

1. A Behavioural Science Approach to Pedestrian Safety

Executive Data Report - what the existing data tells us about adult pedestrian casualties in Liverpool



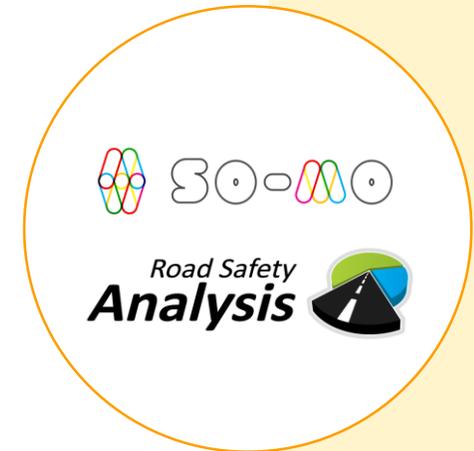
Road Safety
Analysis



**MERSEYSIDE
ROAD SAFETY
PARTNERSHIP**

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Introduction

For the last 10 years the number of adult pedestrian casualties has plateaued across the UK. In this respect Liverpool is no different. However, when ranked according to casualty rates, Liverpool holds the highest adult pedestrian casualty rates outside of London. There is no obvious explanation as to why figures are so high, nor any consensus view as to the most effective ways to address this problem.

So-Mo has been working with Road Safety Analysis to understand why this is the case and are using an approach grounded in behavioural science to address the problem. The discovery process has included analysing all available data from the period 2012 to 2016 and by conducting supplementary research designed to understand the what, where, when and who of adult pedestrian casualties in Liverpool. As always though, the most challenging and important question is 'why'?

This resulting body of work is one of the most comprehensive studies into UK Adult pedestrian casualties to have been undertaken in the last five years and, whilst both analysis and findings focus on Liverpool, we are confident that the information contained in this document will be of interest to other urban areas, particularly those with similar road networks and socio demographic profiles.

This document sets out the findings from the first phase of the work, which was the consideration of available data. The second document in this series is the Insight report, which sets out a range of psychological and social factors gained from the combined analysis of data with ethnographic, behavioural and interview based research.

Finally, the options report, the third document in the series sets out the next opportunities as well as a recommended direction of travel for the delivery phase.

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A note on methodology

Use of comparator localities

In order to understand what is unique or different to Liverpool we identified seven comparator authorities.

These localities were selected on two main criteria – the road or social environment. Similarities of road network was defined by calculating ‘network density’ and ‘percentage of urban roads’ figures. Socio-demographic profiling utilised MOSAIC profiling.

This enabled our analysis to take into account not only the physical environment within which these incidents are taking place but also the relevance of other less tangible factors such as deprivation or education levels. From a Behavioural Intervention perspective, this is vital information which will inform the design of any future solution.

As a general trend, Liverpool demonstrates more similarities with comparators selected for their socio-demographic profiles, than it does to areas with similar road network profiles.



Network Comparators

1. Bournemouth
2. Southend on Sea
3. Wolverhampton

Socio-demographic Comparators

1. Kingston upon Hull
2. Manchester
3. Sheffield
4. Nottingham

Comparisons between Liverpool, network comparators and socio-demographic comparators will not be made unless there is something significant to report.

When

Times of day, days of the week and seasonal trends

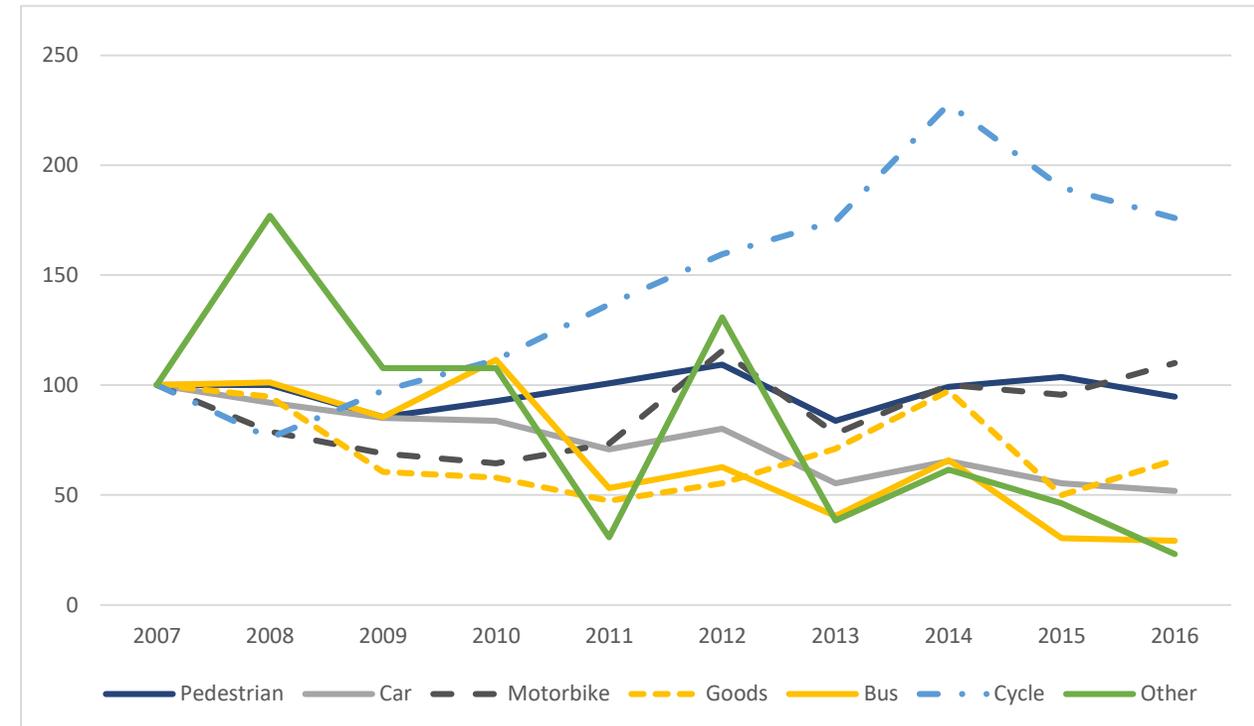
Collisions involving adult pedestrians have not got any worse over the last 10 years but they certainly haven't got any better! They account for around 16% of all collisions and, out of all casualty types pedestrian casualties represent the highest percentage of people killed or seriously injured (KSIs) on the road (38%).

Unsurprisingly, collisions peak at around 5pm with the fewest casualties occurring in the early hours of the morning. This does not mean that collisions involving pedestrians are only a daytime issue; collisions occurring between the hours of 6pm and 6am account for 40% of all adult pedestrian casualties.

As with most urban areas we see a peak on Fridays. More interesting is the increased risk of collision which occur on Sundays, when 14% of pedestrians in Liverpool are injured (compared to 10% for the network and 11% for the socio-demographic authorities).

54% of the adult pedestrians injured on Sundays were involved in collisions between 6pm and 3am, which indicates that the night time economy may have a significant part to play.

In terms of seasonal trends in Liverpool, there are peaks in November, December and January, with the majority of collisions occurring in good weather.



Trends by casualty type in Liverpool, 100-based compared to 2007 (2012-2016)

Where

Dual carriageways and arterial routes

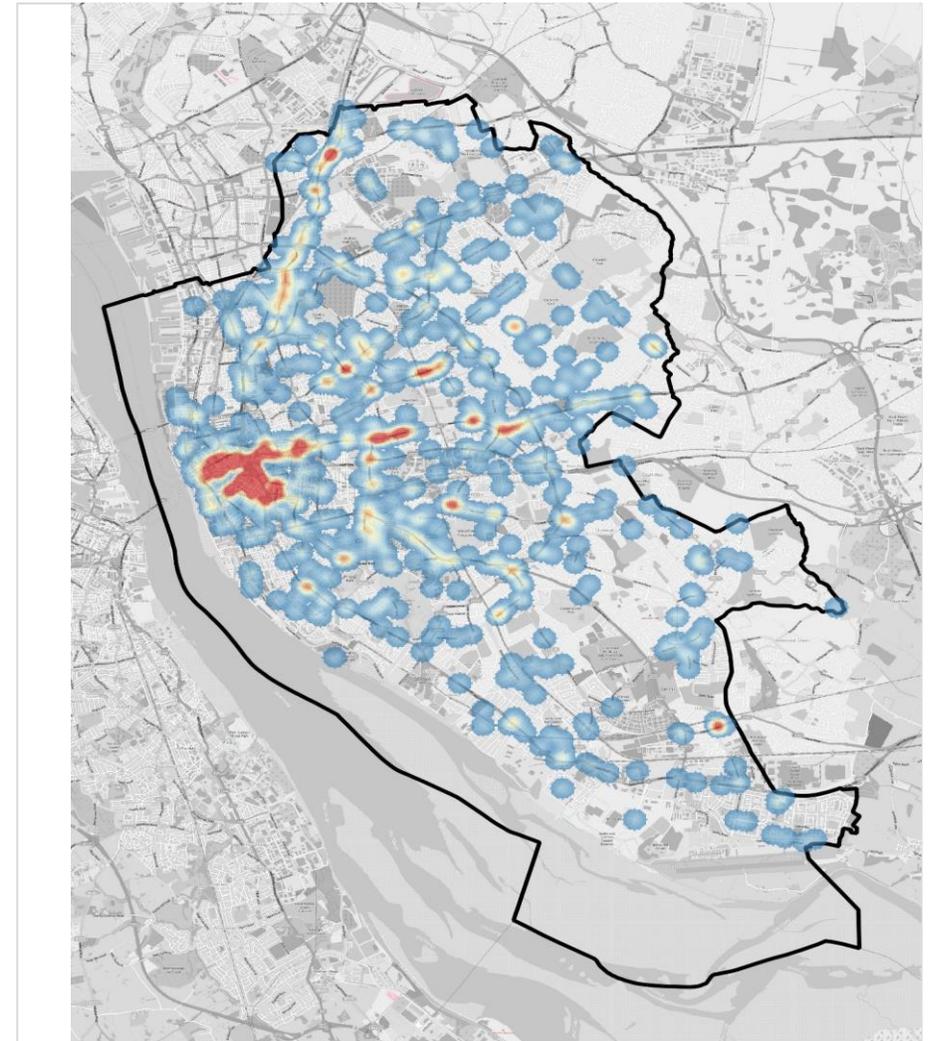
20% of all collisions involving pedestrians occur on a dual carriageway. This is twice the rate for both network and socio-demographic comparators, which fall at around 10%.

Liverpool has almost double the amount of dual carriageways out of all of our comparators with the exception of Manchester where the percentage of major road dual carriageway length is almost identical. Despite this, only 13% of Manchester's adult pedestrian casualties were on dual carriageways, compared to Liverpool's 20%.

The heat map shows where the highest densities of collisions occur in Liverpool, these are shown in red. The colour range goes through orange and yellow to the lowest density areas shown in blue.

The overview map shows a concentration of collisions in the city centre, with collisions also occurring on the main routes of:

- A59 (particularly the junction with the A506)
- A5089 Oakfield Road with Breck Road
- A5049 West Derby Road (near the railway line)
- A57 Prescott Road junction with Derby Lane and Broad Green Road
- A57 Prescott Road junction with B5189
- A57 Prescott Road/Kensington near B5188 Sheil Road
- A57 Prescott Road near Royal Liverpool University Hospital



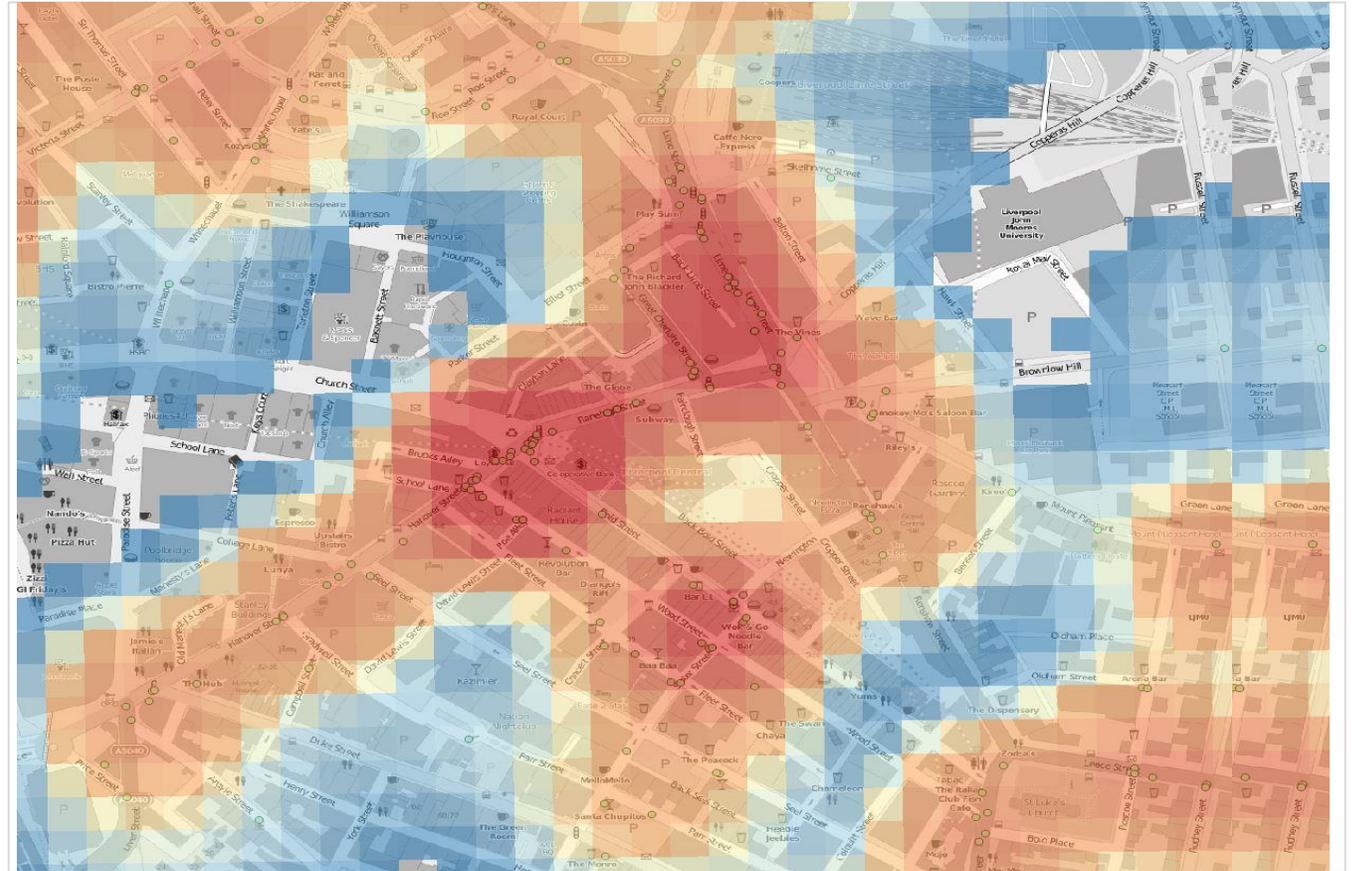
Heat map showing where collisions in Liverpool occur (all types) ⁶

Where

Road type and location

The majority of collisions are happening on 30mph roads despite 70% of Liverpool's roads having a designated 20mph speed limit. We would expect this to be the case, as collisions occurring at lower speeds are less likely to result in serious injury (and therefore less likely to be reported).

Liverpool has a solid reputation for being a city where it is possible to have a great night out. So it is unsurprising that collisions which occur at night and especially at weekend are concentrated around the city centre.



Collisions at night and especially at the weekend are concentrated around the city centre

Where

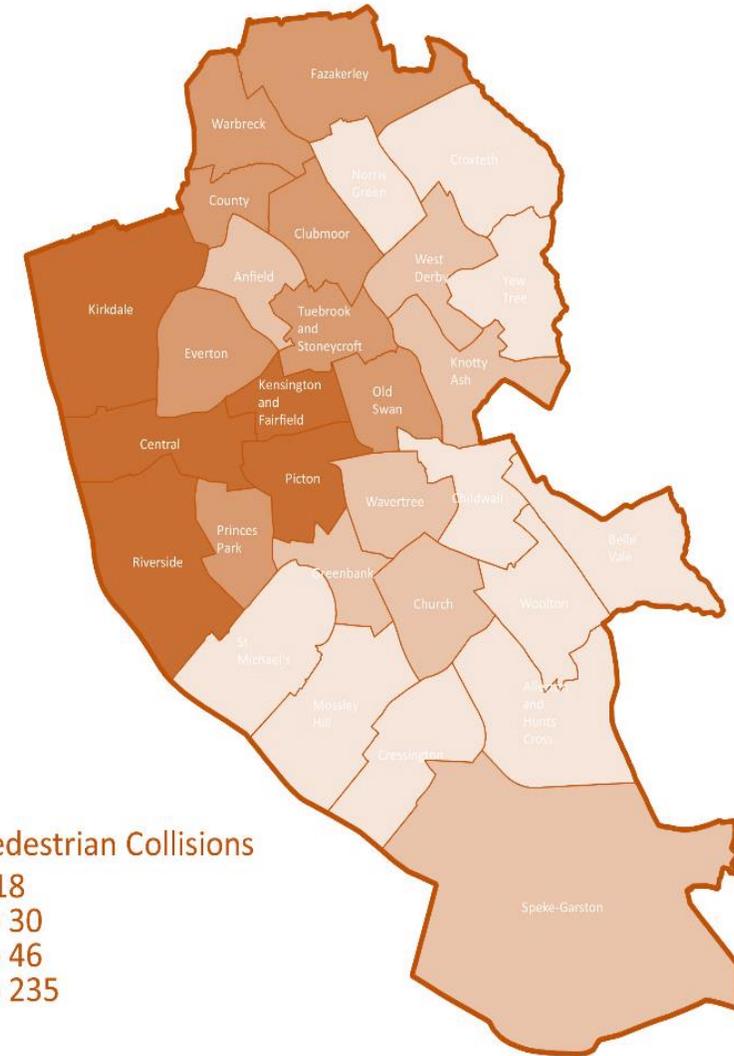
Ward based analysis

Analysis of the wards where adult pedestrians are more frequently involved in collisions is shown here. There are concentrations in the Kirkdale, Central, Riverside, Kensington and Fairfield, and Picton wards.

In addition to mapping the wards where adult pedestrians are involved in collisions, it is possible to analyse the routes where they crashed.

The highest percentages of both KSI casualties and all casualties were on unclassified routes, with the A57 and A59 featuring highly for all severity levels.

Route	KSI		All	
	Number	Percentage	Number	Percentage
Unclassified	179	46%	619	51%
A57	22	6%	79	7%
A59	20	5%	69	6%
A5038	14	4%	46	4%
A580	17	4%	42	3%
A5058	17	4%	36	3%
B5339	9	2%	34	3%
A562	17	4%	32	3%



Adult Pedestrian Collisions

- 9 to 18
- 19 to 30
- 31 to 46
- 47 to 235

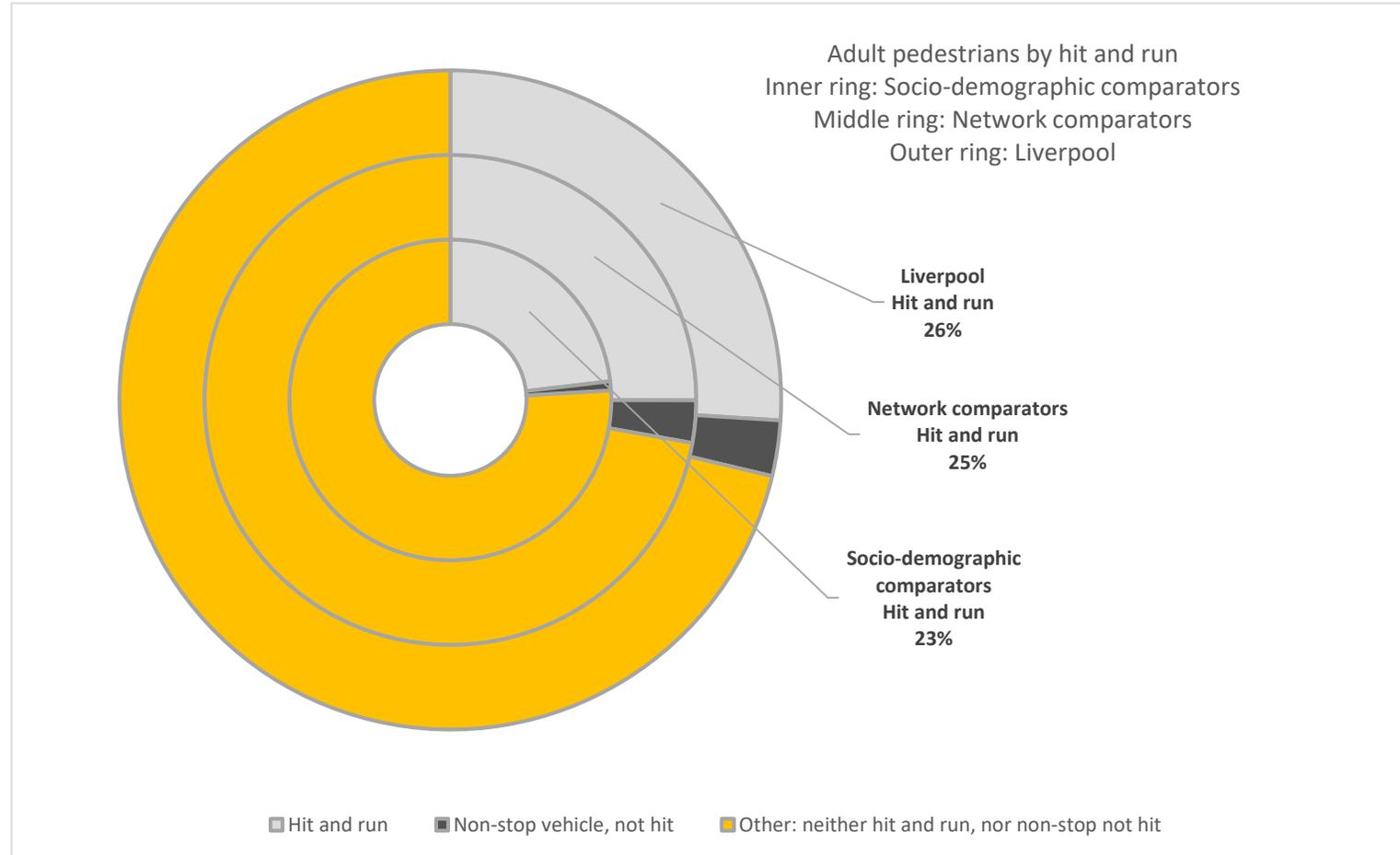
Wards where adult pedestrian casualties were injured in Liverpool (2012-2016)

How

vehicle profile

The majority of pedestrian casualties are hit by a car (69%) and over 50% of vehicles in conflict with a pedestrian are traveling straight ahead at the time of collision.

26% of collisions are recorded as hit and run and, whilst this figure seems shocking it is not unique to Liverpool.



How

taxis

Perhaps more startling, is the percentage of adult pedestrians who are hit by taxis (13.8%). This figure is significantly higher than on our network comparators (6.3%) and also our socio-demographic comparators (9%).

In addition, 42% of adult pedestrian casualties hit by taxis are injured between the hours of 9pm and 3am. During these hours taxis, particularly in the city centre drastically outnumber other forms of transport.

Of equal interest is the fact that collisions involving taxis show a dramatic increase around 2009, prior to this figures have rested around 8% of all collisions, post 2009 figures remain at significantly higher levels.



Related Vehicle	Liverpool	Network Comparators		Socio-Demographic Comparators	
	%	%	Index	%	Index
Cars	69.2%	75.6%	-8%	71.1%	-3%
Taxi	13.8%	6.3%	+118%	9.0%	+53%
Minibus	0.4%	0.5%		0.3%	
Motorbike up to 125cc	1.6%	1.6%		1.4%	
Motorbike over 125cc	1.5%	1.0%		1.3%	
Light Goods	5.6%	5.5%	+2%	4.7%	+20%
Heavy Goods	1.8%	2.0%		1.7%	
Bus	4.8%	3.5%	+35%	7.8%	-38%
Cycle	1.0%	2.0%		0.9%	
Tractor	0.0%	0.1%		0.0%	
Other	0.2%	1.8%		1.6%	

Number of adult pedestrian casualties by the related vehicle (2012-2016)

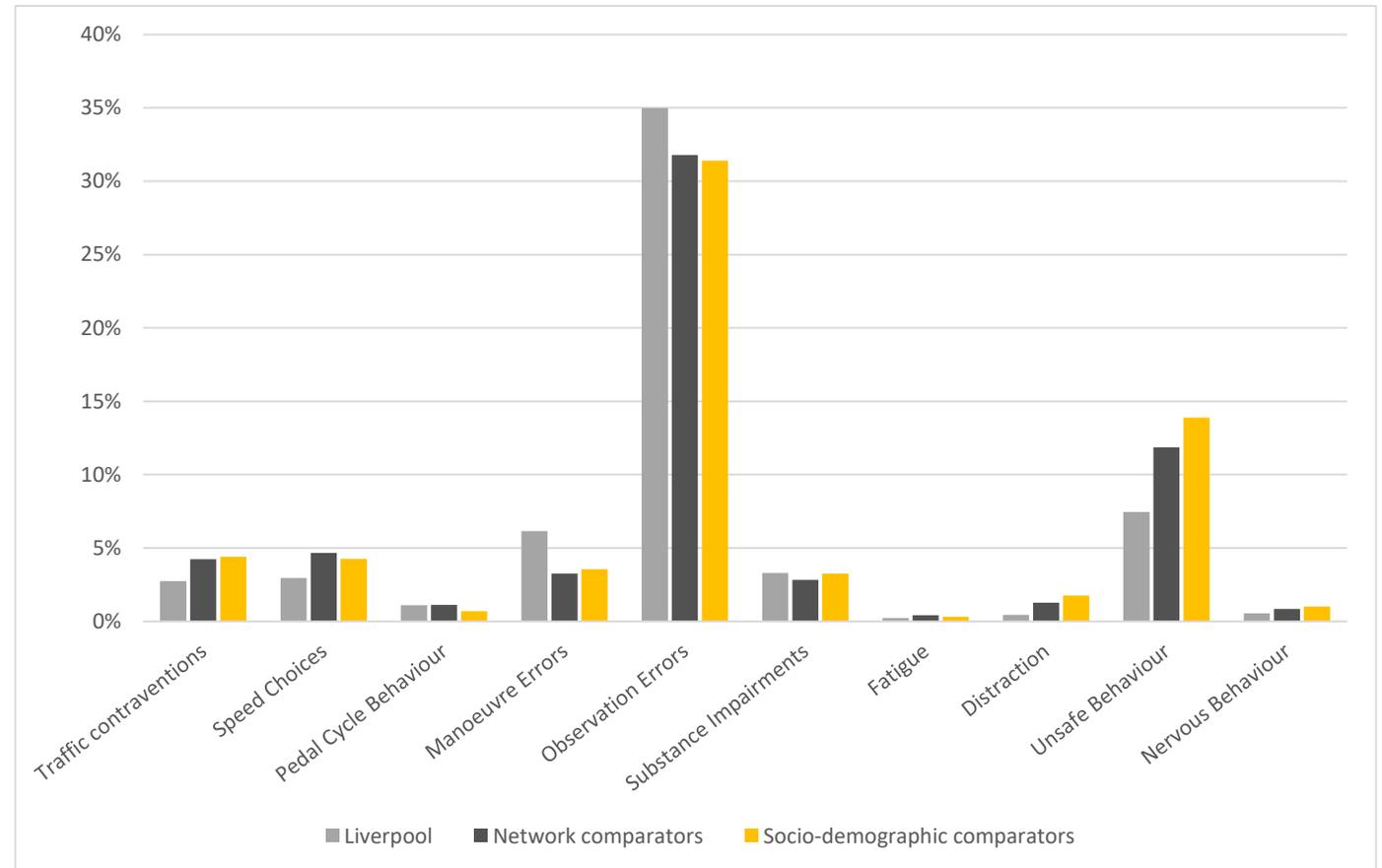
How

How – contributory factors

When we look at the contributory factors recorded by police officers at the time of collision, almost three-quarters of adult pedestrian casualties in Liverpool are thought to have contributed to their collision in some way. The most common factor being, 'failed to look properly' (52%) followed by 'impaired by alcohol' (21%).

In contrast, only 49% of drivers are thought to have contributed to the collision in some way. The most common factor being 'observations errors' followed by 'unsafe behaviour'. Substance impairment accounts for just 3% of recorded factors for drivers.

Whilst this is interesting, it should be remembered that the contributory factors assigned at the time of the collision are not the result of extensive investigation.



Percentages of adult pedestrian casualties by the contributory factors assigned to related drivers in Liverpool and comparators (2012-2016)

Who

age and sex

There is a peak in casualties aged 16 to 24 years old (26%), pedestrian casualties are more likely to be male.

55% of drivers involved in collisions are aged between 16 and 44 years old.

65% of all casualties are in conflict with male drivers.

Just over a quarter of casualties are in conflict with a driver who is driving for work (not commuting), for example taxis, goods vehicles and buses.

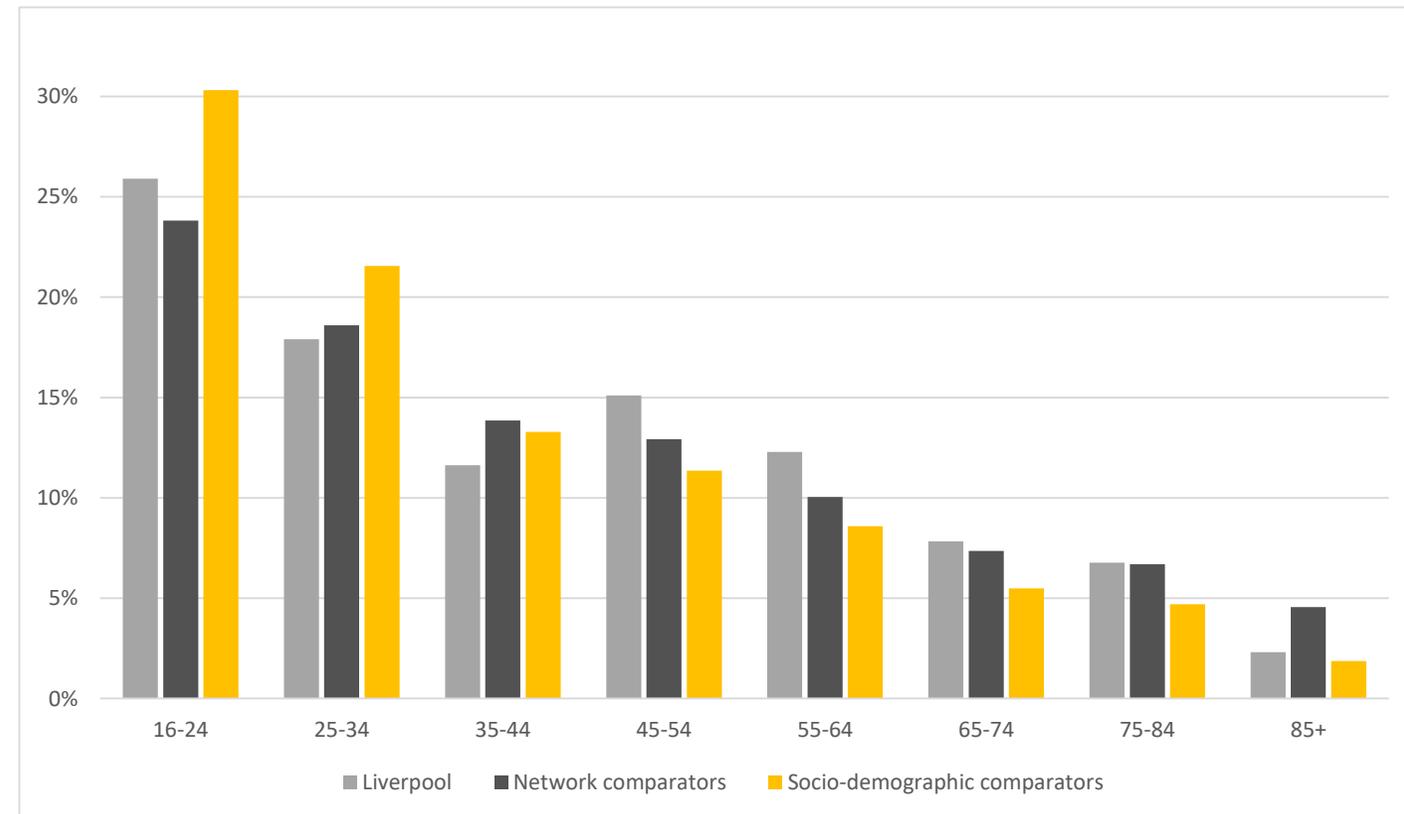
Pedestrian casualties

59% of all pedestrians casualties are male

Drivers

65% male
19% female
16% unknown

Both driver and pedestrian profiles demonstrate that males aged between 16 -35 are far more likely to be involved in a collision than their female counterparts



AGE OF ADULT PEDESTRIAN CASUALTIES INJURED IN LIVERPOOL AND COMPARATORS (2012-2016)

Who

socio demographic analysis

As well as demographic and spatial analysis, we undertook socio-demographic analysis. Using MOSAIC profiling we are able to profile pedestrians in terms of demographics, lifestyle, culture and behaviour. Pedestrians are then grouped into 1 of 15 categories.

Using the Index of Multiple Deprivation (IMD), we learn that half of the adult pedestrian casualties injured in Liverpool live in the 10% most deprived communities in the country. Deprivation in this sense is not limited to actual wealth but spans poverty of education, health, crime, access to services and living environment .

Driver Analysis

A comparable analysis found that the highest groupings of drivers also come from Group L, Group N and Group O.

So we know that in Liverpool drivers are from similar backgrounds to the pedestrian casualties.

Whilst there are differences, all 3 Groups tend to comprise of

- single households with no children,
- are deprived
- are benefit claimants or students.

	Group L – 'Transient Renters'	Group N – 'Vintage Value'	Group O – 'Municipal Challenge'
Age 16-24	X		
Aged 25-35	X		X
Single households	X	X	X
No children	X	X	X
Student/ unemployed	X	X	X
Low confidence in police	X	X	X
No qualifications	X	X	X
Bad or very bad health	X	X	X

The three most common MOSAIC groups (drivers and then separately pedestrians) out of a possible 15 categories

Who

The challenge that emerges

Deprivation levels are high, with high numbers of benefit claimants with low qualifications. It is likely that residents face a number of daily challenges and worrying about their safety as pedestrians is unlikely to rank highly amongst them.

When you consider this through the lens of behavioural science, pedestrians falling into these groupings have what we would term a lower mental 'bandwidth' than those who are well off.

In this sense, lower "bandwidth" means that you are less insightful, less forward-thinking, and less controlled. The ability to focus and pay attention is seriously hampered, making it exceptionally difficult to stick to plans or resist impulse.

The language used in any intervention should reflect education levels. Calls to action which require sustained attention, retention of complex messages or require exercise of consistent restraint are unlikely to be successful.



Emerging themes

From this detailed collision analysis we have identified three themes worthy of further investigation. These are:

- collision on arterial roads, with a specific focus on dual carriageways
- collisions in locations associated with the night time economy, with a particular focus on taxis
- Mobile phone use for both pedestrians and drivers. Whilst the collision analysis did not reveal this theme specifically due to limitations in the data, it was decided to include mobile phone use as it is increasingly viewed nationally as a new and significant threat to adult pedestrian safety.

With the identification of the three themes, further primary and secondary evidence has been gathered and collated to better understand these issues. The findings of these investigations are set out in the Insights report which accompanies this document.

Further reading

Full data report

A detailed data analysis report is available for road safety planners. This includes a literature review.

Executive Insight report

This report is part of a suite of three executive documents which draw out key findings for decisions makers and is the second of three documents. It outlines the process that So-Mo undertook in order to begin answering the questions which arose from our data analysis and provides ten usable insights.

Executive Options report

This report is part of a suite of three executive documents which draw out the key findings for decisions makers. This is the third in the series and sets out opportunities as well as a recommended direction of travel for the next phase of the work. It is preceded by a data report and an insight report.

A copy of all 3 reports can be accessed from our website www.so-mo.co.uk