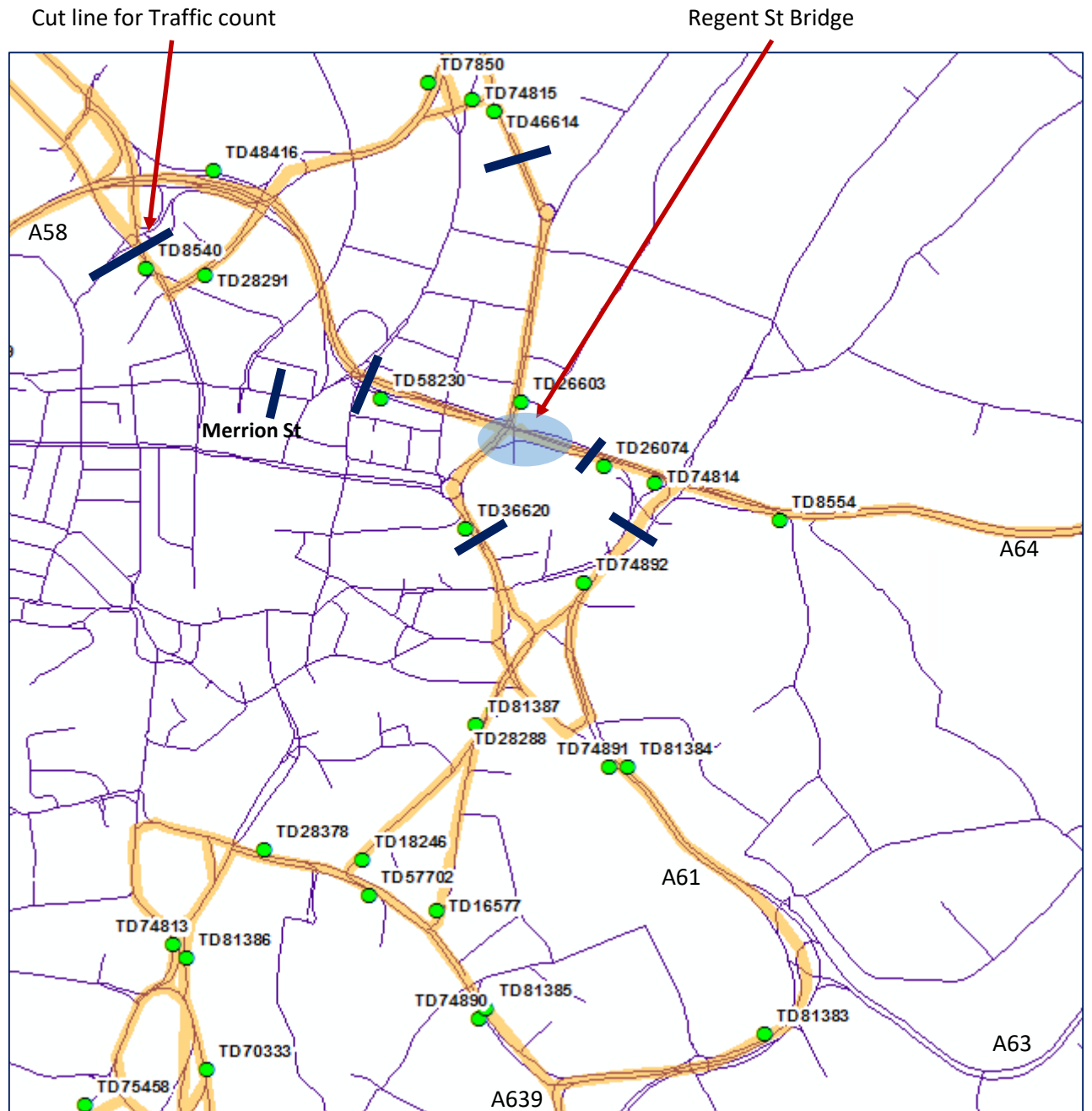
The map on the right details the extents of the Leeds Transport Model (black lines). The roads contained in the national Pollution Climate Mapping (PCM) model in the orange. Modelled Target Determination receptors for determining compliance with the Air Quality Directive as the green dots. There is one determination receptor per PCM model link. Links outside the PCM model have not been assessed for compliance against the EU AQD and will instead be monitored under UK Local Air Quality Management Guidance (TG.16).

Of all the receptor points, only one was shown to be exceeding in the 2020 Do-Minimum model as per the 2018 Business Case. TD58230 to the west of the bridge.

The 2018 Results are shown below for modelled NO<sub>2</sub> in levels at the worst sites. Red is >39µgm<sup>3</sup> of NO<sub>2</sub>, Orange those between 35-39µgm<sup>3</sup> of NO<sub>2</sub>. TD58230 is the worst, exceeding in the predicted 2020 Do-Minimum scenario with no Clean Air Zone, but decreasing steadily and achieving compliance by 2022 if nothing else was done, based on expected fleet turnover.

The question being explored is the unmodelled 2021 year and the impact of the bridge works on NO<sub>2</sub> levels.

Site ID	2015 DM	2020 DM	2020 CAZ-B+	2022 DM	2022 CAZ-B+
TD58230	52.6	43.7	38.4	36.7	33.0
TD36620	50.4	39.8	33.4	34.3	29.0
TD18451	47.5	39.8	36.8	33.1	31.7
TD28288	46.6	39.1	36.6	32.8	29.0
TD47438	44.6	35.6	33.3	28.0	26.1
TD8548	44.5	35.1	34.4	27.2	26.7
TD36055	43.7	35.9	35.7	31.0	30.8
TD74892	43.3	36.3	33.0	31.0	28.2
TD26618	43.1	32.9	30.7	25.9	24.2
TD26603	43.0	35.5	33.0	30.2	28.3
TD81387	42.1	35.1	32.8	30.0	27.1
TD9050	41.7	35.3	33.4	28.0	27.8
TD28378	40.8	33.9	30.9	28.5	24.5
TD29051	40.7	34.5	32.9	28.3	26.7
TD74818	40.7	33.0	30.2	27.3	25.5
TD99546	40.0	32.2	31.7	27.4	26.9





## West-bound closure - Traffic

The traffic impacts are less severe than expected. The A64(M) has a reduction of 11,000 and 3,300.

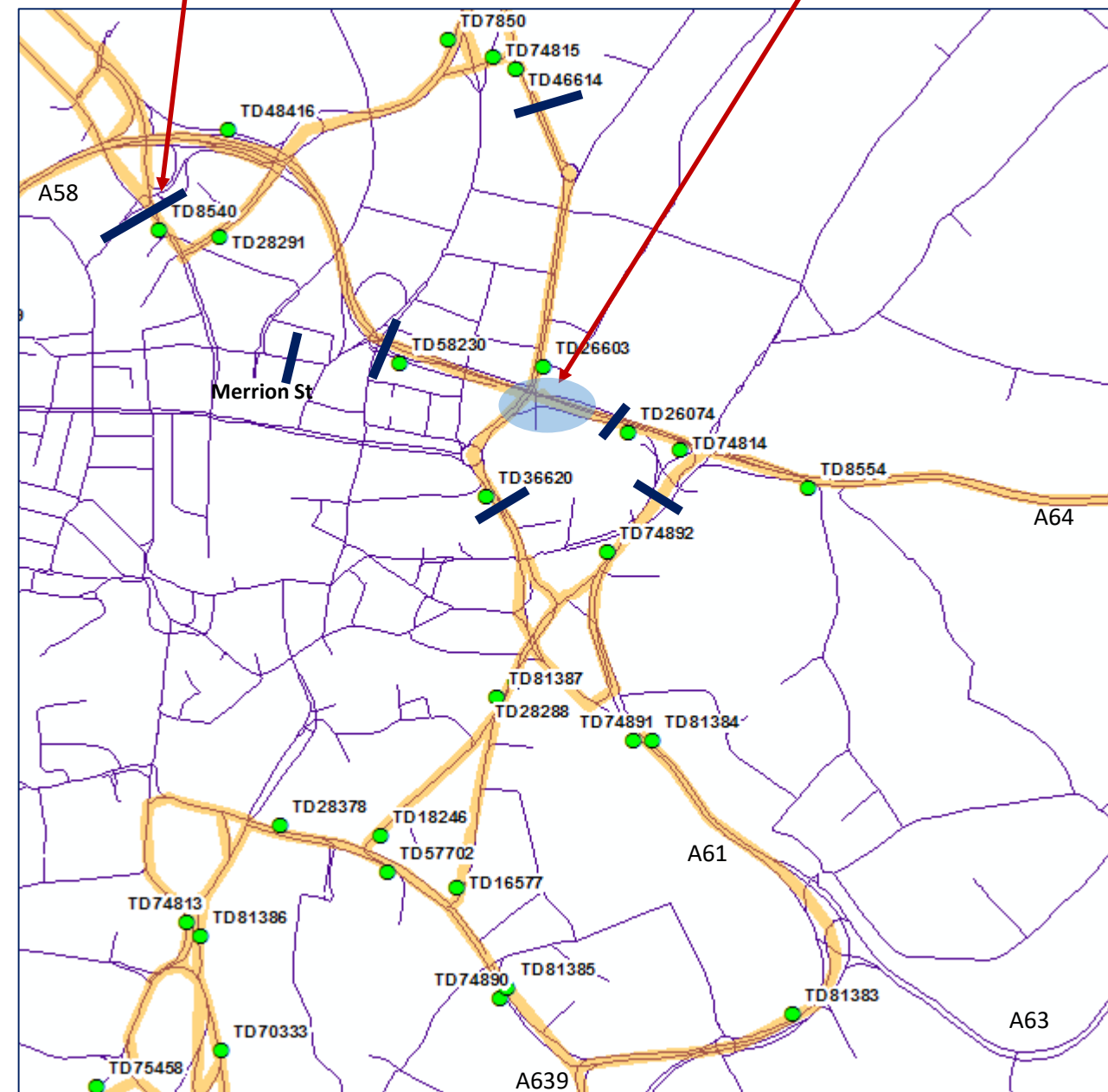
Slight increases of around 1,000 are seen on the other links as the traffic rebalances.

While not accounting for the full reduction in traffic observed on the A64(M), some of those trips will be strategic through trips which are expected to divert down other key radials onto the Inner and Outer ring roads.

Receptor	Road	Direction	Link ID	AADT		
				2021	2021 A	2021 A 105%
TD36620	St Peters St	SB	2545_3090	18,859	19,612	19,906
TD36620	St Peters St	NB	2006_3214	12,895	13,454	13,698
TD74814	Marsh Lane	NB	2526_2524	12,305	16,091	16,678
TD74814	Marsh Lane	SB	2522_2525	14,962	17,462	18,080
TD8540	Woodhouse Lane	SB	2079_1956	3,470	4,799	5,111
TD8540	Woodhouse Lane	NB	1956_2079	6,996	6,931	7,185
TD58230	A64(M) (North St)	EB	2085_1998	26,568	15,585	15,982
TD58230	A64(M) (North St)	WB	1987_1929	20,274	16,935	17,647
TD58230	New York Rd	EB	2288_1991	2,382	3,564	3,880
NA	Merrion St	EB	1907_1906	14,639	14,795	15,483
TD26074	Marsh Lane WB On slip	WB	5423_2527	9,586	-	-
TD26074	A64(M) (Quarry House)	EB	1998_2003	15,089	15,585	15,982
TD26074	A64(M) (Quarry House)	WB	2527_2000	29,460	16,935	17,647
TD26074	New York Rd Tunnel	EB	1999_2524	15,338	-	-
TD46614	A61 Sheepscar St S	NB	3006_2097	6,323	7,850	8,075
TD46614	A61 Sheepscar St S	SB	2097_3006	11,761	10,856	11,333

## Cut line for Traffic count

## Regent St Bridge



## West-bound closure - AQ

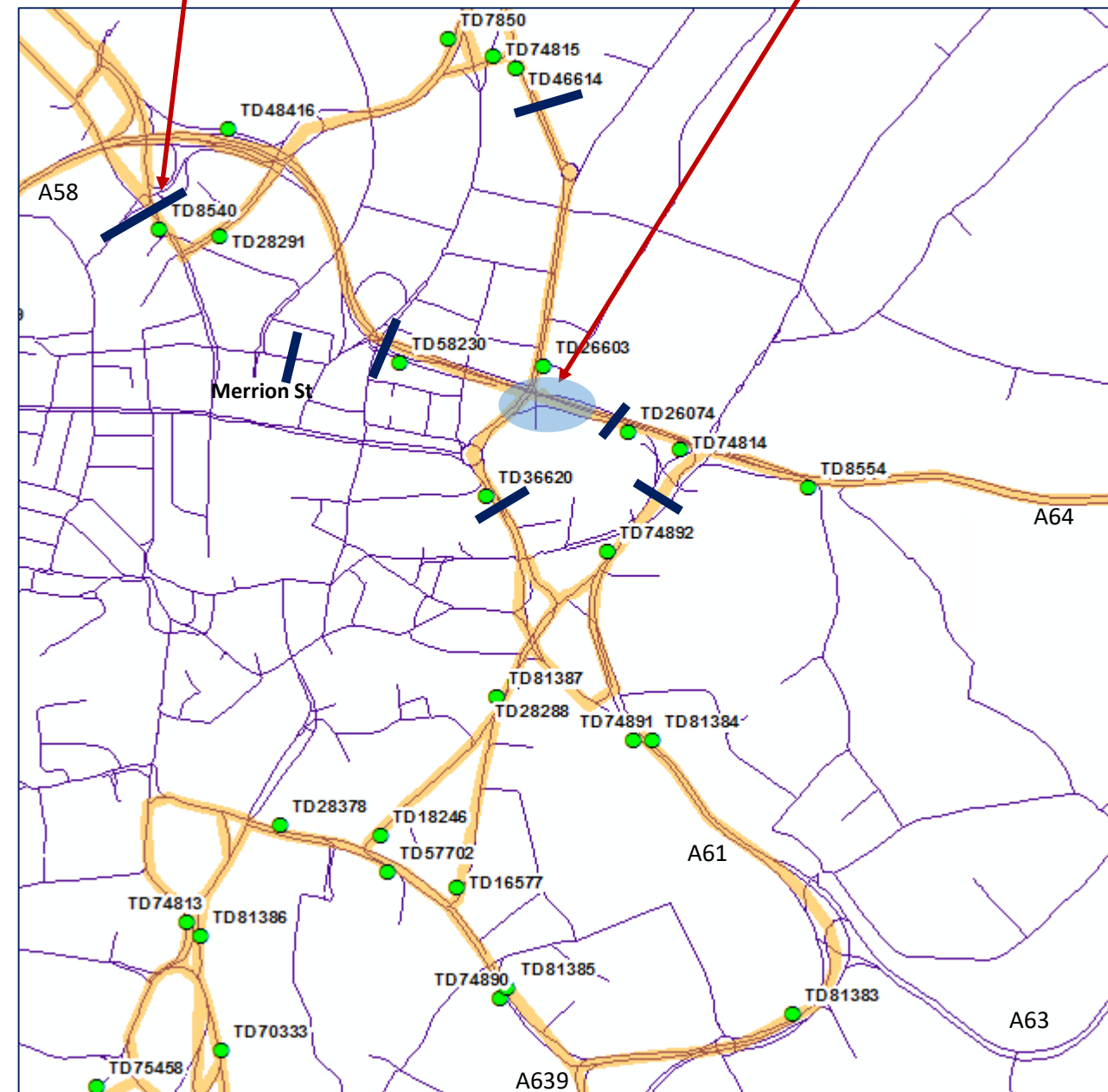
The table gives modelled NO<sub>2</sub> results for key receptors relating to the planned West Bound diversion route. ANPR delineates modelling undertaken with updated vehicle fleet as recorded in Jan-2020 which was significantly cleaner than the 2016 estimates with a 90% compliance for buses and HGVs.

TD8540 on Woodhouse Lane and TD74814 on Marsh Lane which are both on the official diversion route, despite an increase in AADT only see a small change in NO<sub>2</sub> values at the relevant receptors.

SiteID	DM2020	DM20 ANPR	2021 DM ANPR	2021 DM A ANPR	2021 DM A ANPR 105%
TD58230	43.7	38.9	38.7	34.8	35.4
TD36620	39.8	34.4	34.5	34.2	34.8
TD18451	39.8	37.2	37.0	36.9	37.5
TD28288	39.1	36.8	37.0	36.3	37.0
TD74892	36.3	33.3	33.2	31.5	32.0
TD36055	35.9	34.4	34.7	34.8	35.3
TD47438	35.6	33.3	33.0	33.0	33.8
TD26603	35.5	33.3	33.2	31.9	32.4
TD9050	35.3	33.5	24.9	25.0	25.5
TD81387	35.1	33.1	32.9	32.5	33.1
TD8548	35.1	34.4	34.5	34.5	34.8
TD26074	27.0	25.3	25.3	23.4	23.7
TD74814	29.3	26.7	26.5	25.1	25.4
TD8540	27.3	25.1	24.6	24.5	24.9
TD26618	32.9	30.3	29.9	30.0	30.6
TD28378	33.9	31.1	31.1	31.2	32.0
TD29051	34.5	33.0	32.4	32.8	33.3
TD74818	33.0	30.7	30.6	30.5	31.1
TD99546	32.2	30.8	31.5	31.5	32.1
TD46614	26.1	24.6	24.2	24.2	24.6

## Cut line for Traffic count

## Regent St Bridge



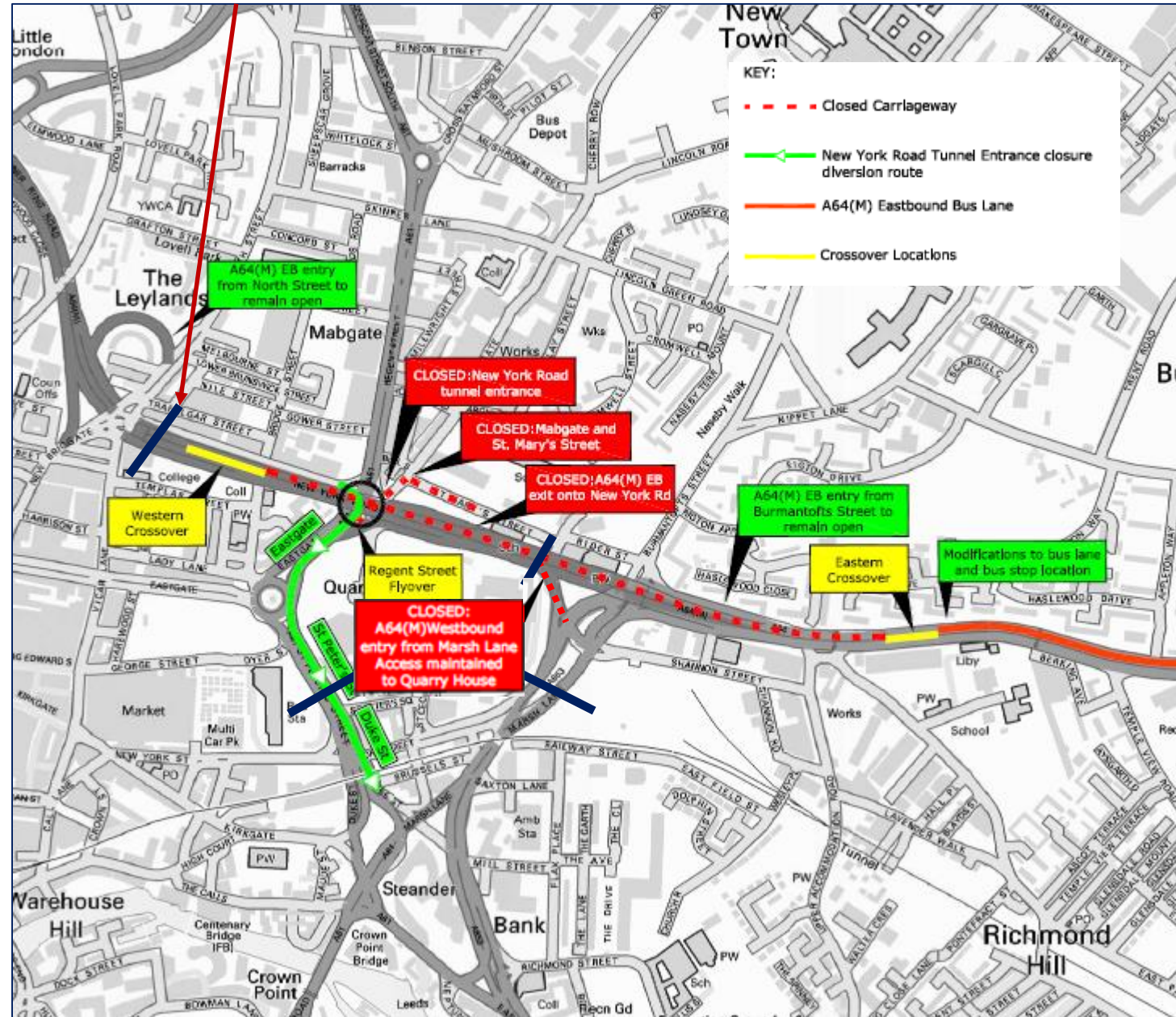
## East-bound closure

The east bound bridge span closure continues to keep New York Rd tunnel and the Quarry House WB slip roads shut.

The WB North St / New Briggate junction reopens removing the need for the blue diversion route via Woodhouse Lane.

A new closure of the A64(M) EB exit on New York Rd requires traffic to exit the A64(M) one junction earlier and divert via New York Rd and the yellow diversion route where it can return to the intended path north or south.

## Cut line for Traffic count



## East-bound closure - Traffic

The traffic impacts are less severe than expected. The A64(M) has a similar reduction of 11,000 and 3,300 to the West bound closure

Slight increases of around 1,000 are seen on the other links as the traffic rebalances.

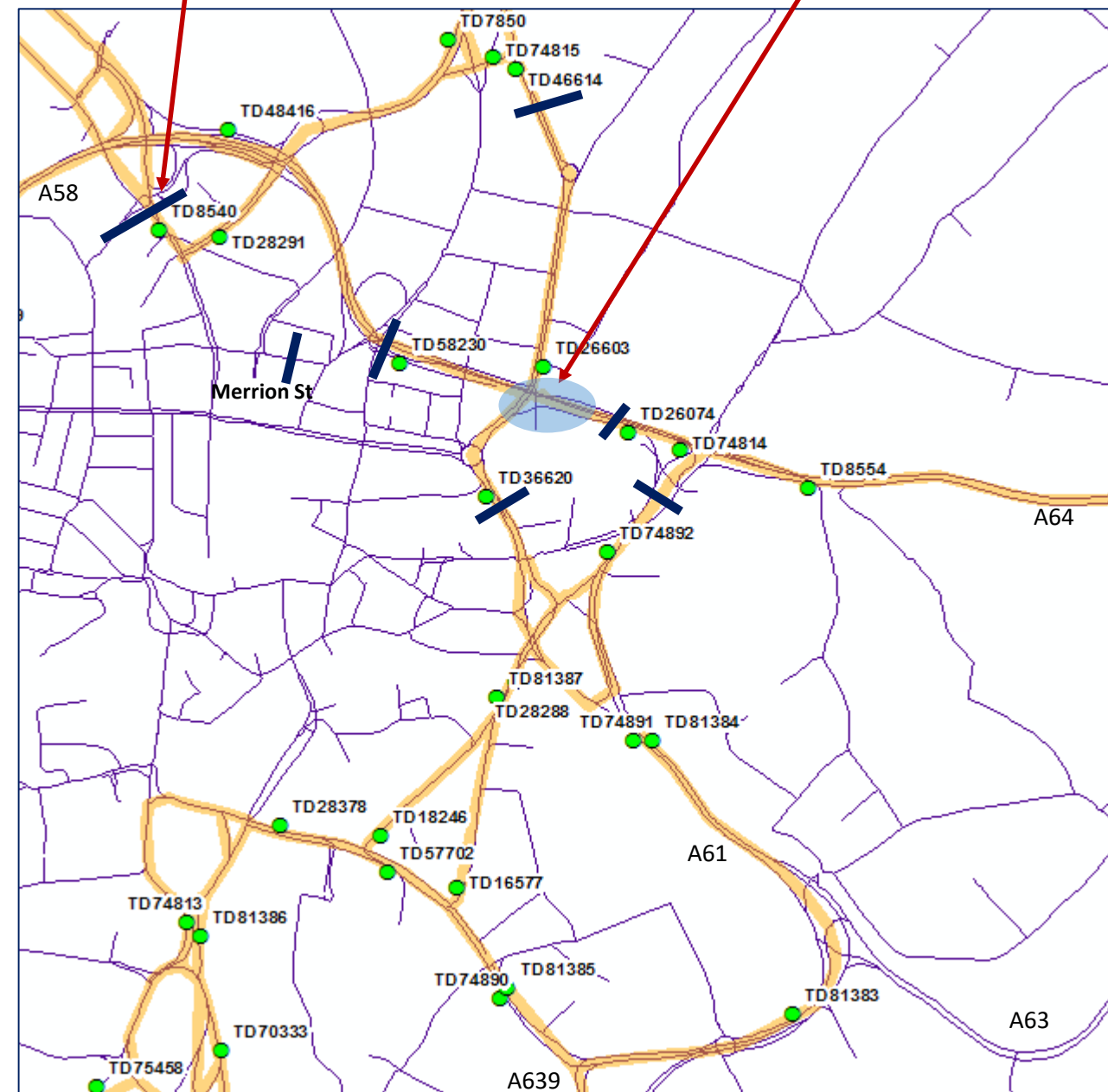
The 5% growth scenario results in additional traffic as would be expected.

While not accounting for the full reduction in traffic observed on the A64(M), some of those trips will be strategic through trips which are expected to divert down other key radials onto the Inner and Outer ring roads.

Receptor	Road	Direction	Link ID	AADT		
				2021	2021 B	2021 B 105%
TD36620	St Peters St	SB	2545_3090	18,859	19,590	19,890
TD36620	St Peters St	NB	2006_3214	12,895	13,192	13,498
TD74814	Marsh Lane	NB	2526_2524	12,305	15,844	16,452
TD74814	Marsh Lane	SB	2522_2525	14,962	16,893	17,728
TD8540	Woodhouse Lane	SB	2079_1956	3,470	2,927	3,117
TD8540	Woodhouse Lane	NB	1956_2079	6,996	6,962	7,208
TD58230	A64(M) (North St)	EB	2085_1998	26,568	15,584	15,938
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Cut line for Traffic count

Regent St Bridge



### East-bound closure - AQ

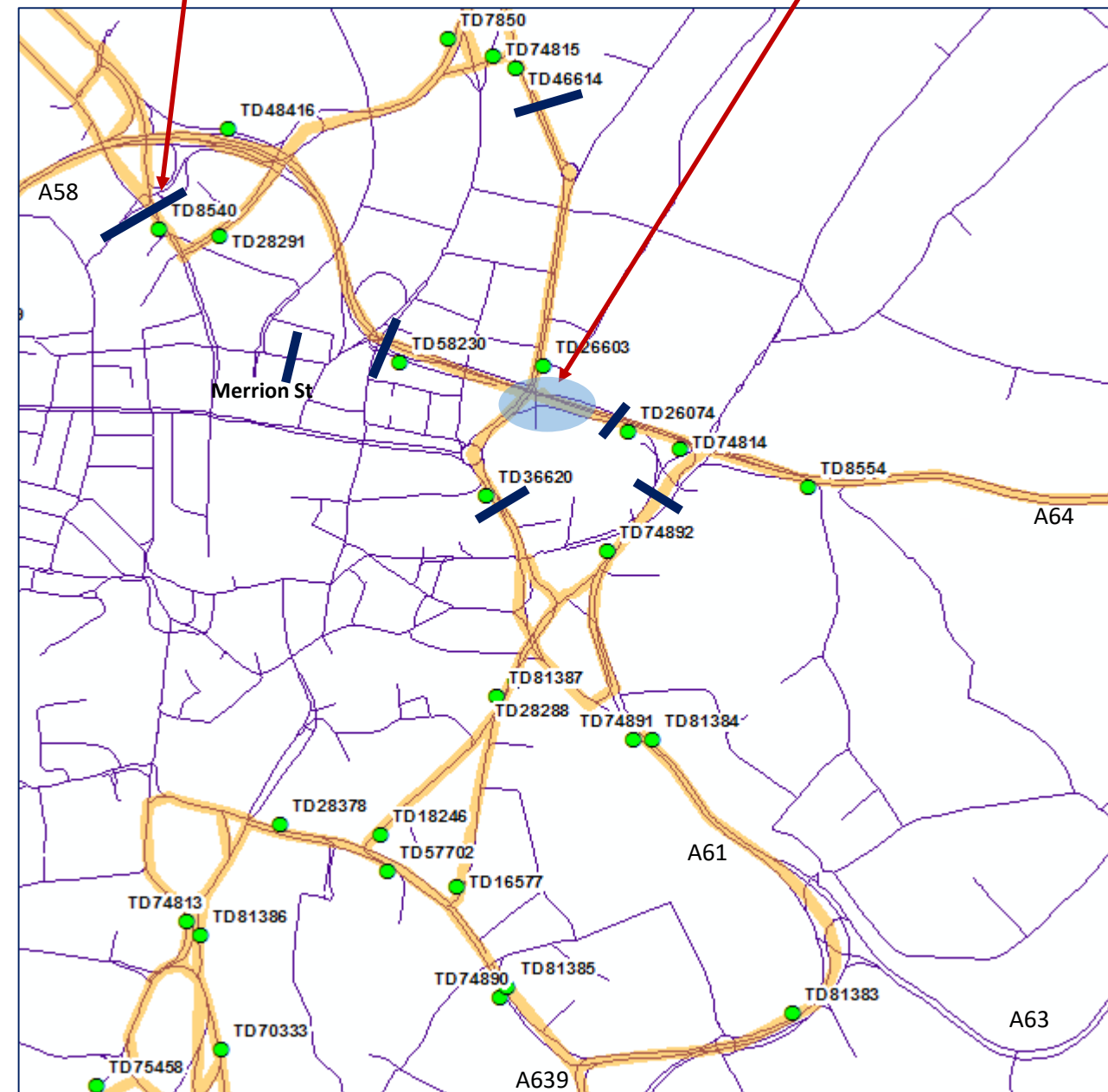
The table gives modelled NO<sub>2</sub> results for key receptors relating to the planned East bound diversion route. ANPR delineates modelling undertaken with updated vehicle fleet as recorded in Jan-2020 which was significantly cleaner than the 2016 estimates with a 90% compliance for buses and HGVs.

There are only slight changes to expected NO<sub>2</sub> levels indicating that the diversion has no significant impact on compliance.

SiteID	DM2020	DM20 ANPR	2021 DM ANPR	2021 DM B ANPR	2021 DM B ANPR 105%
TD58230	43.7	38.9	38.7	35.1	36.8
TD36620	39.8	34.4	34.5	34.2	34.8
TD18451	39.8	37.2	37.0	36.8	37.4
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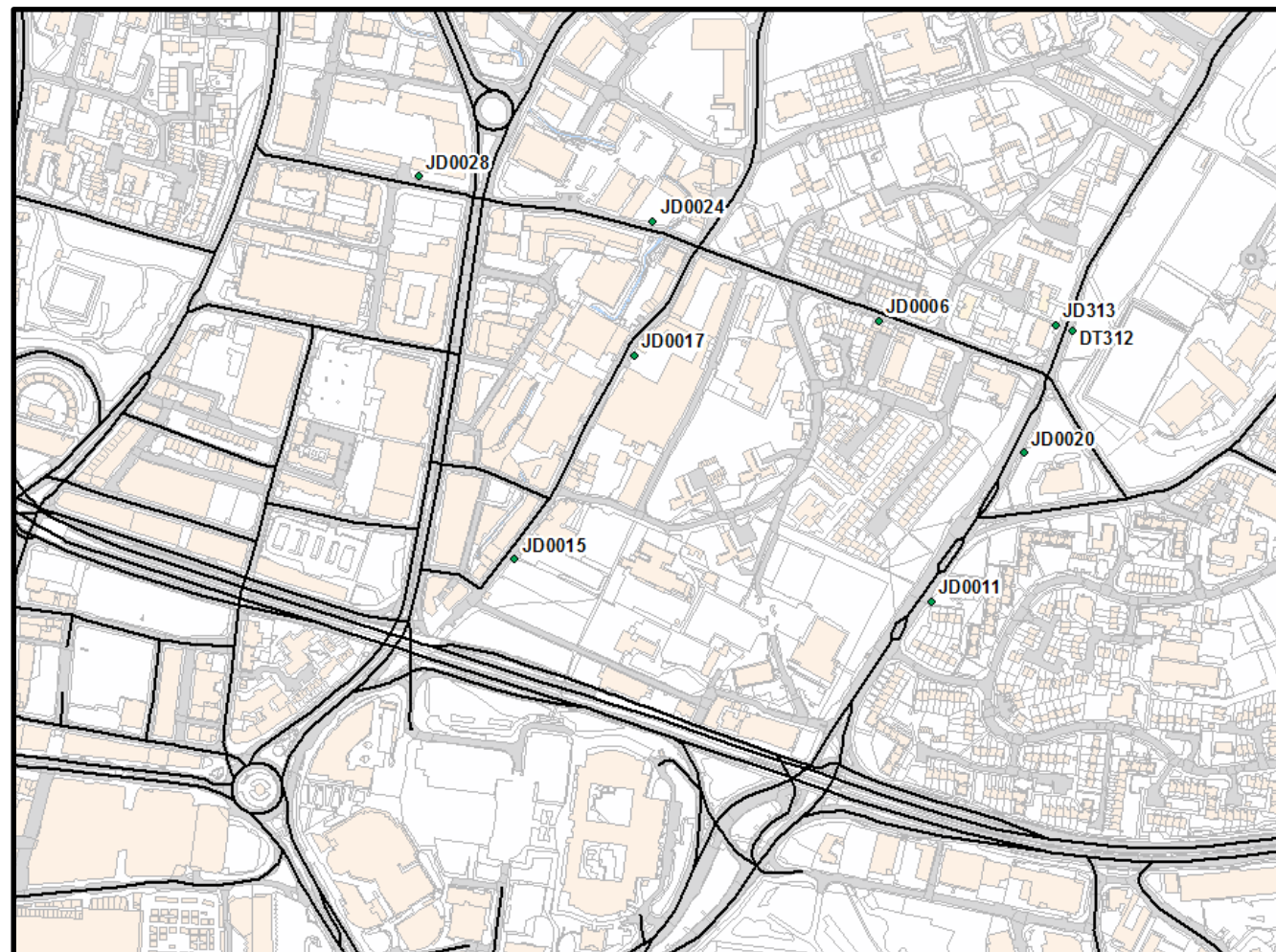
### Additional AQ Modelling

The Independent Review of the work conducted to support cancellation of the CAZ requested additional modelling work of local roads on Mabgate, Skinner Lane and Beckett St. Whilst not in the PCM network these links were modelling as showing an increase in traffic whilst the bridge works are taking place.

The results indicate no significant increase in NO<sub>2</sub> levels as a result of the diversion that would result in a breach of the Air Quality Directive.

Conscious that the air quality model is not as well calibrated for the local road network as it is for the PCM links, included in the results is a diffusion tube location (DT312) which in 2019 reported an annual average of 29µgm<sup>3</sup> of NO<sub>2</sub>. It has been modelled at 25.5 in the 2020 scenario.

SiteID	DM20 ANPR	DM21 ANPR	DM21 A ANPR	DM21 B ANPR	DM21 A ANPR 105%	DM21 B ANPR 105%
JD0006	22.53	22.17	22.50	22.44	22.81	22.78
JD0011	26.55	26.23	25.82	25.73	26.26	26.22
JD0015	30.43	30.12	29.38	29.23	29.74	29.70
JD0017	23.40	23.05	23.10	23.05	23.39	23.37
JD0020	24.23	23.86	23.93	23.89	24.29	24.27
JD0024	23.66	23.36	23.53	23.48	23.89	23.91
JD0028	23.75	23.49	23.38	23.35	23.71	23.76
DT312	25.50	25.03	25.21	25.15	25.64	25.62
JD313	24.36	23.93	24.08	24.03	24.47	24.46





### Conclusion

The bridge replacement, required contraflow and slip road closures has limited impact on city centre air quality. The increase in AADT around the receptor locations results in a marginal increase in NO<sub>2</sub>.

Current monitoring of traffic flows around Regent St Bridge indicate that the model is performing within the validation window for reduced and diverted flows at key monitoring locations.

Both phases of the contraflow modelled over a year result in no exceedances of the 40 µgm<sup>3</sup> limit. As such switching between the two mid 2021 is not expected to materially impact compliance.

The impact of Covid-19 has not been modelled in any of these scenarios. Current real time monitoring undertaken by LCC through the duration of the pandemic indicates that traffic flows on all monitored links is still trending below observations made in 2019.

As such the 2020 and 2021 business as normal scenarios that have been modelled are assumed to be representative as worst case of the current situation.

