

A summary of the rationale for introducing a 20mph area within Freeland

Background

Freeland Parish Council is looking into several initiatives to reduce the speed and volume of traffic through the village, both in the context of current traffic flows but also because of the very likely increase in future traffic volumes.

The Parish Council is concerned that with the combination of increased housing in the surrounding villages, the opening of the Park & Ride and the duelling of the A40, our village could be seen as an even more convenient route for travelling between the A4095 and the A40 – and a rat run for frustrated motorists caught in tailbacks.

While we are fortunate to currently have a very good road safety record within the village, there are growing risks from speeding traffic, construction traffic and frustrated drivers. These risk the safety of children and parents around the school twice a day, cyclists, horse riders and dog walkers, and pedestrians when they cross the road at blind spots to access footpaths. Furthermore, these risks would all increase substantially if traffic volumes grew without some form of control.

The Parish Council alone has very limited powers to solve these issues, but feels it is important to investigate anything that can be done to help reduce these risks and continue to make our village a place where we can all walk, cycle or drive in harmony. Creating a 20mph zone is a measure that is both achievable and effective on a number of fronts.

The case for a 20mph in Freeland

Oxfordshire County Council is changing its approach and acceptance of 20mph restrictions which will enable a much greater coverage across Oxfordshire. To gauge the appetite for the introduction of 20mph in villages in his ward, County Councillor Liam Walker ran a survey at the end of 2021/start of 2022 to ask local residents whether they supported a 20mph area in their village or not.

On the back of the responses, Freeland Parish Council has decided to request a 20mph area in the village extending from the Pigeon House Lane junction to Oakland Close, to encompass the village school.

This brief provides a summary of the aspects Freeland Parish Council has taken into account in its decision, and a summary of the current evidence on impacts including on safety and air quality from introducing a 20mph area.

Speedwatch evidence

Following the easing of Covid restrictions, Speedwatch activities were resumed in Freeland on 5 September 2021. During the following seven months, up to 7 April 2022, 92 sessions were held with 8,077 vehicles being monitored. Of these, 812 (10%) were recorded as travelling in excess of 35mph, with 166 (2%) at 36-40mph, 35 at 46-50mph and seven in excess of 50mph. The highest speed recorded was a car travelling along Wroslyn Road towards The Green at 63mph.

It has been noticeable that since the resumption of Speedwatch activities, the speed of vehicles travelling through Freeland has decreased slightly and it is encouraging to note that nobody has been caught doing more than 50mph since 18 January. This illustrates the considerable potential to influence driver behaviour through proactivity and effective reminders of the speed limit.

Speed survey evidence

A speed survey was conducted in September 2021. Four sites had speed and traffic volume monitors set up: Wroslyn Road near the industrial site (site 1); Wroslyn Road near the school (site 2); near the Memorial Gardens (site 3); and at The Green (site 4). This is a summary of the results:

- The number of vehicles travelling daily through the village on weekdays was around 1,000 for sites 1 and 2, and 700 for sites 3 and 4 (NB this was shortly after lockdown had lifted and therefore traffic was lighter than usual; typical Speedwatch data shows around 100 vehicles per hour is normal during working hours on weekdays).
- The built-up parts of the village where sites 1 and 2 were located had lower overall speeds than the other sites, with site 2 near the school the lowest. However, around 15% of vehicles near the school still travelled over 30mph, with 3% travelling over 35mph.
- Site 3 outside the Memorial Gardens running north to south was one of the worst areas for speeding, with 55% over 30mph and 22% doing over 35mph.
- Site 4 at The Green heading south down the hill saw 57% speeding and 17% travelling over 35mph.

For information, the statistics quoted by DriveTech, which conduct Thames Valley Police's speed awareness courses, state percentage risk of causing a pedestrian fatality when travelling at various speeds as:

- 20mph – 1%
- 30mph – 7%
- 40mph – 31%

Cllr Walker's survey

In total, 124 people from Freeland responded. 52 supported introducing a 20mph through the whole village (which was the question asked). 63 objected to a 20mph through the whole village, but of these, five said they would support 20mph in part/s of the village (school or village hall). Nine people neither supported nor objected, but of these, eight said they'd support a 20mph in part/s of the village.

It was also worth noting that among those not supporting the introduction of a 20mph area, five supported use of a 20mph at certain times outside the school, and three said traffic calming was needed, even though they didn't think 20mph should be part of that.

In conclusion, while 51% did not want a 20mph through the whole village, 52% supported a 20mph area in specific parts of the village.

Conclusion about the situation in Freeland

Speeding is a concern to village residents. While views differ on how a reduction in speed can be achieved, a small majority support a 20mph area in part of the village. While the school area actually has some of the lowest levels of speeding, and the Memorial gardens and The Green areas have the highest, a 20mph area within the village cannot exclude the school. Equally, it would be especially hard to enforce a 20mph area in the extremities of the village. The other consideration is the central part of the village incorporating the garden centre, the pub, the village hall and the church has most foot traffic.

Hence the decision was made to introduce a 20mph area extending from the Pigeon House Lane junction to Oakland Close, the other side of the village school. The 20mph area within the village could also be publicised at the village boundaries and the Cuckoo Lane turning to dissuade people from travelling through the village, as volume of traffic, including construction traffic, is also a concern.

Impacts of a 20mph area

Establishing the evidence

Here we examine the various ramifications of introducing a 20mph area. The main impacts of concern are safety, emissions and fuel consumption in 20mph areas, mainly in comparison with 30mph areas. A [literature review](#) of the evidence including safety and emissions was carried out by Dr Adrian Davies, a Bristol-based transport and health consultant, in 2018. His review included 29 peer-reviewed studies published between 2010 and 2018, mostly conducted in the UK but also in European countries and Japan, with a further two having global reach. Here, the conclusions on road safety and air quality are summarised. Following this, other evidence on fuel consumption is examined.

Road Safety: Casualty reduction

The evidence for reduced casualties as an outcome of 20mph is strongest in the review. UK evidence provides a consistent outcome of declining casualties including fatalities. These are consistent with evidence from previous research that for each 1mph average speed reduction there is a 6% reduction in urban traffic collisions.

Estimations of the likely level of lives and casualties avoided have been estimated by [Jones and Brunt \(2017\)](#) for the Welsh Government. This study reported that if all 30mph roads in Wales were replaced by 20mph speed limits, 6–10 lives would be saved and 1,200–2,000 casualties avoided each year, at a prevention value of £58m–£94m each year. A number of studies looking into the introduction of 20mph areas reported average speed reductions of between 1.3mph and 2.7 mph. One study also found a slight drop in speeds driven on 30mph speed limit roads – possibly due to drivers being more conscious of their speeds.

Another road safety aspect concerned children and so-called ‘visual looming’. The evidence reported by [Wann et al \(2011\)](#) is that children in their study could not reliably detect a vehicle approaching at speeds higher than 25mph and did not generally achieve adult levels of speed perception. The findings have important implications for road-safety policy in terms of the upper limits of vehicle speed that allow children to make accurate judgments, and these findings complement evidence that the risk of pedestrian accidents involving children is nearly three times higher in places where mean speeds exceed 25mph compared with places with lower mean speeds.

Air quality

Three studies within this review examined evidence on air quality impacts. The conclusions were that some emissions go up, and others go down, but the bigger determinant of emissions was driving style, with braking and accelerating/decelerating adding significantly to emissions output. Therefore, while the introduction of a 20mph zone within a 30mph zone would theoretically lead to more braking while entering it, a lower travelling speed within the 20mph zone could result in a more consistent speed as there is less need to carry out additional braking within the zone.

To summarise these three papers in more detail:

- [Dons et al \(2013\)](#) examined exposure to ‘black carbon’ (also called particulates/particulate matter or PM) which – at low speeds including 30km/h (~20mph) in urban areas – increased due to a reduction in following distance and so elevated exposure via nearby vehicles; however, this was mostly on main highways rather than local roads due to traffic intensity. Exposure in urban areas was higher for both in-vehicle occupants and active travellers than in rural areas, although higher for in-vehicle occupants. Travelling in peak hours increased exposure for all road users.
- [Williams et al \(2013\)](#) addressed the question of the environmental impacts of 20mph restrictions in central London. Although there was a moderate increase in CO₂ and NOx from petrol cars, the study reported that particulate matter emissions reduced for both petrol and diesel cars and NOx and CO₂ emissions reduced for diesel cars. As road traffic is responsible for up to 80% of particulate pollution, and diesel vehicles

were found to emit around 10 times more particulate matter and 11 times more nitrous oxides than petrol vehicles, this was a significant finding. An 8.2% and 8.3% reduction in PM10 and NOx when driving at 20mph consequently had a significant impact on air quality – equivalent to removing up to half of all petrol cars off the road. The paper concluded: it would be incorrect to assume a 20mph speed restriction would be detrimental to ambient local air quality, as the effects on vehicle emissions are mixed; driving styles were found to be different on 20mph roads as compared to 30mph roads; streets where traffic flow was more likely to be interrupted were shown to have higher emission rates; it was accepted that lower speed limits resulted in lower demand for power, which was likely to be beneficial to emissions.

- [Jones and Brunt \(2017\)](#) identified that 20mph speed limits as a possible intervention would impact positively on road traffic injuries, air quality and encourage active travel. The authors recognised that if children are allowed to play, walk or cycle near roads, their similar height to motor vehicle emissions and faster breathing rate than adults posed a particular risk from emissions. However, they estimated that as a result of introducing 20mph speed limits across Wales, while deaths attributed to nitrogen dioxide (NO₂) would increase by 63 each year and years of life lost by 753, deaths attributed to particulates (PM2.5) would decrease by 117 and years of life lost by 1,400, thus saving 54 lives and decreasing years of life lost by 647. The authors also noted that 30mph roads were likely to contribute more air pollution because of the range of vehicles, the numbers of vehicles and the stop start nature of the motorised traffic on them; and that the effect of a 20mph zone on increasing cycle and walking would also reduce net emissions as this would displace traffic.

The review summarise that there is little evidence for the effect of 20mph speed limits on air quality. The study by [Jones and Brunt \(2017\)](#) did provide calculations for an overall improvement in air quality. Overall, where there has been any investigation into air quality impacts, these are reported as either negligible or a slight improvement; and that it would be incorrect to assume a 20mph speed restriction would be detrimental to ambient local air quality, as the effects on vehicle emissions are mixed.

Fuel consumption and travel time

There is a dearth of information on this, with driving style appearing, again, to be the dominant factor. [NICE guidelines](#) mention the benefits of smoother driving and speed reduction. They say motorists driving steadily at the optimum speed can help reduce stop-go driving and so improve fuel consumption as well as reducing congestion and air pollution.

In the National Academies of Sciences, Engineering, and Medicine 1995 special report 245 ["Expanding Metropolitan Highways: Implications for Air Quality and Energy Use"](#) (p369), German research indicated that traffic calming reduced idle times by 15%, gear changing by 12%, brake use by 14%, and petrol use by 12%. An evaluation of cutting the speed limit from 50km/h (31mph) to 30km/h (19mph) in Germany assessed two different driving styles. Even aggressive driving under the slower speed limit produced lower emissions (but higher fuel use) than under the higher speed limit, although calm driving produced greater reductions for most emissions, and delivered net fuel savings.

However, [Kyoungho and Rakha \(2009\)](#) found that while traffic calming measures reduced vehicle speeds and contributed to enhanced road safety, they could result in significantly higher fuel consumption and emission rates when drivers accelerated aggressively. Speed humps were most responsible for extra fuel consumption; roundabouts produced the least. By eliminating sharp accelerations, significant energy and emission savings were possible.

Lastly, it is estimated that the length of Freeland's proposed 20mph area is approximately 0.52 miles within a village estimated to be 1.44 miles in length in total, which means the 20mph area is around a third of the total length of the village. The difference in time to travel the length of the village would be calculated to rise from 2 minutes 53 at 30mph throughout, to 3 minutes 24 seconds at the combination of 20 and 30mph, an increase of around half a minute or 18%.

Conclusions

Freeland suffers from ongoing issues with speeding traffic. While many are aware of this currently, upcoming infrastructure changes and building in the area are likely to substantially increase the volume and potentially frustration levels of traffic coming through the village.

There is majority support (albeit marginal) for the introduction of a 20ph zone within part of Freeland, especially one across the busiest areas of the village, and the school. Associated traffic calming and traffic redirection could provide a benefit in slowing traffic elsewhere in the village and reducing overall traffic flow. Additionally, the partial nature of the zone should only add up to 45 seconds to travel times.

The safety benefits of a 20mph zone are clear and overwhelming. The zone would be likely to increase the amount of cycling and walking within the village, which would be beneficial to all. Concerns about impact on air quality appear largely unfounded. Different emissions are affected in different ways, but the net effect if traffic flow remains the same appears to be a reduction in emissions, especially if the complementary traffic calming methods encourage a consistent speed. However, the 20mph zone would also be likely to reduce traffic flow from both discouraging traffic through the village and increasing cycling and walking. Fuel consumption seems more related to driving style than speed.

Freeland Parish Council, 26 April 2022