Report
November 2022

Traffic Filters - Assessment of Road Safety Impacts

Oxfordshire County Council
Our ref: 24194201
Client ref:

steer

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1 Introduction and overview of approach

Traffic filter proposals

1.1 A Traffic Filter is a short section of road which can only be used by some types of vehicles at certain times. Six Traffic Filters are proposed on main roads in Oxford.

1.2 The Traffic Filters will operate seven days a week from 7am to 7pm. The Traffic Filters on Marston Ferry Road and Hollow Way will not operate on Sundays. When they're operating, private cars will not be allowed through without a permit. All other vehicles will be allowed at all times. This includes buses, coaches, taxis, private hire vehicles, mopeds, motorbikes, vans, HGVs and special vehicles (such as emergency services).

1.3 In addition, permits for private cars will be available for:

- Blue Badge holders
- Professional health or care workers
- Cars used as goods vehicles by businesses based in and around Oxford city boundary

1.4 Further information about the Traffic Filter proposals is available at **https://letstalk.oxfordshire.gov.uk/traffic-filters-2022**

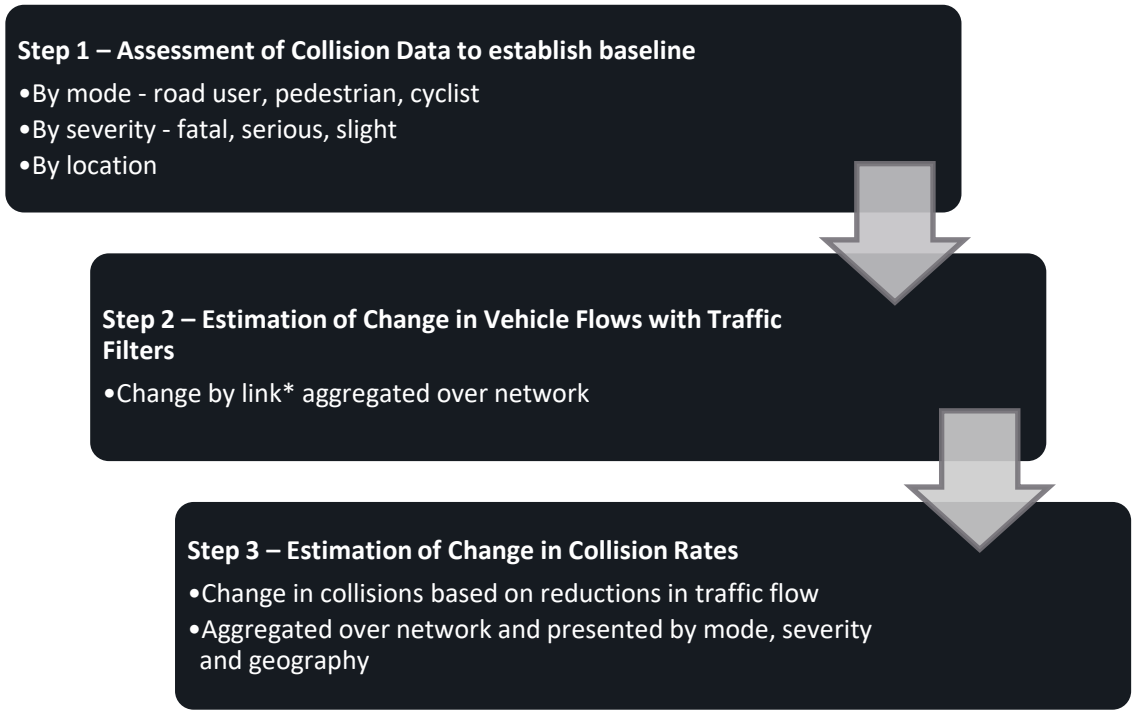
1.5 One of the main aims of the Traffic Filter proposals is to reduce the number of road collisions and casualties in Oxford, specifically for more vulnerable road users.

Assessment of road collision impacts – overview of approach

1.6 The analysis implicitly assumes that the level of collision risk is directly proportionate to the level of traffic flow. This reflects standard practice for high-level collision assessments, where collision risk is constant in relation to the level of vehicle kilometres travelled.

1.7 The overall approach is based on three key steps, as shown in Figure 1-1.

Figure 1-1 Overview of Approach



** Links are short sections of highway as defined by the Oxfordshire Strategic Model*

1.8 The evidence upon which the assessment is made is:

- The collision rate (relative to average annual daily traffic) based on Oxford collision data between 2015 and 2019 for all modes of transport (Step 1).
- Changes in traffic flow based on the transport modelling for the 2024 'Do Something' Traffic Filter scenario (Step 2)[1].
- The estimated change in collisions was based on applying the 'collision rate' from Step 1 to the change in traffic flows (Step 2) to derive the overall estimated change in collisions. The underlying assumption is that the collision rate remains constant but that changes in traffic levels will mean the overall number of collisions changes.

1.9 While analysis of the baseline collisions and changes in traffic flow are both undertaken at road 'link' level, the purpose of the assessment is not to predict the change in collisions at this spatial level of detail. Rather, the analysis used empirical observed collision data and the change in traffic flow to estimate the likely change in overall collisions across the city. The results have been grouped into three types of geography. These are:

- Within the ring road.
- The Oxford ring road.
- Areas outside the ring road, but within the Oxford built-up area.

[1] The modelling approach, using the Oxfordshire Strategic Model, is summarised in the "Oxford traffic filters - summary of transport modelling" document available on Let's Talk Oxfordshire at **https://letstalk.oxfordshire.gov.uk/traffic-filters-2022** Traffic modelling reports are available at **https://www.oxfordshire.gov.uk/residents/roads-and-transport/connecting-oxfordshire/traffic-filters#paragraph-14153**

2 Baseline collision data

Data used for the analysis

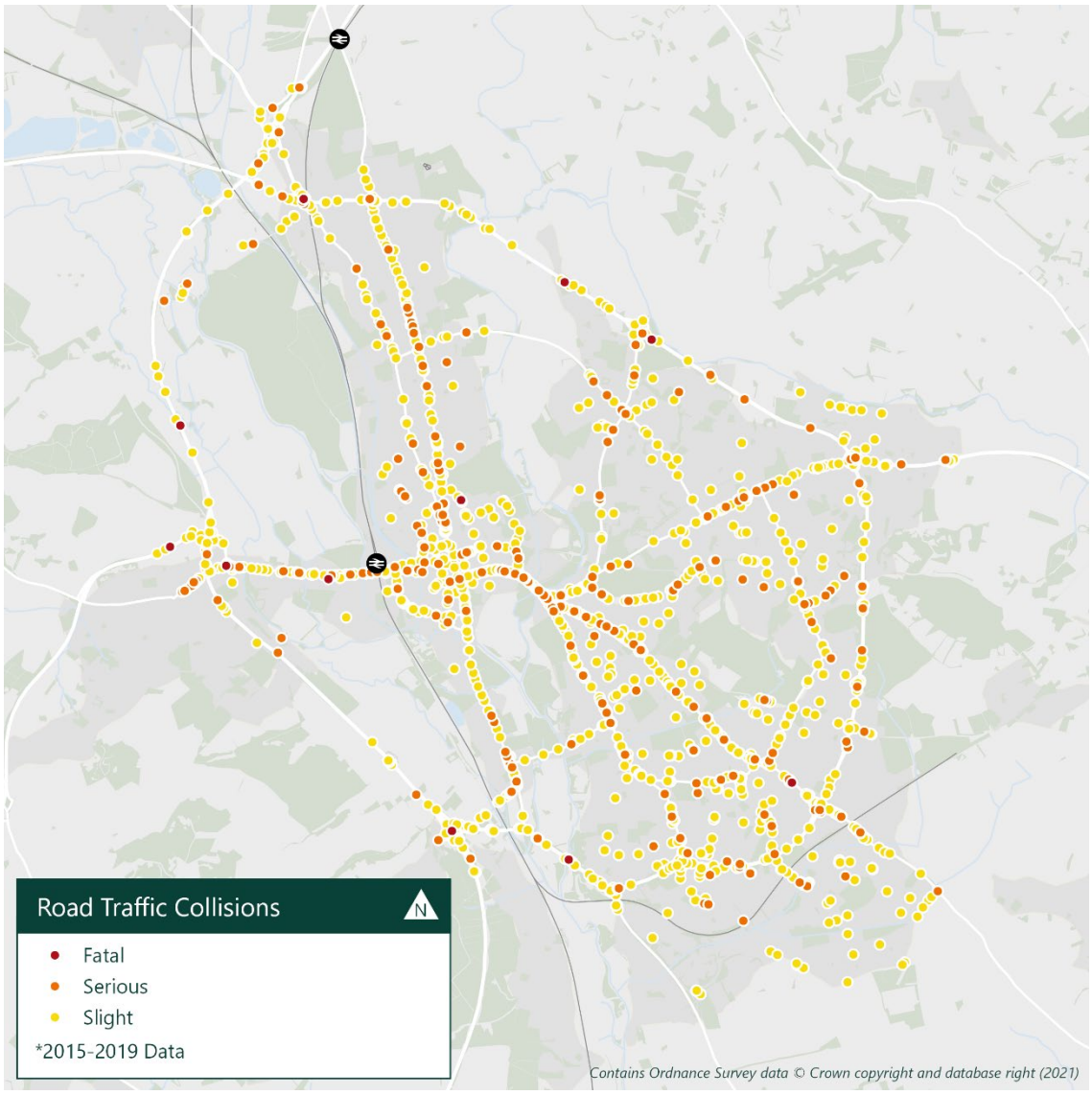
2.1 Oxfordshire County Council collects road collision data which was provided for the analysis that informs this report. Analysis and mapping of data for 2015 and 2019 was undertaken to provide an understanding of collisions by area, mode and severity. The data covers the entire Oxford city area, as well as the A34 western bypass and A423 southern bypass.

2.2 The data used for the analysis only covers collisions that resulted in a human casualty on public highways. Damage-only collisions, with no human casualties, and collisions on private roads or car parks are not included.

Baseline mapping of collisions

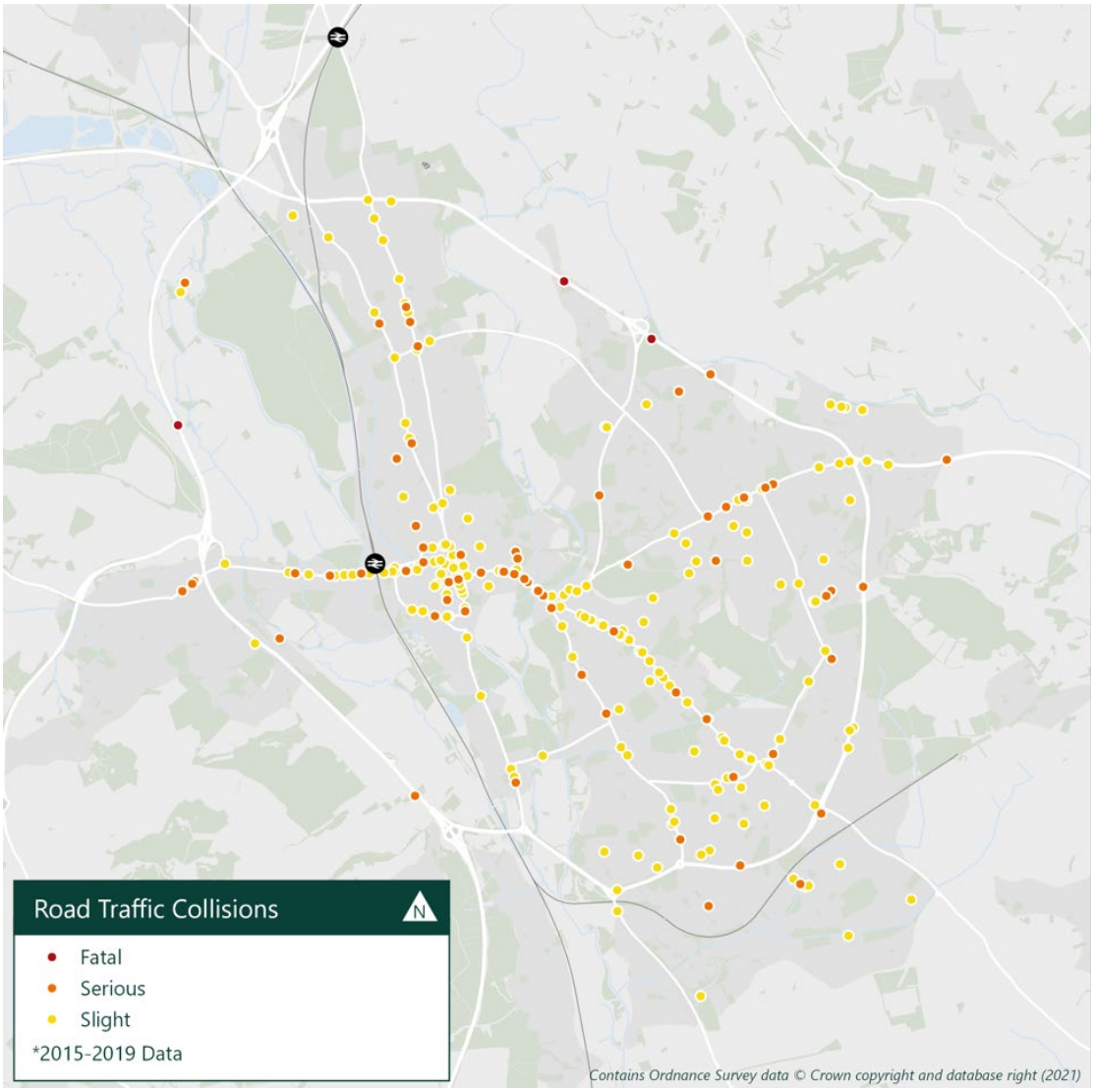
2.3 Figure 2-1 shows collisions in Oxford by severity for all road users. It is clear that many collisions occurred in the city centre, but that a high proportion of the collisions resulting in serious casualties occurred along arterial routes. A higher proportion of collisions resulting in fatalities occurred on the ring road itself (where average speeds are higher).

Figure 2-1 All Road User Collisions, by Severity (2015-19)



2.4 Collisions involving pedestrians, by severity of casualty and location, are shown in Figure 2-2. They were also overwhelmingly concentrated in the city centre, with a number of serious casualties suffered along the High Street. Arterial routes, in particular Botley Road and the B480, also had high concentrations of pedestrian road casualties. There are relatively few pedestrian casualties on the ring road, though several collisions resulted in fatalities.

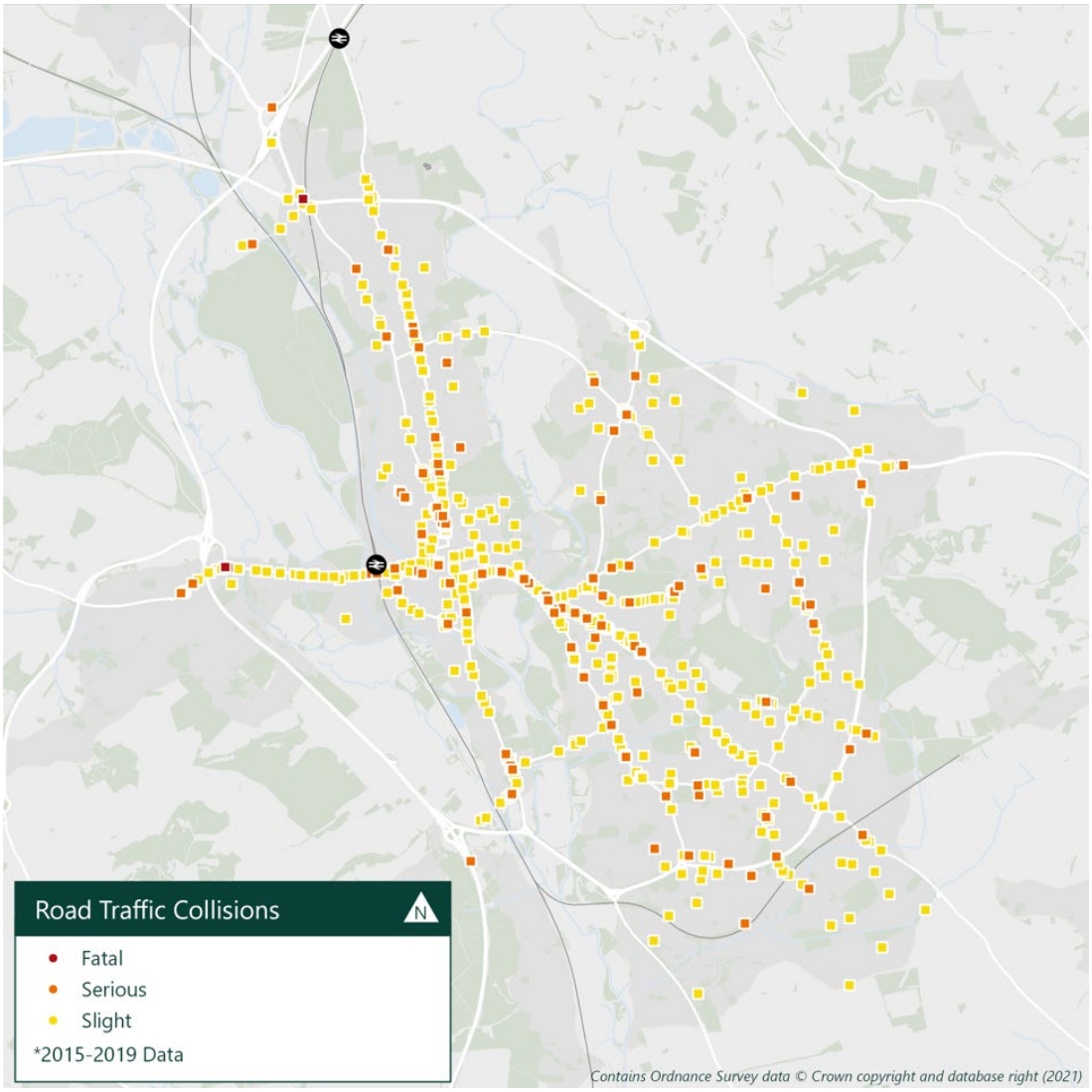
Figure 2-2 Pedestrian Collisions, by Severity (2015-19)



2.5 Cycling collisions (shown in Figure 2-3) are distributed far more widely across the city, though many did occur in the city centre (including most of the collisions resulting in serious casualties) and on the key radial routes to the city centre. Almost all Oxford's arterial routes had high concentrations of cycling collisions, with few exceptions (e.g. the B4495, the B1550, large parts of the A4144).

2.6 There are relatively few cycle casualties on the ring road. This may reflect the fact that there are segregated sections of cycleway along the ring road and or other more attractive cycle routes, that mean that few cyclists use the main carriageways of the ring road.

Figure 2-3 Cycling Collisions, by Severity



Baseline collisions and casualties by area and mode

2.7 The baseline data mapped in the previous section is quantified in Table 2-1 and Table 2-2.

2.8 Collisions reflect the number of reported incidents, whereas casualties reflect the number of casualties that result (a collision may result in multiple casualties). Overall, between 2015 and 2019 there were over 1,700 collisions resulting in over 2,000 casualties.

2.9 Cycle collisions account for almost half (47%) of total casualties, of which 88% were within the ring road. By contrast, only around half (51%) of motorised collisions were within the ring road.

Table 2-1 Baseline Collisions

	Ring Road	Within Ring Road	Other	Total	% by mode	% within RR
Motorised collisions	173	341	160	674	39%	51%
Pedestrian collisions	12	208	25	245	14%	85%
Cycling collisions	33	710	60	803	47%	88%
Total	**218**	**1259**	**245**	**1722**	**100%**	

Table 2-2 Baseline Casualties

	Ring Road	Within Ring Road	Other	Total	% by mode	% within RR
Motorised casualties	251	490	214	**955**	47%	51%
Pedestrian casualties	12	212	26	**250**	12%	85%
Cycling casualties	36	728	60	**824**	41%	88%
Total	**299**	**1430**	**300**	**2029**	**100%**	

3 Estimated impact of traffic filters

Estimated casualty reductions

3.1 Table 3-1 shows expected changes in the number of road casualties in Oxford by road user type and area. These results reflect the change in forecast traffic levels, based on transport modelling, of a 2024 'Do Something' (with Traffic Filters) scenario compared to a 2024 'Do Minimum' scenario.

3.2 The change in forecast traffic flows is forecast at a link level but, for the reasons summarised from paragraph 1.9, the estimated change in casualties is reported a more aggregated spatial level, as summarised in Table 3-1.

3.3 A total reduction in road casualties of 9% is estimated, almost entirely driven by reductions in levels of traffic within the ring road. Cycling casualties, which are more spatially concentrated in areas where traffic is forecast to reduce, are estimated to decrease by around 13%, whereas motorised casualties are estimated to reduce by around 6% (and pedestrian casualties to fall by 10%). The net forecast increase in traffic on the ring road is forecast to result in an increase in casualties on the ring road of 5%.

Table 3-1 Percentage Change

	Ring Road	Within Ring Road	Other	Total
Motorised Casualties	4%	-12%	-3%	**-6%**
Pedestrian Casualties	8%	-11%	-4%	**-10%**
Cycling Casualties	5%	-13%	-1%	**-13%**
Total	**5%**	**-12%**	**-3%**	**-9%**

3.4 Based on the 2015-19 absolute number of casualties of around 2,000 (see Table 2-2), a 9% overall reduction in casualties would represent a decrease of around 172 (based on the 5-years of historical casualty data), equivalent to 34 casualties per year. Over half of the reduction would be accounted for by reduced cycle casualties. The annual implied change in casualties is summarised in Table 3-2.

Table 3-2 Estimate of Annual Change in Casualties

	Ring Road	Within Ring Road	Other	Total
Motorised Casualties	+2	-12	-1	**-11**
Pedestrian Casualties	0	-5	-0	**-5**
Cycling Casualties	0	-19	-0	**-18**
Total	**+3**	**-35**	**-2**	**-34**

3.5 Note: the change in casualties reflects the change resulting from traffic flows in the Do Minimum versus Do Something scenarios, and not the change from the baseline. The changes are therefore those that are attributable to the effects of traffic filters.

Caveats and limitations

3.6 There are a number of caveats and limitations to be aware of in interpreting the analysis above:

1. The analysis is based on five years of collision data. This provides a robust evidence base for assessing the broad relationship between traffic levels and collisions across the network and supports a meaningful comparison across areas (e.g. the city centre and arterial routes) and major roads, particularly the ring road. These areas are where the number of collisions is higher, and therefore a more meaningful systemic relationship can be inferred between traffic levels and collision rates.
2. The analysis does not seek to predict or estimate the change in collisions on any specific road or link as a result of changes in traffic flow. At a detailed link level, observed collision data will be more variable and potentially less reliable.
3. There is likely to be some 'under-reporting' in the data, particularly for cycling collisions. It is assumed that this would continue to be the case post-implementation of the Traffic Filters.
4. Other road safety mitigations proposed and in-progress (such as junction improvements) were not factored into the analysis. External factors, such as future developments in vehicle technology (e.g. e-scooters) or mode shift to cycling, were similarly not considered.
5. The analysis does not take account of the change in collision risk associated with any change to the physical layout of roads following the introduction of the Traffic Filters.

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