Storrington Air Quality Management Area scheme proposals review, June 2022

1 Introduction

This review note has been prepared by officers from Horsham District Council (HDC) and West Sussex County Council (WSCC) for the Storrington Air Quality Steering Group. It reviews the previous measures and assessments undertaken for all the identified measures proposed to address air quality issues in the Storrington Air Quality Management Area (AQMA). This includes traffic management related measures, and other measures as listed below which are drawn from the Storrington Air Quality Action Plan (October 2012), the previously commissioned Ricardo-AEA Traffic Management Feasibility Study (January 2013), other more recent studies, as well as other proposals previously highlighted by the Steering Group. This review is an update from the previous version published in June 2017. Further information about the extent of and the monitoring of air quality within the Storrington AQMA is contained within the Horsham District Council Air Quality Annual Status Reports available to view at: https://www.horsham.gov.uk/environmental-health/air-quality/how-we-monitor-air-quality, however the most recent diffusion tube monitoring information is summarised below.

The document is structured into the following sections:

2 Air quality status in Storrington

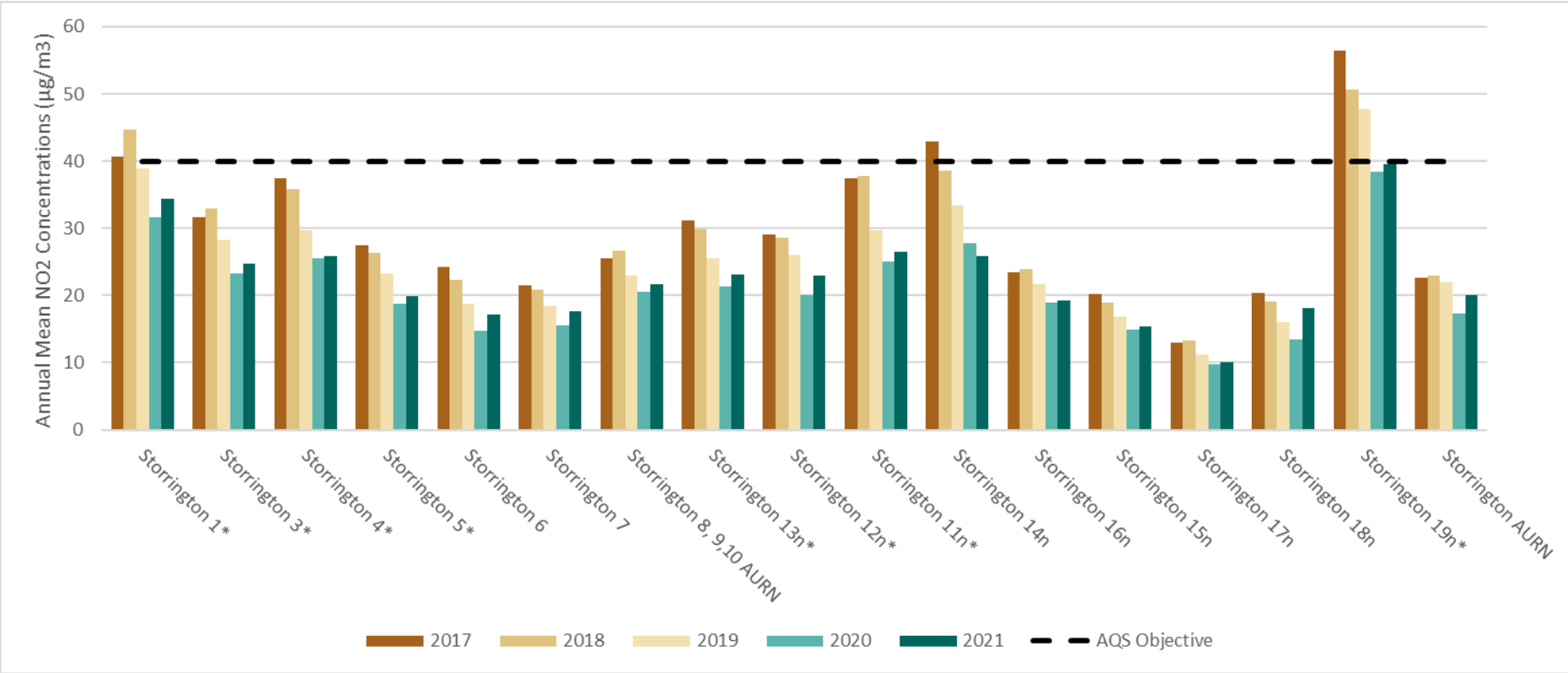
The most recent ratified data (2021) in Storrington shows an increase of 8% in the concentrations across all monitoring sites relative to 2020, but in relation to 2019 (before the pandemic), in 2021 there was an average decrease of 10%. When considering only sites within the AQMA, there was an increase of 7% relative to 2020 and a decrease of 13% in relation to 2019. All sites in Storrington show a descending linear trend for the past five years. The graph below presents the Annual Mean NO_2 concentrations for all sites in Storrington (sites with an asterisk are located within the AQMA).

Table 2.1 — Percentage change of NO_2 in 2019, 2020 and 2021

Site name	From 2019 to 2020	From 2020 to 2021	From 2019 to 2021
Storrington 1*	-19%	9%	-12%
Storrington 3*	-18%	6%	-12%
Storrington 4*	-14%	2%	-13%
Storrington 5*	-20%	6%	-15%
Storrington 6	-21%	16%	-9%
Storrington 7	-15%	13%	-4%
Storrington 8, 9,10 AURN	-10%	6%	-5%
Storrington 13n*	-16%	8%	-10%
Storrington 12n*	-23%	15%	-12%
Storrington 11n*	-16%	6%	-11%
Storrington 14n	-17%	-7%	-23%
Storrington 16n	-13%	2%	-11%
Storrington 15n	-12%	3%	-9%
Storrington 17n	-13%	2%	-11%
Storrington 18n	-16%	35%	13%
Storrington 19n*	-19%	3%	-17%
Storrington AURN	-21%	16%	-9%
Average	**-17%**	**8%**	**-10%**

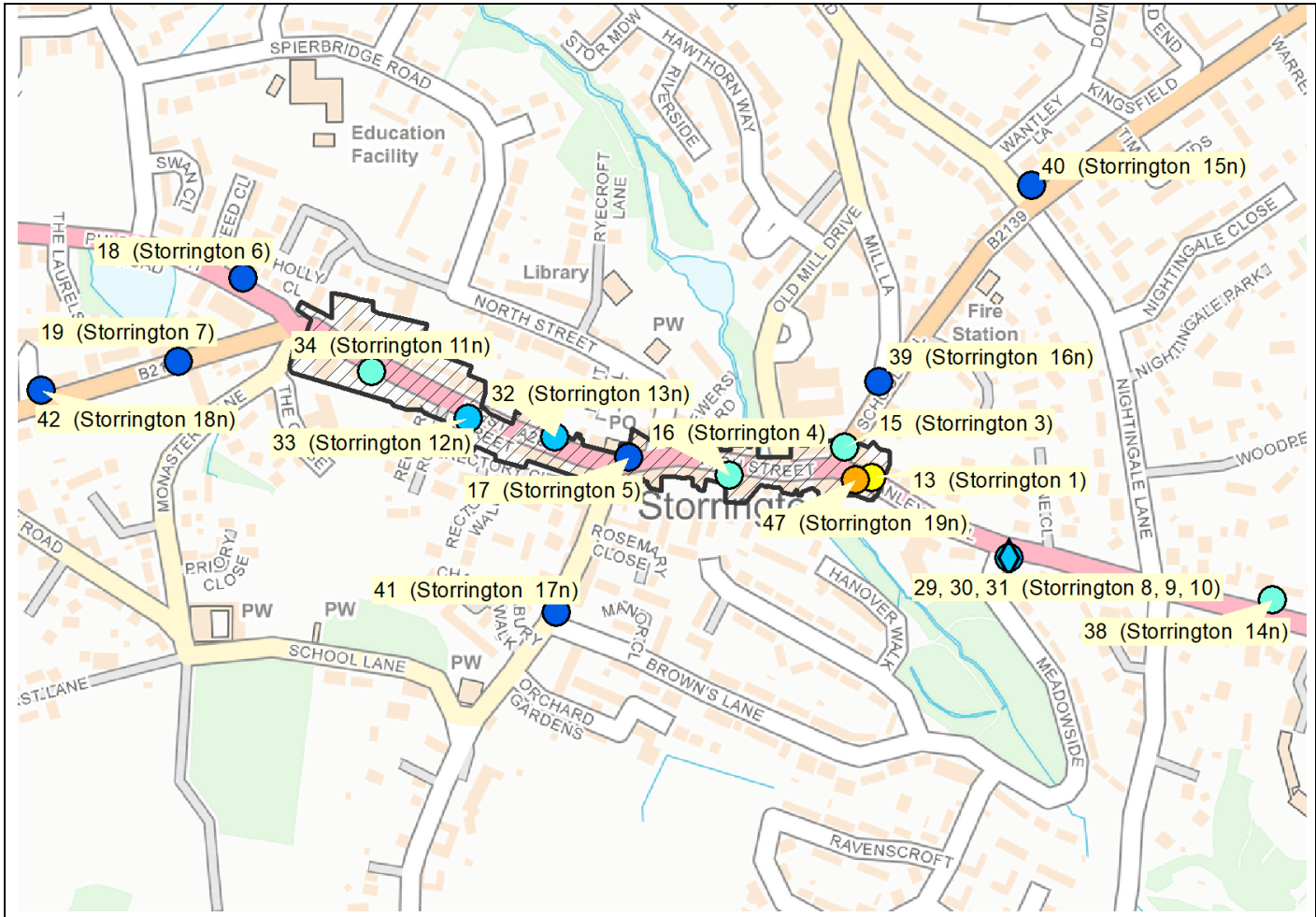
Note: Site names with an asterisk (*) are within the AQMA.

Figure 2.1 – Trends in Annual Mean NO_2 Concentrations: Storrington



Note: Site names with an asterisk (*) are within the AQMA.

Figure 2.2 – Map of Storrington Air Quality Monitoring Stations



NO2 Diffusion Tube Concentration 2021, µg/m3

- 0.0 - 20.0
- 20.0 - 24.0
- 24.0 - 28.0
- 28.0 - 32.0
- 32.0 - 36.0
- 36.0 - 40.0
- 40.0 - 45.0

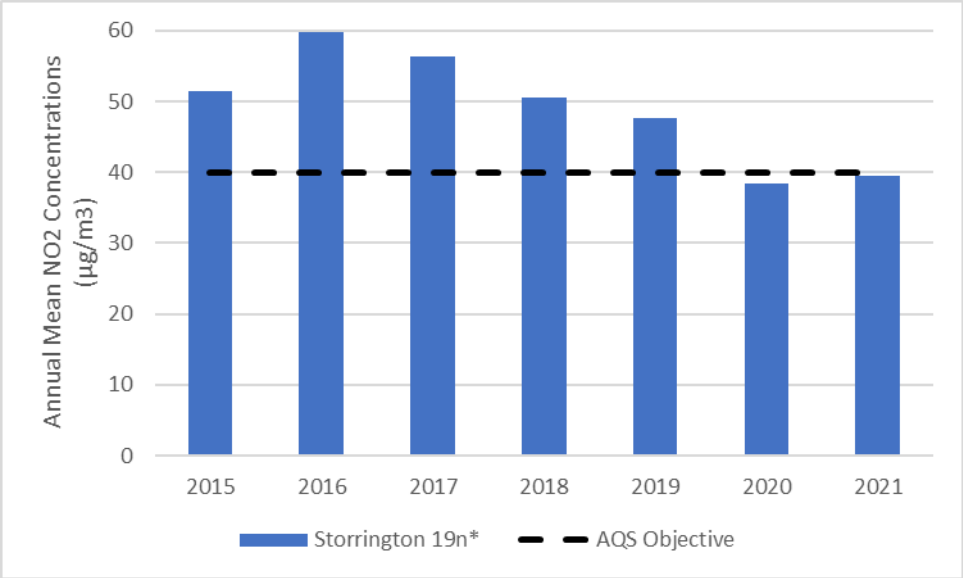
Continuous Monitoring Location 2021

AQMA Boundary

Scale	**Title**
Not To Scale	Map of Storrington Air Quality Monitoring Stations
Date	Figure 2.2
June 2022	

In 2021 Storrington 19n - the worst-case monitoring location in the Storrington AQMA - at the junction of Manley's Hill and School Hill was the only site that measured concentrations within 10% of the annual mean objective, recording 39.6µg/m^3; which shows an increase of 3% in relation to the previous year (2020), but in relation to 2019 there was a decrease of 17%.

Figure 2.3 – Trends in Annual Mean NO_2 Concentrations: Storrington 19n



3 Traffic in Storrington summary

The average total traffic flow in the monitored sites presented below decreased 13% in 2021 when comparing to 2019 data. The site with the most reduction was 00005196 (B2139 Amberley Road) which presented a 21% reduction.

Table 3.1 — Percentage change of traffic in 2019, 2020 and 2021

	From 2019 to 2020	From 2020 to 2021	From 2019 to 2021
00005574	-24%	16%	-12%
00004266	-21%	16%	-8%
00002828	-23%	9%	-16%
00000031	-22%	15%	-10%
00005196	-25%	5%	-21%
Average	**-23%**	**12%**	**-13%**

Figure 3.1 – Annual Average Daily Traffic: Storrington

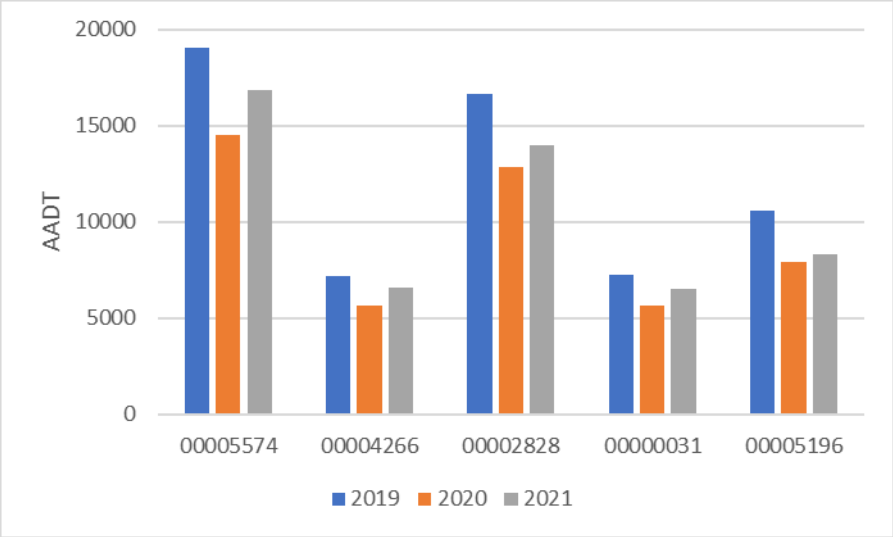


Figure 3.2 – Traffic monitoring site location: Storrington

It should be noted that traffic flows during 2021 were still reduced because of the COVID-19 pandemic, and it remains unclear the extent to which they might reach or exceed pre-COVID-19 flows due to the impacts of working from home, the impacts of rising fuel prices and changes in sustainable transport use.

The continuing long-term trend in reductions in NO_2 concentrations within the AQMA appears to have been driven to a large extent by general improvements in the emissions standards of vehicles but also to some extent by local traffic management related measures, although it is difficult to isolate the impacts of interventions.

This long-term improvement trend is relevant for considering traffic management interventions to solve localized AQMA problems. Significant traffic management measures are unlikely to be justifiable solely on the grounds of addressing exceedances of air quality objectives in Storrington, where these objectives are on the border of being achieved.

4 Progress summary

4.1 Implemented measures

Elements of several specific traffic management measures identified within the 2017 review have now been completed and include the measures summarised below.

4.1.1 Weight restriction on B2139 School Hill

This scheme was completed in Spring 2019 and involves the banning of all goods vehicles over 7.5 tonnes from the B2139 School Hill between the mini-roundabout at A283 Manley's Hill/School Hill and the access to the Mill Lane Car Park (except for access) (Figure 4.1). Lorries turning into School Hill from Manley's Hill were previously identified blocking traffic on Manley's Hill exacerbating congestion on Manley's Hill and School Hill within the AQMA which was believed to add to air quality problems. A scheme to improve the enforcement of breaches of the weight restriction is discussed in the main table review below.

Figure 4.1 – A283 High Street-A283 Manley's Hill-B2139 School Hill junction, Storrington [Image capture: September 2021]

Source: ©2022 Google Street View

4.1.2 Restrictions for goods vehicle loading/deliveries at the junction of North Street/A283 High Street

A scheme was implemented in Summer 2019 to prohibit waiting, loading, and unloading in North Street near the junction with the A283 West Street through the installation of double yellow lines and road signs (Figure 4.2). This was implemented because of concerns about illegal parking at this location resulting in congestion in the High Street impacting air quality within the AQMA.

Figure 4.2 – A283 High Street-A283 West Street-North Street junction, Storrington [Image capture: September 2021]

Source: ©2022 Google Street View

4.1.3 Alteration to parking near to the A283 West St/Pulborough Road/B2139 Amberley Road mini-roundabout

This scheme involved the removal of 2 parking bays on the A283 West St near to the junction with A283 Pulborough Road and B2139 Amberley Road in 2019 (Figure 4.3 and Figure 4.4), which were previously identified as resulting in congestion near to an air quality hotspot within the AQMA. Monitoring of air quality in the vicinity has shown a significant improvement since the parking bays were removed.

Figure 4.3 – A283 West Street (east of A283 Pulborough Road-B2139 Amberley Road junction), Storrington [Image capture: July 2016]

Source: ©2022 Google Street View

Figure 4.4 – A283 West Street (east of A283 Pulborough Road-B2139 Amberley Road junction), Storrington [Image capture: September 2021]

Source: ©2022 Google Street View

4.1.4 Sussex Air Quality Alert service

Air pollution free warning service (website, app, text message) provided by the Sussex Air Quality Partnership (Sussex-air), that sends free messages direct to registered people when air pollution levels increase in their area.

The service is aimed at vulnerable people, schools, health professionals and public who may be adversely affected by air pollution.

Available at: https://sussex-air.net/sussex-air-quality-service-for-sussex/

5 Ongoing measures

Several measures intended to support general improvements in air quality are ongoing, including the progression of proposals in relation to the West Sussex Electric Vehicle Strategy, the promotion of sustainable travel measures and the application of air quality planning policy measures. These measures are summarised in the table below.

The measures that are expected to make the most significant difference to the AQMA in Storrington are continue improvements in the emissions standards of vehicle fleets which are expected to be led by wider National Government intervention and potential improvements to the A27 and the A24 which can encourage longer distance traffic to use these routes rather the A283 through Storrington. The historic settlement pattern of Storrington and practicalities of different interventions means that there are limited other straightforward local solutions to address the AQMA issues in the village. It is recommended that opportunities to support and improve walking and cycling, public transport and low emission vehicle infrastructure are continued to be considered, as well as a watching brief over any other locally identified traffic management improvements e.g. parking and traffic enforcement.

6 Measures review

6.1 List of traffic management related measures reviewed

- (1) Enforcement of breaches of weight restriction for HGVs accessing B2139 School Hill
- (2) Improvements to lorry route signage around Storrington
- (3) Review on-street car parking and loading bay provision and restrictions
- (4) Review two pedestrian crossings along the High Street/West Street
- (5) Amend A283 Manley's Hill/B2139 School Hill junction to a priority T junction
- (6) Mini-roundabout at North Street/High Street
- (7) Use of variable message signage (VMS) on strategic routes outside the village
- (8) Assess the impact of diverting HGV traffic to Old Mill Drive and Mill Lane, rather than School Hill
- (9) Review Car Parking incentives
- (10) Assess impact of Low Emission Zone (LEZ) in Storrington
- (11) Assess impact of imposing a restriction on heavy goods vehicles
- (12) Weight limit restriction on B2139 Houghton Bridge, near Amberley
- (13) Assess impact of changing Old Mill Drive to a shared surface
- (14) Assess impact of re-opening Nightingale Lane
- (15) Assess impact of traffic gating option
- (16) Assess impact on air quality of imposing a 20mph speed restriction through the centre of the village
- (17) Assess impact of a wider 20mph speed limit or other traffic management measures
- (18) Improvement of the A27
- (19) Strategic improvements to the A24 Worthing-Horsham corridor

- (20) Access improvements to Arun Valley Rail stations

6.2 List of other measures reviewed

- (21) The development of a local Air Quality Planning Policy Guidance document
- (22) Low emission vehicles
- (23) Bus and community transport services
- (24) Travel plans
- (25) Freight deliveries
- (26) 'Storrington in Bloom'
- (27) Walking and Cycling Measures

6.3 Next steps conclusions scoring definitions

Measures have been assessed based on their anticipated air quality benefit for the Storrington AQMA on a low/medium/high (L/M/H) basis. Next step recommendations are provided in relation to each measure for the Steering Group, based on the red-amber-green scoring definitions below. Please note that few of the schemes are marked 'green'. This is because few schemes have been identified which have both an obvious air quality benefit and are clearly deliverable without significant challenges.

Scheme has a clear air quality benefit and appears to be deliverable. Scheme should be investigated further.

Scheme appears that it may have an air quality benefit, however the scale of this benefit is unknown, and/or the deliverability of the scheme is unclear. The scheme could potentially be investigated further

Scheme is expected to have little or no expected air quality benefit and/or is not viable

Scheme is being developed through other delivery mechanisms

6.3.1 Assessed Traffic Management Measures

	Scheme	Description	What do we know about this scheme?	What are the main issues associated with this scheme?	Anticipated AQMA air quality benefit (L/M/H)	Next steps recommendations	Supporting Evidence references
1	Enforcement of breaches of weight restriction for HGVs accessing B2139 School Hill	Installation of CCTV equipment at the mini-roundabout of School Hill and Manley's Hill to enforce the weight restriction for lorries using School Hill.	- It follows the Neighbourhood Wardens having witnessed several breaches of the restrictions since the prohibition signs were installed.	- This weight restriction was completed in Spring 2019 and involves the banning of all goods vehicles over 7.5 tonnes from the B2139 School Hill between the mini-roundabout at A283 Manley's Hill/School Hill and the access to the Mill Lane Car Park (except for access). - There are challenges with enforcement. Local Transport Authorities can now apply for 'Part 6' powers to enforce 'moving traffic offences' which would include Traffic Regulation Order breaches such as in relation to this weight restriction. WSCC is reviewing the practicalities of applying for these enforcement powers, including the business case for back-office arrangements for enforcement before considering what sites would be most appropriate to enforce.	Unknown but expected low relating to prevention of congestion resulting from occasional incidences of lorry turning movements at junction	In 2022 WSCC is undertaking a review of the original scheme (three years since implementation) examining a number of lines of enquiry related to sign visibility, additional sign deployment, review of sign text size and undertaking suitable surveys in School Hill to assess extent of non-compliance.	
2	Improvements to lorry route signage around Storrington	Possible improvements to advisory lorry route signage, particularly regarding access from Washington Road to the east of Storrington	- Advisory signage already exists for lorry traffic entering Storrington from the A283 Washington Road needing to access "Water Lane Trading estate", whilst all traffic for West Chiltington and Thakeham are advertised to use Water Lane. - A voluntary agreement exists for Waitrose deliveries to access Waitrose via Water Lane, Thakeham Road, and School Hill, and signs have been installed to support this.	- WSCC is undertaking a review in 2022 of the effectiveness of current signs in relation to the lorry routing in particular to the east of Storrington, and also in relation to the weight restriction on School Hill highlighted above. - The potential to rename the local centre (Old Mill Square) to assist with signing deliveries to the centre of the village is being discussed.	Unknown but expected low	WSCC is undertaking a review in 2022 of the effectiveness of current signs in relation to the lorry routing in particular to the east of Storrington, and also in relation to the weight restriction on School Hill highlighted above.	
3	Review on-street car parking and loading bay provision and restrictions	Possible re-designation of on-street car parking spaces as dedicated loading bays, to reduce number of goods vehicles stopping on the carriageway; or further amendments to loading arrangements; or timing restrictions.	- Two areas of investigation fall under this measure: re-designation of parking bays, and clearer or amended no-parking restrictions and enhanced parking control enforcement - Further detailed evaluation could be considered to understand the causes of congestion through the High St/West St related to the interactions of the pedestrian crossings, junctions, parking and deliveries. The scheme could entail re-designation of on-street car parking spaces as dedicated loading bays, to better manage arrangements for goods vehicles stopping on the carriageway. - West Sussex County Council has a programme of reviews in relation to on-street parking management it is undertaking across larger towns across West Sussex and a light touch	- The potential impact of congestion related air quality issues associated with deliveries and parking is not known - Potential sensitives regarding changes to availability of parking. - The need to meet the needs of local businesses requiring deliveries. - Progression of a parking review for Storrington would be dependent on the availability of a local funding resource, as the county's current programme resources (and hence funding resources) are allocated elsewhere.	Unknown but likely low as an isolated measure	A more detailed air quality assessment of changes to and re-designation of parking-bays and loading bays could be investigated further. Progression of a review will likely require local support and identification of resource to support this.	Storrington Air Quality Action Plan (October 2012) - Congestion Improvement Measures

	Scheme	Description	What do we know about this scheme?	What are the main issues associated with this scheme?	Anticipated AQMA air quality benefit (L/M/H)	Next steps recommendations	Supporting Evidence references
			version of this could be an avenue through which to progress this evaluation further.				
4	Review two pedestrian crossings along the High Street/West Street.	Review two pedestrian crossings along the High Street/West Street to establish whether there is any benefit in coordinating the timings of the red signal.	- Both crossings have previously been upgraded to Puffin crossings. They use kerbside detectors to cancel demands on the crossing no longer required (if a person crosses before the green man lights). - The crossings were linked in 2015 to limit when the crossings change to the pedestrian stage, to the same point each minute to minimise the frequency which vehicles are stopped. - The crossings do not include microprocessor technology (Microprocessor Optimised Vehicle Actuation - MOVA) which is a system that can optimise the operation of traffic signals. The challenge with this type of advance operation at these crossings, is the slow speed of traffic approaching and gaps which are left between queuing vehicles. It is possible that due to the slow speeds generally experienced with queuing traffic, that the frequency which the pedestrian stage appears, would increase, as the controller would identify more gaps in the traffic.	The potential of introducing MOVA signal control for the crossings has been considered but it is not thought that meaningful benefit could be achieved by introducing MOVA technology.	- Limited	- A watching brief to be kept over technology enhancements but MOVA technology is not recommended at this time.	Storrington Air Quality Action Plan (October 2012) - Congestion Improvement Measures
5	Amend A283 Manley's Hill/B2139 School Hill junction to a priority T junction	- Amending the priorities at this junction to a priority T junction to improve traffic flows on Manley's Hill	- Amending the junction priority to a priority T junction with School Hill traffic needing to give way to Manley's Hill traffic could improve traffic flows on Manley's Hill which is a hotspot for air quality problems within the AQMA.	- This would be expected to result in significant peak time traffic queues on School Hill, and potential other consequences for air quality along School Hill. - Visibility from a give way line on School Hill to the left-up Manley's Hill for right turn traffic movements into the High Street appears limited so this could raise safety concerns. - There could be a contradiction in this and other measures which then make it easier for traffic to move along the A283 through Storrington and potentially attract more vehicles to use this route for longer distance trips e.g. using the B2139 through Amberley and A283 through Storrington between the A27 at Fontwell and the A24 at Washington, rather than using the County Strategic Road Network via the A27, A280 and A24.	Medium-High benefit for Manley's Hill, but negative impact on School Hill resulting in assumed neutral overall change	It is not recommended that this proposal is explored further	
6	Mini-roundabout at North Street/High Street	- A new mini-roundabout at North Street/High Street could help to improve traffic flows at this junction, by enabling westbound traffic on the High Street to turn more easily into	- A new mini-roundabout at North Street/High Street was considered in the previous Waitrose Store Extension plans. - The final Sept 2012 air quality assessment report	There are several known issues associated with implementing a mini-roundabout at North Street/High Street junction which include: - A potential reduction in the ease of pedestrians	Unknown but expected Low-Medium	The scheme did not meet threshold criteria for progression on the WSCC Infrastructure Works Programme list of projects (2017/18). The scheme showed a negative impact on traffic flow	Air Quality Assessment: Waitrose Extension, Storrington (September 2012)

	Scheme	Description	What do we know about this scheme?	What are the main issues associated with this scheme?	Anticipated AQMA air quality benefit (L/M/H)	Next steps recommendations	Supporting Evidence references
		North Street.	for this Waitrose scheme concluded that (page 8, para 3.6) 'the proposed development includes a new mini-roundabout at the North Street junction. This will assist westbound vehicles turning right into North Street and will help to reduce westbound queuing along the High Street and back to Manley's Hill, thereby reducing congestion through the village. It is logical to assume there would be a small improvement (i.e. an increase in speeds); this would serve to further reduce emissions of NOx'. - The main problems with traffic related air pollution relate to westbound traffic travelling down Manley's Hill needing to give way to traffic coming down School Hill at the School Hill/Manley's Hill mini-roundabout and also the stop-start nature of traffic through the High Street and West Street due to the regular calls at the two pedestrian crossings and vehicles parking. Within this context, the relative scale of benefits resulting from the mini-roundabout scheme appear more limited.	crossing North Street adjacent to the junction due to the widening of the junction which would be necessary to facilitate the introduction of the mini-roundabout. - There is believed to be utility provision under the carriageway on North Street immediately adjacent to the junction. If this is the case, this is likely to significantly increase the costs of any scheme (initially estimated in the order of £40k). - No consideration appears to have been made to date of the potential air quality impact of this measure on eastbound traffic approaching the junction from West Street. Whilst the scale of this potential impact appears more limited, this should also be considered.		and scored low on pedestrian safety and low on environmental benefits. It is not recommended that this scheme is a priority for future progression	
7	Use of variable message signage (VMS) on strategic routes outside the village.	- Use of variable message signage (VMS) on strategic routes outside the village to discourage through traffic during periods of congestion within the AQMA.	- Congestion on the A27 through Arundel and Worthing/Lancing is believed to result in some longer distance traffic routing through Storrington. - Various scenarios were assessed by Ricardo-AEA to consider the potential impact of using VMS on strategic routes outside of Storrington to discourage through traffic during periods of congestion within the AQMA. - It is difficult to quantify how much of an effect improved signage would have on the number of vehicles passing through Storrington. The effect of 'improved signage' has been modelled for three indicative sub-scenarios each representing a potential reduction in the number of vehicles that enter the village but do not stop. The sub-scenarios modelled were: a) 10% reduction in through traffic b) 25% reduction in through traffic c) 50% reduction in through traffic - The results indicated that a 10% reduction in through traffic resulted in a decrease of 1.1-1.4	- Realistic alternative routings to the north via the A24, A272 and A29/A284 or to the south via the A29, A27 and A280/A24 are significantly longer diversions to the route for medium distance traffic flows between Pulborough or Whiteways Cross (A29/A284/B2139 junction) and Washington roundabout (A24) which appear to be the logical positioning of any VMS. - It is unlikely that VMS signs further away from Storrington at locations on the National Highways trunk road network where drivers route choices would be made - i.e. Fontwell on the A27 or the A23 dedicated specifically to congestion though Storrington - would be practical or acceptable because of the myriad of strategic traffic flow routes that pass these locations. - Improvements to the A27 are believed to have the potential to result in a much more significant impact in influencing the behaviour of long distance 'through traffic' drivers than VMS. - It appears very unlikely that a 10% reduction in traffic flows could be achieved by this measure, and any impact is expected to be very low.	Unknown but expected low	- As the impact of this measure is expected to be very low, it is not recommended that this measure is investigated further.	Traffic Management Feasibility Study: Ricardo-AEA Storrington Traffic Management Options Appraisal. Air Quality Assessment (January 2013)

	Scheme	Description	What do we know about this scheme?	What are the main issues associated with this scheme?	Anticipated AQMA air quality benefit (L/M/H)	Next steps recommendations	Supporting Evidence references
			µg/m3 on Manley's Hill near the Manley's Hill/School Hill mini-roundabout. - The other scenarios would provide more improvement. - However, the report notes (page 35) that 'It is difficult to quantify how much of an effect improved signage would have on the number of vehicles passing through Storrington'. The assessment does not provide any firm assessment of where through traffic diverted from Storrington would be encouraged to divert to because of installation of VMS.				
8	Assess the impact of diverting HGV traffic to Old Mill Drive and Mill Lane, rather than School Hill	To remove problems associated with HGV turning movements at the School Hill/Manleys Hill junction, diverting School Hill HGV traffic to use Old Mill Drive and Mill Lane has been suggested	- This scheme has not been assessed specifically in air quality terms.	- The complex nature of this alternative route (3 additional junctions) and the narrow nature of Mill Lane means that this routing is likely to be an undesirable alternative to School Hill. - This scheme is superseded by the weight restriction introduced on School Hill and the alternative routing of HGVs promoted via Water Lane.	Unknown	This alternative routing is not believed to be desirable and is not recommended for further investigation.	
9	Review Car Parking incentives	Car Parking Standards: Preferential parking for low emission vehicles within AQMA. Graduated price parking permits (based on emission bands).	- Off street car parking tariffs are set by Horsham District Council and those currently do not differentiate between vehicles. - There are no on-street parking permits or charging in Storrington on which to base incentivisation of parking for low emission vehicles.	- The level of future uptake of low emission vehicles and associated charging infrastructure is difficult to predict. - Levels of impact on Storrington are likely to be limited in the short term, however this measure could form part of wider promotion of low emission vehicles which are expected to have an increasingly bigger impact going forward.	Unknown but expected to be low.	The proportion of low emission vehicles across the vehicle fleet is expected to increase and HDC is keen to explore offering subsidised or free parking in Mill Lane and North Street car parks to zero emission capable vehicles subject to s106 funding.	Storrington Air Quality Action Plan (October 2012) - Promotion of Alternative Transport Options
10	Assess impact of Low Emission Zone (LEZ) in Storrington	The LEZ would limit access to the village for specific vehicle types not meeting minimum specified emission standards (e.g. Euro V). A scenario was previously considered where access to the AQMA was restricted so that the vehicle classes met the following standards in 2015: • Rigid HGVs : Euro V or better • Articulated HGVs: Euro V or better • Buses: Euro V or better	- The proposed LEZ would restrict all HGV's of pre–Euro V classification from entering the village. The model predictions indicated that an access restriction on Bus and HGV to Euro V or better could help achieve compliance with the NO_2 annual mean objective at all locations within Storrington. It was also noted however that Euro V HGV's NOx emitted, on average greater quantities of NOx than Euro IV HGV's at low speeds. - The model predicted a decrease in the NO_2 concentrations of about 2-3 µg/m3 on West Street and about 7-9 µg/m3 on Manley's Hill near the mini-roundabout.	- The trial was undertaken over the period 2014-2016 in partnership with Siemens UK using their Greenzone low emission zone solution. - The scheme could not go ahead due to the Greenzone system not operating well in a rural setting. Signal reception problems affected the system resulting in significant loss of data, whilst there were also problems with the categorisation of vehicles into Euro standard categories. - It is not known whether previous data collection problems would now be resolved due to advances in technology. - Additional considerations were needed to be	Expected Medium-High	It is recommended that other measures such as improvement to the A27 and A24 routes to encourage strategic longer distance traffic flows to use these routes, and potential other traffic management measures are considered ahead of revisiting this measure.	Traffic Management Feasibility Study: Ricardo-AEA Storrington Traffic Management Options Appraisal. Air Quality Assessment (January 2013)

	Scheme	Description	What do we know about this scheme?	What are the main issues associated with this scheme?	Anticipated AQMA air quality benefit (L/M/H)	Next steps recommendations	Supporting Evidence references
				given to the practical enforceability of any LEZ restrictions, whether exemptions were needed for local access, and the impacts of the LEZ on local businesses and the local community. It is expected that there would still remain significant challenges with the practical enforcement of any restrictions and exemptions required for local access even if technological issues were overcome.			
11	Assess impact of imposing a restriction on heavy goods vehicles	Discouraging or preventing heavy goods vehicles accessing the village by means of access restrictions, either by way of height or weight, at strategic locations outside the village was also considered by Ricardo-AEA. This is a more extreme version of the LEZ considerations.	- Four sub-scenarios were modelled to represent varying percentage reductions in HGV traffic passing through Storrington in 2015 as follows: • 25% reduction in HGV • 50% reduction in HGV • 75% reduction in HGV • 100% reduction in HGV - The results indicated that a 25% reduction in HGVs entering Storrington resulted in a decrease of 2-3 µg/m3 on Manley's Hill near the Manley's Hill/School Hill mini-roundabout, however a 75% reduction was needed to achieve compliance with the 40 µg.m3 NO_2 annual mean objective at all locations.	- Implementing general access restrictions on all HGV vehicle movements through Storrington would be extremely difficult to deliver and enforce. In order to retain viability of businesses in Storrington arrangements would need to be made for smaller vehicles to undertake deliveries, which creates specific logistical problems for those businesses. In addition consideration needs to be given to how lorries could access businesses on the fringe of Storrington and further beyond, and the impact that rerouting of such vehicles has on other communities.	High	As it appears very unlikely that it will be possible to implement or enforce this proposal, it is not recommended that this measure is a focus of Steering Group further investigation going forward.	Traffic Management Feasibility Study: Ricardo-AEA Storrington Traffic Management Options Appraisal. Air Quality Assessment (January 2013)
12	Weight limit restriction on B2139 Houghton Bridge, near Amberley	Suggestions have been highlighted to impose a weight limit on the B2139 at Houghton Bridge.	- There is currently a height restriction of 13ft on this road at the Amberley Station railway bridge. - Neither the B2139 nor the A283 through Storrington are part of the West Sussex Advisory Lorry Route network. - The need to impose a weight limit on the B2139 at Houghton Bridge has been investigated. The condition of the bridge is under regular review by West Sussex County Council in accordance with the County Council's structures inspection strategy and this has not identified a technical reason to impose a weight restriction on this bridge to date.	- The only restriction which could be implemented is a general route restriction between the A29/A284/B2139 junction at Whiteways Cross and Storrington. - This restriction is not believed to be enforceable at this large route scale due to the exemptions that would be required for local access (local buses, farm vehicles, deliveries, etc).	Expected low/medium	There is no technical reason to impose a weight restriction on the B2139 at Houghton Bridge, A general weight restriction is very unlikely to be enforceable at this scale due to exemptions required for local access.	
13	Assess impact of changing Old Mill Drive to a shared surface	Horsham District Council previously considered a partial closure of Old Mill Drive as part of a regeneration scheme for an existing shopping precinct area. It was agreed that the impact of this proposal should be tested by Ricardo-AEA.	- Results were presented at specified receptors on Old Mill Drive and School Hill only as there was no change in predicted concentrations at any of the other receptors. - The results indicated that annual mean NO_2 concentrations increased by up to 1 µg/m3 at some of the specified receptor locations on School Hill but were still below the 40 µg/m3	- The restriction of traffic on this road would necessitate the redistribution of up to 1600 vehicles per day onto adjoining roads within the AQMA. - Restricting buses from using Old Mill Drive would mean that an alternative bus stop would be required somewhere on the High Street. This would contribute to congestion and traffic	No benefit	The results of the feasibility study and Waitrose Extension assessments have shown that the scheme is unlikely to result in air quality improvements within the Storrington AQMA.	Traffic Management Feasibility Study: Ricardo-AEA Storrington Traffic Management Options Appraisal. Air Quality Assessment (January 2013)

	Scheme	Description	What do we know about this scheme?	What are the main issues associated with this scheme?	Anticipated AQMA air quality benefit (L/M/H)	Next steps recommendations	Supporting Evidence references
		The following scenarios were considered: a) All Buses + HGV removed from Old Mill Drive - average speed reduced to 10 mph - 25% of traffic re-routed to School Hill. b) All Buses + HGV removed from Old Mill Drive - average speed reduced to 10 mph - 50% of traffic re-routed to School Hill. c) All Buses + HGV removed - average speed reduced to 10 mph - 75% of traffic re-routed to School Hill.	objective. The highest concentration was predicted for a receptor in School Hill (near the Manley's Hill/School Hill mini-roundabout) at 36.4 µg/m3 for scenario c) - increasing from the base of 35.8 µg/m3. The concentrations in Old Mill Drive were predicted at about 12 µg/m3. - The impact of this proposal was therefore not considered to be significant in air quality terms. - Separate assessment was also undertaken as part of the original submission air quality assessment for the Waitrose extension concerning closing Old Mill Drive to all traffic. - This predicted annual mean NO_2 concentrations to increase by up to 0.6 µg/m3 on Manley's Hill near the mini-roundabout and decrease by 0.1-0.3 µg/m3 on the High Street. Receptors at School Hill were shown to increase in the range 1.6-2.3 µg/m3.	queuing on the High Street as stopping buses would block westbound traffic; it may also however help reduce congestion as it will reduce the number of buses and HGVs stopping and waiting to turn right onto Old Mill Drive, and hence holding up westbound traffic when approaching from the east. The effects this may have on congestion on the High Street are difficult to quantify.			Air Quality Assessment: Waitrose Extension, Storrington (October 2011)
14	Assess impact of re-opening Nightingale Lane	- Nightingale Lane is a residential road linking Manley's Hill and School Hill. The road was closed approximately 40 years ago on safety grounds. Ricardo-AEA assessed whether re-opening the road to some vehicles would offer an opportunity to alleviate congestion at the School Hill/Manleys Hill junction.	- It was proposed to re-open Nightingale Way to cars and light goods vehicles only. - The assessment predicted reductions of up to 0.7 µg/m3 in NO_2 annual mean concentrations (0.7 µg/m3 reduction for the mini-roundabout of Manley's Hill and School Hill).	- As Nightingale Road was originally closed to through traffic on safety grounds, this would still be an issue if this road were to be reopened. - The impact on local residents of Nightingale Road would be a key consideration.	Low	As the road was originally closed on safety grounds, and the anticipated air quality benefits are low, it is not recommended that scheme is investigated further.	Traffic Management Feasibility Study: Ricardo-AEA Storrington Traffic Management Options Appraisal. Air Quality Assessment (January 2013)
15	Assess impact of traffic gating option	Controlling traffic flow through the Storrington AQMA by means of traffic light 'gates' outside the village. The likely effect of the gating options on congestion in the town is not known; therefore, four sub-scenarios were modelled by Ricardo-AEA to represent varying percentage reductions in congestion times in 2015: a) 25% reduction in queuing during each hour when congestion is known to occur	- The results indicated that a 25% reduction in queuing resulted in a decrease of 3-4 µg/m3 on Manley's Hill near the Manley's Hill/School Hill mini-roundabout. The other scenarios would provide even more improvement. - The report recommended consulting a traffic engineer for additional assessment of how effective 'gating' can be at reducing congestion in Storrington. - Subsequently the implementation of the scheme was investigated, however concerns were raised by Sussex Police.	- Concerns have been raised that this is not practical to implement, because it would be confusing for drivers, and would be likely to lead to driver non-compliance and 'rat running' if long-red phases would be needed to restrict movements. - The study did not conclude whether it would be possible to achieve the theoretical levels of queuing through the village that it assumes.	Medium-High	As it appears very unlikely that it will be possible to implement this proposal, it is not recommended that this measure is a focus of Steering Group further investigation going forward.	Traffic Management Feasibility Study: Ricardo-AEA Storrington Traffic Management Options Appraisal. Air Quality Assessment (January 2013)

	Scheme	Description	What do we know about this scheme?	What are the main issues associated with this scheme?	Anticipated AQMA air quality benefit (L/M/H)	Next steps recommendations	Supporting Evidence references
		b) 50% reduction in queuing during each hour when congestion is known to occur c) 75% reduction in queuing during each hour when congestion is known to occur d) 100% reduction in queuing during each hour when congestion is known to occur					
16	Assess impact on air quality of imposing a 20mph speed restriction through the centre of the village	Ricardo-AEA study investigated whether imposition of a 20mph speed restriction through the AQMA would improve air quality by smoothing flow and reducing congestion.	- Ricardo-AEA considered it unlikely that imposing a 20mph speed limit on the AQMA would lead to an improvement in air quality. Numerical model predictions were not included for this scenario. - The average speed of the current traffic through the Storrington AQMA was considered to be around 20mph during free-flowing periods and less than 20mph during busy periods; this is mainly due to congestion caused by vehicles reducing speed or stopping to allow other vehicles to park/turn. Ricardo-AEA concluded that if traffic in the town centre could flow freely at an average speed of 25 to 30 mph this would give rise to lower vehicle emissions of nitrogen oxides than at 20mph.		None	No predicted improvement in air quality, so not recommended in air quality terms.	Traffic Management Feasibility Study: Ricardo-AEA Storrington Traffic Management Options Appraisal. Air Quality Assessment (January 2013)
17	Assess impact of a wider 20mph speed limit or other traffic management measures	Assess impact of a wider 20mph speed limit or other traffic calming infrastructure throughout Storrington to reduce the attractiveness of Storrington for through traffic.	- A wider 20mph speed limit throughout the village, or other physical traffic calming infrastructure (for example priority flow narrowing) could help to discourage through traffic by extending journey times.	- Installation of 20mph speed limits on approach roads to the centre of the village will need to be in accordance with WSCC Speed Limit Policy. The West Sussex Transport Plan 2022-2036 notes that WSCC is committed to a review of the Speed Limit Policy. - Any proposals for physical traffic calming measures on main routes into Storrington would need to also consider other unintended localised traffic consequences such as rat running to less appropriate residential streets or rural lanes. - Timing of delivery of Storrington traffic management measures is likely to be a key consideration, due to current traffic pressures through Arundel. This is likely to mean Storrington traffic management measures will need to be delivered after A27 Arundel improvements are in place. - Proposals for physical traffic calming would likely need to be the subject of a community highways scheme application and would need to be	Low	Strategic improvements to the A27 and A24 routes to encourage strategic longer distance traffic flows to use these routes are the current strategic priority for available resource to support transport network improvements in the area. However, a locally funded and managed feasibility study of Storrington traffic management measures, including to understand the level of community support for interventions could be an avenue through which to explore this.	

	Scheme	Description	What do we know about this scheme?	What are the main issues associated with this scheme?	Anticipated AQMA air quality benefit (L/M/H)	Next steps recommendations	Supporting Evidence references
				considered in line with county policy, consultation with local councillors and the community, and available funding.			
18	Improvement of the A27	- A27 Arundel and Worthing/Lancing improvements	A27 improvements are expected to reduce traffic flows through Storrington where longer distance traffic is understood to avoid the A27 due to congestion.	- National Highways undertook a statutory consultation on the Arundel bypass preferred route for the scheme in early 2022. Following review of consultation responses, a development consent order application for the scheme is expected to be submitted in 2022, with a decision to be made about implementation of the scheme by the Secretary of State between 2023 and 2024. With regard to Worthing and Lancing improvements, National Highways is expected to consult on potential options that have been under review in autumn 2022. The Worthing-Lancing options are expected to be relatively low cost and impact in comparison to the Arundel scheme.	Unknown but expected medium	- If approved, construction of the Arundel bypass scheme is currently scheduled to commence in 2024 with completion scheduled for 2027. - National Highways are expected to consult on options for the A27 Worthing and Lancing scheme during autumn 2022.	Storrington Air Quality Action Plan (October 2012) - Road Infrastructure Improvements A27 Arundel Bypass Statutory Consultation January 2022
19	Strategic improvements to the A24 Worthing-Horsham corridor	- Improvements to junctions on the A24 corridor.	- WSCC has undertaken a feasibility study of the A24 corridor between Worthing and Horsham including a package of traffic junction and sustainable transport measures. This includes proposals for potential junction improvements at Findon, Washington, Buck Barn and Hop Oast which together with proposals for the A27 at Arundel ad Worthing/Lancing are intended to encourage longer distance traffic flows to stay on the A27, A280 and A24 corridors for journeys for example to and from the south west and north east of the county, and to avoid use of less suitable routes such as the B2139/A283 through Amberley and Storrington.	- This scheme is in the early stages of development and requires the further develop of designs, consultation, development of business case and securing of funding to deliver the package of measures.	Unknown but expected low-medium	This scheme is being developed by WSCC.	A24 Worthing-Horsham Corridor Feasibility Study reports
20	Access improvements to Arun Valley Rail stations	Access improvements to Pulborough railway station	- Potential access improvements to Pulborough station such as increased parking, improved step free access and improved pedestrian and cycle connectivity have been discussed previously and continue to be considered.	This scheme would be expected to have a relatively minor impact on air quality issues in Storrington.	Unknown but expected very low	As this scheme appears to have minor implications for air quality issues in Storrington no specific actions by the Storrington Air Quality Steering Group are recommended.	Storrington Air Quality Action Plan (October 2012) - Promotion of Alternative Transport Options

6.3.2 Other measures

	Scheme	Description	What do we know about this scheme?	What are the main issues associated with this scheme?	Anticipated AQMA air quality benefit (L/M/H)	Next steps recommendations	Supporting Evidence references
21	The development of a local Air Quality	The guidance provides advice to developers on how to address local air quality when making a planning application in Horsham District.	The Planning Advice Document: Air Quality and Emissions Reduction Guidance has been completed and has been included in the Environmental Protection Policy 24 of	N/A	Unknown	The document undergoes regular revisions and updates by Sussex Air Partnership. The guidance is embedded in HDC's	Storrington Air Quality Action Plan (October 2012) and new Horsham Air Quality Action Plan (in preparation) - District-Wide

	Scheme	Description	What do we know about this scheme?	What are the main issues associated with this scheme?	Anticipated AQMA air quality benefit (L/M/H)	Next steps recommendations	Supporting Evidence references
	Planning Policy Guidance document.		Horsham District Planning Framework (HDPF).			environmental policy. The wording of HDC's new Environmental Policy in the emerging Local Plan is stronger and the policy requires developers to adhere with the requirements of the guidance. Horsham District Council is looking whether to adopt this air quality guidance as a Supplementary Planning Document (SPD).	Measures Air quality and emissions mitigation guidance for Sussex (2021)
22	Low emission vehicles	**West Sussex Electric vehicle strategy:** Roll out of electric vehicle charging infrastructure **HDC Electric Vehicle Point Strategy** (adopted in 2020: Roll out of EV charging infrastructure with priority given to housing without off-street parking. Work has started on Low Carbon Plan for the Horsham District.	To deliver the ambitions of the West Sussex Electric Vehicle Strategy, West Sussex County Council has formed a partnership with Horsham District Council, Adur and Worthing Councils, Arun District Council, Crawley Borough Council and Mid Sussex District Council. A supplier has been identified to purchase, install, operate and maintain a regional network of charge points (excluding Chichester DC). The organisation is Connected Kerb. They have signed a 15-year contract. The first delivery is to replace the existing charge points in Billingshurst, Storrington and Horsham. A Network Plan and a Delivery Plan will then be agreed for where charge points will be installed, the type of charge point and when the installation will take place. The network was launched in June 2022. The rapid charging point in the library car park has been replaced with 3 new fast charging points– 3 points, 6 sockets. Review undertaken of HDC vehicles at Storrington transport depot to establish opportunities for upgrading/ replacing with low emission vehicles. Horsham District Council Waste and Cleansing Vehicle Replacement Strategy is now complete. HDC has continued with eV vehicle leases for three vehicles: one Nissan Leaf car and two Peugeot Partner vans, which are used by	- The level of future uptake of low emission vehicles and associated charging infrastructure is difficult to predict. - Levels of impact on Storrington are likely to be limited in the short term, however these measures form part of wider promotion of low emission vehicles which are expected to have an increasingly bigger impact going forward.	Medium	This is being developed through a separate workstream.	Storrington Air Quality Action Plan (October 2012) - District-Wide Measures and Promotion of Alternative Transport Options WSCC Electric Vehicle Strategy 2019-2030 HDC Electric Vehicle Charging Point Strategy Connected Kerb – West Sussex Chargepoint Network Council's new green wheels hit the streets Horsham streets ahead with new electric street sweepers
23	Bus and community	**Community minibus** – enhance existing Storrington minibus service by replacing			Low		West Sussex Bus Service

	Scheme	Description	What do we know about this scheme?	What are the main issues associated with this scheme?	Anticipated AQMA air quality benefit (L/M/H)	Next steps recommendations	Supporting Evidence references
	transport services	existing diesel fleet with Low /Zero emission vehicles. Funded by local businesses or new developments via planning contributions, possible link to CNG refuelling strategy. **Improve local bus emissions** Continue to liaise with local bus operators to explore opportunities to improve the emissions standards of buses operating through the AQMA subject to value for money considerations **Bus service information –** Explore potential to provide local real-time passenger information (RTPI) and improved network information at bus stops particularly in relation to potential WSCC Bus Service Improvement Plan (BSIP) funds to promote use. **Bus fares** – Provide discounted fares for young people to encourage the use of buses rather than cars, subject to confirmation of BSIP funds. **Mobility hub** – Explore the potential of Storrington as a mobility hub in relation to future BSIP fund opportunities					Improvement Plan
24	Travel plans	**Transport Plans/ Travel Plans**: Secure Travel Plans through the planning process for larger commercial and residential developments to promote and incentivise public transport, active travel, and car sharing.			Low		
25	Freight deliveries	**Freight Deliveries:** Encourage use of WSCC advisory lorry route rather than A283 through Storrington AQMA **Fleet accreditation:** Consider working with fleet accreditation schemes through local authority procurement contracts and to build into planning consents **Home delivery scheme**: Encourage through businesses use of low emission delivery vehicles with possible link to district EV Charge Point Strategy.			Low		
26	'Storrington in Bloom'	Introducing recognised pollution absorbing plants and planting methods into the village to improve air quality within the AQMA	It was established that there are no suitable sites for tree planting in West Street or the High Street so the project cannot be progressed.		Unknown	As there are no suitable sites, this strategy cannot be progressed.	

	Scheme	Description	What do we know about this scheme?	What are the main issues associated with this scheme?	Anticipated AQMA air quality benefit (L/M/H)	Next steps recommendations	Supporting Evidence references
27	Walking and Cycling Measures	**Encouraging walking and cycling**: Consider opportunities to promote bike rental scheme with local cycle business, seek funding for improvements to local walking and cycling paths, improve signage, provision of secure bike storage **Working with schools**: Work to enhance school travel plans, identify safety improvements to encourage walking, cycling, walking buses etc. Contribute to air quality awareness education programmes.	Potential WSCC Local Transport Improvement Programme (LTIP) walking and cycling path improvement identified to link Water Lane with Hurston Lane using Riverside Walk and Public Rights of Way.	These schemes are being investigated through various delivery routes. Their direct impact on Storrington air quality issues in the short to medium are not likely to be significant, however they form part of a wider approach of promoting a culture of using alternative travel options to single occupancy car use. Proposals for the Water Lane to Hurston Lane improvement require the support of local schools to progress. WSCC no longer has dedicated Safer Routes to School officers to focus on school travel plans but supports schools with advice on travel planning when approached.	Unknown but expected low	These schemes are being investigated through various other delivery avenues and are subject to different deliverability and value for money considerations.	Storrington Air Quality Action Plan (October 2012) – Smart Choices West Sussex Local Transport Improvements Programme