

From: [REDACTED]
To: [A303 Stonehenge](#)
Subject: Fwd: URGENT - TR010025 - A303 Amesbury to Berwick Down DCO - new evidence
Date: 04 April 2022 23:22:32
Attachments: [Rubbernecking the cause of A303 congestion at Stonehenge.docx](#)
[GoogleTrafficA303_1650Sunday15Dec2019.png](#)
[ComMA AppB Fig13-21 Google API A303 Eastbound .png](#)
[Speed-Flow Charts A303 2km West of Stonehenge.png](#)
[DFT THINK screenshot_A303_Stonehenge_2013-18.png](#)

Dear A303 Stonehenge Planning Inspectorate case team,

Further to my email of earlier today, I attach my incomplete 'holding' representation.

I look forward to hearing from you.

Kind regards,

Andrew Nicolson MSc

[REDACTED]

-----Original Message-----

From: [REDACTED]
To: A303Stonehenge@planninginspectorate.gov.uk
<A303Stonehenge@planninginspectorate.gov.uk>
Sent: Mon, 4 Apr 2022 16:31
Subject: Representations deadline problem

Dear A303 Stonehenge Planning Inspectorate case team,

I write to let you know I am having extreme difficulty in completing my representation in time for today's deadline.

The best I can do is to submit an incomplete, 'holding' representation by tonight.

Please may I have your permission to submit my completed representation within a few days?

I am a person with [REDACTED]

[REDACTED] To quote a recent High Court Witness Statement,
"... Mr Nicolson takes [REDACTED]

[REDACTED]

(Second Witness Statement of [REDACTED], 22 November 2021, R ([REDACTED]) v Wiltshire Council, CO/3569/2021).

We have also had Covid-19 in my immediate family, and, while vaccinated and boosted, I have felt unwell and tired, though I have not taken a test at the relevant time.

I gave evidence at the 2019 Examination-in-Public into the scheme, both on behalf of Cycling UK and in my own name.

I made an application to the High Court in R (Save Stonehenge World Heritage Site Ltd) v Secretary of State for Transport, CO/4844/2020, and wrote in my Witness Statement, "2. *Locus standi*. I am a citizen of Wiltshire. I use the section of the A303 subject to the proposed scheme, by car and bicycle. I would be adversely affected by the scheme, particularly when cycling (because cycling is to be prohibited from the carriageways and the alternative provision is, in my view, inferior and inadequate for my purposes). I am therefore prejudiced by the Defendant's decision. I attended and gave evidence at the 2019 Examination-in-Public, as a cyclist and representative of Cycling UK, in respect of cycling on the road. I also gave evidence independently as a citizen and independent researcher. I am aggrieved by the Defendant's rejection of the recommendation of the Examining Authority."

Can you clarify whether I have Interested Party status, please?

Kind regards,

Andrew Nicolson MSc



Infrastructure Planning A303 Amesbury to Berwick Down

Planning Inspectorate Scheme Reference TR010025

Planning Act 2008

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

A303 Amesbury to Berwick Down Development Consent Order 20[xx]

New evidence of Andrew Nicolson, MSc, Wiltshire

1. Introduction

For highway and traffic engineers Stonehenge is globally unique among monuments. It is ancient, iconic, short in stature, in a rural area, and close to a major road of moderate capacity. It is no wonder that it induces rubbernecking, the distraction of drivers who then slow down.

This submission demonstrates that rubbernecking at Stonehenge is both *prevalent*, and a dominant cause of delay, and *perennial*, taking place year-round not just on summer weekends. This implies that the ambitious A303 tunnel scheme ‘takes a sledgehammer to crack a nut’, is poor value for public money and needs to be reviewed in a radical new way.

Where and when rubbernecking delays occur is well understood in traffic engineering and its research literature. In flows near saturation, a visible accident scene or roadside distraction results in variable slowing-down, tailbacks and an accordion effect of ‘start-stop waves’ or shockwaves that travel back from a ‘seed point’. Just a few rubberneckerers can cause congestion and stop-start driving. On freeways, this can result in collisions on the opposite carriageway to the distraction. Once traffic is slowed, more drivers get a better look, so delays can worsen. Micro analysis of traffic oscillations was pioneered in California by Michael Mauch at UC Berkeley. Tim Rees of TRL in the UK has studied these shockwaves and their propagation back from seed points in the context of speed-controlled motorways.

It is unsurprising that the A303 at Stonehenge might offer an ideal case study of rubbernecking. It is permanent, constant in size, highly salient to many road users on this vacationers’ artery, far from urban traffic and away from junctions. And indeed the pattern turns out to be chronic. One may view Google Maps live traffic any time in daylight, not just summertime, to see delays opposite the monument and tailing back. The picture is clouded by proximity to the nearby Western end of the A303’s Amesbury Bypass dual carriageway, where four lanes drop to two near the first Westbound view of the famous trilithons opens up almost directly ahead across a small valley.

Rubbernecking is well known to the transportation community. A 2001 Crash Investigation Team study at a Virginia university found that, “Rubbernecking caused by vehicle crashes and other incidents accounted for 16% of all vehicle crashes, while the total number of ‘outside the car’ distractions accounted for 35%.” UK Conditions are different, but in 2013 the DfT rolled out 105 sets of 30 x 2m x 2m incident screens to Police forces as part of the

CLEAR initiative at a cost of £2.3M, and reported that the mean time savings benefit associated with each use of these was £194k. A 2020 report by Select Car Leasing places Stonehenge in the top five “most dangerous landmarks to drive past” and states, perhaps not accurately, that “The problem has become so severe in recent years that authorities have put forward plans to build a tunnel next to Stonehenge, to put a lid on the issue.”

We may ask how Highways England (“HE”) portrayed Stonehenge rubbernecking at the Examination-in-Public into its A303 Amesbury to Berwick Down Development Consent Order application. Answers lie in its Transport Assessment, Combined Modelling and Appraisal Report (“ComMA”) and Transport Model Package, Appendix B to the ComMA. As HE engineers observed, on a Friday “busy day (summer)” site visit, “‘rubber necking’ occurs as certain drivers pass Stonehenge, (in one observed case [to] take photos). This results in lower link capacity on the A303 past Stonehenge, when there is a higher proportion of leisure / tourist trips,” and “Vehicles were observed going extremely slow past the stones with large headway to the vehicle in front.”

On the “neutral month” site visit, an early October Tuesday in 2017, “no obvious congestion was observed on the network, in either direction” and “rubber-necking behaviour was not clear from the data in the neutral month.” HE made the leap to concluding that it is largely absent outside of summer holiday weekends. Their modellers created a separate ‘busy day’ time period or “summer model” for July and August Fridays and weekends. In their VISSIM micro simulation traffic model, they added a new “specific driving behaviour (E)” with “larger headway and following variation but shorter standstill distances between vehicles” to replicate observed rubbernecking queues. Another “summer model specific driving behaviour (D)” was added to reflect anomalous observed eastbound queuing several miles West of the henge. Note that these customisations model and predict observed behaviour, but do not explain it.

I have developed software that has captured very many Google Maps Live Traffic screenshots of the A303 at the proposed scheme. This data allows analysis of congestion patterns at fine granularity in terms of location (to some 25m) and time (seconds or minutes). Image-processing code can be written that counts coloured pixels and quantifies congestion against both location and time. Another application is to knit the images into videos, providing a dynamic visualization of actual congestion patterns on documented dates.

2. Evidence that rubbernecking at Stonehenge is prevalent and dominant

Rubbernecking has a drastic effect on the A303’s capacity whenever it takes place on the single carriageway link past Stonehenge. It takes few extra-slow vehicles to cause a hold-up that can shift the traffic from free-flowing to behaviourally exceeding capacity.

1. Site observation provides direct evidence of drivers slowing down, vehicle occupants photographing Stonehenge, etc. From time to time a coach will slow to below 15mph so its passengers can view the monument. This driver behaviour is continual, though the proportion of drivers slowing rises and falls around the weekly and seasonal cycles. It is absent after dark, unless a floodlit event is on at the stones. This can be captured with a hand-held radar speed gun and a mobile-phone camera.

2. The phenomenon is embedded in popular culture: searching Twitter etc. for 'Stonehenge' and 'rubbernecking' or 'rubbernecker' provides qualitative evidence.
3. Google Maps Traffic displays real-time or typical traffic delays at far finer space and time resolution than HE's WebTRIS automatic counts, though with fewer speed bands and only relative, not actual speed. The usual scenario is of slow traffic arising opposite Stonehenge, backing to the East, West or both depending on time of day, week and year. Though the slower cohorts often extend downstream, they rarely reach or originate from the roundabouts that define this link – very unusual, because junctions are normally the bottlenecks on a series of consecutive road links. This pattern caused by rubbernecking is visible at all times of year, albeit more so at weekends (and Fridays and some Monday mornings).
4. A key fact is that the brown, red and amber congestion ribbons in Google Maps Live Traffic almost invariably disappear at dusk - after lighting up time but before Astronomical Twilight (sun 18 degrees below horizon). The clear inference is that the congestion is caused by rubbernecking when Stonehenge is visible.
5. HE publishes online WebTRIS data from automatic traffic counters (ATCs) on trunk roads. This includes ¼ hour traffic counts and 5mph speed bands. Speed-flow curves plotted from A303 ATCs just upstream of Stonehenge show significant behaviour changes between weekdays and Fridays/weekends. Maximum speeds are lower at weekends, and traffic breaks down into 'turbulent' unstable flow with maximum throughput declining while traffic backs up into a jam – the speed-flow curves turns back on itself. Tuesdays are the least affected.
6. HE's Transport Model Package presents (on page 13-23) a Google API graphic showing eastbound congestion shockwaves. Their seed point is very near Stonehenge and the striking traffic waves travel West up to five miles, at roughly the expected 10mph, gaining amplitude. This shockwave effect going back beyond Winterbourne Stoke offers a plausible explanation for needing to create "specific driving behaviour (D)" eastbound past the village: rubbernecking is sporadic and causes large 'following variation'. The accordion effect propagates back upstream.
7. DfT online accident mapping at the government's designated road safety campaign THINK! shows a cluster of injury-causing collisions opposite Stonehenge, and a series of others upstream to the West. Of 25 daytime collisions in 2013-2018, 13 involved more than two vehicles (one involved five), suggesting these were pile-ups caused by the distraction central to rubbernecking. A 2020 study of THINK! map data by Select Car Leasing placed Stonehenge in the top 5 most dangerous landmarks in the UK to drive past.

3. Evidence that rubbernecking at Stonehenge is perennial round the year

Apart from stating that rubbernecking was "not clear from the data" for the "neutral month", the EiP documents are notably quiet on the possible year-round incidence of

rubbernecking. This is regrettable. It needs to be known if it is a factor at other times of year, and if so to what extent. As this article asserts it to be a principal cause of delays, the case for the bored tunnels is undermined if a more frugal scheme that deters or prevents rubbernecking is feasible. I briefly review a range of evidence, including unconventional data sources.

1. Google Maps Live Traffic shows that hold-ups are present even on winter weekdays when flows are high, as stated, but when Stonehenge is no longer visible in darkness they melt away during or before the PM peak hour. Lighting up time at Amesbury comes before 5pm from 7 November to 16 January, and before 4pm near the winter solstice. Stonehenge is somewhat visible for up to another $\frac{3}{4}$ hour depending on weather conditions.
2. Speed-flow plots derived from WebTRIS ATC data show lower apparent capacity (max flow and speed) and unstable flow in “neutral” and winter months as well as in summer on Fridays and weekends.
3. When VISSIM defaults did not accurately represent the observed behaviours and queues, HE’s modellers created a further “specific driver behaviour (C)”, for the one-lane sections of the A303 near Stonehenge, that increases the headway and standstill distance. They found it necessary to apply this behaviour all year round to replicate surveyed traffic.
4. Of the 25 THINK! mapped injury collisions at or just West of Stonehenge in 2013-18, only three were on summer “busy days” (July/August Friday/Saturday/Sunday or Bank Holiday), and only six others were in July or August.
5. A seasonal analysis of annoyed “Stonehenge rubbernecking/ers” Tweets (2011-2020) indicates that apart from a burst in the 2nd week of August, it is an even all-year effect. April-July, Autumn and Winter (3 months each) yielded some 20 Tweets each of 75 in all.

HE’s experts have missed these clues. The assumption that high levels of general and seasonal congestion are the main cause of slow and unreliable journeys on the Stonehenge A303 is both deeply embedded in their narrative and self-fulfilling. Denying or missing the reality of year-round rubber-necking casts the identified problem as one of capacity, not driver behaviour. It leads to conventional capacity-building improvements – ‘to a hammer, everything is a nail’. It feeds HE’s aspirations for whole-corridor A303-A358 improvements to “Mile-a-Minute Expressway”, even though “Using the Department’s appraisal process, Highways England currently considers the five uncommitted projects along the corridor as low to poor value for money.” (2019 NAO Report). As unleashed de-congestion from Stonehenge cascades westwards, their NPV may indeed improve – curing the ills created by the tunnels, at great expense, but not aiding UK decarbonisation.

There has been divisive controversy over the proposed bored road tunnels in the Stonehenge UNESCO WHS. Witnesses have noted that the economic value of predicted net time savings and minimal net accident reductions is dwarfed by the claimed monetised

value to paying Stonehenge visitors, hence the economy, of removing the road and its intrusive noise and visual impact from their vista, as seen in HE's promotional telephoto images.

Rubbernecker's (and all drivers') sightings of *Stonehenge from the A303* are valued at nil, or to be exact not monetised, even though there is pervasive evidence in popular culture that generations of Home Counties families have collective holiday memories of passing Stonehenge. This neglect is helpful for HE's case, because of course the proposed tunnels would put a permanent end to these experiences.

4. Capacity not the primary problem? Tunnels not the optimal solution

HE is not in a position to confirm, deny or quantify the influence or economic impact of rubbernecking in year-round Stonehenge A303 congestion, because it has not investigated it thoroughly outside of its "summer busy days". The models generating the forecast time savings, and the ultimate Net Present Value of benefits, use a starkly binary model of A303 Stonehenge traffic as either "busy (summer)" or neutral. The forecast time savings are ultra-dependent on the number of days declared "busy", because those provoke the big delays.

At very low cost, Highways England can run empirical trials, e.g. using incident screens. As the phenomenon is perennial, this need not wait until next summer. Only about 1.5km of road is involved. For the westbound hillside approach a barrier needs to be either extremely tall or placed on the hatched central divider strip. In any case most of the traffic benefits should be realised even if a brief glimpse of Stonehenge is still possible. However, I am concerned that HE cannot be expected to undermine its flagship project spontaneously or voluntarily, for reasons of organizational culture.

How to prevent rubbernecking *permanently* in such a sensitive cultural and archaeological site and landscape, is for the many stakeholders to debate. Various ways have been suggested: a hedge, fence, wall, dyke, haia or avenue of native trees. A locally lowered roadway as well would moderate the impact. I would advocate a prior archaeological investigation at 100% sampling. Lorry drivers and coach occupants will still be able to see, but the former are regular users and professional drivers with time constraints, while the value to the latter's passengers is economically significant. Any such measure will of course reciprocally improve the calculated extremely valuable visual and acoustic experience of Stonehenge's paying visitors by hiding and muting the traffic.

On accident savings, the tunnels are expected to reduce collisions on the line of A303 in the scheme, but increase them on roads in the model area, by attracting demand. Reducing or eliminating rubbernecking, without dualling, should increase safety but induce less traffic growth.

The approximately £2bn cost of the proposed scheme with its bored tunnels is material. If trials with incident screens cost a hypothetical £5M and mitigating measures £15M (including planting but not archaeology, which should be done anyway) then a low-impact scheme addressing rubbernecking but not officially forecast long-term traffic growth could cost 1/100th of the current proposal, a very significant saving. Whether congestion is

reduced by say 40%, 60% or 80%, the NPV is likely to be very much higher. There may still be a case for a dual carriageway between Winterbourne Stoke and Berwick St James, outside the WHS and where the A303 is narrow and hilly but that should be considered sequentially.

The Mile-a-Minute Expressway is a declared HE aspiration, with large future cost implications as miles of parallel access roads cycle paths and accommodation bridges would be needed for prohibited cycles and slow agricultural vehicles. Claims for putative economic benefits to the Southwest region, from reduced journey times, need to be viewed in the light of the seminal Standing Advisory Committee on Trunk Road Assessment (SACTRA, 1999) report **Transport and the economy** (DETR, London). This highlighted that a highway to a peripheral region is as prone to suck economic benefit out as inject it: “the effects are complex, and may go in different directions sometimes favouring a large central region and sometimes a small peripheral region.”

Highways England asks to draw down some £2bn of public money to further the Expressway programme it is committed to promoting. The A303 single carriageway between Long Barrow and King Barrow is two miles. Drive times and example delays are in this table:

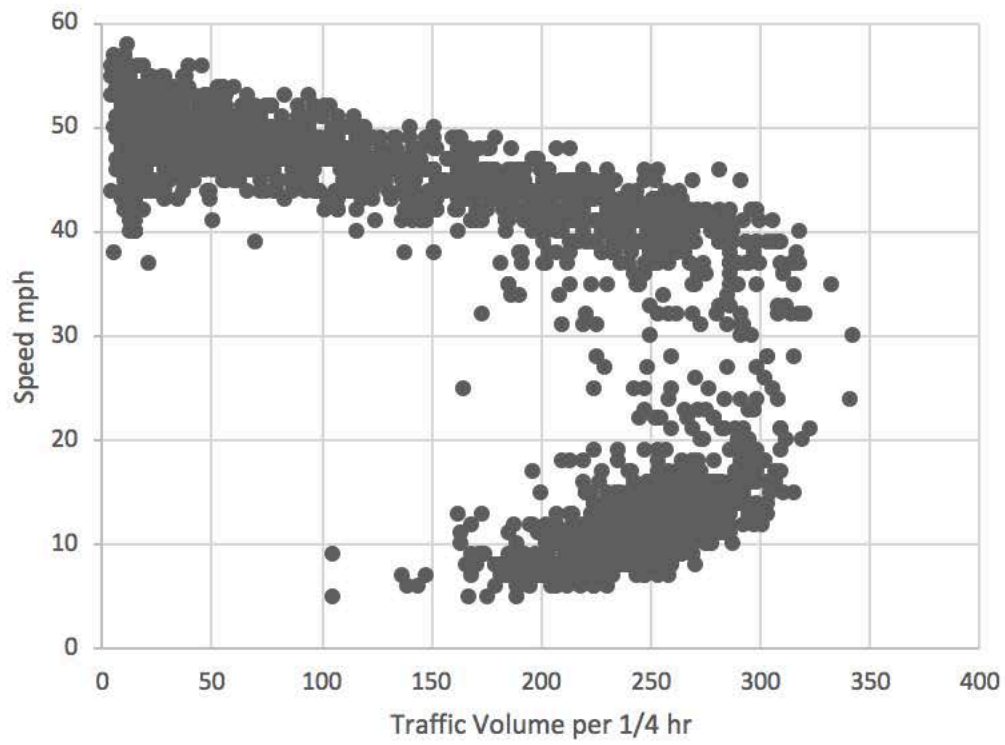
Speed (mph)	Journey time (2 miles)	Delay relative to 60 mph (minutes)
20	6	4
30	4	2
45	3.3	1.7
60	2	0

In context of a commute, delivery, holiday trip or “strategic” journey these differences are not significant in common sense, There is cultural value to a delay that explicitly respects the UK’s foremost prehistoric monument, adding a sense of place and occasion to the drive through the WHS. The very queues demonstrate that holidaymakers’ demand behaviour is inelastic at this location. This section of proposed Expressway would have almost negligible strategic value by itself, so the real bill is the whole-programme cost.

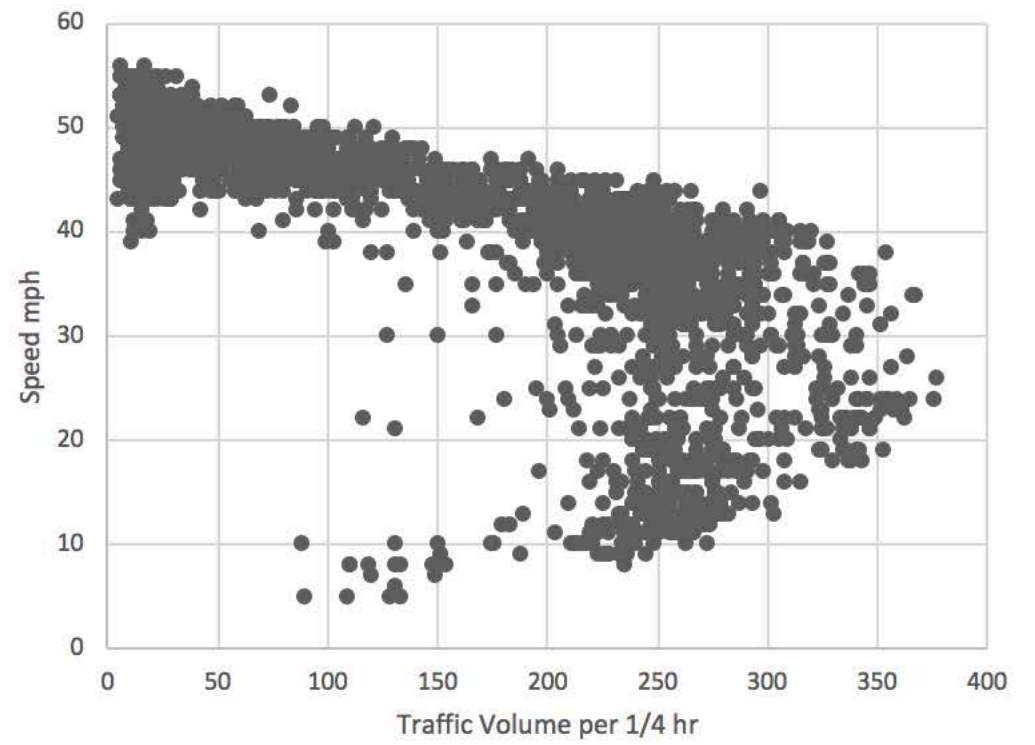
I do not claim that the promoters are telling untruths, when in fact they do not know enough. But I assert that the HE case and EiP report do not tell the *whole* truth. HE applies to draw down billions to *support a programme* that is not settled public policy, the Mile-a-Minute Expressway, in the name of *solving a problem*, congestion at Stonehenge. HE cannot accurately say rubbernecking is not a or the major cause of congestion: it has not been adequately investigated; nor that it is not perennial, on the basis of brief site visits that did not observe it in October 2017. It clearly is year-round, to some unknown degree.

The appropriate and rational course of action is first to invite systematic and objective investigation of the contribution of rubbernecking to the congestion, and the benefits of preventing it as a radical scheme option.

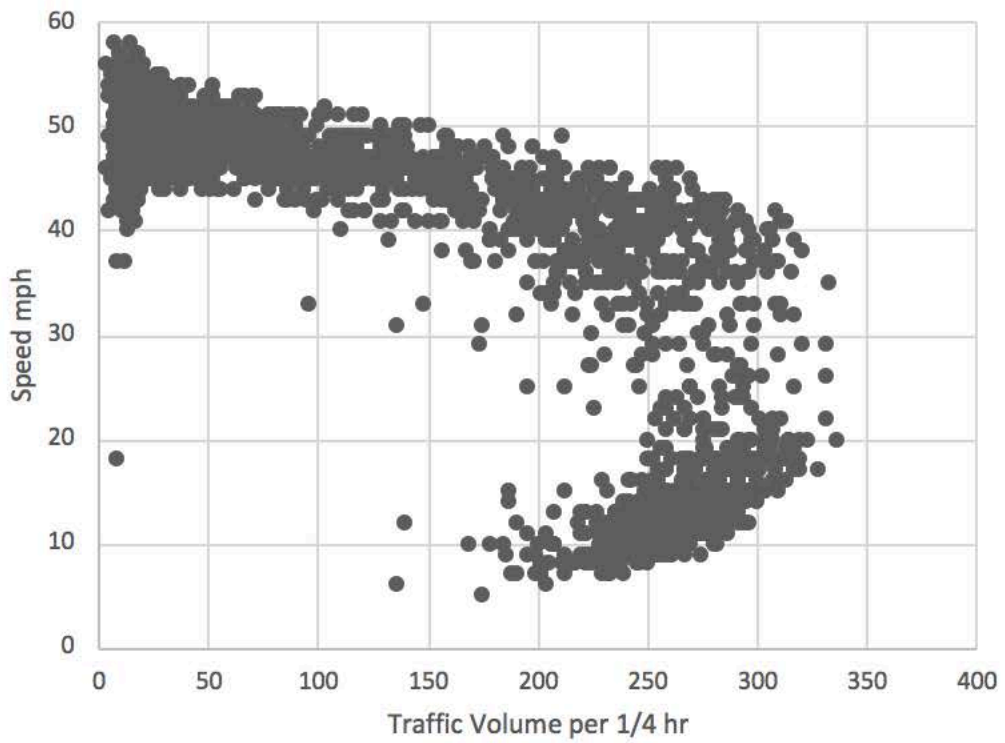
A303 Eastbound July-Aug 2018 Fri-Sat-Sun



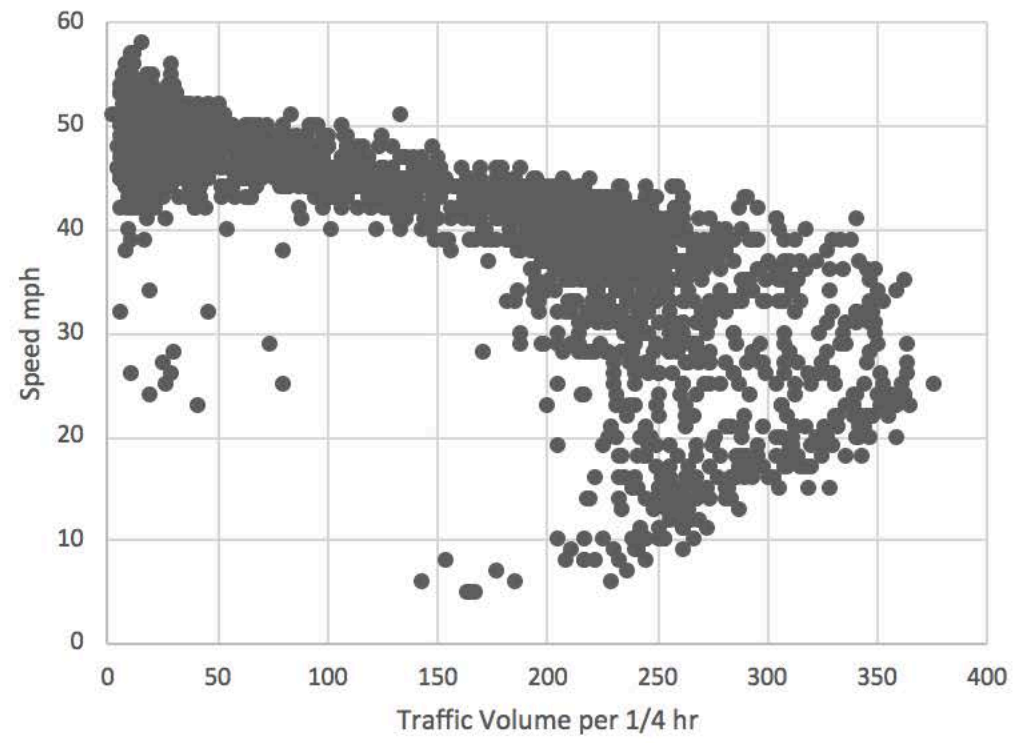
A303 Eastbound July-Aug 2018 Tue-Wed-Thu



A303 Eastbound Sept-Oct 2018 Fri-Sat-Sun



A303 Eastbound Sept-Oct 2018 Tue-Wed-Thu





Stonehenge

4.5 ★★★★★ (31,205)
Historical landmark

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- Save
- Nearby
- Send to your phone
- Share

BUY TICKETS

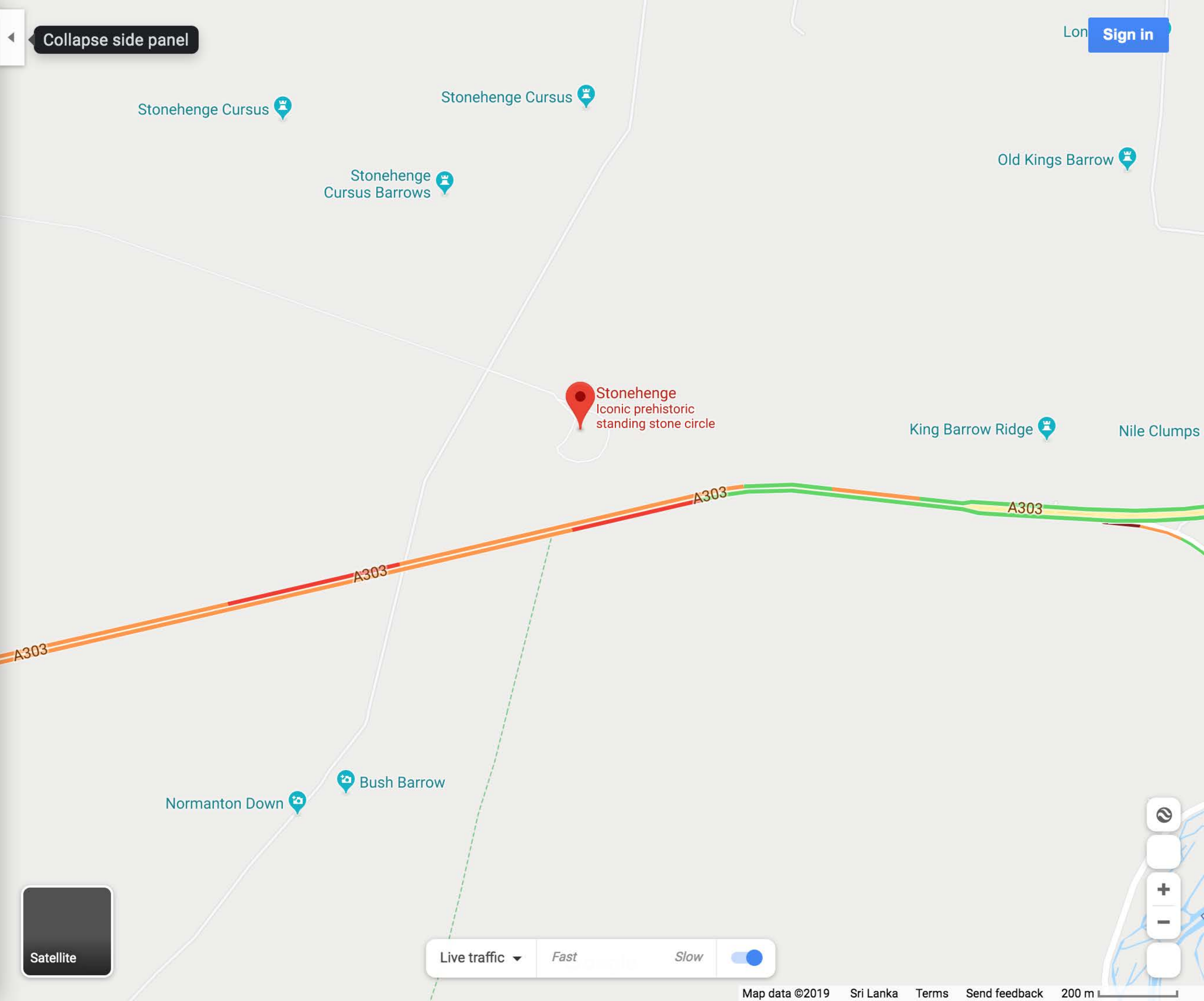
Legendary neolithic monument made using stones transported from Wales and built for unknown purpose.

- Salisbury SP4 7DE, United Kingdom
- 55HF+HG Salisbury, United Kingdom
- english-heritage.org.uk
- +44 370 333 1181
- Closing soon: 9:30AM–5PM

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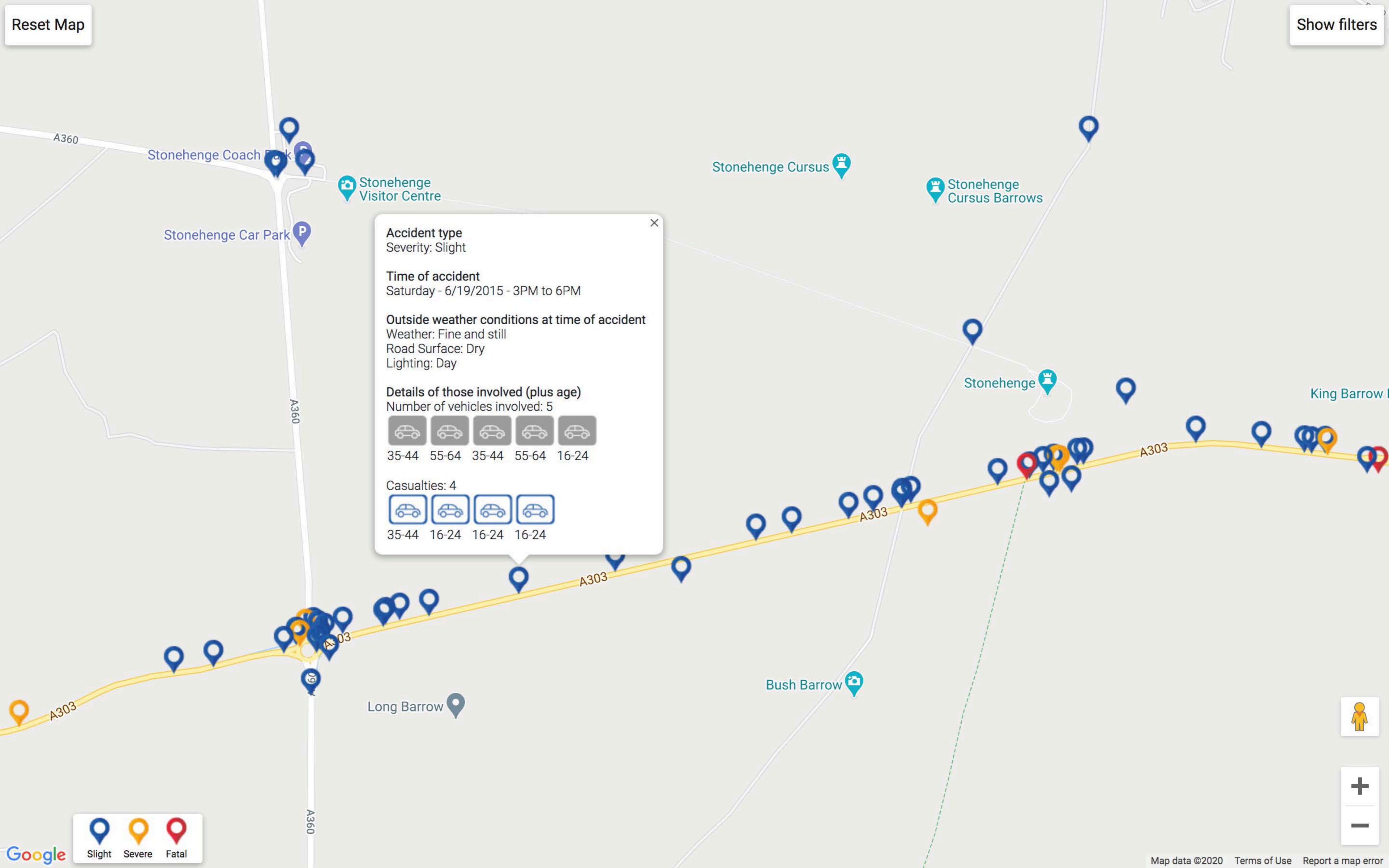


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