



**Streets Systems**

# **Winstree Road, Colchester**

## **Movement Study**

Prepared for: Sustrans





#### Document Control

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# 1 Executive Summary

This study has been produced by Streets Systems to a brief prepared Sustrans. The purpose of the study is not to record or examine the behaviour of individuals but rather to create an anonymised dataset to inform decision making and management of the public realm.

Over 300 hours of video was recorded in and around the study area on Friday 8<sup>th</sup>, Monday 11<sup>th</sup> and Tuesday 12<sup>th</sup> November 2019. Data on the movement of people and vehicles was extracted using computer vision algorithms.

A similar survey was then carried out Thursday 8<sup>th</sup>, Friday 9<sup>th</sup> and Monday 12<sup>th</sup> October, 2020 to enable a comparison of pedestrian and vehicular behaviour. For the majority of sites data was also recorded on 13<sup>th</sup> October and is included within the charts and tables.

Differences are observable in the way visitors use the street across the two surveys which are explored in detail below.

## 2 Understanding of the Brief

### 2.1 Background

The first survey recorded a baseline and then also collected data on street behaviour with a limited deployment of the Sustrans Streetkit at key locations.

The second survey took place during the Covid-19 Pandemic at a time when schools and businesses were open but some changes in public behaviour had occurred, for example reduced public transport use.

The second survey again captured a baseline but then also recorded activity after a more extensive temporary street intervention altering the appearance of the carriageway.





### 2.2 The Studies

The studies deployed High Definition cameras at four locations to collect data over the two periods on movement through the study area. Multiple views were recorded from each location, a total of ten “camera views” were used for the movement analysis.

Two of the camera locations recorded were consistent across the surveys, with the other two varying to reflect the different nature of the trials being monitored.



2019 cameras

-  camera - street sign
-  187 - Fiveways Entrance
-  183 - New Farm
-  camera-lighting column

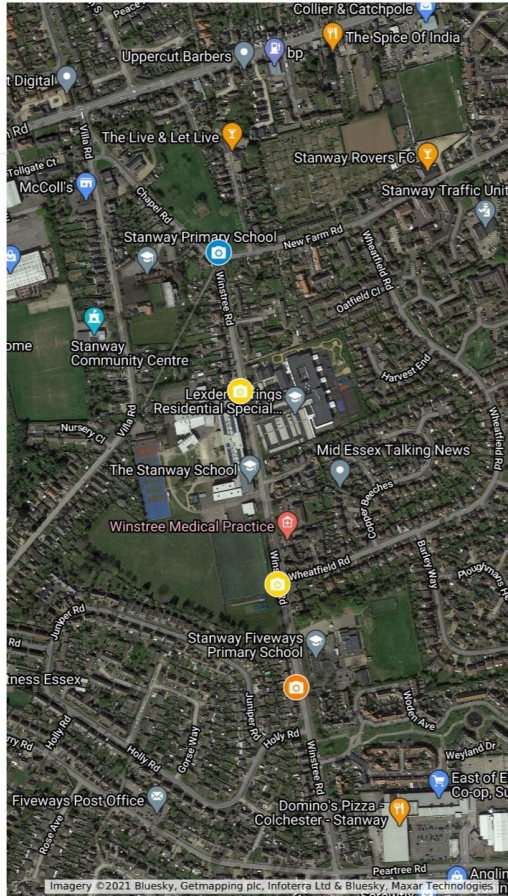


Figure 1 Camera locations 2019

2020 trials

-  trial
-  trial
-  trial
-  trial

2020 cameras

-  187 - Fiveways Entrance
-  183 - New Farm
-  159 - Winstree North
-  182 - Fiveways South

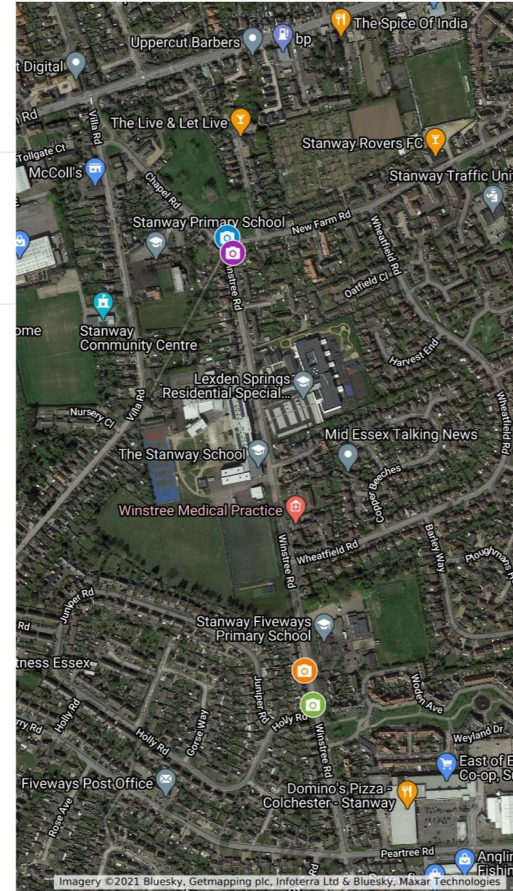


Figure 2 Camera Locations 2020

## 2.3 Movement

Analysis was conducted using Computer Vision to extract tracks for all street users pedestrians, cyclists and motor vehicles. We have then graphically represented these tracks to show movements of each user type.

The report contains a number of images where the movement of street users is overlaid as tracks showing the path taken by each individual. On these images pedestrian movement is represented in Green, Cyclists in Blue, Motor Vehicles in Red. Where there are larger amounts of movement taking place, movement is presented as a heatmap with darker shades of Green indicating the densest concentrations of pedestrian movement paths.

# 3 Vehicular Traffic Comparison

In comparing traffic volumes and speeds we have focussed on the two camera locations which are consistent across the 2019 and 2020 surveys.

Traffic behaviour was recorded in all directions at this three way junction between Wistress Road, New Farm Road and Chapel Road.

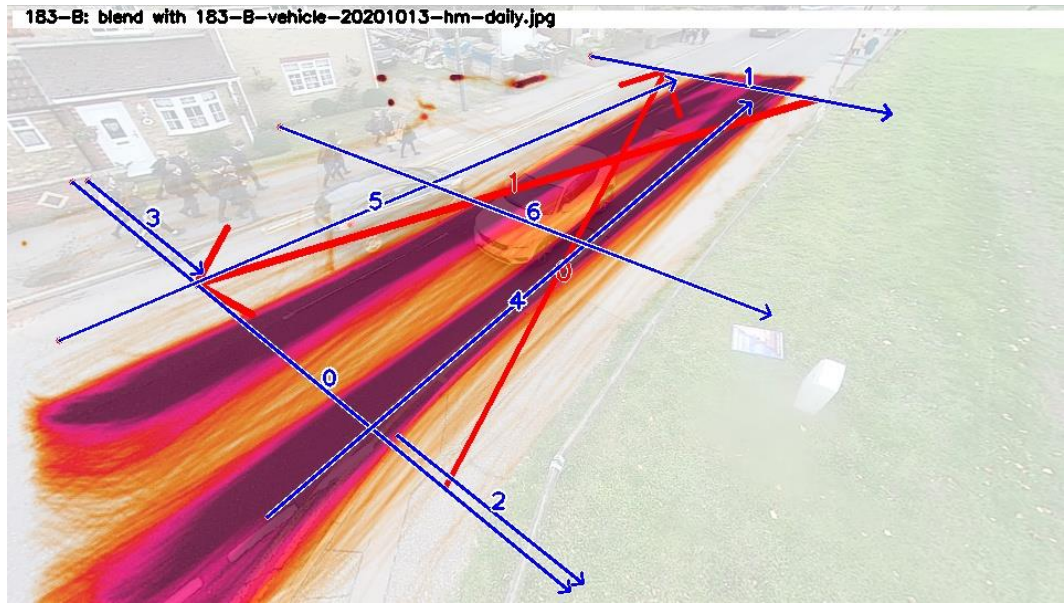


Figure 3 Pedestrian and Vehicle Countlines Chapel Road

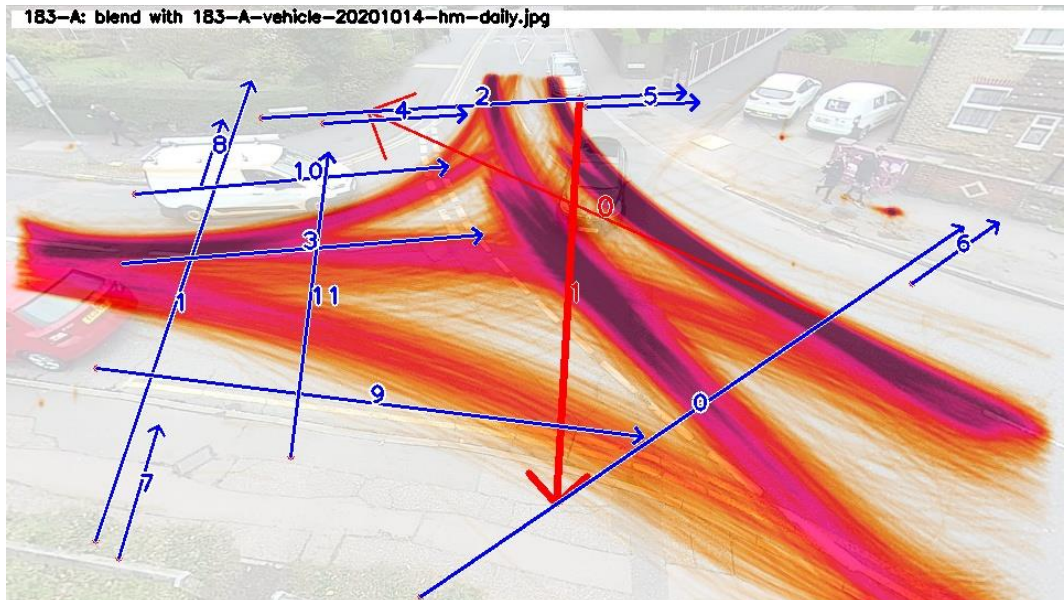
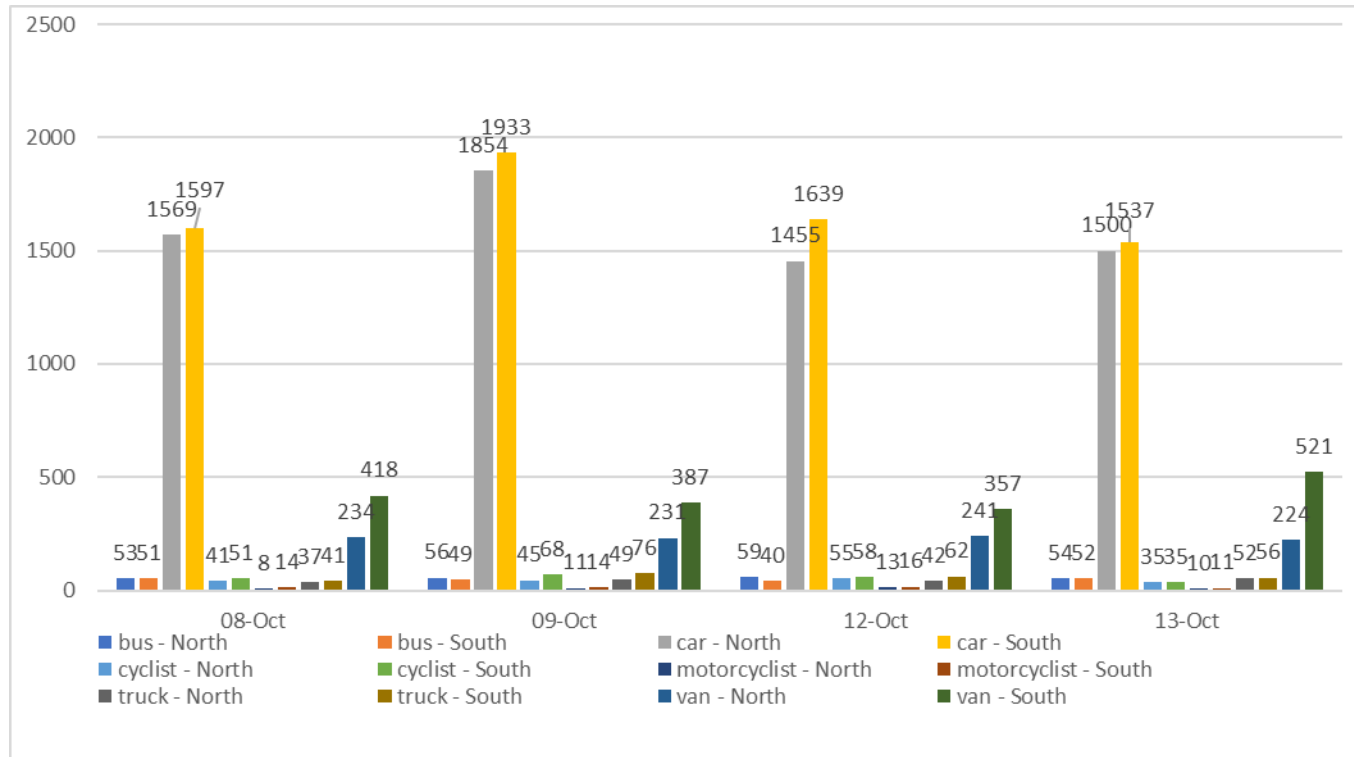


Figure 4 Pedestrian and Vehicle Countlines New Farm Road Junction



## 3.1 New Farm

### 3.1.1 Survey 2 - 2020– Entering / Leaving Chapel Road 7am – 7pm



Daily vehicular traffic flows average 4252 per day in all directions 7am to 7pm, the majority of which is private car traffic.



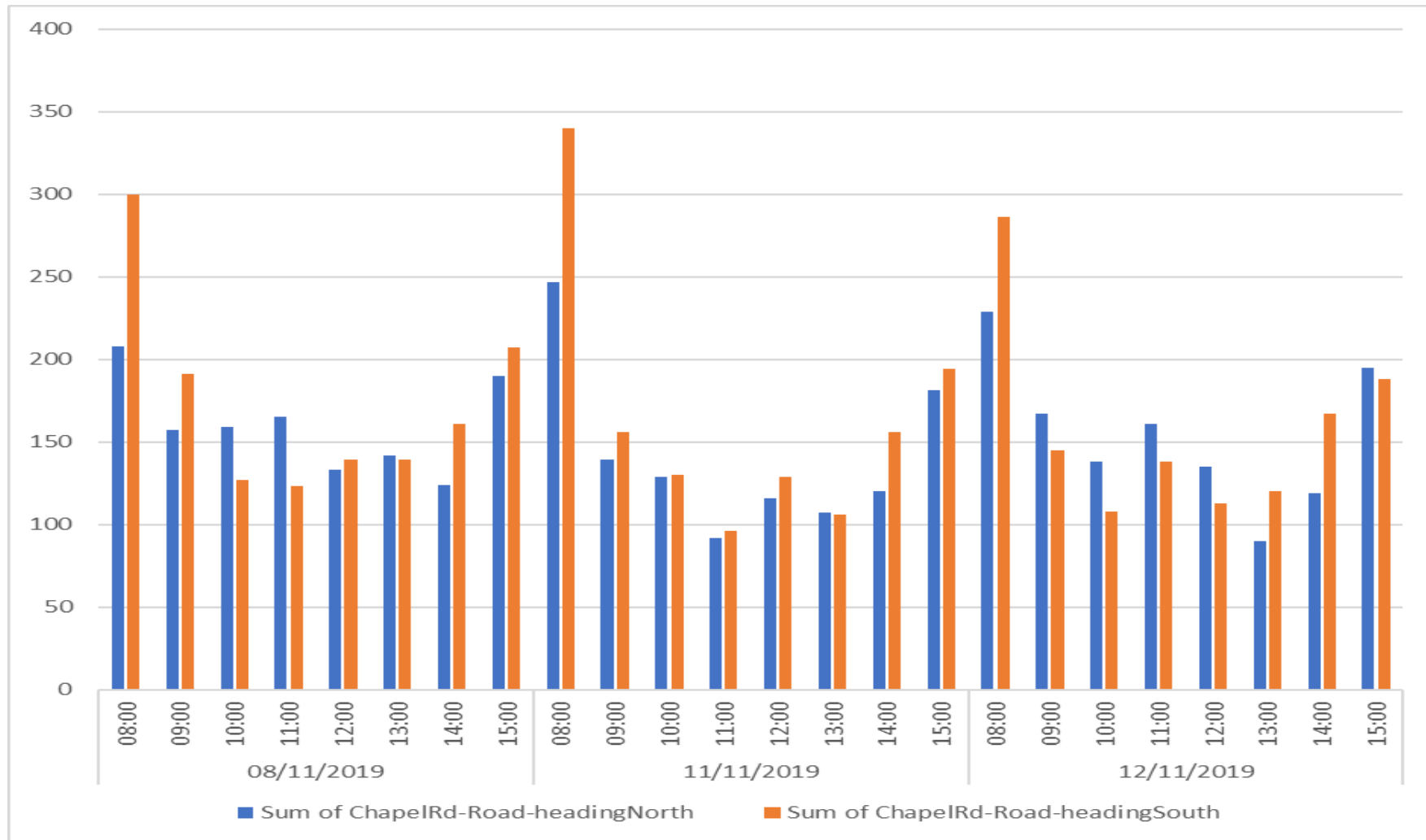
Daily flows hide the intensity of the morning peak, with half of the 8am flows shown the in the table below occurring between 8:20am and 8:40am.

Row Labels	Chapel Rd Heading North	Chapel Road Heading South	Peak Hour Totals
<b>08-Oct</b>			
08	244	326	570
15	195	169	364
<b>09-Oct</b>			
08	257	334	591
15	278	242	520
<b>12-Oct</b>			
08	232	316	548
15	214	185	399
<b>13-Oct</b>			
08	227	308	535
15	220	215	435

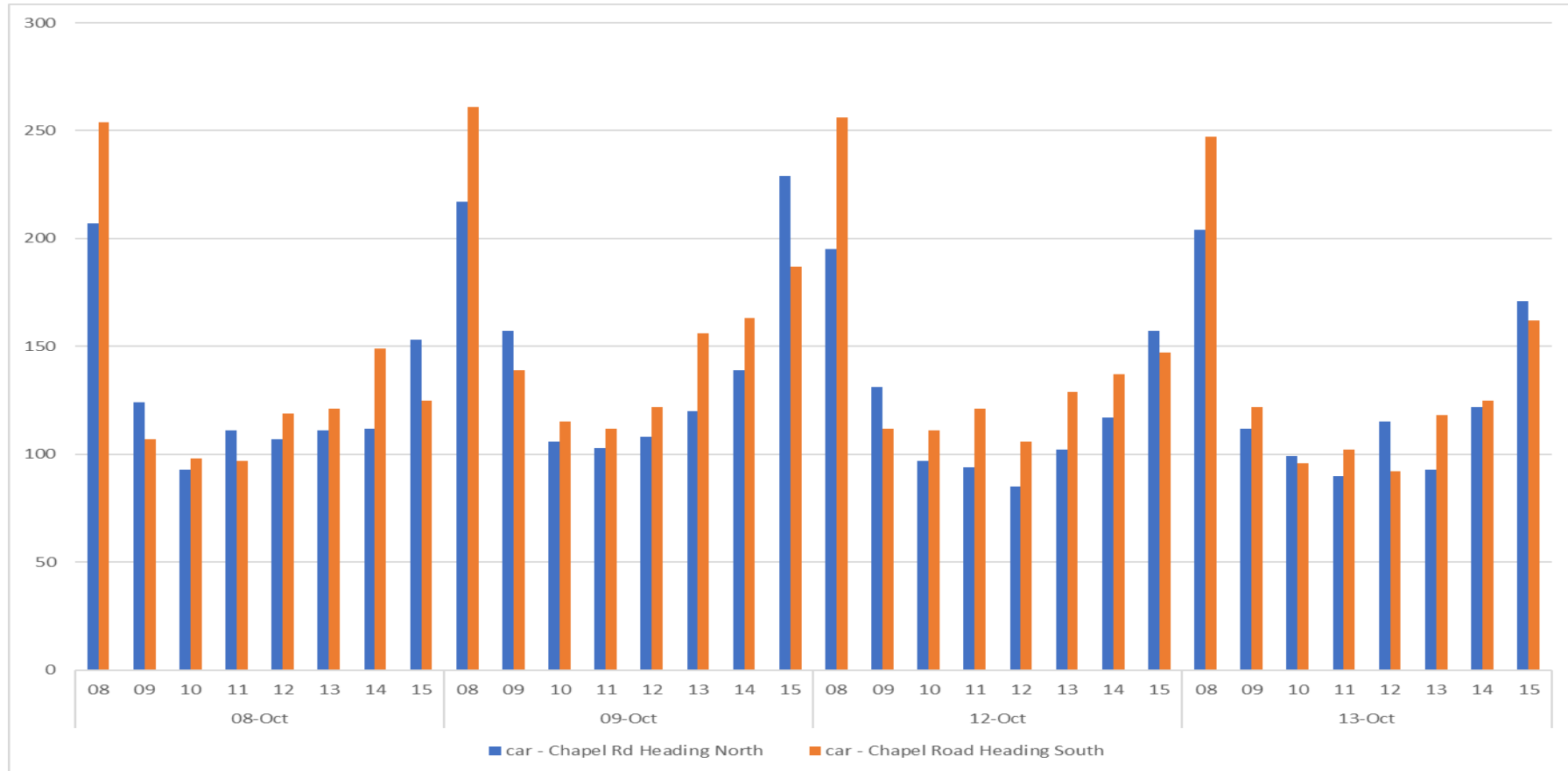
Figure 5 Peak Hour Flows Chapel Road All Vehicles 2020

### 3.1.2 Hourly Pattern – Survey 1 - 2019 – Car Traffic

Private car volumes declined slightly between the two surveys as shown by the two hourly charts below, this is consistent not only for the morning peak but across the school day.

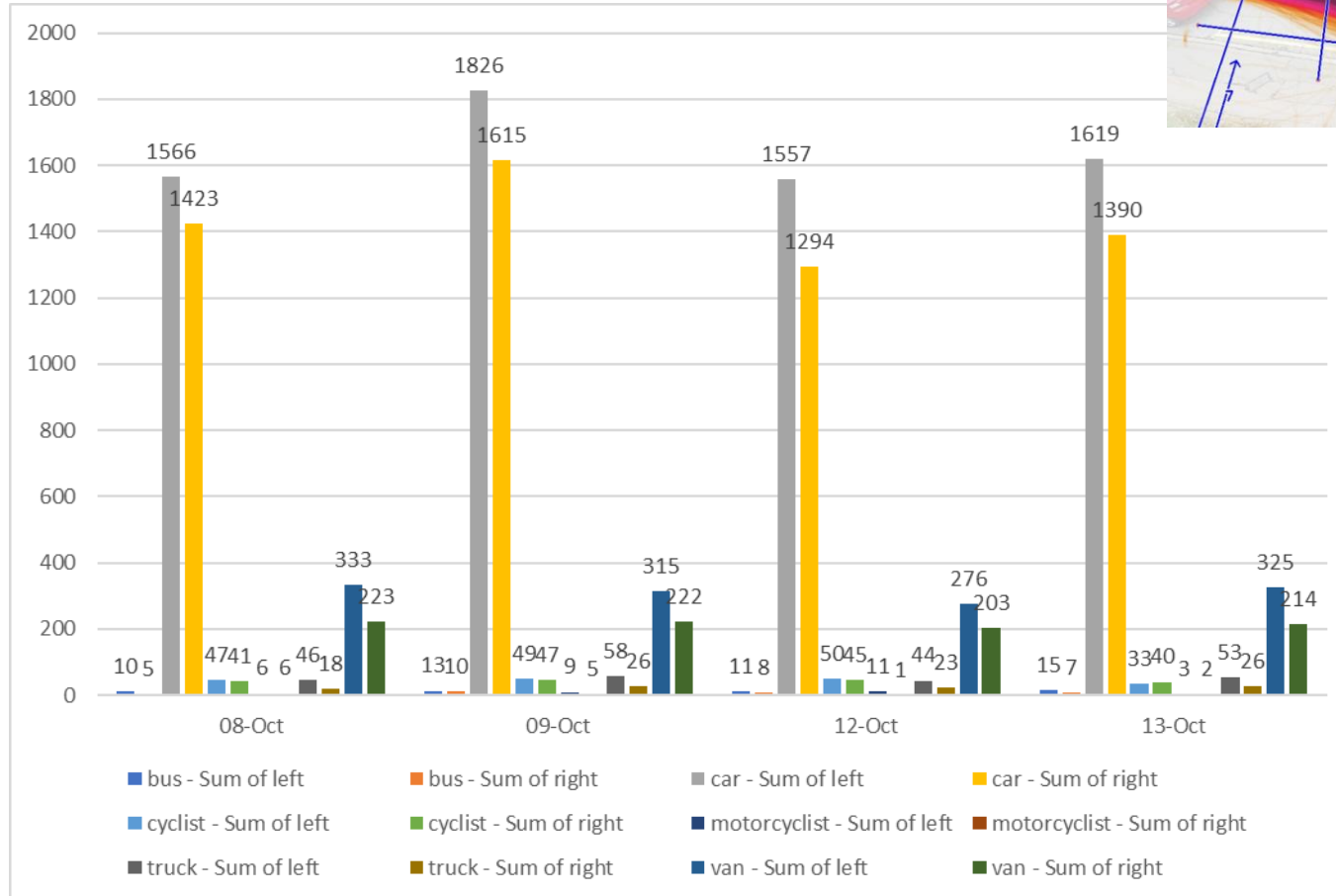
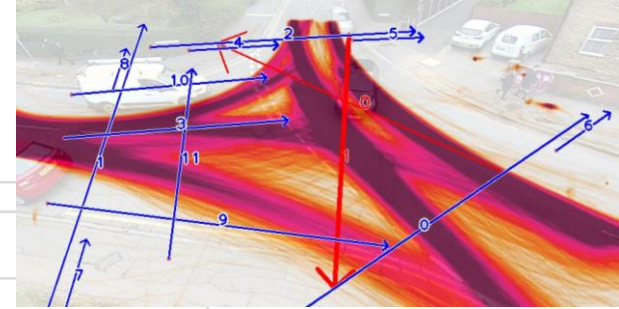


### 3.1.3 Hourly Pattern Survey 2 - 2020 – Car Traffic



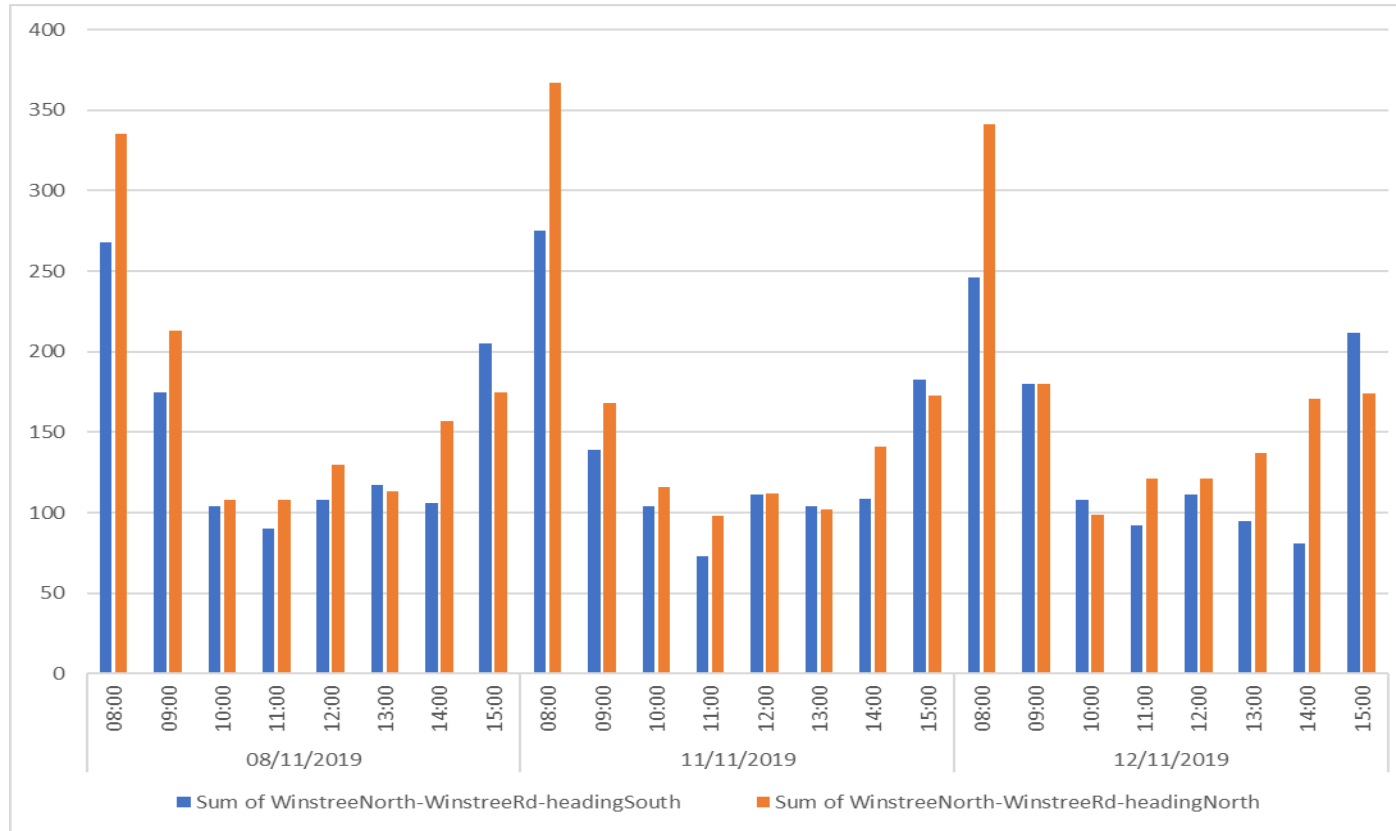
## 3.2 Winstree Road North

### 3.2.1 Survey 2 2020 – Entering / Leaving Winstree Road



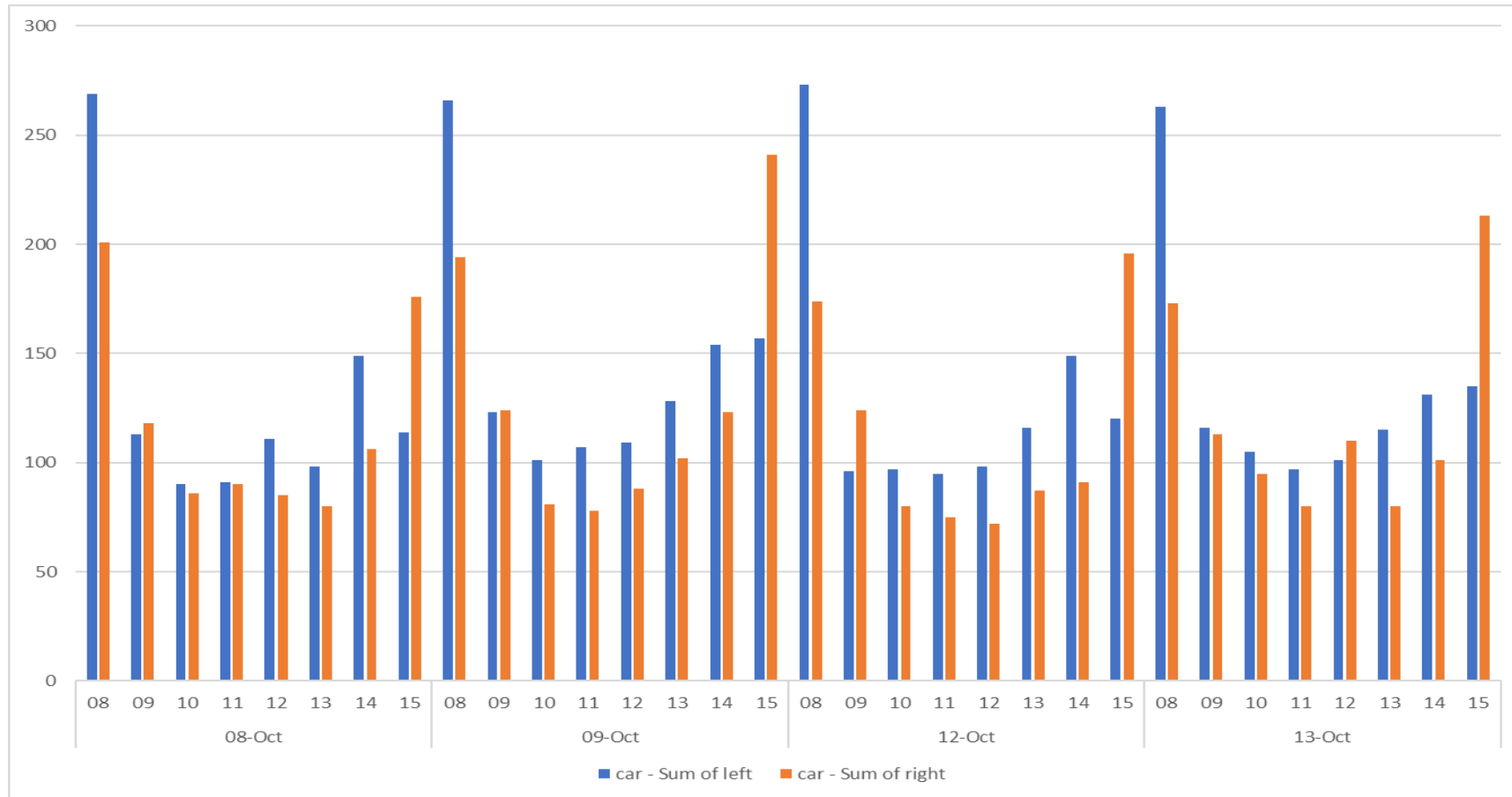


### 3.2.2 Hourly Pattern 2019 – Car Traffic



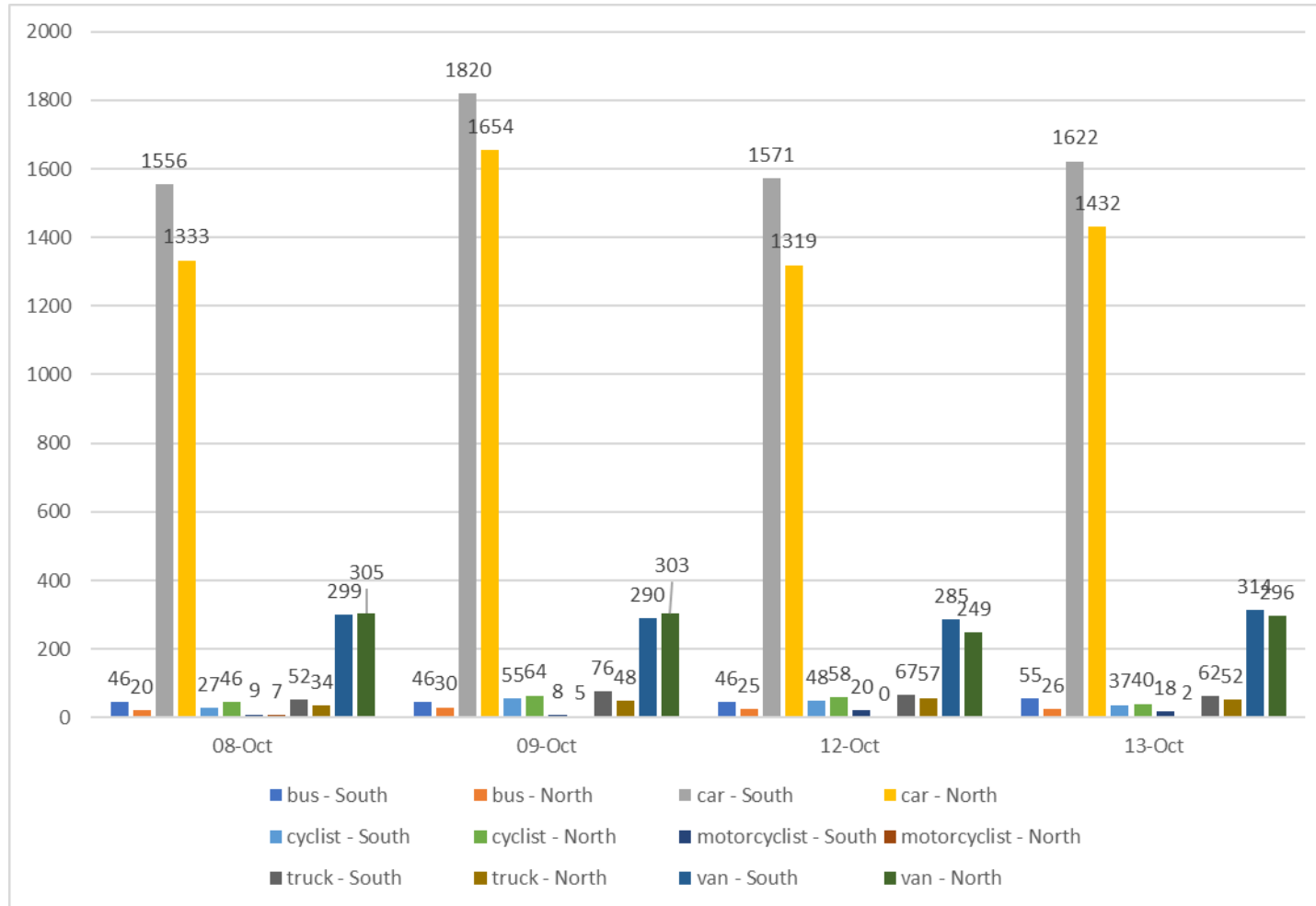
Traffic on the northern section of Winstree Road shows the same pattern of a small but noticeable decline at all times of the school day between the two surveys.

### 3.2.3 Hourly Pattern 2020 – Car Traffic



### 3.3 Winstree Road South (Fiveways)

The average daily flow 7am to 7pm was 3958 vehicles in all directions.

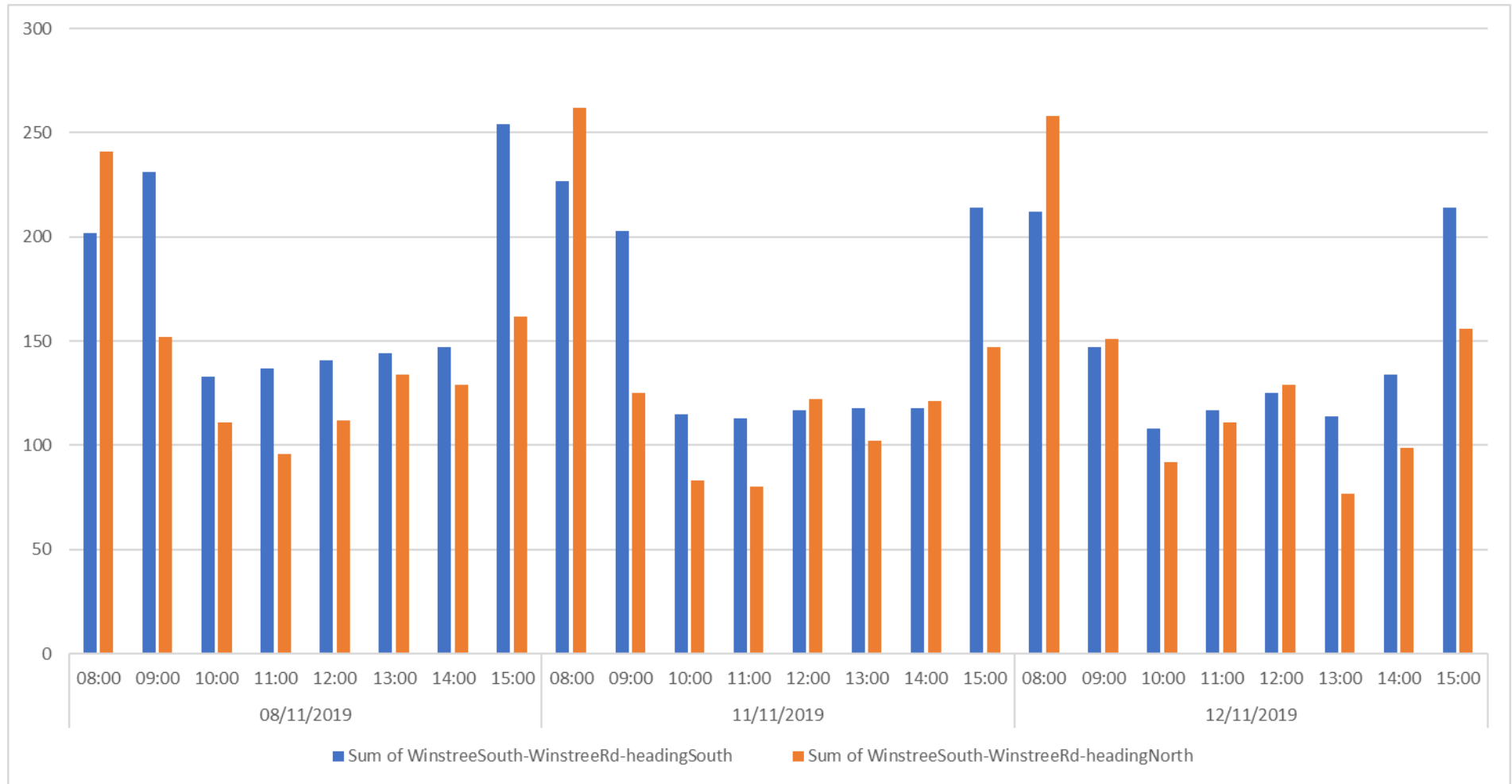


The intensity of the morning peak is higher than would be expected from the daily flow, showing the unusual nature of the street with its very high concentration of education sites.

Row Labels	South	North	Peak Hour Totals
<b>08-Oct</b>			
08	247	304	551
15	229	167	396
<b>09-Oct</b>			
08	237	327	564
15	293	203	496
<b>12-Oct</b>			
08	246	298	544
15	249	169	418
<b>13-Oct</b>			
08	237	313	550
15	267	190	457

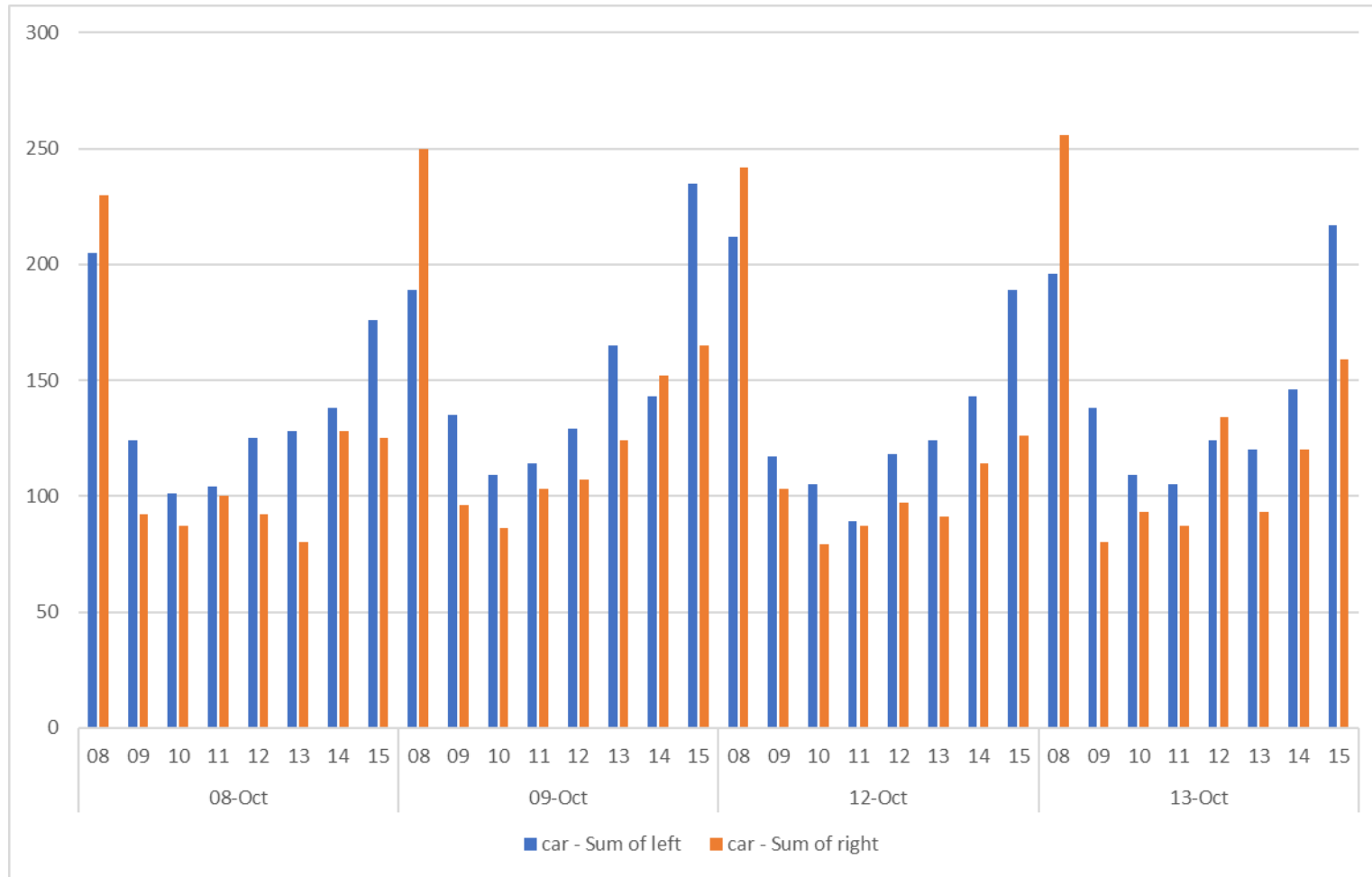


### 3.3.1 Hourly Pattern 2019 – Car Traffic



Whereas with the Northern Section of Winstree Road we saw a fall in hourly totals, for the southern section shown here there is little change in hourly private car peak flows.

### 3.3.2 Hourly Pattern 2020 – Car Traffic



## 3.4 Vehicle Speeds - kph

### 3.4.1 Chapel Road

In 2019 speeds on Chapel Road close to Winstree Road reduce slightly in response to the 2019 temporary street trial, even the very slight change of the introduction of the coloured streetkit has some influence.

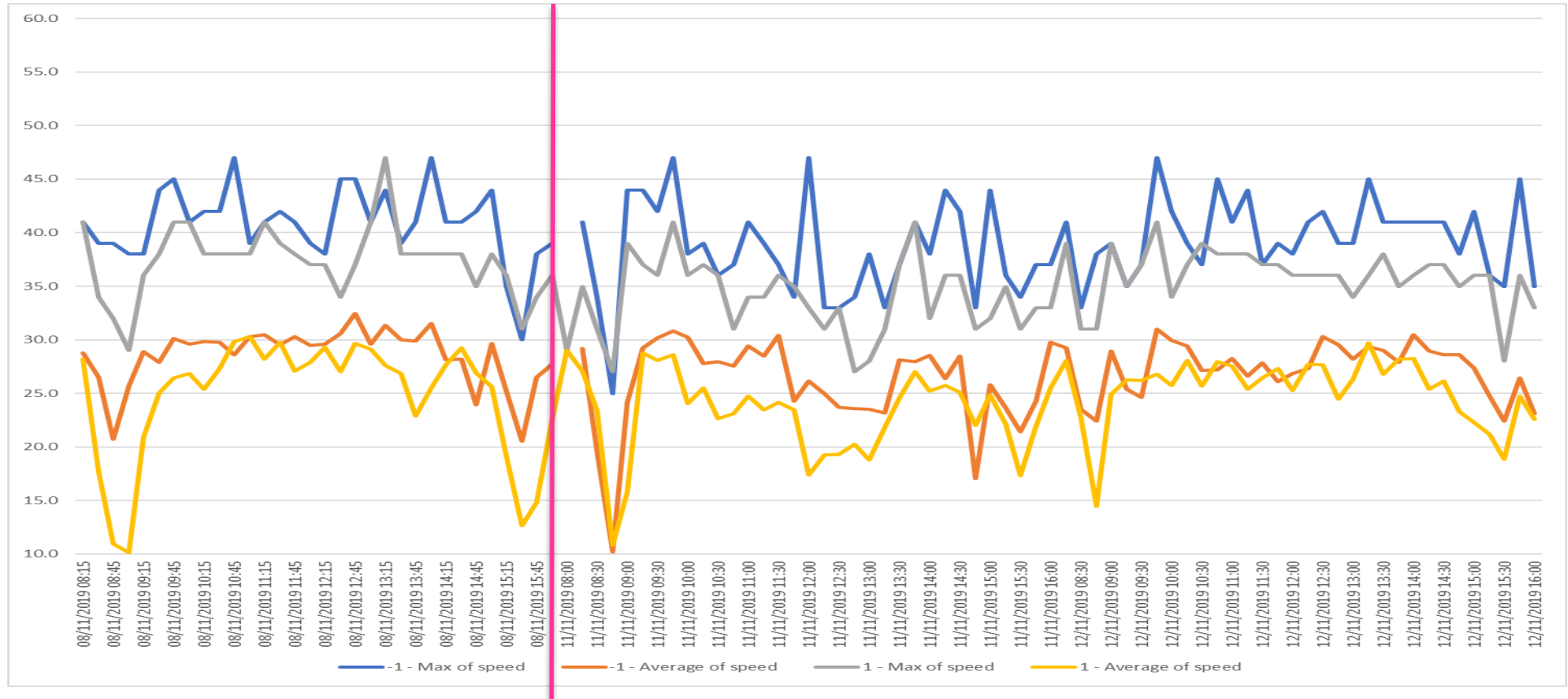


Figure 6 Chapel Rd 2019 Speeds

In 2020 we see average speeds fall in response to the 20mph limit being introduced even though our speed measurement zone is north of the change in speed limit.

Row Labels	Average kph South	Average kph North
08-Oct	29	28
09-Oct	30	28
12-Oct	28	27
13-Oct	27	26
14-Oct	27	26

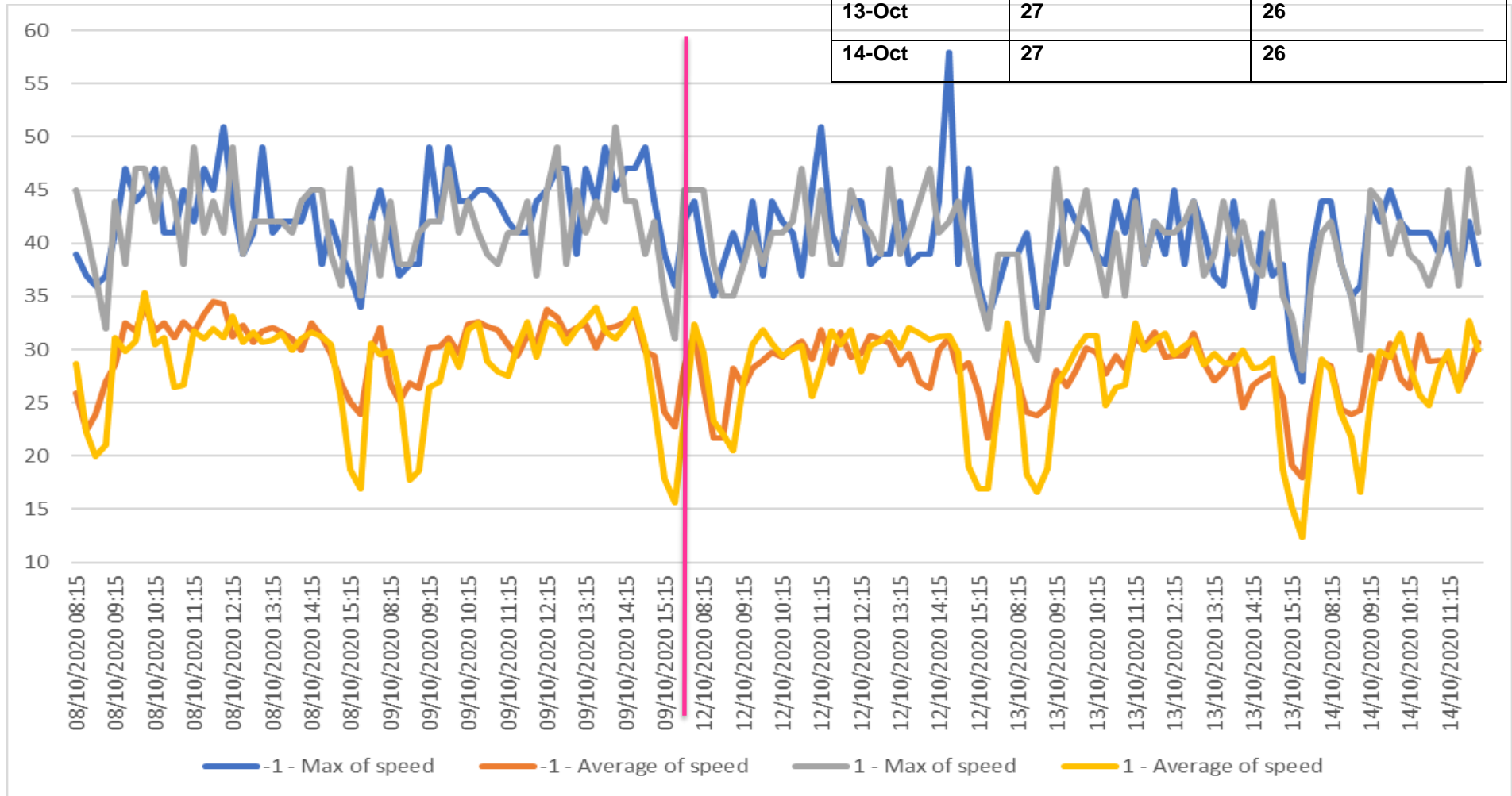


Figure 7 Chapel Rd 2020 Speeds



### 3.4.2 Winstree Road South (Fiveways)

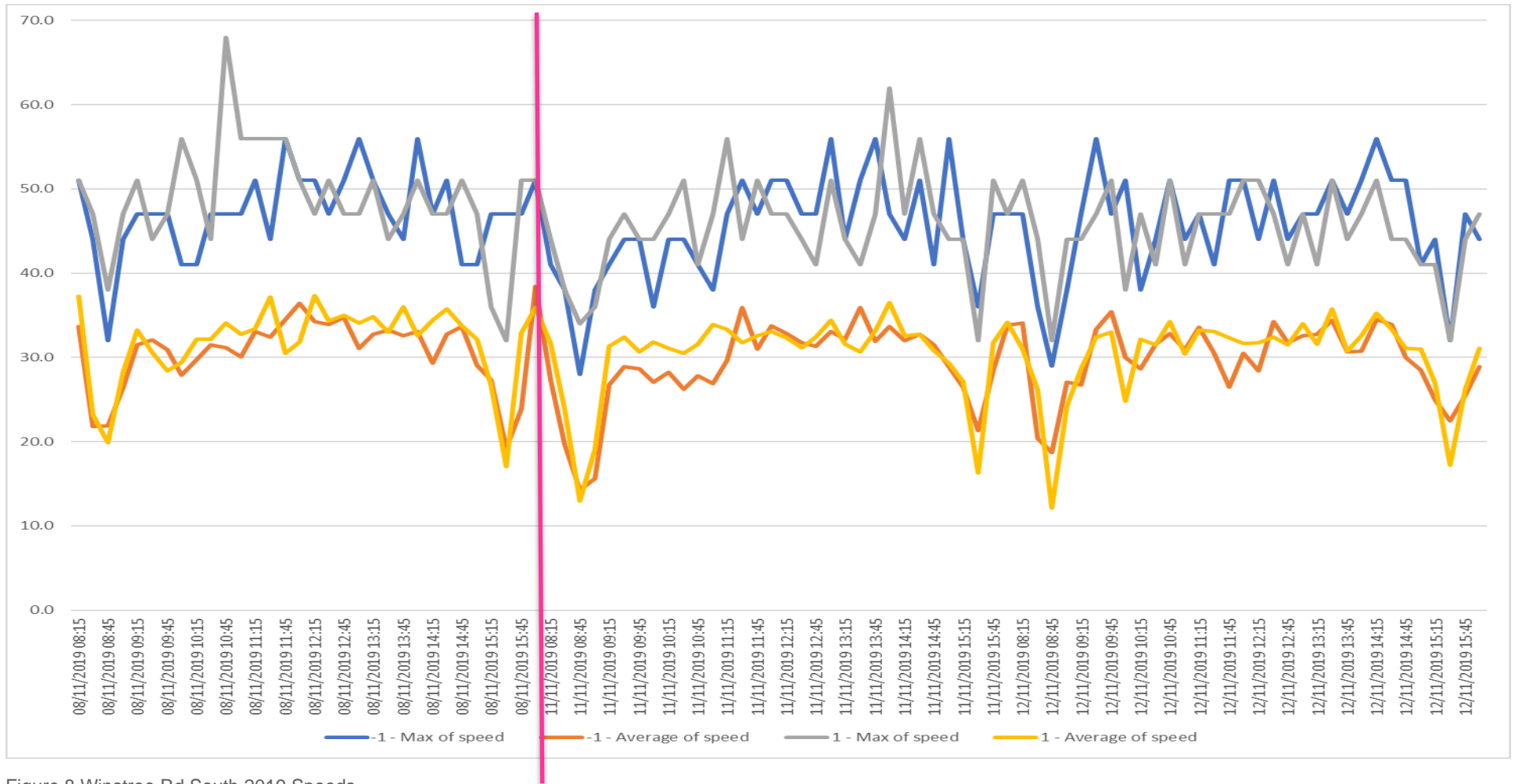


Figure 8 Winstree Rd South 2019 Speeds

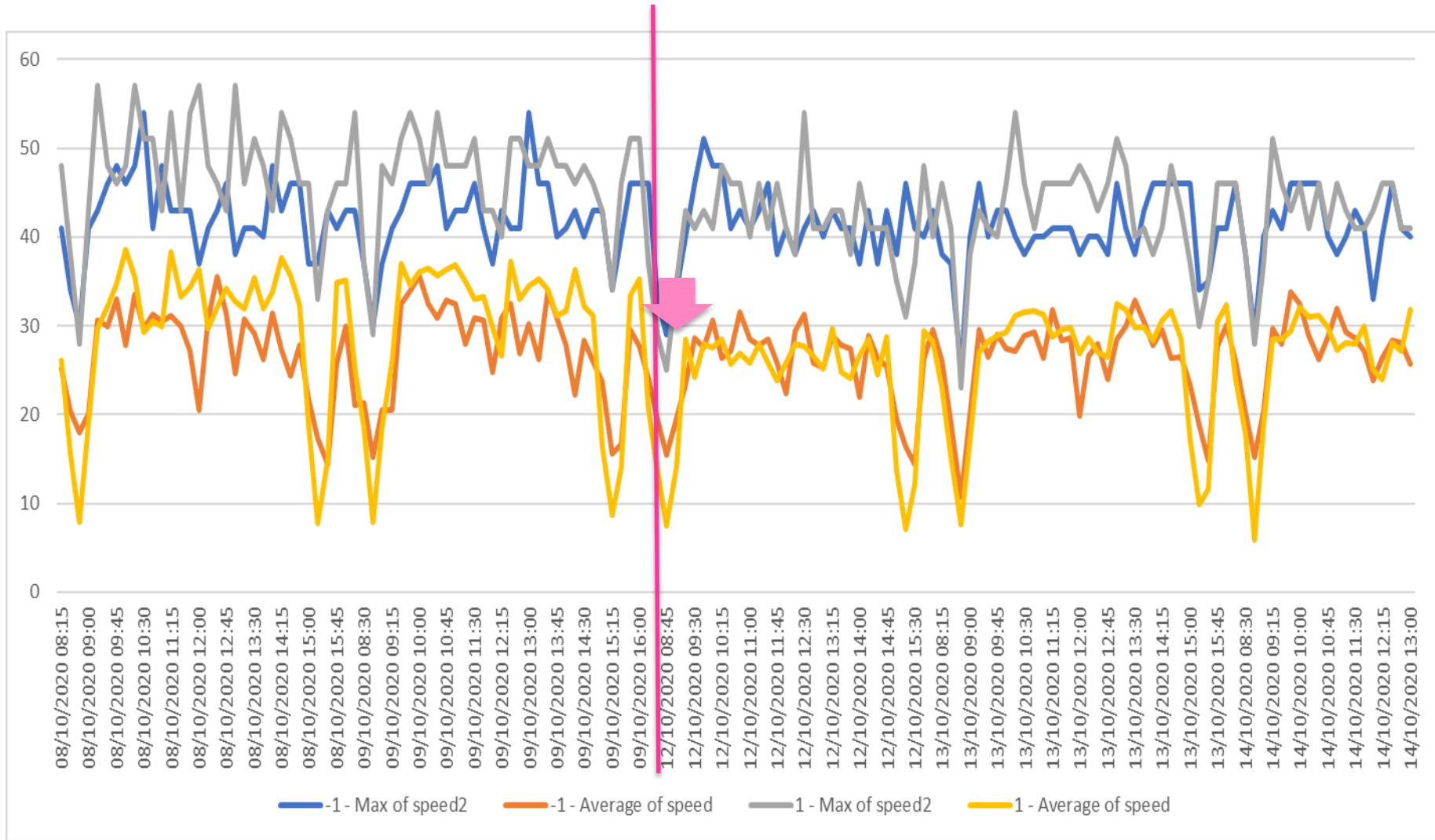


Figure 9 Winstree Rd South 2020 Speeds

Speeds at Fiveways Primary School are slower from 12<sup>th</sup> October 2020, likely resulting from the introduction of a 20mph (32kph) speed limit and the temporary street markings. This presents as both slightly lower average speeds and lower maximum speeds.

Day	Average kph North	Average kph South
08-Oct	24.293	25.377
09-Oct	23.686	25.211
12-Oct	22.870	20.538
13-Oct	23.563	23.467

Figure 10 Daily Average Speeds Winstreet South - Fiveways 2020

The change in speeds resulting from the street trial is visible in more detail in the below Whisker Charts. These show the reduced incidence of higher speeds on the 12<sup>th</sup> & 13<sup>th</sup> October.

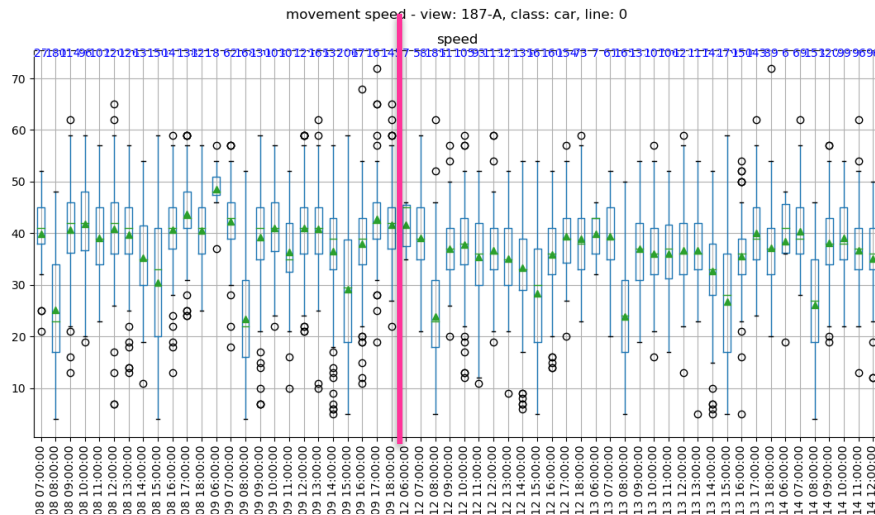


Figure 11 Southbound Speeds Winstree Rd South Fiveways entrance

The midline of the box is median (50%), top and bottom of the box are lower and upper quartile (25% & 75%), whiskers with bars at end are limits above/below which you see outliers (circles).

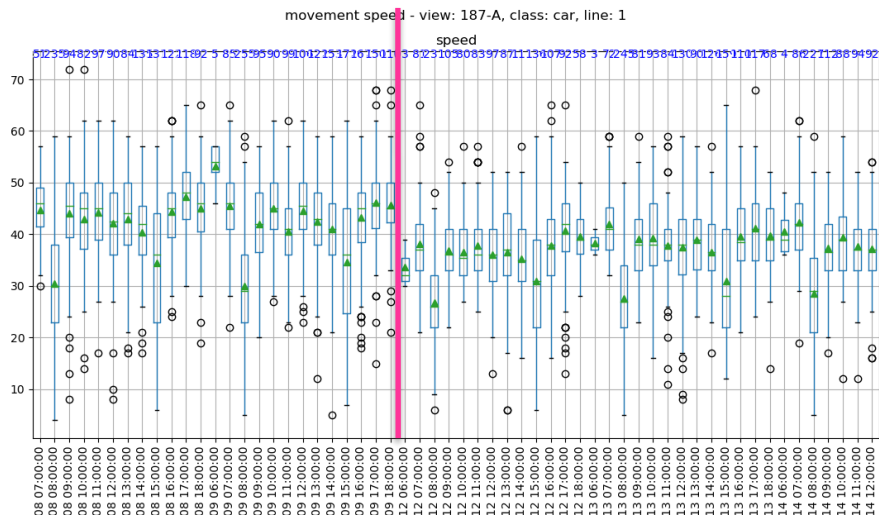
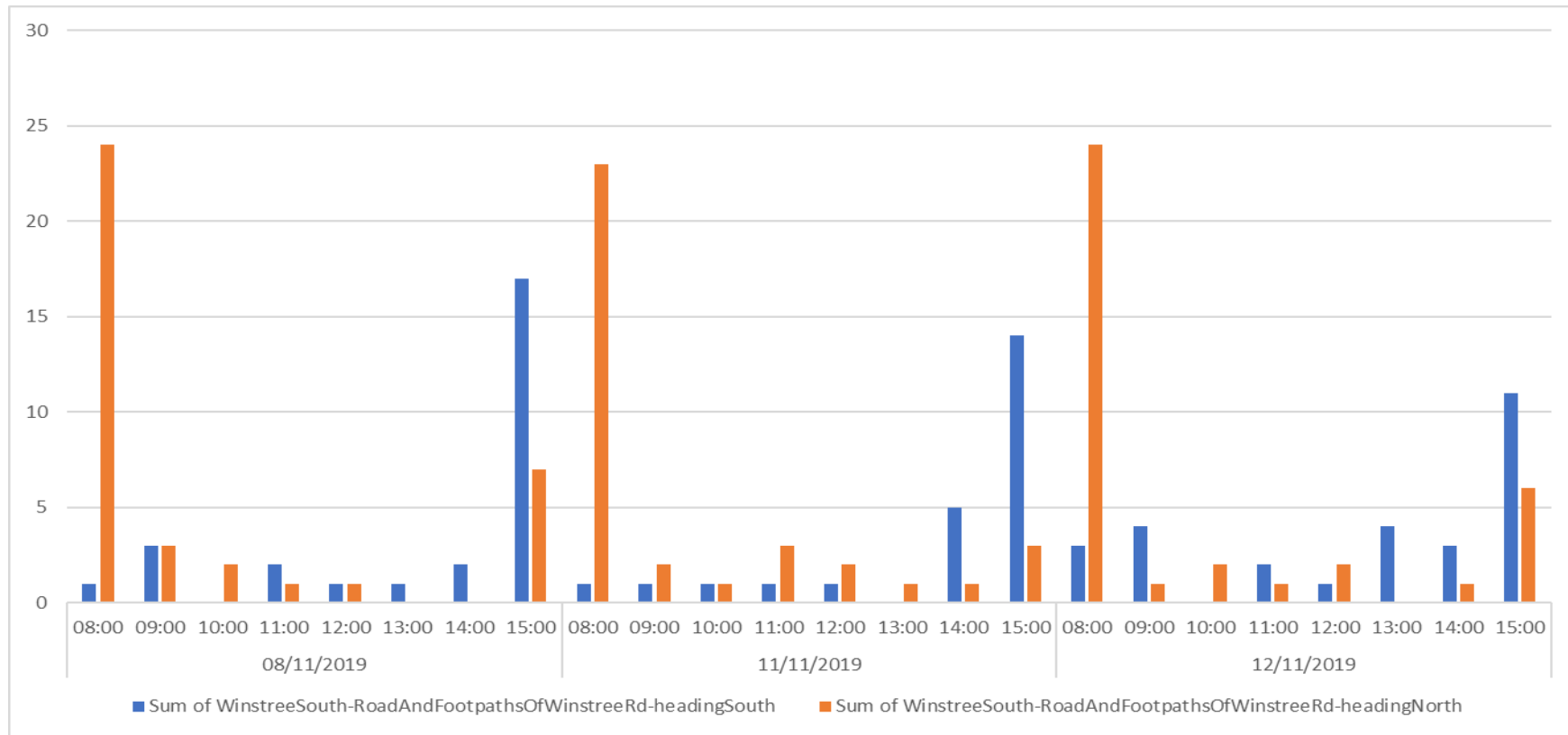


Figure 12 Northbound Speeds Winstree Rd South Fiveways entrance

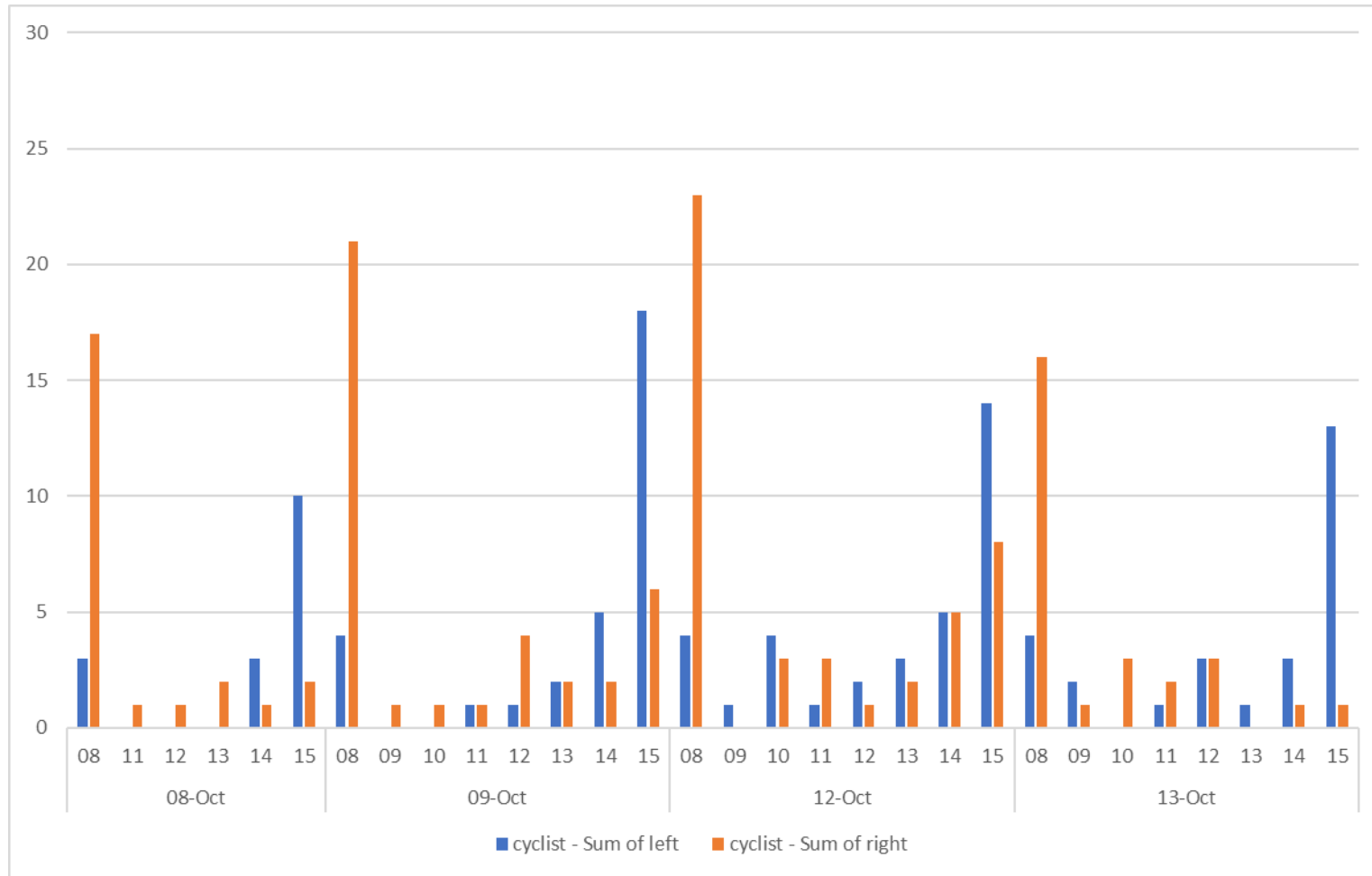
The reduction in outlier high speeds is greatest on the Monday morning, perhaps suggesting that those inclined to speed had figured out that there was no physical calming after its initial impact.

## 3.5 Bicycle Traffic

### 3.5.1 Survey 1 –



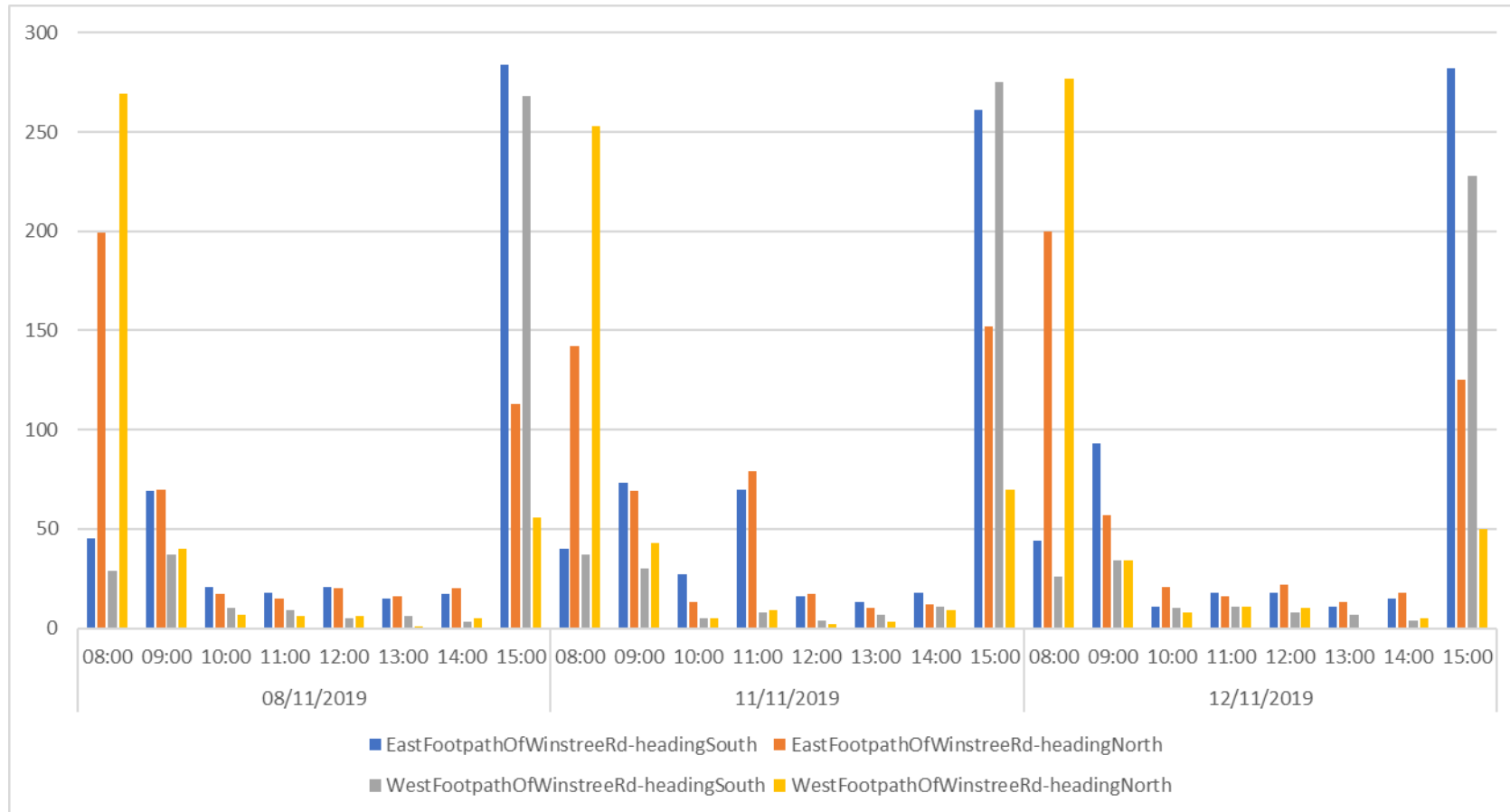
### 3.5.2 Survey 2 –



# 4 Footfall Comparison

## 4.1 Winstree Road South (Fiveways)

### 4.1.1 Survey 1 2019



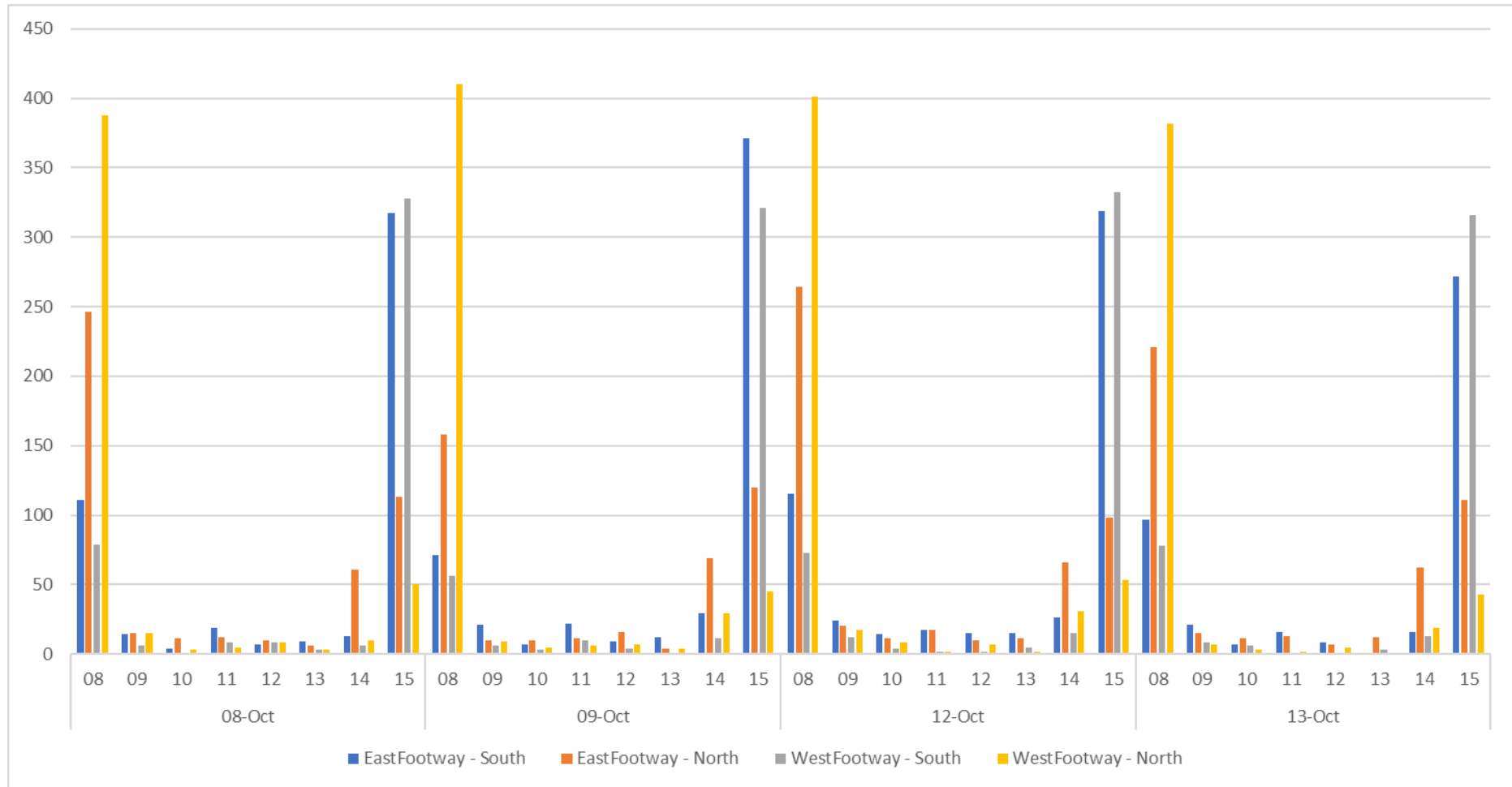


Row Labels	EastFootpathOfWinstreeRd-headingSouth	EastFootpathOfWinstreeRd-headingNorth	WestFootpathOfWinstreeRd-headingSouth	WestFootpathOfWinstreeRd-headingNorth
08/11/2019	490	470	367	390
11/11/2019	518	494	377	394
12/11/2019	492	472	328	395

#### 4.1.2 Survey 2 2020

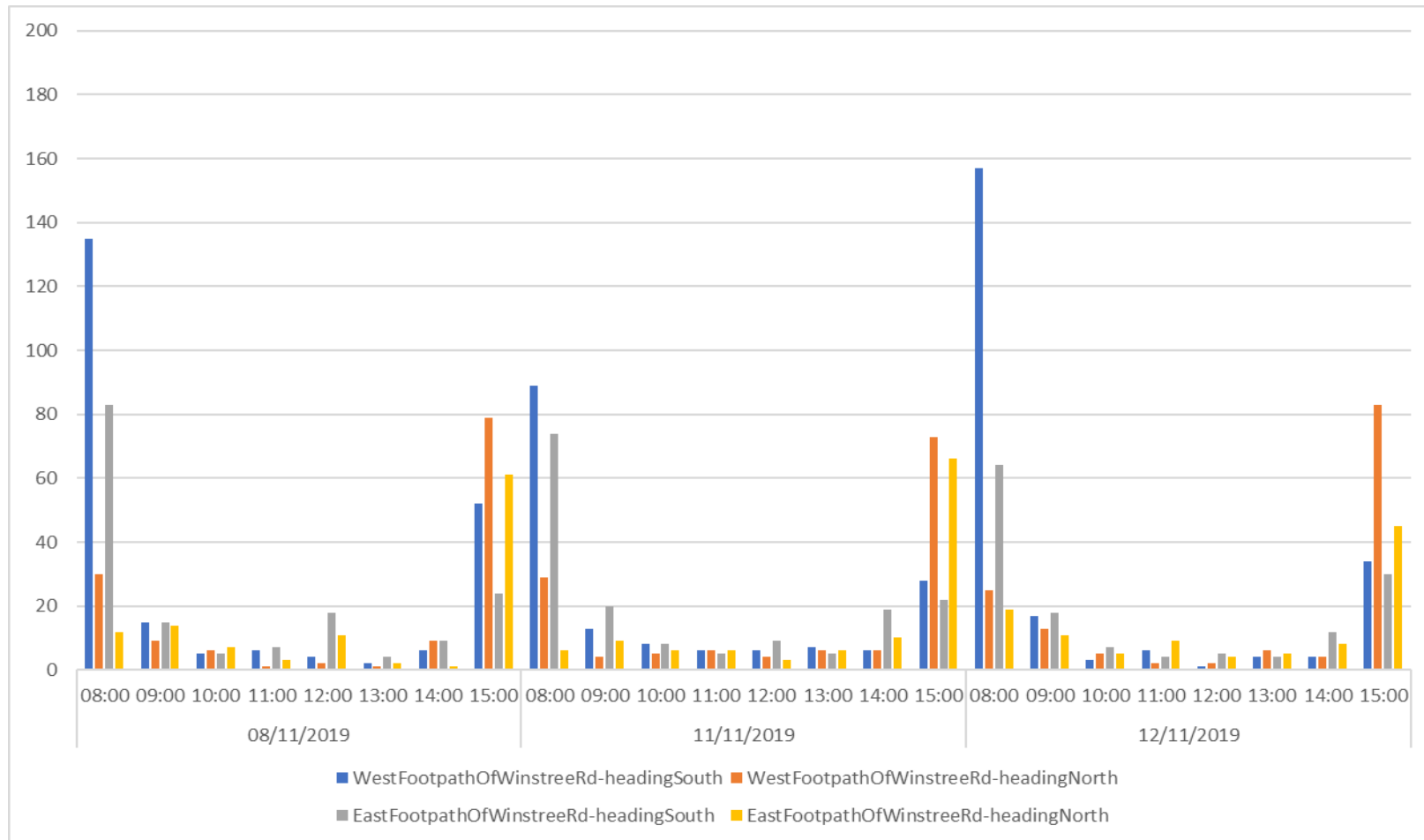
	EastFootway		WestFootway	
Row Labels	South	North	South	North
08-Oct	494	474	439	482
09-Oct	542	398	411	515
12-Oct	545	497	445	521
13-Oct	438	452	424	462

There has been some increase in walking between 2019 and 2020 some of what is seen in the chart below is a more pronounced 8am peak.



## 4.2 Winstree Road North (New Farm Rd )

### 4.2.1 Survey 1 2019

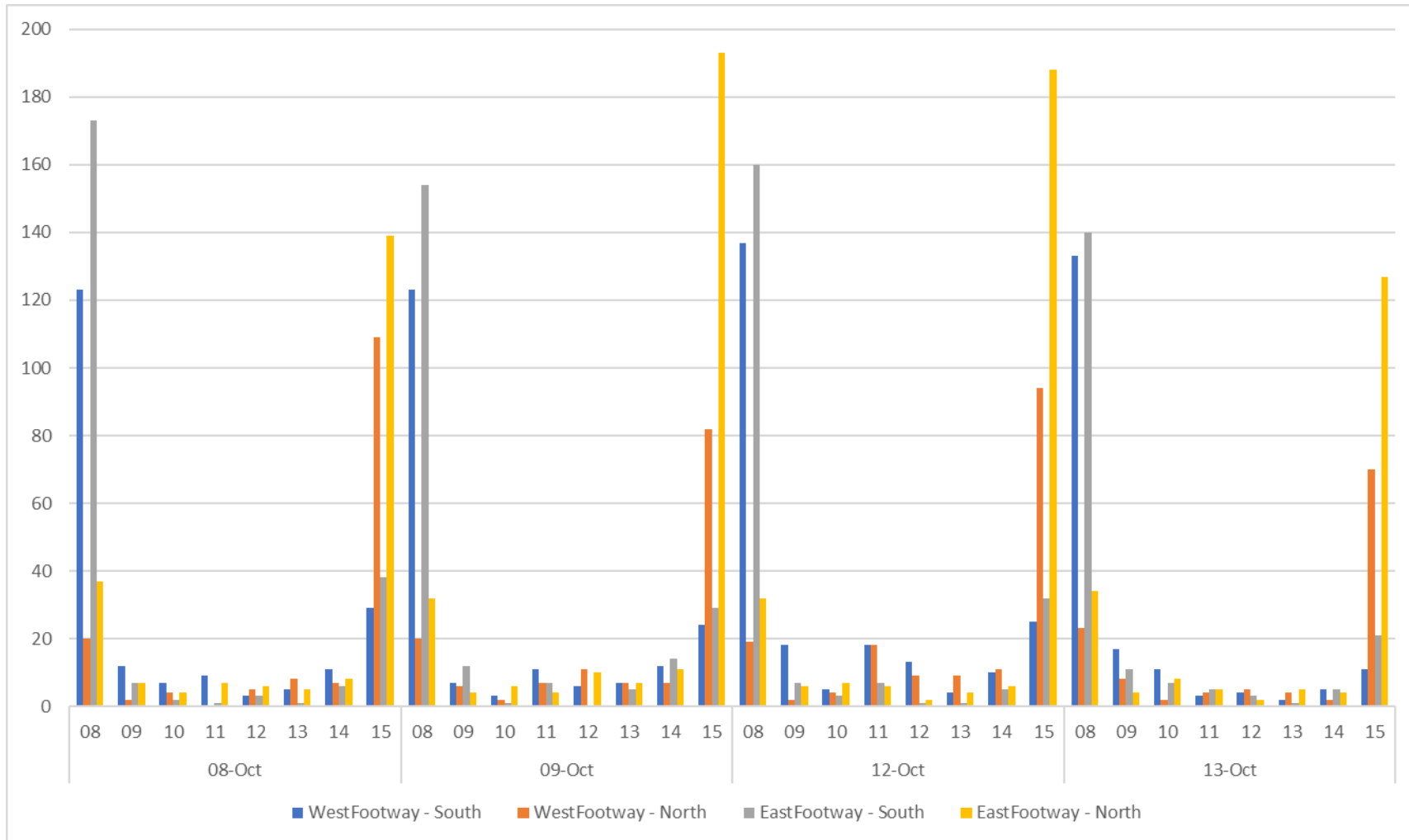


Row Labels	WestFootpathOfWinstreeRd-headingSouth	WestFootpathOfWinstreeRd-headingNorth	EastFootpathOfWinstreeRd-headingSouth	EastFootpathOfWinstreeRd-headingNorth
08/11/2019	225	137	165	111
11/11/2019	163	133	162	112
12/11/2019	226	140	144	106

#### 4.2.2 Survey 2 2020

	WestFootway		EastFootway	
Row Labels	South	North	South	North
08-Oct	199	155	231	213
09-Oct	193	142	222	267
12-Oct	230	166	216	251
13-Oct	186	118	193	189

There is an overall increase in walking between the two surveys with volumes climbing on the East Footway.



# 5 Crossing Interactions

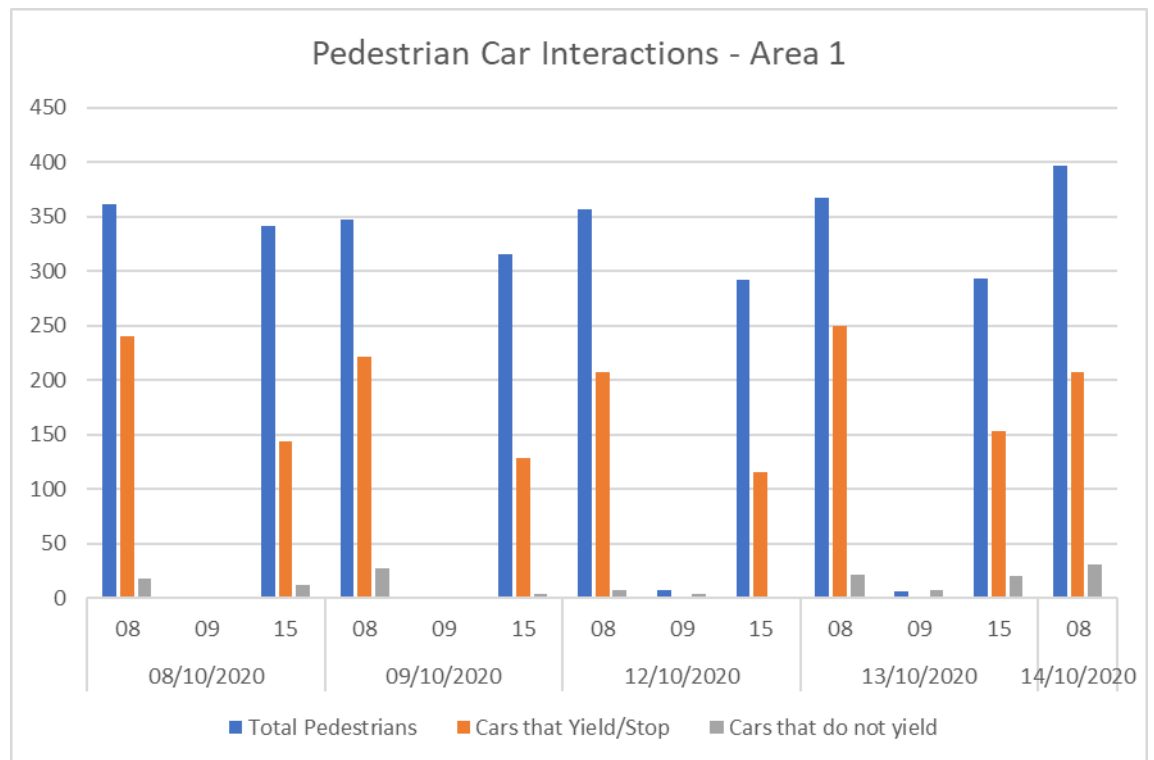
We looked at crossing interactions between pedestrians and vehicles at the two areas near Fiveways Primary School where coloured carriageway markings were introduced from Monday 12<sup>th</sup>. For both these locations camera coverage also recorded behaviour on the morning of 14<sup>th</sup> October.

Crossings in both areas are typically escorted primary school pupils with a small number of unaccompanied secondary school pupils.



Figure 13 Area 1

Area 1 has a crossing attendant on duty during both morning and afternoon peak which is when the vast majority of crossing movements occur. Control exerted over the crossing area is such that no difference in driver or pedestrian yielding behaviour is observable before or during the intervention. The layout of the green and white barriers may reinforce this control.



Prior to the intervention almost no pedestrians chose to cross in Area 2 when motor vehicles are approaching. Pedestrians will typically check whether a vehicle is approaching and if one or more is on approach will continue walking towards Area 1 choosing to cross there.

There is a change in behaviour after the intervention with an increase in pedestrians choosing to cross when vehicles are nearby and some instances of vehicles yielding. However overall use of this area remains low.

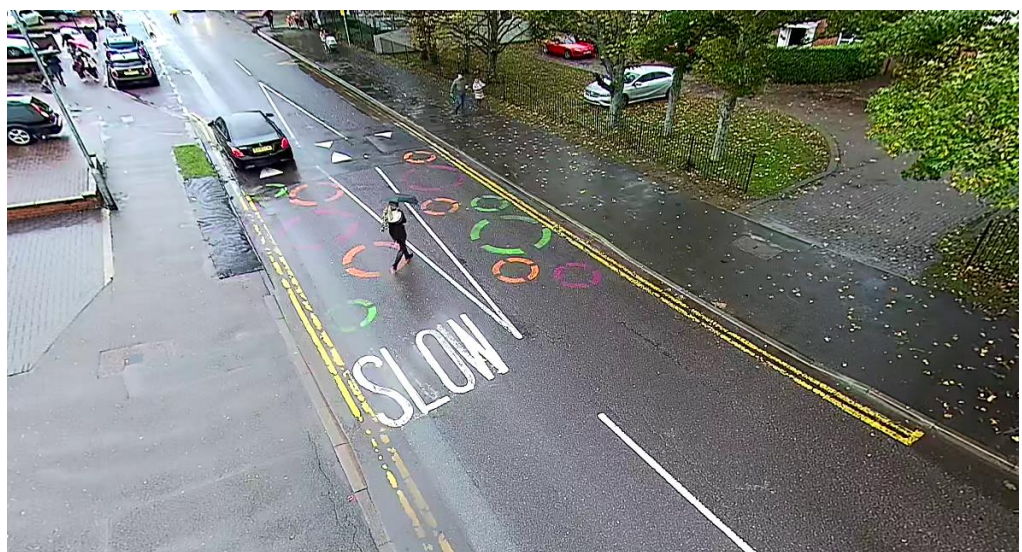
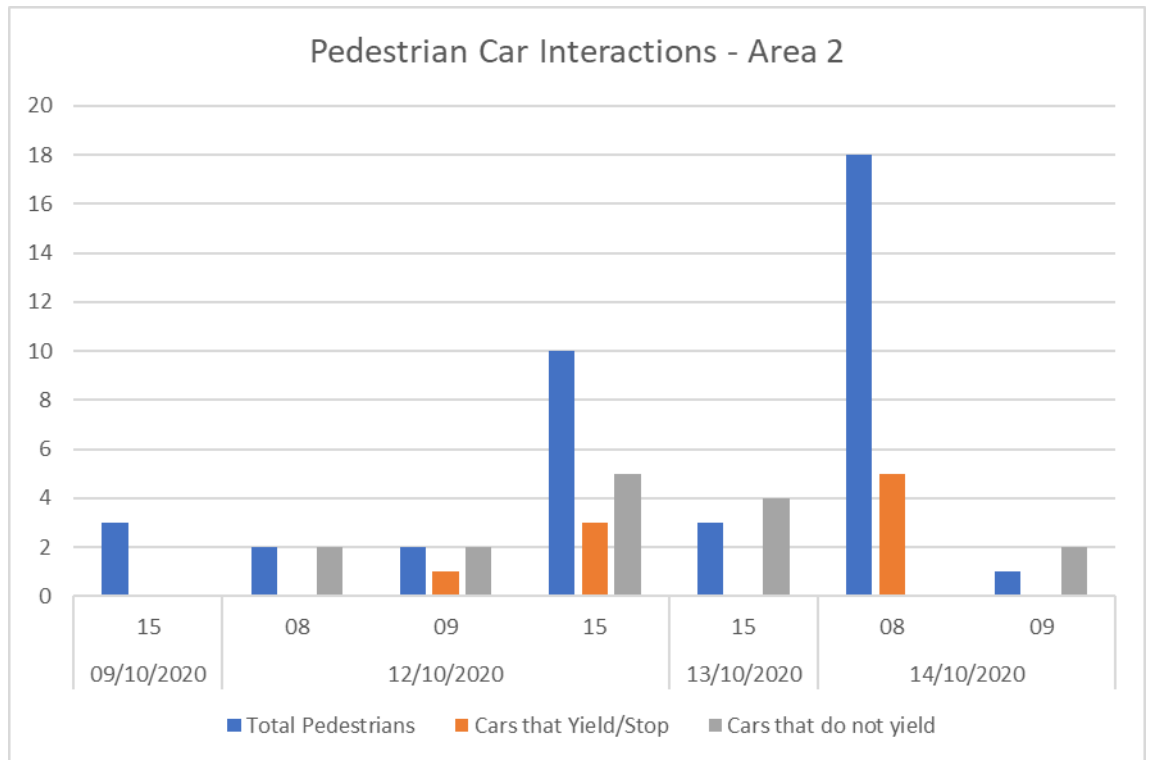


Figure 14 Area 2



# 6 Desire Line Changes

## 6.1 Pedestrians within the intervention area

### 6.1.1 Fiveways Entrance

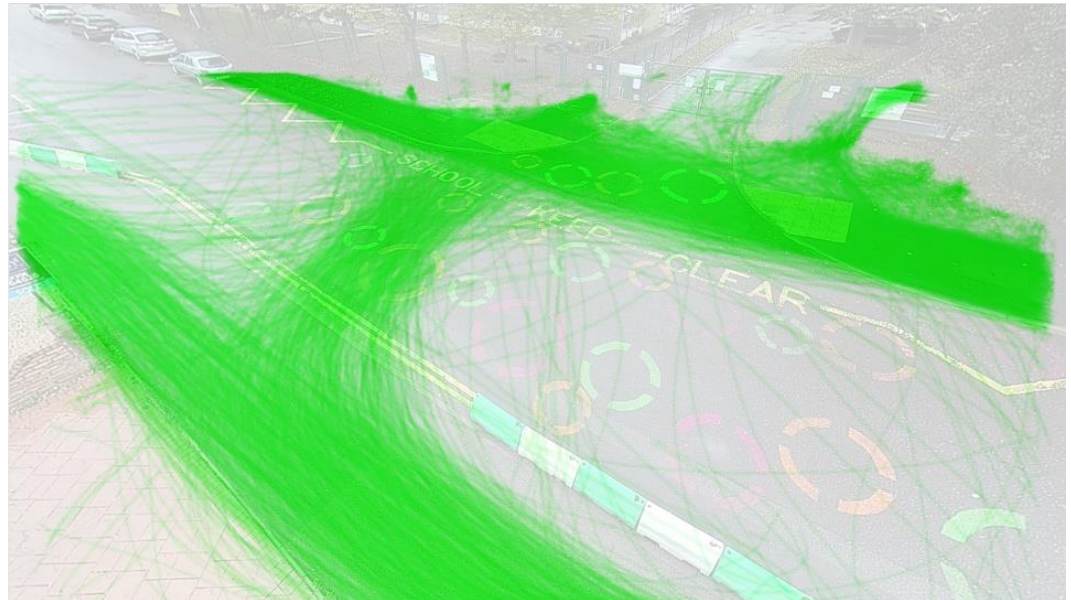


Figure 15 Before the intervention 9th Oct

The street intervention does impact crossing behaviour but it is difficult to differentiate between the impact of the road markings and the barrier system which alters desire lines.

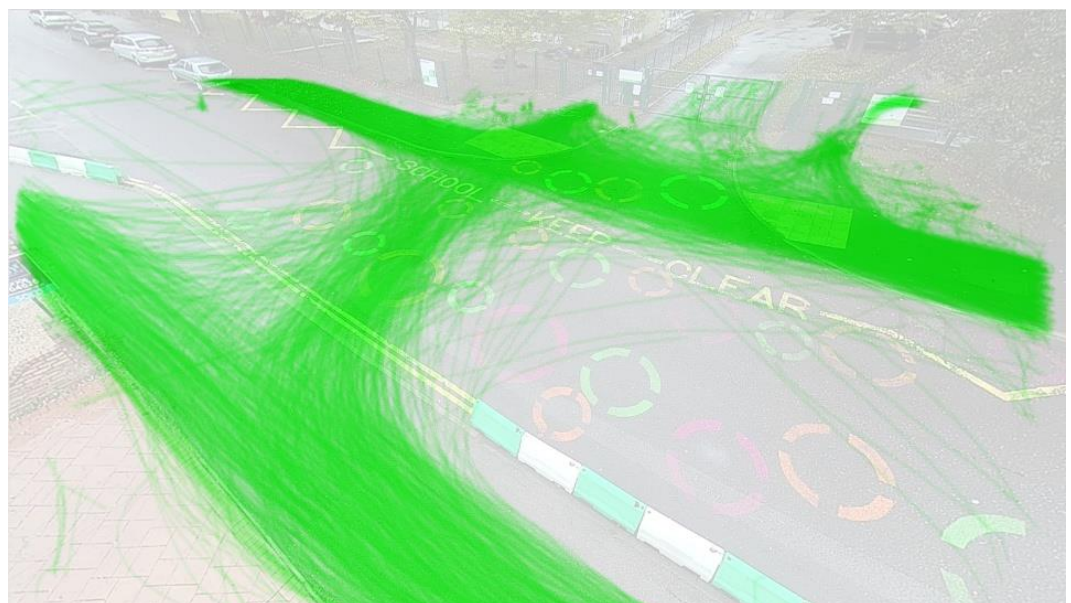


Figure 16 After the intervention 13th Oct

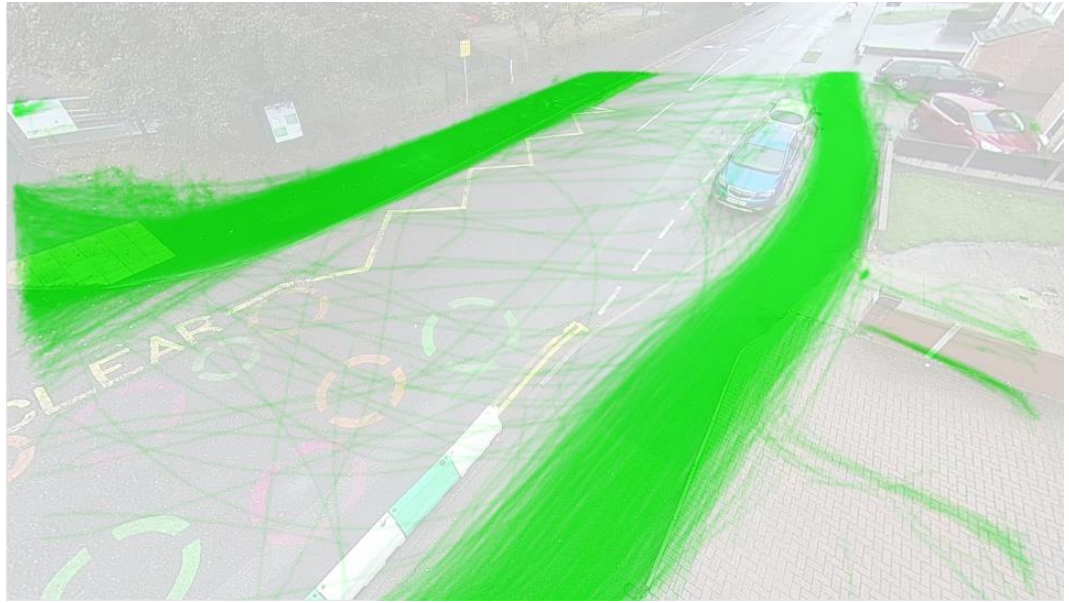


Figure 17 Pedestrian Movement 8th Oct

South of the school entrance pedestrians cross the street at many points with little concentration of desire lines.

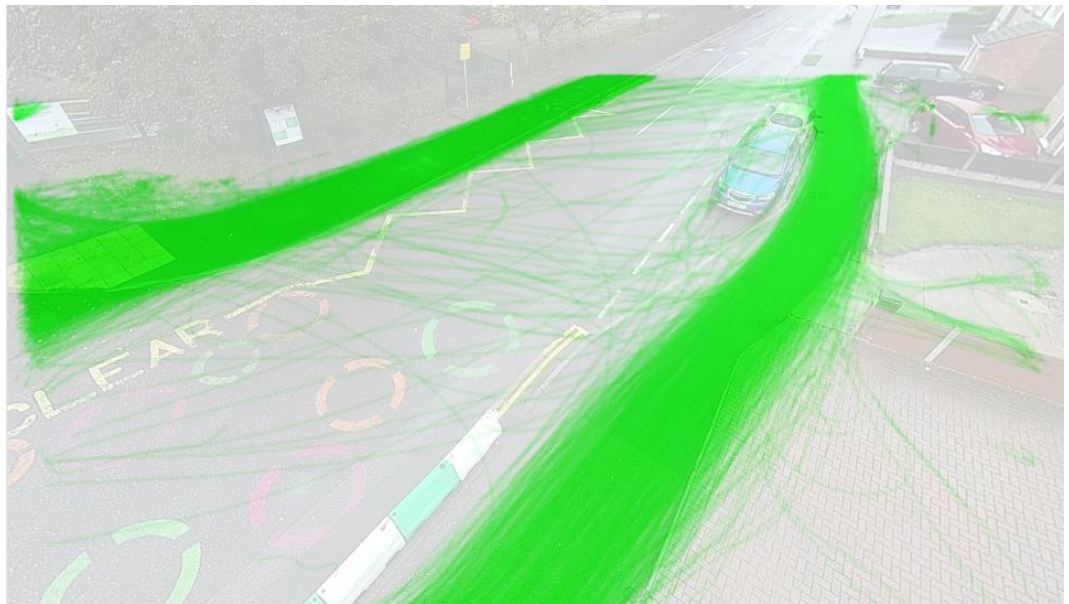


Figure 18 Pestrain Movement 12th Oct



## 6.1.2 South of Fiveways

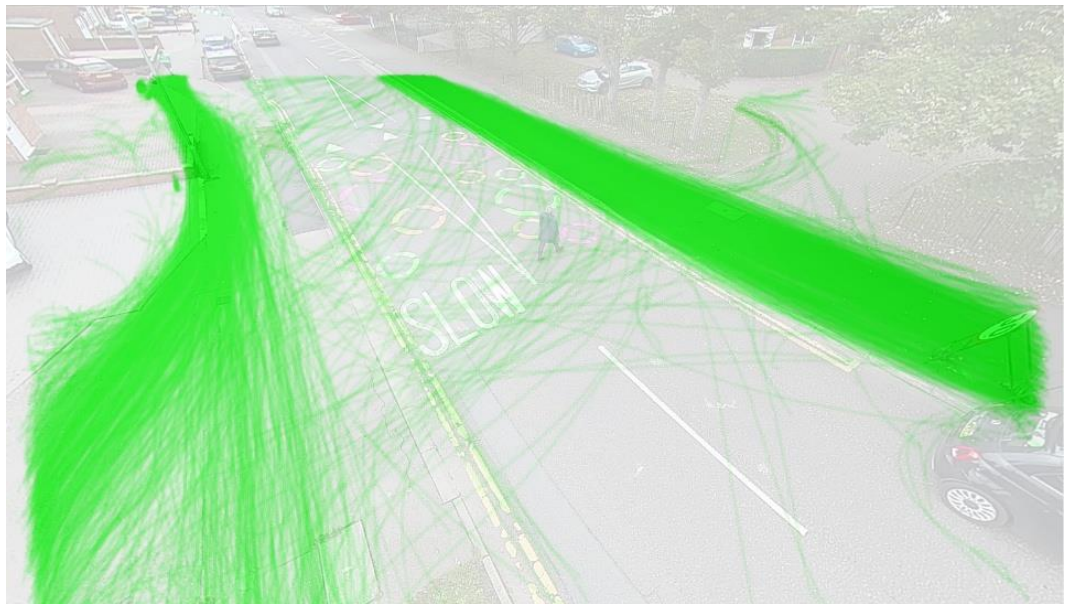


Figure 19 Pedestrian Movement Pre-intervention 8th Oct

The temporary markings on the carriageway do not lead to a concentration of desire lines.

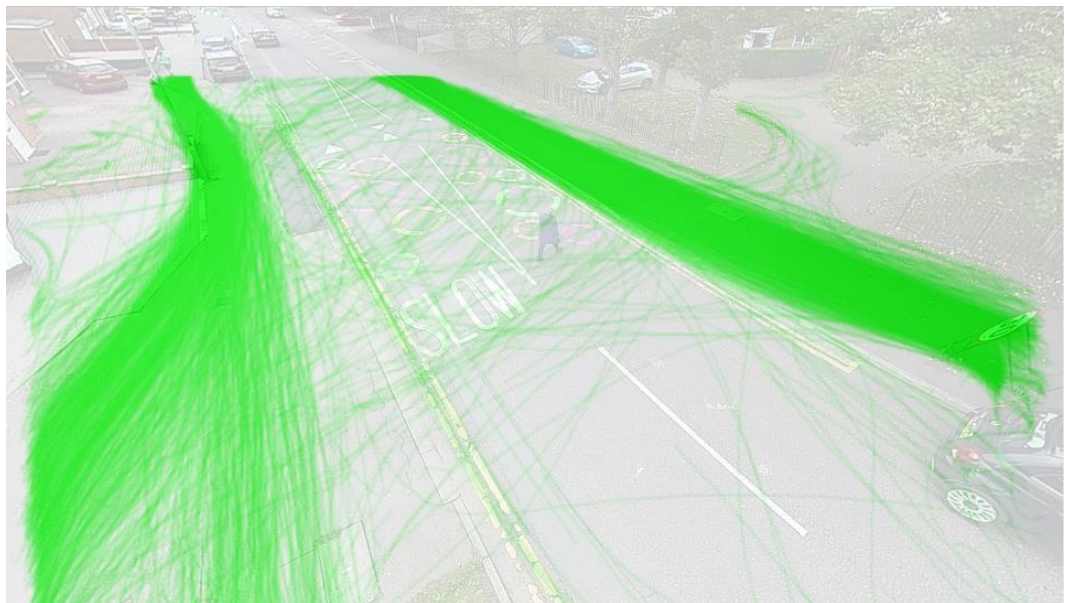
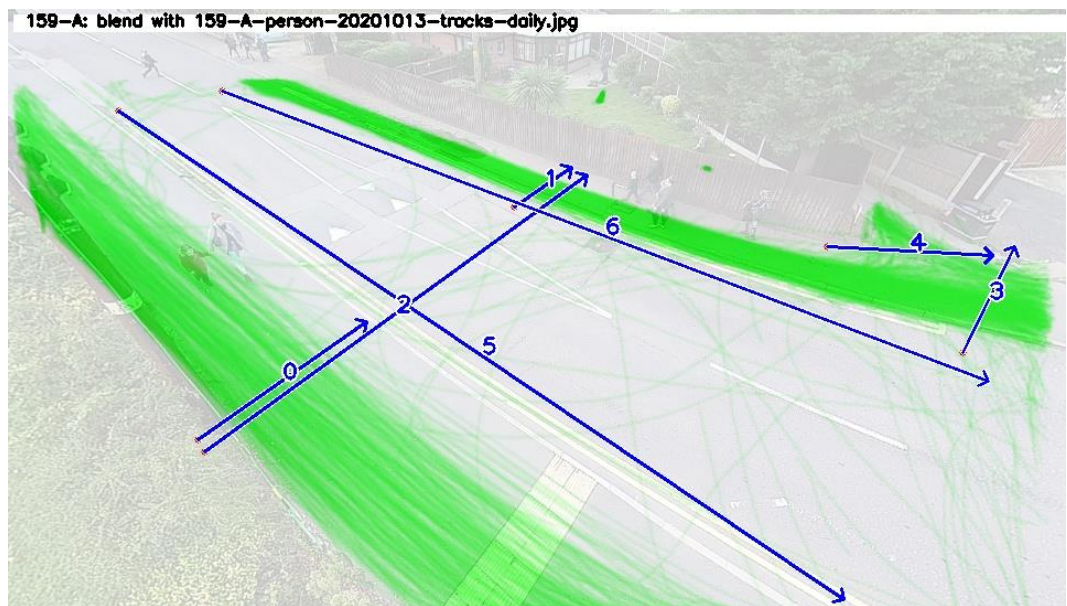
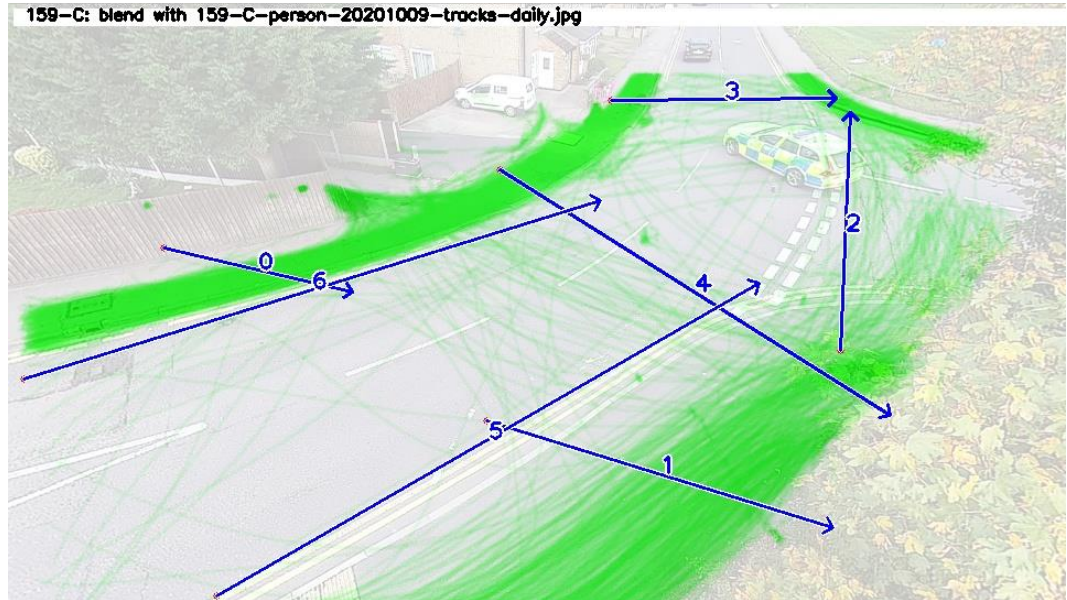


Figure 20 Pedestrian movement post intervention 12th Oct

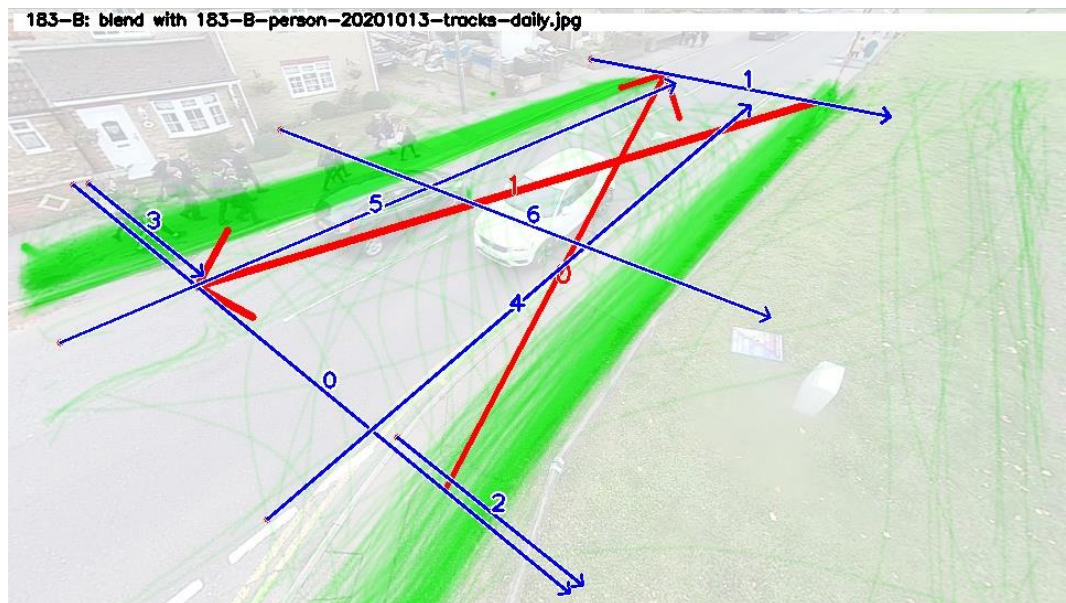
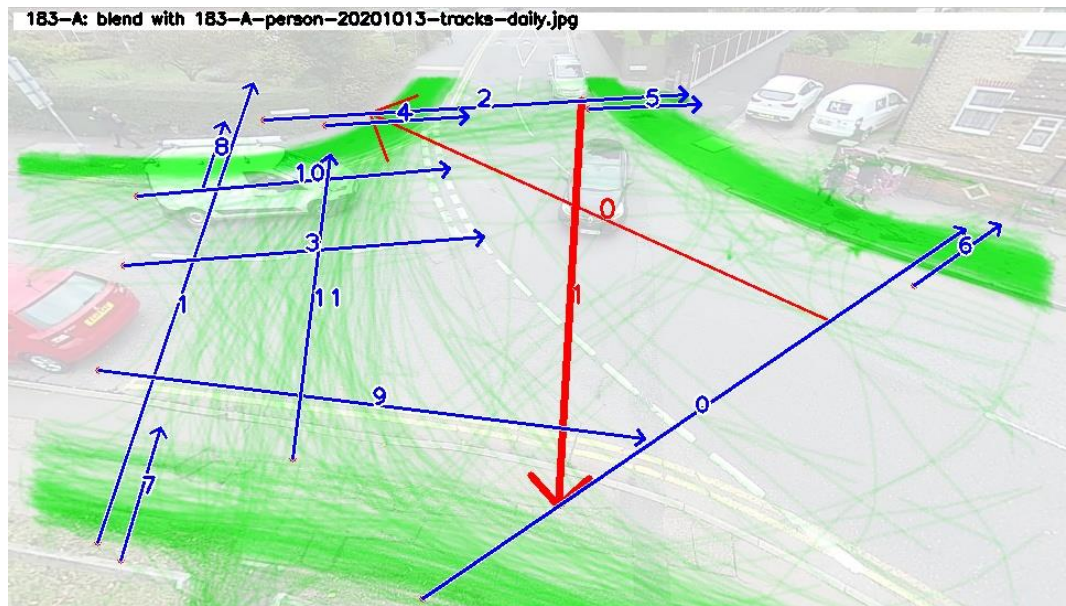
## 6.2 Pedestrian Movement North of the intervention area.

### 6.2.1 Winstree North





## 6.2.2 New Farm Road





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