RWA Technical Note			
Project	Southgate Circus Congestion Review		
Subject	Data Analysis and Congestion Alleviation Recommendations		
Prepared by [redacted]	**Date** 25th January 2021	**Document Reference** RWA-21-22-199	
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1. Introduction

The London Borough of Enfield (LB Enfield) have been receiving recent reports from members of the public that traffic congestion has increased at the Southgate Circus Gyratory.

TfL iBUS data shows that bus journey times for routes using these approaches have increased in the period between February 2020 and October 2021.

A potential contributory factor to increased congestion at Southgate Circus is the introduction of the Fox Lane Quieter Neighbourhood scheme in September 2020. This scheme may have influenced the local and surrounding highway network potentially increasing / decreasing flows at Southgate Circus Gyratory, leading to increased congestion.

NRP have produced the 'Fox Lane Quieter Neighbourhood Post Scheme Monitoring' document which provides bus journey time analysis around Southgate Circus. The analysis showed that routes using High Street and travelling north in the AM peak experienced a reduction in journey time of up to 28 seconds between 2019 and 2021. In the PM peak all routes using High Street traveling northbound saw an increase in journey time. The data showed that the W9 which is the only route that uses The Bourne, saw an increase in journey time by over 2 minutes in the AM (137 seconds) and 16 seconds in the PM.

LB Enfield have commissioned Red Wilson Associates (RWA) to review existing data sources, including camera surveys, and to undertake an initial investigation to determine how traffic patterns have changed at Southgate Circus pre and post the implementation of the Fox Lane Quieter Neighbourhood scheme. RWA are also to provide high level short, and medium/long term recommendations that could be implemented to alleviate congestion. Further work will need to be carried out to develop these suggestions, particularly the medium/long-term options.

2. Traffic, Pedestrian, and iBUS Data Analysis

2.1. Data Sources

The available data to assess how traffic conditions have changed at Southgate Circus are shown in the table on the following page. Surveys conducted in 2020 were all prior to any COVID-19 restrictions. The iBus Journey Time Data has been extracted from the Fox Lane QN Post Scheme Monitoring document produced by NRP..

The Manual Classified Traffic Counts (MCTCs) cover all turning movements at Southgate Circus. They represent flows at the junction on a single day pre and post implementation of Fox Lane Quieter Neighbourhood Scheme. There is potential for natural variability in traffic counts day to day, and

accidents or road works on the broader network can influence daily counts at a specific location. There were however no known incidents on the network on the day of the MCTCs. The counts were sampled on a "neutral" weekday (free from holidays, and not a Monday / Friday), as per a standard methodology.

As such we have good confidence that they are representative of average traffic counts at the junction that provide a representation of conditions at the time of being sampled.

Relevant Data Source	Pre-Implementation of Fox Lane Quieter Neighbourhood Scheme	Post Implementation of Fox Lane Quieter Neighbourhood Scheme – September 2020
MCTCs – Southgate Circus Gyratory	3rd March 2020	2nd November 2021
Video Surveys	3rd March 2020	2nd November 2021
iBus Journey Time Data	September 2019 - February 2020	September- October 2021
Trafficmaster traffic speed data	Average weekday data 01/01/2019 to 31/12/2019 between hours of 08:00-09:00, and 17:00 and 18:00	Comparable data not currently available

2.2. MCTC Traffic Data Comparison

Appendix A to this technical note provides a comparison of the 2020 and 2021 MCTCs in both the AM and PM peaks. A summary of observations between the two sets of data are as follows: -

- Traffic coming both in and out of High Street increases in both peak periods;
- In the PM there is also additional traffic entering and exiting The Bourne, most notably between The Bourne and Chase Side;
- As there is an increase in the volume of traffic utilising High Street, The Bourne (the next arm to the right) is giving way to a greater volume of traffic;
- As the network was already congested in 2020, increasing the volume of traffic that The Bourne gives way to exacerbates the level of congestion on this approach;
- The increase in the volume of traffic using High Street could be attributed to traffic rerouting as a result of implementation of the Fox Lane Quieter Neighbourhood scheme.

2.3. Bus Journey Time Data

As part of the post-scheme monitoring of the Fox Lane Quieter Neighbourhood scheme, bus journey times have been compared from September 2019 to October 2021. We have reviewed this data with a focus on the buses using The Bourne and High Street.

The report compares bus journey times and provides commentary on those that have changed significantly across the two measured time periods.

2.4. Trafficmaster Data

Appendix A also provides a copy of the 2019 DfT produced Trafficmaster data.

Trafficmaster Data provides average traffic speed data for individual sections of road gathered from road users satellite navigation systems and smart phones. Trafficmaster data is purchased by the DfT from a variety of GPS providers. By comparing actual vehicle speeds against overnight 'free-flow' speeds, the data gives an insight into levels of delay on the road network.

The data shows that prior to COVID restrictions and the Fox Lane Quieter Neighbourhood scheme speeds are lowest on Chase Side in the AM peak period. On all other approaches in the AM peak traffic slows on the approach to Southgate Circus, with little variance between High Street and The Bourne.

Speeds are slower still in the PM on Chase Side with the The Bourne appearing to operate better than in the AM. Speeds on the High Street slightly worsen in the PM when compared to the AM peak.

2.5. Pedestrian Flow Comparison

Analysis of pedestrian flow across the two zebra crossings in the centre of Southgate Circus show that for the AM peak hour there was little difference between 2020 and 2021 surveys. In the PM peak there is a slight decrease in pedestrian volumes. We do not believe this contributes to the aforementioned delay experienced in the area.

2.6. Summary

Trafficmaster data shows that prior to the implementation of the Fox Lane Quieter Neighbourhood scheme, traffic speeds were lower on Chase Side than the other approaches to Southgate Circus. Low speeds were also experienced on the approaches of High Street and The Bourne.

The traffic flow data indicates that the total overall traffic flows at Southgate Circus have remained broadly the same in both the AM and PM peaks between 2020 and 2021. There is however a significant difference in flows entering and exiting the High Street; the volume of traffic using this approach has increased whilst other arms drop in flow, other than movements to the High Street. This has placed more pressure on that approach itself and The Bourne which now gives way to more traffic accessing the High Street arm.

3. Observations from Video Surveys

We have observed AM and PM peak videos from both 2020 and 2021 to determine the factors causing delays. The following provides a summary of the observed issues in each peak period.

AM Peak Period

A key observed issue is that traffic blocks back from the High Street exit into Southgate Circus. As Figure 1 shows below this has a significantly negative impact on The Bourne as the queueing can be extremely slow moving, obstructing entry into the roundabout.

Figure 1 - 2nd November 2021, 08:39am, The Bourne approach to Southgate Circus

This issue can also be observed in the 2020 set of videos in the AM peak, however the problem is not as acute. This is likely because as previously discussed traffic exiting the roundabout southbound was lower prior to the implementation of the Fox Lane Quieter Neighbourhood scheme.

We do not have a video in 2021 that clearly shows the traffic dynamics on the High Street exit; however, Figure 2 below is a screen shot from 2020.

Figure 2 -3rd March 2020, 08:38am, High Street exit of Southgate Circus

As can be clearly seen the right turn into Crown Lane is heavily used. This is both vehicles turning into it and out of it. The interaction here causes heavy queueing back into Southgate Circus.

At times the zebra crossing in the image above did cause queueing but not overly so.

The remaining sections of the roundabout appeared to operate relatively smoothly, with queues on Chase Side and Winchmore Hill which discharged as gaps in traffic appeared.

PM Peak Period

In the PM peak period, there were occasional instances of friction caused by traffic turning into and out of Crown Lane, however there were much fewer instances of blocking back into Southgate Circus when comparing to the AM.

Typically, traffic exiting the High Street was impeded by traffic blocking from the Chase Side exit around to The Bourne. Figure 3 below shows typical conditions for traffic exiting from the High Street.

Figure 3 - 2nd November 2021, 16:52pm, High Street approach to Southgate Circus

This issue was principally caused by friction northwest bound on Chase Side. Based on the video surveys this was most significant between 16:30 and 17:00. Thereafter there was less blocking back from the Chase Side exit.

Traffic was still slow to progress northbound out of High Street after this point. This was mainly due drivers choosing to give way to traffic turning out of Crown Lane, buses exiting the bus station, and then getting stopped at the zebra crossings internal to the junction.

Again, based on the videos we have available the remainder of the roundabout appeared to operate relatively smoothly throughout the PM peak period.

4. Summary & Intervention Recommendations

Based on the observations we recommend that as a priority, measures should be put in place that reduce friction on the exits of both Chase Side and High Street. We also highly recommend measures that attempt to keep clear the entries into the Southgate Circus from The Bourne and High Street even when there is internal queueing.

The issues that currently cause congestion existed previously to the implementation of the Fox Lane Quieter Neighbourhood scheme, however they appear to have been exacerbated by a slight variation in traffic flow, which is to be expected given the network operated with queueing already.

Traffic signals are often a method used to control traffic through and network, improve co-ordination and balance queues. However, we feel that signals controlling the entry and exits to Southgate Circus and or converting the zebra crossings to signalised crossings should not be considered until the following recommendations are put in place where feasible.

Appendix B is a drawing of Southgate Circus that plots both the short and medium to long term interventions described in the following sections.

4.1. Short Term

ST1 – Keep clear markings to be introduced onto the circulatory at the points where The Bourne and High Street enter the roundabout. This will likely keep the circulatory clear for traffic in the offside lanes to enter the roundabout and use the inside lanes of the circulatory when blocking back occurs.

ST2 – There are currently two pedestrian signalised crossings on Chase Side. These have maximum green times to traffic set at 20 seconds, meaning that when permanently demanded (likely in the peak periods) they disrupt traffic flow regularly. We would recommend increasing this maximum green time to 30 seconds. It is important to note that this increase would slightly increase pedestrian wait times.

ST3, 4, & 5 – These measures all attempt to reduce friction on the southbound High Street exit. Extending the right turn pocket into Crown Lane would reduce instances of blocking back, as would introducing northbound keep clear markings. Although we did not notice too many instances of disruptive parking and loading in this area, double yellow lines and double blips would also assist in smoothing the traffic flow.

4.2. Medium to Long Term

LT1 – We would recommend investigating if there are any measures that could be bought in along the length of Chase Side up to the roundabout with Chase Way. The carriageway appears narrow in places, and is constrained by parking and loading.

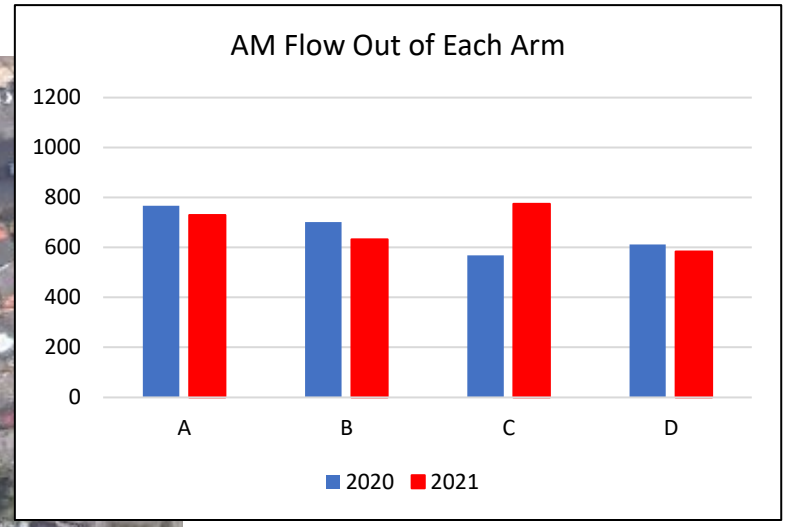
LT2 – Bringing the two crossings onto UTC control would better ensure they optimise their cycle time based on traffic demand, and that the green offsets are better synchronised, reducing stops as traffic travels away from Southgate Circus.

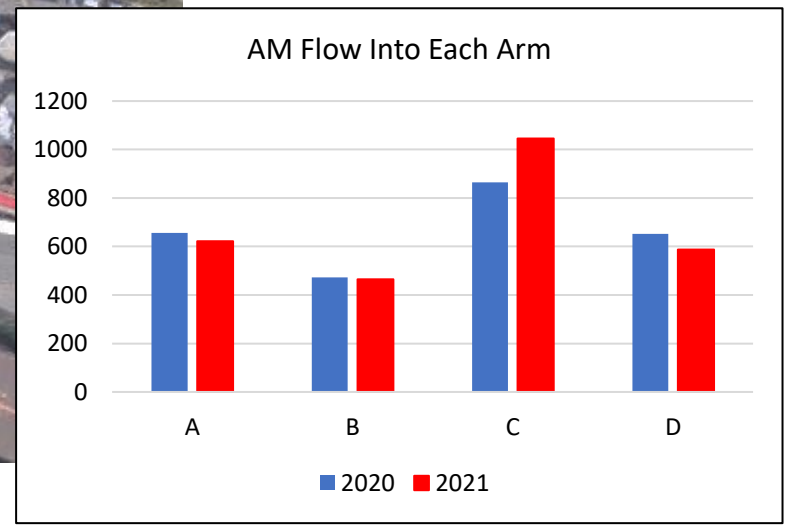
LT3 – The junction of Crown Lane with High Street is a priority junction with heavy flows in and out of it. It appears as if both Crown Lane and Burleigh Gardens are partially used as "rat runs" by through traffic to avoid Chase Side. We would recommend further review work into this small section of the network with a view to collating supporting surveys and making recommendations to reduce the pressure on the Crown Lane / High Street junction – which is having a knock-on effect to Southgate Circus.

Appendix A – Data Analysis

Southgate AM Flow Analysis- March 2020 vs. November 2021

- The flow tables and graphs show a greater volume of traffic coming in and out of Arm C- High Street in 2021.
- The volume of traffic on the remaining approaches coming in and out has reduced apart from an increase in those accessing Arm C.
- This means, Arm B- The Bourne is giving way to a greater volume of traffic in 2021.
- Although this is only by 20 PCUs (Passenger Car Units), as the roundabout is already congested in 2020, the delay and queue on the approach is likely growing exponentially.





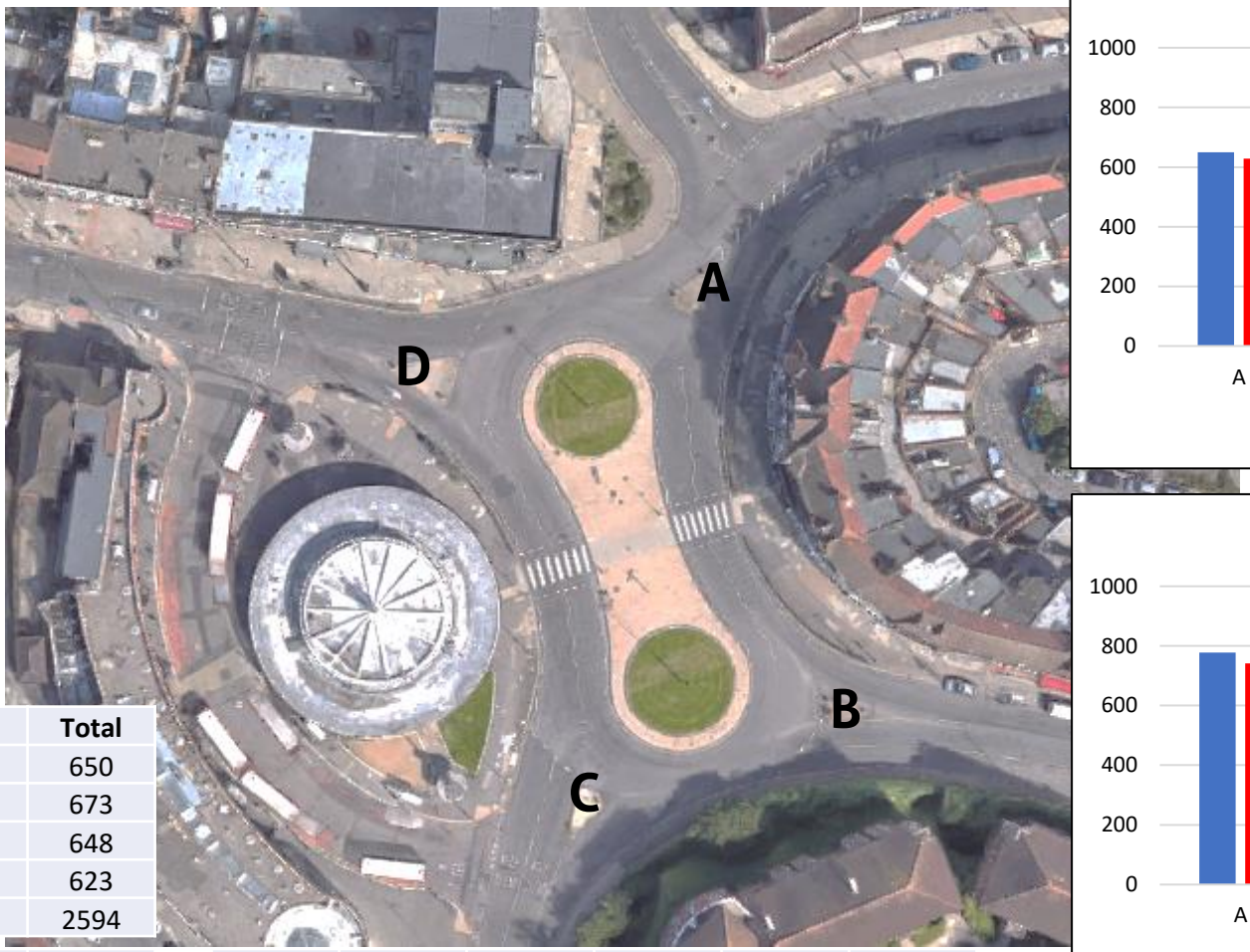
AM 2020	A	B	C	D	Total
A	5	122	485	154	766
B	137	5	226	333	701
C	338	74	0	156	568
D	176	272	154	9	611
Total	656	473	865	652	2646

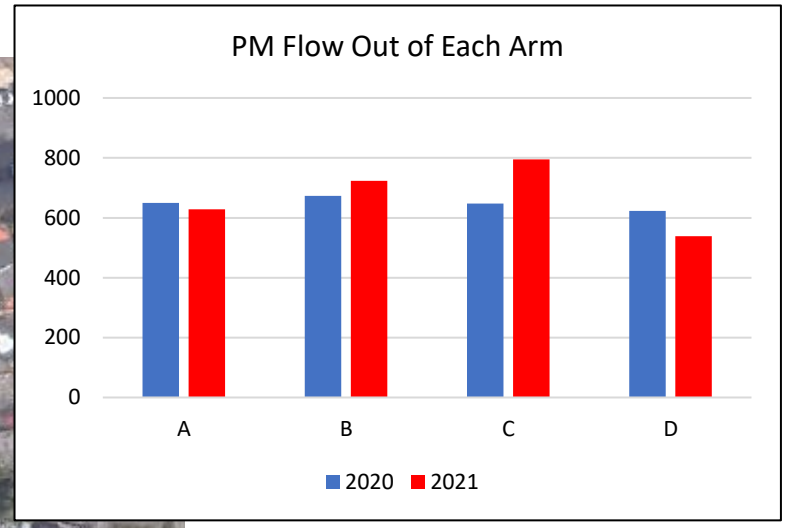
AM 2021	A	B	C	D	Total
A	0	76	548	105	729
B	52	2	330	248	632
C	402	142	1	229	774
D	168	245	166	5	584
Total	622	465	1045	587	2719

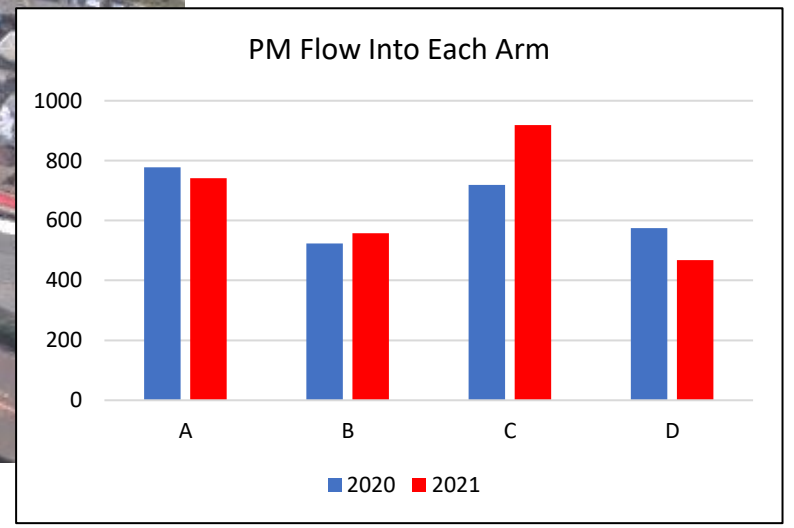
	A	B	C	D	Total
A	-5	-46	63	-49	-37
B	-85	-3	104	-85	-69
C	64	68	1	73	206
D	-8	-27	12	-4	-27
Total	-34	-8	180	-65	73

Southgate PM Flow Analysis- March 2020 vs. November 2021

- The flow tables and graphs show a greater volume of traffic coming in and out of Arm B- The Bourne and Arm C- High Street in 2021.
- The volume of traffic on the remaining approaches coming in and out has reduced apart from an increase in those accessing Arm C.
- This means, Arm B- The Bourne is giving way to a greater volume of traffic in 2021.
- Although the volume of traffic travelling from Arm B to Arm A decreases there is a net increase in traffic using The Bourne as there has been an increase in those travelling between arms B and D.







PM 2020	A	B	C	D	Total
A	4	111	415	120	650
B	209	4	200	260	673
C	373	90	0	185	648
D	192	318	104	9	623
Total	778	523	719	574	2594

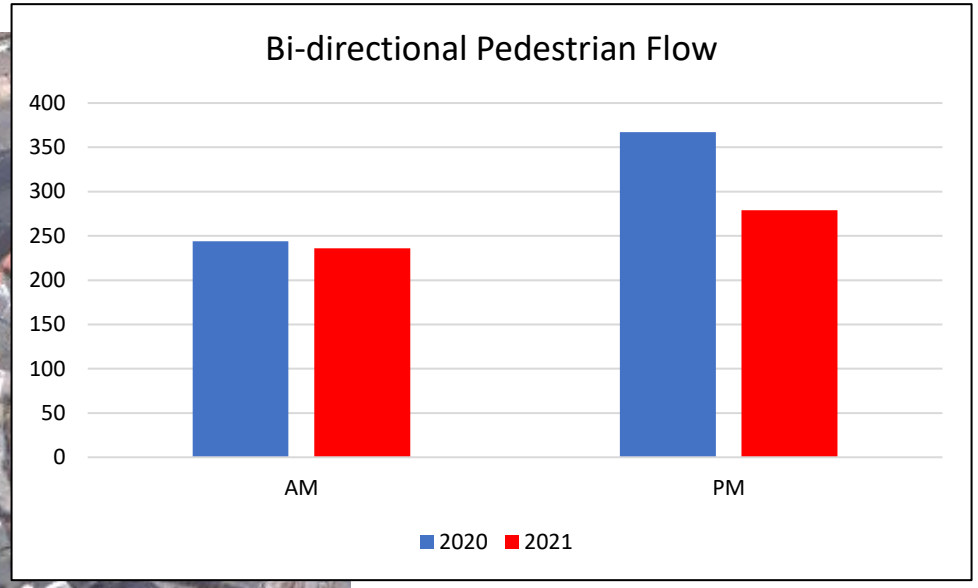
PM 2021	A	B	C	D	Total
A	1	44	532	51	628
B	83	6	283	351	723
C	523	208	0	64	795
D	134	299	104	2	539
Total	741	557	919	468	2685

	A	B	C	D	Total
A	-3	-67	117	-69.1	-22.1
B	-126	2	83	91	50
C	150	118	0	-121	147
D	-58	-19	0	-7	-84
Total	-37	34	200	-106.1	91

Southgate Pedestrian Flow Analysis- March 2020 vs. November 2021

- The pedestrian flows show that in the AM peak there is little variance between 2020 and 2021.
- In 2020, there was a greater volume of pedestrians using the zebra facilities in the PM.
- In the PM most pedestrians travel eastbound, exiting the London Underground station.
- This could be attributed to the AM peak hour falling within school commuting times (08:45-09:45) whereas the PM peak is more in line with working hours (17:30-18:30).
- In 2021 we would expect to see less commuters utilising the zebra to access the tube to travel to work due to the COVID-19 pandemic.

	AM	PM
	2020	
Eastbound	93	229
Westbound	151	138
	2021	
Eastbound	90	191
Westbound	146	88



Southgate AM Congestion Analysis- 2019 Trafficmaster Data

- The data shows that in the AM speeds are lowest on Chase Side.
- As expected, traffic slows on the approach to Southgate Circus on all other approaches with little variance between High Street and The Bourne.

Southgate PM Congestion Analysis- 2019 Trafficmaster Data

- Speeds are slower in the PM on Chase Side with The Bourne appearing to operate better than in the AM peak.
- The speeds on The Bourne increase with the High Street appearing to operate marginally slower speeds than when compared to the AM peak.

Appendix B - Interventions

PRELIMINARY ISSUE

LT1. Investigate ways in which "friction" can be reduced on Chase Side. For example parking and loading review, reduction in pinch points, minor carriageway widening etc.

ST2. Pedestrian crossing maximum vehicle time to be increased to 30 seconds (currently 20)

LT2. Existing pedestrian crossings to be put onto UTC control

ST1. Keep Clear markings to be introduced

ST3. Double yellow lines and double blips to be introduced on circulatory and on approaches / exits

ST4. Right turn pocket to be lengthened and island removed

ST5. Keep clear markings to be introduced

LT3. Consideration to be given to introducing measures on Crown Lane and Burleigh Gardens to discourage vehicles "rat running" attempting to avoid Chase Side

0 12.5m 25m 37.5m 50m

RED WILSON ASSOCIATES

CLIENT

ENFIELD Council

NOTE: DO NOT SCALE OFF THIS DRAWING.

CLIENT	London Borough of Enfield
PROJECT	Southgate Congestion Study

DESIGNED	CHECKED	REVIEWED	APPROVED
DS	PEG	PEG	SNW
DATE JAN 22	DATE JAN 22	DATE JAN 22	DATE JAN 22

TITLE

SOUTHGATE CONGESTION INTERVENTIONS

SCALE	DRAWING No	REV
1:500 @ A1	RWA-21-22-199-GA	1

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