

## **Probus by-pass traffic speeds and serious accidents**

### **Summary**

This report has been compiled by Bob Egerton, Cornwall Councillor for Probus, Tregony and Grampound. It analyses the data on speed of traffic on the A390 Probus by-pass and the accident data for the road.

The data on speed show that there is a significant percentage of drivers who are driving in excess of the speed limit for the road (60 mph). Although one set of data (Police SDR data Oct-Nov 2019 at Wakeham's Grave) seems to show much lower speeds with an 85th percentile figure of 49 mph in the westward direction, this figure is an outlier and all other data captured for this road show 85th percentiles in the high 50s or low 60s mph. There is a potential question mark over the accuracy of the SDR data and it is requested that a further check is made using the Council's standard Radar Class equipment.

With most data showing an 85th percentile figure around 60 mph, this means that 15% of drivers are breaking the speed limit, representing more than 1,500 drivers every day. This should not be acceptable.

There have been many serious injury and fatal accidents on this road. Most have been at or close to the junctions at Trevorva (turning for A3078 to the Roseland) or at Denas Water (turning for B3275 and Probus). Both of these junctions are T junctions with traffic from the minor road having to enter or turn across a high speed road.

At the eastern end of the bypass, at the Trewithen roundabout, in 20 years, there have been no serious injury or fatal accidents. The contrast with the Denas Water junction is stark. It seems reasonable to conclude that, if the Denas Water junction had been constructed as a roundabout rather than as a T junction, there would have been far fewer serious injuries and fatalities over the past 20 years. It also seems reasonable to conclude that, if measures could be taken to reduce the speed of traffic through the Denas Water junction to speeds similar to those on the Trewithen roundabout, the number of serious injuries and fatalities at this junction in the future could be cut significantly.

It is requested that mandatory speed control measures are introduced at the Denas Water junction.

### **Traffic speeds**

The Council's intranet mapping transportation layer shows the data that have been collected from speed checks on the Probus bypass.

Radar Class readings were taken over a week in October 2014 at two locations close to Wakeham's Grave (either side of the junction of Tregony Road with the bypass) labelled on the map (attachment A) as Wakeham's Grave North and Wakeham's Grave South. Readings were taken for traffic in both directions at each of these locations.

The police recorded SDR data in a period October-November 2019 at a position close to the previous Wakeham's Grave South location. They also recorded data further west on the by-pass close to the junction to Trelowthas Farm. Both sets of data were for both directions.

Radar Class readings were taken over a week in February 2020 at the Denas Water junction. Two separate reports were issued, one for eastbound traffic and one for westbound traffic.

The data from the two Radar Class surveys at Wakeham's Grave in October 2014 were very similar. For westbound traffic, the mean speed was slightly higher at Wakeham's Grave south than Wakeham's Grave north – 53.9 mph vs. 51.6 mph. This is not entirely surprising as this suggests a slight acceleration after passing the Tregony Road junction. The 85th percentile figures were similar to each other at 61 mph vs. 60 mph. For eastbound traffic, the mean speeds were virtually the same at both positions – 53.3 mph vs. 53.0 mph; the 85th percentiles were the same at 60 mph.

The data from the police SDR data at Wakeham's Grave in October-November 2019 were markedly lower. For westbound traffic, the mean speed was 43 mph and the 85<sup>th</sup> percentile 49 mph. For eastbound traffic, the mean speed was 46 mph and the 85<sup>th</sup> percentile 54 mph. The conclusion drawn from these data by the Local Transport & Road Safety Lead is that the drivers on this part of the by-pass are remarkably compliant with the speed limit and there is no speeding problem here. If the data were reliable, then this would be a very reasonable conclusion. However, I am not sure that the SDR data are typical of the usual daily traffic movements on this road. It suggests that the traffic was moving at 7-10 mph slower in 2019 than it was in 2014. As a regular local road user, I would be very surprised if this were the case. It may be that there were particular road conditions at that time that caused a significant reduction in traffic speeds. I cannot recall anything in particular, but it may be that there were roadworks or similar.

The average daily traffic volumes recorded by the police SDR system do not seem right. The figures at Wakeham's Grave are 6081 eastbound and 6135 westbound. However, at Trelowthas, the figures for the same period are 4395 eastbound and 5674 westbound. The Trelowthas figures on their own look wrong in that one would expect the eastbound and westbound figures at one location to be close to each other – what goes into Truro, generally comes out of Truro on the same day. There will be a small variation because some drivers will be going in one direction only that day, or will return by a slightly different route, e.g. through Probus instead of on the bypass. However, a variation of eastbound vs westbound of 29% looks wrong and is inconsistent with the data collected on all the other surveys (maximum difference between eastbound and westbound at any one location is 6%). Furthermore, the SDR recorded traffic volumes are lower at Trelowthas than at Wakeham's Grave. This looks wrong. The traffic volumes at that end of the bypass should generally be higher because of the traffic that joins the bypass or leaves the bypass on the A3078 to Tregony and the Roseland.

Examining the SDR data for Trelowthas shows that eastbound traffic is travelling at very high speeds. With an 85<sup>th</sup> percentile figure of 67 mph, it is difficult to see how one can conclude that there is not a speeding problem. However, as I said above, I am not convinced that the police SDR data are reliable. There are too many inconsistencies in them.

It is requested that further Radar Class surveys are carried out by the Council's own teams at both Wakeham's Grave and Trelowthas.

At Denas Water, the speed data from the Radar Class surveys carried out in February 2020 are interesting, although not at all surprising. At this junction, the mean speed eastbound on the A390 is 53.5 mph and the 85th percentile is 60 mph. In other words, at the very point where traffic is potentially emerging from the B3275, 15% of drivers are already exceeding the 60 mph speed limit. It is hardly surprising that, if a driver makes a mistake exiting the side road in front of a car on the main road, then the consequences will be serious.

## Accident data

Details of accidents on this road are available from the Council intranet mapping transportation layer – last 5 years of collision data. The Crashmap website has data back to 1999, i.e. just over 20 years. Each accident that has been recorded by the police is on this website. Clearly, there will have been other accidents where nobody has been injured which will not appear in the statistics. The injuries are classified as slight, serious or fatal.

The difference between slight and serious is not clear cut and, with some injuries, it may be a matter of judgement. The definitions in a Department of Transport paper in 2008 gave the following:

**Serious:** An injury for which a person is detained in hospital as an 'in-patient', injury or any of the following injuries whether or not they are detained in hospital: fractures, concussion, internal injuries, crushings, burns (excluding friction burns), severe cuts, severe general shock requiring medical treatment and injuries causing death 30 or more days after the accident. An injured casualty is recorded as seriously or slightly injured by the police on the basis of information available within a short time of the accident. This generally will not reflect the results of a medical examination, but may be influenced according to whether the casualty is hospitalised or not. Hospitalisation procedures will vary regionally.

**Slight:** An injury of a minor character such as a sprain (including neck whiplash injury), bruise or cut which are not judged to be severe, or slight shock requiring roadside assistance. This definition includes injuries not requiring medical treatment.

At the Trewithen roundabout, Crashmap records only 5 accidents in 20 years, each of which had one slightly injured person.

At the Denas Water junction, there were 29 accidents in which, in total, there were 44 slight injuries, 8 serious injuries and 3 fatalities. (I have not included the pedestrian fatality close to the Denas Water junction in 2002.)

At the Trevorva junction, there have been a number of accidents including 8 with serious injuries and one fatality.

When it comes to analysing the causes of road traffic accidents that result in serious injuries or fatalities, the potential reasons include the following:

- Catastrophic mechanical failure
- Unforeseen medical episode affecting a driver
- Impact by object from off the highway, e.g. falling tree or collapsing infrastructure such as a wall or building
- Deliberate act by a driver
- Severely reckless act by a driver, e.g. intoxication or drug abuse, or deliberate excessive speed
- Driver error

The final reason in the above list, driver error, is the one that is so often attributed to an accident and probably accounts for the vast majority of accidents. The temptation is for the highways authority to conclude that there is little or nothing that they could have been done to avoid the accident happening. They conclude that it was not the fault of the highway authority. However, is there something that could have been done to reduce the chances of a serious accident?

## **Potential ways of reducing the severity of accidents at these junctions**

Motor car manufacturers have gone to great lengths to put in safety features in new cars that are designed to protect drivers from their own mistakes. Starting with safety belts, then the introduction of air bags, anti-lock brakes, automatic braking in some cases, titanium safety shells protecting the integrity of the passenger compartment, front and rear crumple zones, all of these features have meant that drivers making the same mistakes that they have always made are, nowadays, often able to step out of a crash that, 30 years ago, would have been unsurvivable. As a result of these changes, the number of fatalities on Britain's roads has fallen dramatically over the past 30 years.

The highways authority could adopt the same philosophy, although admittedly with much smaller resources than are available to motor manufacturers and also with a much larger potential problem in terms of where and when drivers might make mistakes.

The accidents at the Trevorva and Denas Water junctions are classic examples of where drivers, inevitably from time to time, make the mistake of exiting the side road in front of cars on the main road. The highways authority has undertaken small works at the Denas Water and Trevorva junctions such as constructing sight barriers to prevent drivers seeing one way at the junctions to try to compel the drivers to stop at the junction and look more carefully before exiting. But some drivers have still made mistakes and exited the side roads without looking properly.

Roundabouts are primarily effective at avoiding serious or fatal injury accidents because they significantly reduce the speeds of vehicles at the points at which traffic flows intersect. This means that, if a driver pulls out on to the roundabout in front of another car that has the right of way, the car on the roundabout going at perhaps 25-35 mph has sufficient time to stop, or in the worst case, if they are unable to stop, will hit the other car at a much lower speed and no serious injury occurs. This has been the case at the Trewithen roundabout. Data show no serious injuries in 20 years.

The contrast at Denas Water and Trevorva is that a driver on the main road could be travelling at 60 mph or even more at the point at which a driver pulls out in front of them. The chances of avoiding a collision are minimal and the force of impact at this speed, particularly into the side of the car, is likely to cause serious or fatal injuries. It is therefore inevitable that if we continue to have junctions such as these on 60 mph roads, more serious injury or fatal accidents will occur.

It is clear that the construction of roundabouts to replace the T-junctions would almost certainly significantly reduce the incidence of serious injuries and fatalities at these two junctions. The cost of constructing roundabouts at these sites would be very large, perhaps £1.5-2.0 million for each roundabout and it is unlikely that funds would be available to make these changes in the foreseeable future. However, there is a much cheaper way of reducing the speed of traffic on the main road at these junctions. The imposition of a mandatory speed limit on the main road to, say, 40 mph, strictly enforced with speed cameras, would significantly reduce the speed of traffic passing the T-junction.

When, in the future, another driver makes a mistake in pulling out from the side road in front of a vehicle on the main road, there would be a good chance that the car on the main road would be able to avoid a collision, or in the worst case, the impact will be non-fatal. The effect of imposing such a speed limit on drivers on the main road would be to slow their journey by about 10 seconds, but that would be no more of a delay than if a roundabout were constructed.

I do not think that having flashing signs on the main road indicating that cars are approaching the junction from the side road would have any impact at all. All of the motorists approaching the Denas Water junction are fully aware that vehicles frequently exit from the side road but that does not currently deter them from accelerating to 60 mph or more at this point. Only a mandatory speed limit will slow them down.

### **Conclusion and recommendations**

There have been many accidents on the A390 Probus by-pass over the past 20 years resulting in serious and fatal injuries. Whether this road is worse for accidents than other comparable roads is a matter of debate. But, that is not really the point. There are ways that we could almost certainly reduce the toll of serious injuries and fatalities if the highways authority took action to reduce speeds at the most dangerous junctions.

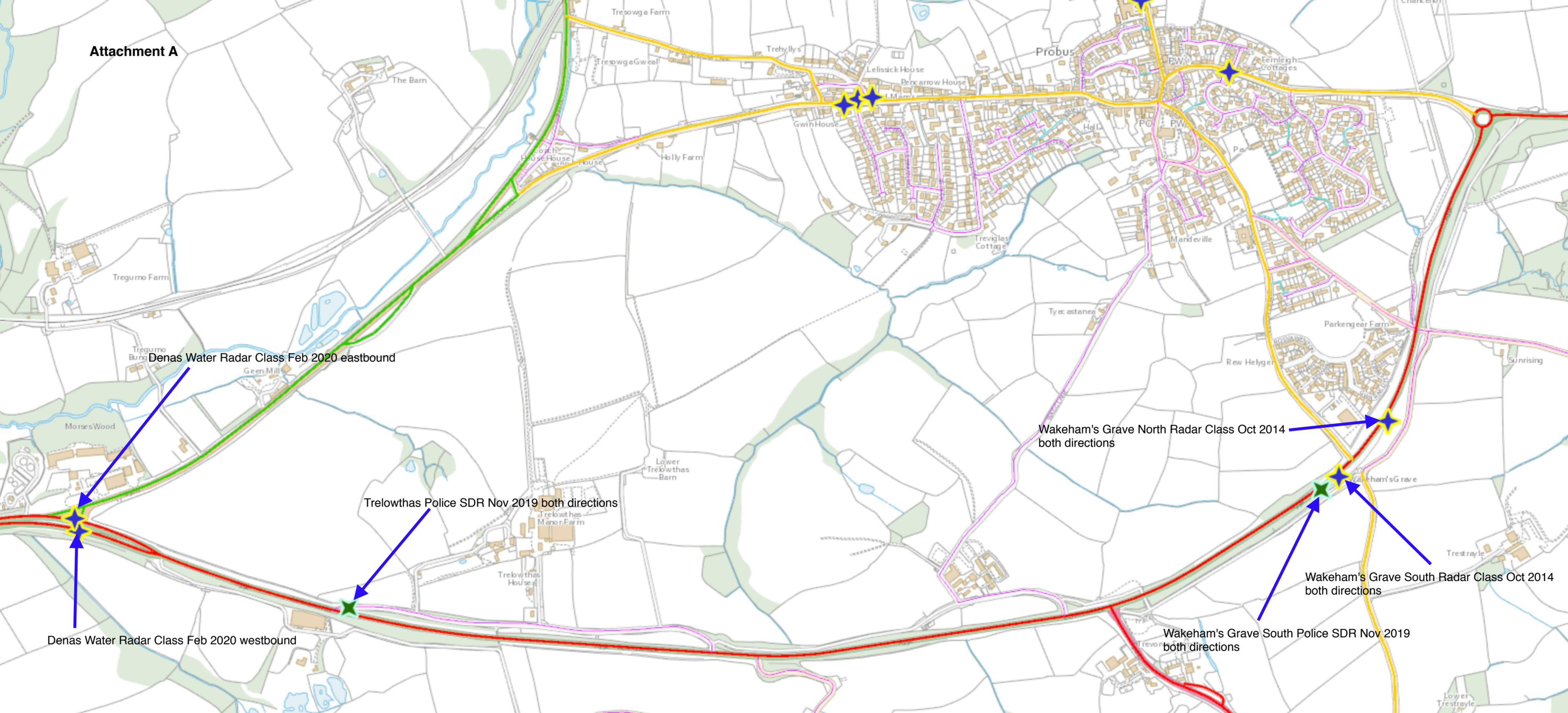
It is recommended that:

- 1) Further data is collected by a Radar Class survey on the speed of traffic on the by-pass, in particular at Wakeham's Grave and Trelowthas.
- 2) If data consistently shows that up to 15% of motorists are breaking the speed limit, action should be taken to bring that percentage down by enforcement.
- 3) A 40 mph speed limit is introduced from the end of the 30 mph limit at Tresillian to the end of the dual carriageway section past the Denas Water junction and beyond the turning on the B3275 into Tresillian industrial estate. The limit should be enforced by permanent speed cameras.
- 4) Consideration is given to introducing the same lower speed limit on the A390 around the Trevorva junction.

### **Attachments**

- A. Probus by-pass Radar Class and police speed check sites
- B. Probus by-pass speed data summary
- C. Probus by-pass accident statistics
- D. Proposed Denas Water 40 mph scheme

Attachment A



Denas Water Radar Class Feb 2020 eastbound

Denas Water Radar Class Feb 2020 westbound

Trelowthas Police SDR Nov 2019 both directions

Wakeham's Grave North Radar Class Oct 2014 both directions

Wakeham's Grave South Radar Class Oct 2014 both directions

Wakeham's Grave South Police SDR Nov 2019 both directions

# Attachment B

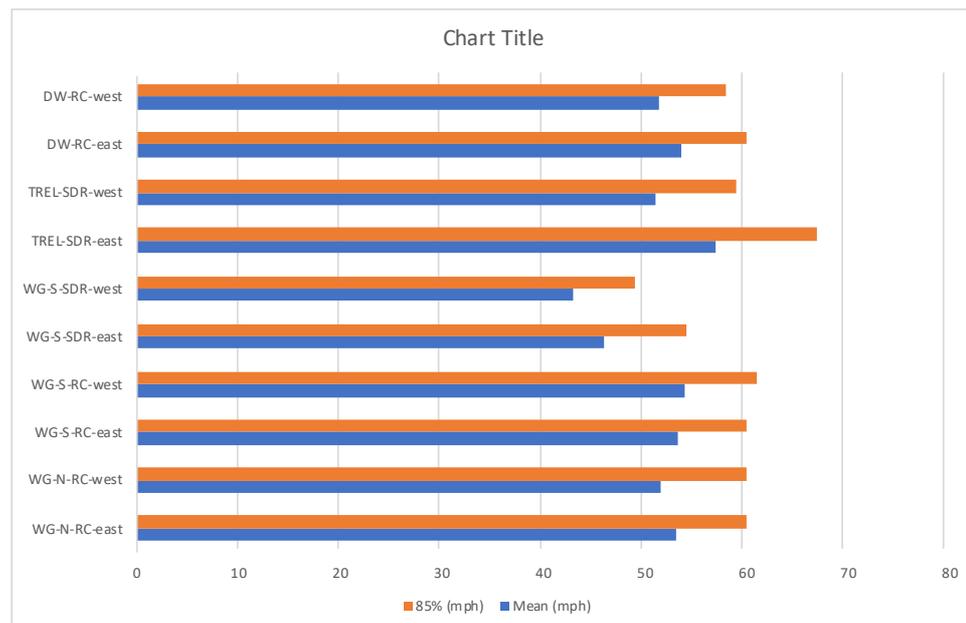
## Probus bypass Radar class and police SDR speed data

Location	Type of check	Direction of traffic	Date	Label	Mean (mph)	85% (mph)	Av. Daily volume
Wakeham's Grave north	Radar class	Eastbound	Oct-2014	WG-N-RC-east	53	60	5197
Wakeham's Grave north	Radar class	Westbound	Oct-2014	WG-N-RC-west	51.6	60	5278
Wakeham's Grave south	Radar class	Eastbound	Oct-2014	WG-S-RC-east	53.3	60	5163
Wakeham's Grave south	Radar class	Westbound	Oct-2014	WG-S-RC-west	53.9	61	4844
Wakeham's Grave south	Police SDR	Eastbound	Nov-2019	WG-S-SDR-east	46	54	6081
Wakeham's Grave south	Police SDR	Westbound	Nov-2019	WG-S-SDR-west	43	49	6135
Trelowthas	Police SDR	Eastbound	Nov-2019	TREL-SDR-east	57	67	4395
Trelowthas	Police SDR	Westbound	Nov-2019	TREL-SDR-west	51	59	5674
Denas Water	Radar class	Eastbound	Feb-2020	DW-RC-east	53.5	60	5810
Denas Water	Radar class	Westbound	Feb-2020	DW-RC-west	51.3	58	5905

**Notes:**

Average daily volumes

For Radar Class data, average calculated from the 6 full days of the period, ignoring first and last half days  
 For Police SDR, taken from 24 hour total figures calculated by police system



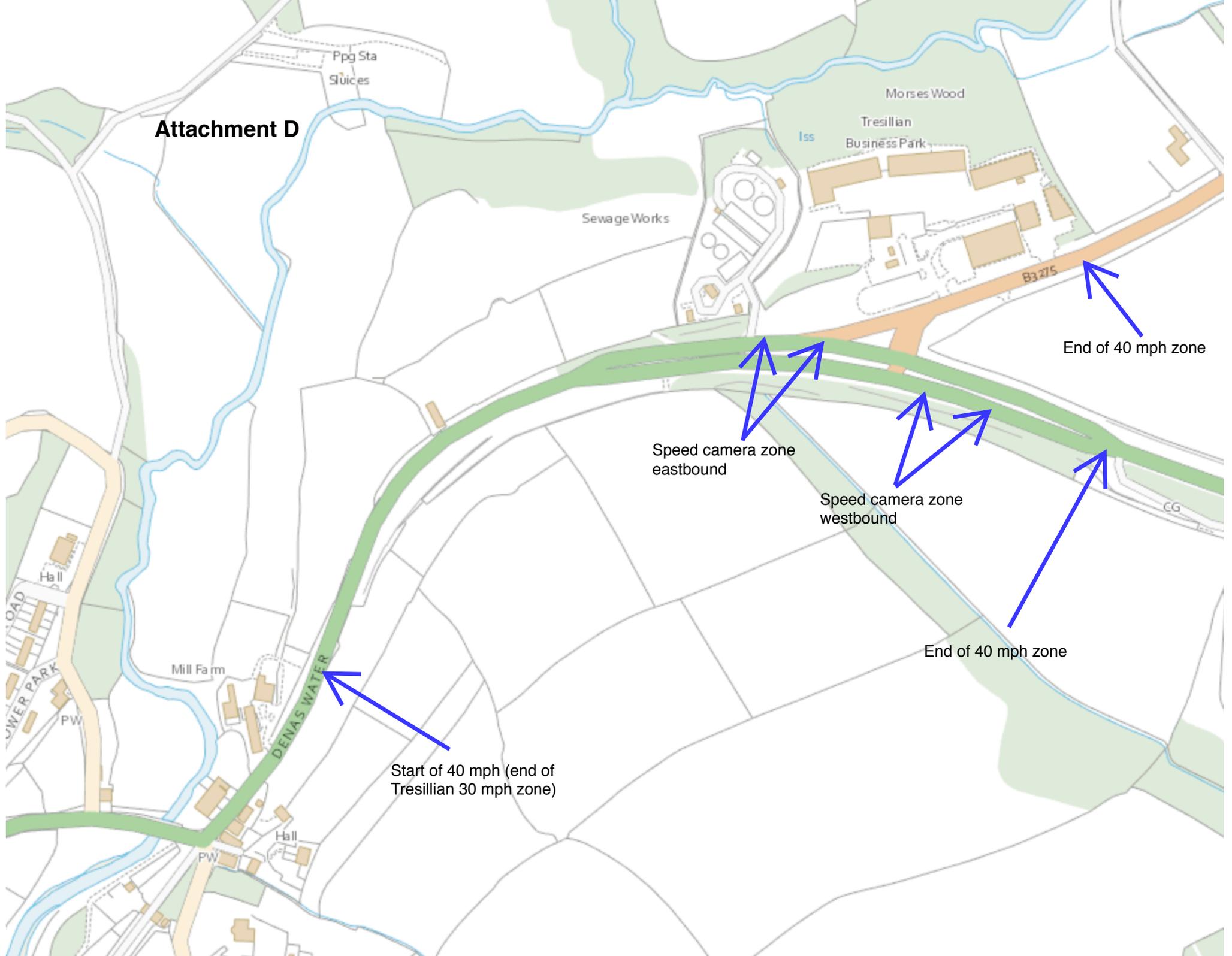
## Attachment C

### Accidents at each end of Probus by-pass

Location	Date	No vehicles	Slight	Serious	Fatal
Trewithen roundabout	31/05/2002	2	1		
	18/09/2004	2	1		
	14/05/2005	2	1		
	05/07/2006	2	1		
	12/02/2020	1	1		
	<b>Totals</b>	9	5		

Denas Water	22/03/1999	2	3		
	11/09/1999	2	1		
	22/04/2000	8	1		
	24/02/2002	2	2		
	08/03/2002	2	3		
	28/04/2002	2	2		
	17/10/2002	2	2		
	19/12/2002	2	1	1	
	24/03/2003	2	2		1
	30/04/2004	1	1	1	
	26/05/2004	2	3		
	15/02/2005	2	2		
	13/05/2006	2	1	1	
	12/01/2007	2	1		
	09/03/2007	2	2		
	14/05/2007	2		1	
	19/06/2007	2	1		
	28/07/2008	2	1	1	
	12/10/2008	2	1		
	06/04/2012	2	2		
	04/05/2012	2	2		
	24/08/2012	2	1		
	02/05/2013	2	1		
	01/12/2016	1	1		
	16/01/2017	2	2		
	07/07/2017	2		1	
	19/02/2018	2	1	2	1
	17/03/2018	2	1		
	10/09/2019	2	3		1
	<b>Totals</b>	62	44	8	3

**Attachment D**



Ppg Sta  
Sluices

Morses Wood

Tresillian  
Business Park

Sewage Works

B3275

End of 40 mph zone

Speed camera zone  
eastbound

Speed camera zone  
westbound

End of 40 mph zone

Start of 40 mph (end of  
Tresillian 30 mph zone)

DENAS WATER

CG

ROAD  
OWER PARK  
PW

Mill Farm

Hall

PW

Hall

PW