



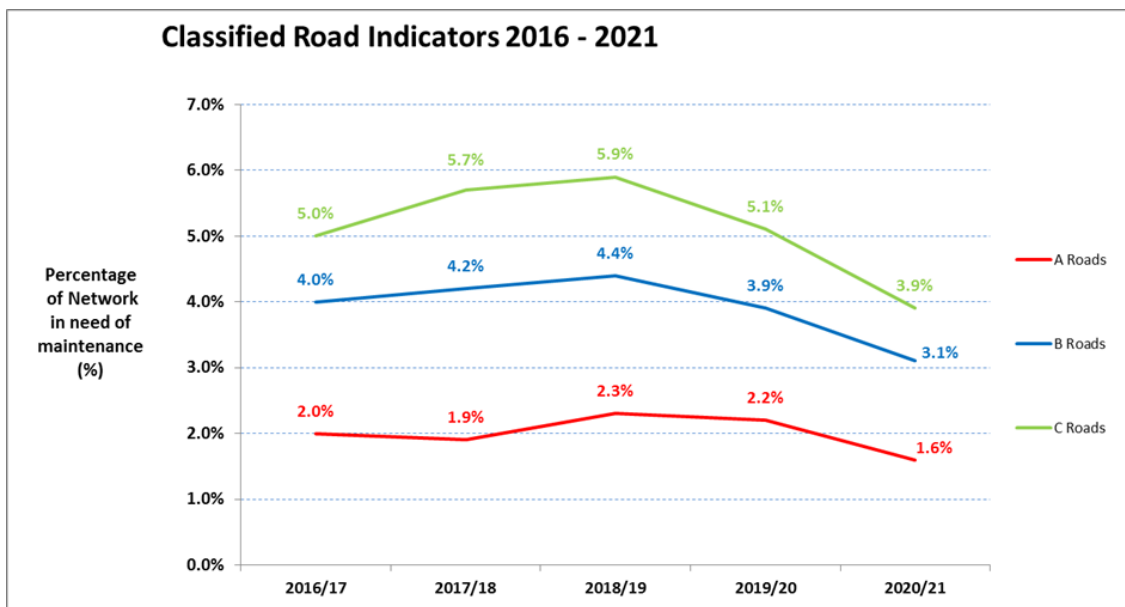
Environment and Communities Scrutiny Committee	
Report Title:	Highway Repair Methods
Meeting Date:	9 th September 2021
Chairman:	Councillor Dominic Morris
Presenting Officer:	Kathryn Haworth
Purpose of Report:	To outline how highways are maintained and repaired
Planned Dates	
Background documents:	Gloucestershire Structural Maintenance Manual Gloucestershire Transport Asset Management Plan
Appendices	
Recommendations	To note the report

1 Introduction & Background

- 1.1 The purpose of this paper is to outline how highways are maintained and repaired. Under the Highways Act 1980 the County Council has a statutory duty to keep the road network safe and in doing so it has to demonstrate that what it has done is reasonably practicable.
- 1.2 The highway network is the most valuable asset that the County Council manages and maintains worth almost £7bn. Carriageways make up the vast majority of the asset and value. It is key to achieving nearly all of the County Council's business objectives, providing the means by which children get to school, the elderly receive home help, waste is transported and County Council staff deliver services all around the county. Gloucestershire County Council directly maintains 5,427 km of county roads. Severe weather events over the past decade have shown up the fragility of the network, and raised awareness of the challenges in maintaining an ageing infrastructure. Travel is an integral part of the local economy in relation to both tourism and supporting economic development. The highway network is equally important to users from other parts of the country. Unfortunately the importance is often only highlighted when parts of it become unavailable and travel becomes difficult.
- 1.3 The highway does not just include the carriageway, but all the features on it and beneath it, including street lighting, traffic signals, drainage systems, signs, bridges etc. This paper focuses primarily on carriageways, footways and cycleways as the largest part of the overall highway asset. There are a variety of methods used to maintain the highway from full scale resurfacing to pothole repairs and cyclical maintenance.

2 Structural Maintenance

- 2.1 Structural maintenance of carriageways is the preferred solution for maintaining the highway over the long term as this restores the residual life of the road and provides the greatest resilience to the overall network. Structural maintenance is usually carried out as resurfacing works, surface dressing works or more localised structural enhancements such as patching or haunching (restoring the edge of the road).
- 2.2 2021/22 is the final year of the £150m investment in carriageway structural maintenance. So far, this money has enabled investment over and above that required to 'standstill' and has focussed on stabilising the deterioration and improving the condition of Gloucestershire's A, B and C roads. The annual condition indicators produced for these roads have all shown improvement since 2018/19. It is anticipated that a further improvement will be seen on these figures when the completed 20/21 and 21/22 schemes are reflected in the overall network condition.



- 2.3 The current calculation of the backlog of structural maintenance is £79.6m. £53.6m of that backlog is for unclassified roads. These have not benefitted from the recent investment programme, but have remained fairly stable over the past few years, with 13% of the unclassified 3000km network being classed as in need of maintenance. This figure is based on SCANNER surveys, which are carried out across the whole network; however nationally there are concerns that SCANNER is not necessarily the most suitable method of assessing the condition of the unclassified network.
- 2.4 Whilst there has been an improvement in the classified road condition, many roads particularly the unclassified ones, are beyond zero residual life. In order to standstill and maintain the roads in the overall condition they are in today, it is calculated that £16.8m should be spent on carriageway maintenance each year. Over the last four years the additional funding has allowed spend above this level. The capital grant funding from Department for Transport (DfT) is inadequate to keep up with standstill and therefore without top up funding from Council or other sources the amount the Council spends on reactive routine maintenance (such as pothole repairs) remains under pressure and the network deteriorates.
- 2.5 Alongside the structural maintenance programme, there will always also be a need to monitor, maintain and make localised repairs to the parts of the network which are not due for resurfacing or similar. This is generally done through inspections to identify issues which need to be made safe on the network, through local area programmes of small scale maintenance and through cyclical maintenance programmes such as grass cutting, gully emptying etc.

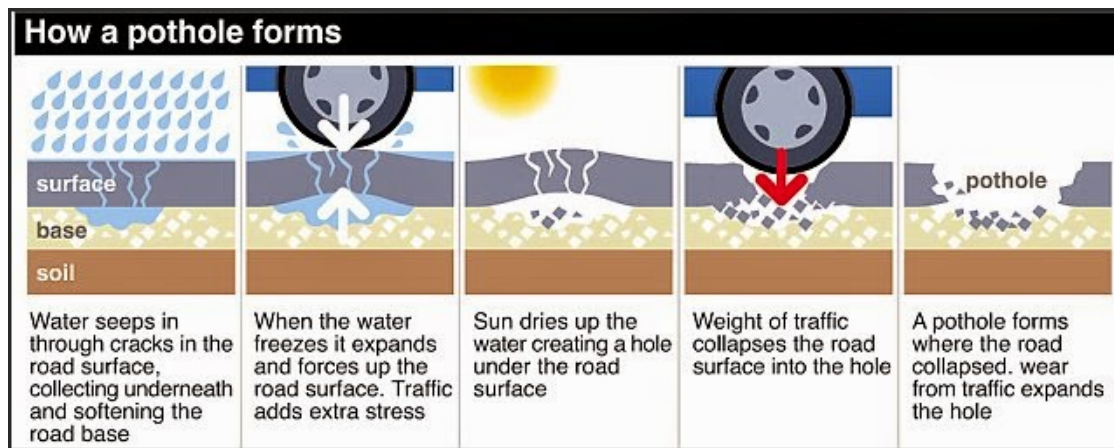
3 Inspections

- 3.1 Safety inspections and repair timescales are covered in Gloucestershire's Safety Inspection Manual. The network is inspected on a scheduled programme carried out by City and Guilds qualified Highway Safety Inspectors.

Inspections use a slow moving vehicle with two personnel - one driving, the other inspecting.

- 3.2 The inspection covers all areas within the highway boundary along that route. In urban areas, particularly when inspecting footways, it may be difficult to ensure that the inspection is carried out correctly by vehicle and it is necessary to carry out these inspections on foot. Walked inspections will be the normal approach for town centres. The inspectors will travel noting areas of concern that warrant further investigation and any defects identified are risk assessed in line with the Highways Safety Inspection Manual and then scheduled for repair within 2 hours; the next working day or 28 days depending on the severity. It should be noted that safety inspectors have discretion to upgrade a response timescale in response to particular local circumstances.
- 3.3 Reactive inspections are also carried out when potholes or defects are reported by the public. These enquiries are inspected and any defects found are allocated for repair in line with the Highways Safety Inspection Manual.
- 3.4 Inspections cover not only potholes but also all carriageway markings; road traffic signs; fences; barriers; street lighting; ironwork; vegetation and trees. Trees within falling distance of the highway are termed 'highway trees' although many will be in private ownership. Any defect or feature likely to cause an obvious danger by encroachment, visibility obstruction, damage, ill health or trip hazard is recorded and the appropriate action taken. GCC carries out additional tree inspections with qualified arboriculturalists in line with GCC's Tree Inspection Policy.
- 3.5 The existing manual is currently being updated to align it with the Code of Practice; Well Managed Highway Infrastructure. This code highlights the need for a risk based approach to all highways policies, and encourages consistency with neighbouring authorities to ensure that users of the network reasonable expectations of consistency are taken into account. Gloucestershire's Policy already follows a risk based approach so revisions are minor – these include reviewing the inspection hierarchy to align it with neighbouring authorities in the South West and ensuring consistency of inspection frequencies across county boundaries. These revisions have been discussed with the Council's insurers and legal team to ensure that the key stakeholders are satisfied.
- 3.6 The Council's approach and policy has been tested in the courts over a number of years. The Manual has been noted by the judiciary as a process which is robust and identifies good practice from throughout the industry. Since 2019 the contractual responsibility for inspections, repairs and consequent third party claims lies with the Term Maintenance Contractor. The Council and Term Maintenance Contractor continue to operate with an average repudiation rate of 95% and this rate is well above the industry standard where 80% is often seen as good. This gives reassurance that the processes, criteria and response times outlined in the existing Manual are robust and reasonable and safeguard the travelling public as well as the County's liability.

4 Repairs



4.1 The diagram above summarises how a defect is formed. Over the past winter (2020/21), Gloucestershire undertook 99 salt runs which indicates the number of nights which were forecasted to have sub zero road temperatures with moisture present. The average number of winter runs over the past 10 years has increased from 52 to 69 and this figure is expected to increase further. This shows the impact of climate change and wetter winter weather on our network and how the network will continue to be impacted. In a road with some residual life a pothole repair could be expected to last 2+ years. However, as highlighted earlier in the report, on roads with little residual life a pothole repair in a crazed or fractured surface will last far less time. This is why the long term solution to road condition is resurfacing, putting structural integrity back into the road.

4.2 Once a defect has been identified by the Safety Inspector, an electronic 'job' is raised and sent to the works team. There are four works teams across the county based from local depots at Cannop; Cirencester; Stroudwater and Bamfurlong. Dedicated schedulers identify the jobs to be repaired by each gang and these are loaded on to their tablets so they have a clear workload for that day. The gang takes a before photo, a Traffic Management photo and an after photo. These photos are used as evidence as well as part of the audit process.

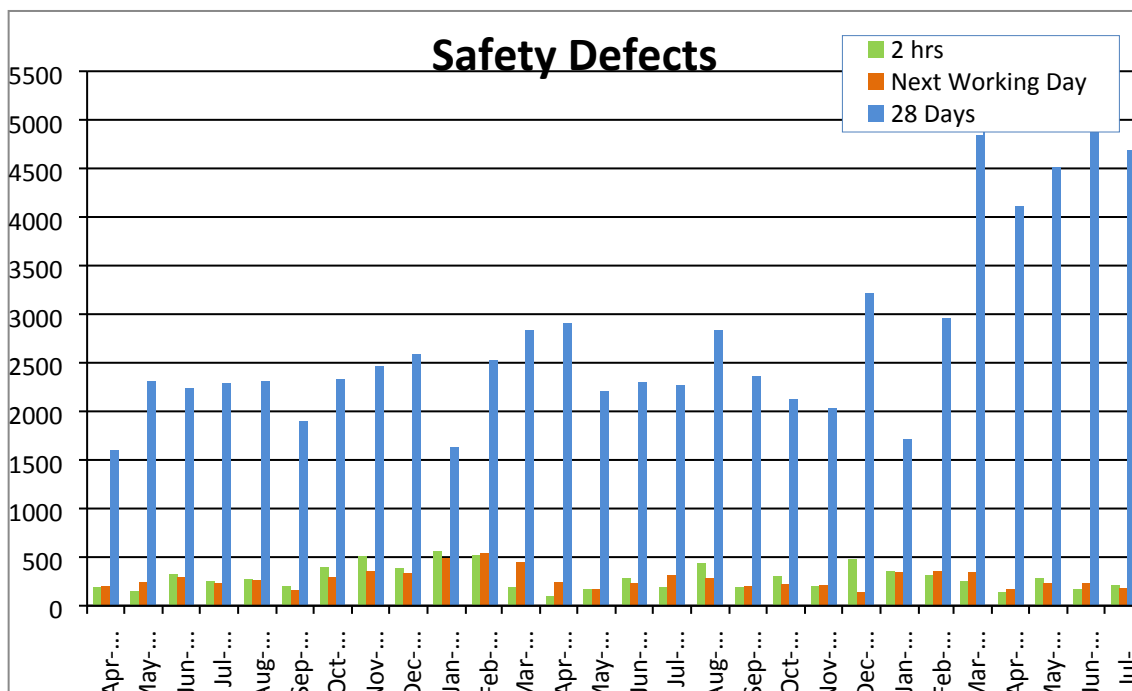


4.3 Repair processes strive for a first-time-fix approach which is set out as follows:

- Use of hot materials for all pothole repairs;
- Saw cutting, tack coating and mechanical compaction for all pothole repairs on classified roads as a minimum;
- 80% of safety defect work done on a planned and programmed approach;
- 90% of Next Working Day repairs to be permanently repaired (not made safe);

- Co-ordination of safety defect repair works using Confirm and CPA in a geographically based approach to ensure gang efficiency and reduce the amount of drive time between defect repairs;
 - When resources allow, other non-safety defects to be proactively picked up by the repair gangs and repaired whilst carrying out safety defect repairs;
 - A positive and proactive approach with the media through the *Client's* website to highlight the high quality and quantity of pothole repairs and to highlight the frequency of a coordinated approach being adopted;
 - An asset management driven approach to co-ordination of patching works where individual pothole repairs are considered inefficient and/or not cost effective;
- 4.4 For defect repairs, whenever resources allow, a locality approach is taken to apply a co-ordinated approach to encompass other local maintenance activities within the vicinity such as gully cleaning, grip cutting, sign replacement/de-cluttering/cleaning, minor works, etc. taking place in the same location at the same time to achieve the greatest presence and impact on customer satisfaction.
- 4.5 GCC carry out a monthly audit programme covering Safety Defects in addition to joint audits undertaken by GCC and Ringway. Weekly defect audits are also carried out with a random selection of 30 defects per area reviewed at the weekly works meetings using before and after photos. This is in addition to Ringway Supervisor and Management audits that are undertaken.
- 4.6 Since last winter, Gloucestershire has experienced high volumes of safety defects which have persisted much longer than the usual post-Winter spike. Our changing climate is impacting on operations as the increased defect numbers are a reflection of our wetter and extended cold winter, again this was highlighted with snow in April this year, and during the last winter we experienced flooding incidents on several occasions, along with an extended period of freeze/thaw cycle from January to March. Unfortunately due to the high volume of defects experienced since February/March, the focus has been driven by ensuring that identified defects are fixed in time, rather than a locality approach, in order to keep the overall network safe for the travelling public.
- 4.7 In an ideal world there would be few enough repairs and sufficient enough resource to be able to allow a repair crew to fix everything within a street, whether it met the intervention criteria or not. However, the first priority has to be to the safety of the travelling public across the whole county. In the first instance it is important to ensure that the most hazardous defects have been repaired, before moving on to those which are less critical. This is the foundation of a risk based approach. The inspection teams are separated from the repair teams to enable this to happen. The inspection teams can then concentrate on ensuring that defects are identified and the works team concentrate on planning and programming repairs.
- 4.8 The graph below shows the volume of defects since April 2019. It can be seen that there is a seasonal variation but historically the average number of defects per month has been approximately 2,500, so it is clear to see that there is a significant increase in defect numbers and consequently the requirement to

deploy additional resources on the network. Average gang numbers have normally been in the region of 26 gangs but this can fluctuate depending on training, leave and defect levels. During this period 40-45 gangs have been deployed to respond.



4.9 A number of actions have been introduced to continue repairing on time and get ahead of the numbers. These include:

- increasing gang numbers to deal with high volumes;
- use of Spray Injection Patcher (sometimes referred to as a Jet Patcher) to enable there to be a proactive approach to annual inspection routes with the aim of reducing the gang resource needed over the coming months. This will enable more efficient programming of defect repairs and better productivity of gangs.
- a patching gang to complete larger defects and undertake larger patches to reduce return visits. This gang has been splitting it's time across the county depending on the location of defects identified;
- agreeing that where resurfacing or patching works are already planned then defects are repaired without a saw cut edge instead of the preferred method of defect repair;
- area based patching works – the teams have identified poor carriageway condition which will be picked up with machine laid patching which is programmed from their minor works budget;
- resurfacing works continue to do a great job of improving the overall network condition.

5 Other Works

5.1 Delivery of works other than safety defects can be achieved through a number of different work streams and these are described below:

- Community Maintenance Gangs – four gangs run across the county from April to November with work prioritised by the local area teams. The type of

work that they can carry out would include a range of basic highway maintenance activities, such as cleaning signs and bollards, straightening posts and verge markers, clearing drainage gullies and grips, dealing with overhanging vegetation, tidying up footways etc. The local teams will collate work from councillors, parish and town councils, as well as identifying works from their visits around the area. Requests should be passed through the Local Highway Manager or Highways Councillor email.

- Highways Local – each councillor has £30k to use on community priorities for the highway in 2021/22. The focus is on keeping our local highways in good condition. Examples of projects that could be supported would be small carriageway or footway patching schemes; minor works such as drainage repairs, dropped kerbs or vegetation management; winter and environmental top up to help communities help themselves such as hand salt spreaders, grit bins, tree planting or additional community maintenance gangs; or contributions towards planned capital programme schemes. Councillors should liaise with their Local Highway Manager to agree details.
- Minor Works – working with the Local Highways Managers to identify areas of work that requires capital investment. This work is prepared by September the year before so that design and planning can be undertaken. There is also a small element of reactive minor works which is available to deal with the emergency situations which occur during the year.

5.2 Appendix 1 contains a summary of where to find more information, or who to contact for different highway issues.

6 Works Co-ordination

6.1 Within the highways team concerted efforts are made to maximise the use of traffic management on the network to achieve as much as possible in an area whilst say, a road closure, is in place. There is also significant work to ensure where possible that sequencing of works is carried out in the most sensible way.

6.2 The County Council's Street Works Team work closely with the Utility Companies and the Area Teams to ensure work plans are shared. Due to the type of works undertaken it is unusual to be able to co-ordinate works under the same closures but good progress has been made to ensure that utility works are undertaken before Gloucestershire's resurfacing works are carried out.

7 What Next

7.1 There are a number of areas for consideration in the future. Technology will bring new opportunities to improve efficiency. Last year GCC carried out a trial of Vaisala's RoadAI system for safety inspections. Whilst it did not prove suitable to replace inspections at that time, there are definitely potential benefits for the use of the AI system to assess road condition on unclassified roads. Additional work is being funded with Vaisala to compare the results on over 1/3rd of the unclassified network with the traditional assessment methods. This will be funded from existing budgets and this system will also provide the ability to collect condition information on the off-carriageway cycleway network.

7.2 We continue to drive efficiencies with our colleagues in Ringway through the use of technology and shared best practice in the industry. This is achieved

through collaboration with our neighbouring authorities in the South West and wider as well as national groups and the wider Ringway team.

- 7.3 As part of our medium and long term plans, an action for 'Identifying ways to reduce our carbon emissions in our highways investment' was identified. Highway operations are often not traditionally considered an environmentally focused area but there is significant work being progressed in this area. At a strategic level it is about getting more people to use active travel options, and to help encourage them to do this the highway needs to be in a good condition so that it does not act as a barrier to them. It also has the benefit that the less traffic which uses the network, the slower the deterioration will be.
- 7.4 Some of the things which are already in place, or which have been trialled are reducing waste and increasing recycling, trials of different surfacing materials, use and conversion to electric hand tools (rather than diesel), electric vehicles and wider. A summary can be found in Appendix 2.

Appendix 1 - Members Information

This section provides a summary/reminder of where to go for different issues:

- **Highways queries** – the Local Highways Manager is the first point of contact for members for highway related issues. We are committed to meeting the County Councillors on at least a quarterly basis but in many cases the local teams meet more regularly than this where there is a desire to do so. Councillors have been invited to open days at depots at the start of September and this is something we hope to continue in the future.
- **Report it** - <https://www.gloucestershire.gov.uk/highways/roads/your-highways-report-it/> please use the website to report individual safety concerns such as potholes or lighting columns out, this way it gets recorded directly into the systems, then tracked and sent to the correct department for action. Emergency issues should be reported via the phone on our 08000 514 514.
- **Highways Councillor email** - highwayscouncillors@gloucestershire.gov.uk – please use this email address to send in your enquires from Parish and Town Councils or Members of the public. This way your email is logged and sent to the most appropriate person(s)/department, you will also be given a log number to track your enquiry. Members of the public should be directed to highways@gloucestershire.gov.uk and 08000 514 514, this way we capture all enquires and can monitor them as well as ensuring they are sent to the most appropriate officer to respond.
- **TROs** – for all enquiries on TRO's please go to the TRO Team - TROenquiries@gloucestershire.gov.uk
- **Roadworks** - <https://www.gloucestershire.gov.uk/highways/roads/roadworks/> us this map to look at the planned works across the county, not just highways works but Utility Companies (water, gas, electric, telecommunications and fibre optic), other contractors and partner agencies.
- **Road Maintenance** - <https://www.gloucestershire.gov.uk/highways/roads/road-maintenance/> use the map to find out current works on the network and our road closures. At the bottom of this page it also has a brief description of the works undertaken for grass cutting, gully emptying, trees etc.
- **Highway Policy and guidance documents** - <https://www.gloucestershire.gov.uk/highways/plans-policies-procedures-manuals/highways-policy-and-guidance-documents/> on this page it includes links to the Transport Asset Management Plan (TAMP), Highway Safety Inspection Policy and our other policy documents which you may find useful.
- **Capital Works** – we have a large number of schemes within our Major Project team and they will provide pertinent updates to councillors as appropriate. These are delivered by our in-house team with Consultants and Contractors providing specialist support. Details of this work is available on our website - <https://www.gloucestershire.gov.uk/highways/major-projects-list/> Again if you have any questions concerning this work that isn't answered on the website, then please contact the LHM in the first instance.

Appendix 2 – Carbon & Environmental Steps

A number of initiatives are being undertaken across the partner organisations (GCC, Ringway, Atkins, Tarmac, Skanska et al) to reduce the impact on the environment.

There has been an increased focus on waste disposal from highways operations by Ringway and using supply chain and the adjacent contract in Worcestershire to recycle highways arisings; as a result we now recycle or reuse 99% of waste generated through operations in the county. There is a current focus on the area of plastic reduction and recycling and Ringway have introduced a plastic graveyard in each of our depots for a local supplier to collect and recycle. Suppliers have been reviewed as well as packaging of deferred set bituminous material to ensure recycling opportunities are maximised. Most recently, dedicated PPE (Personal Protective Equipment) recycling stations have been introduced in each depot. PPE is then turned into recycled pellets and used for Solid Recovered Fuel.

The importance of ensuring recycled products have a market is also recognised and therefore we are working with the supply chain to ensure the purchase of recycled products or that products have an element of recycled content. Ringway purchase 100% recycled Type 1 stone from our neighbours in Worcestershire and purchase recycled bollards through the supply chain.

Within surfacing operations 100% of acceptable material which is removed from the road before the new surface is laid is recycled. (There is a small proportion, around 10%, which is considered hazardous and has to be dealt with using different methods.) Tarmac continues to seek advances in environmental benefits throughout material manufacturing and laying and processes. The initiatives currently include introducing software to track vehicle deliveries better identifying where they are on route allowing real time decisions to be made about running engines on idle for prolonged periods. In addition the use of warm mix asphalt is increasing and Tarmac are promoting its use wherever a more energy efficient manufacturing process can be benefitted from. Disposing of old/used tyres is a major problem in the UK. Another technique processes old tyres into a suitable crumb rubber as an additive in the manufacturing process extending the binder. Although not particularly new technology it has now advanced to a stage where we are attempting to promote trials and eventually wider use. Historic trials of this in Gloucestershire had limited success but as technology moves forward it is hoped that this might be another technique for the future.

There is also a heavy focus on a switch to electric kit such as hedge cutters, strimmers and brush cutters. An electric telehandler has also been trialled in the Stroudwater Depot and, as part of the design process with the supplier, a number of areas where the machine could be improved have been identified. Electric vans have been ordered for the Inspection Teams and all Ringway company car drivers now have the option of an electric vehicle. As a result of this we are currently investing in electric charging points in the depots to further encourage the introduction of electric vehicles.

Around the important winter gritting service we have carried out an optimisation process to reduce the number of lorries required from 33 to 29. This has maximised the efficiency of the routes and optimised the number of miles being driven when gritting the network, with no change in the length of network actually gritted. There is also a commitment to using Euro VI compliant vehicles across the operational fleet.

The Public Rights of Way (PROW) team have also been focusing on the use of recycled materials and have used a 'Flexipave' system on a 2.5mile multiuser trail in Stroud, this utilised over 27,000 used tyres that would have otherwise been sent to landfill. Road planings are also regularly used in PROW and are 100% reused. PROW has also used recycled plastic products in footbridge construction especially where elements are prone to rotting. Another change is that PROW have started to refurbish signs rather than replace the sign completely, leading to less waste and a longer life cycle for the sign.

Our highways depots and Shire Hall are all connected by video conference facilities aiming to reduce the amount of travel to meetings; this has now been reinforced further by the introduction of more home working due to Covid19. Meetings that were traditionally travelled to by car are now carried out via WebEx, MS Teams or other forms of online video conferencing which has reduced our travel and carbon footprint associated with travel. It is highly likely that this reduction in travel will be able to be sustained in the post-covid operations as a result.

Highways land can contribute and improve our local biodiversity providing refuges for some species and links to wider ecological networks in the landscape. We are trialling a number of ways to improve the landscape areas within the highways asset. For example, a trial of yellow rattle is being carried out (which suppresses the growth of grasses), a trial of manual cutting and collecting the grass cut in Andoversford and trials of different planting in central reservations to reduce the amount of grass cutting and improve the biodiversity. Ringway are also working with Plant Life, who are a Wild Flower Conservation Charity to assist with planting options as part of their Road Verge Campaign.

We have also commissioned Atkins to produce an Ultra-Low Emission Vehicle (ULEV) Strategy to provide a policy position for the County to progress actions to enable increases in ULEV uptake. The current phase of the project is focused on the implementation in residential streets, but the planned actions are wider ranging. The number and percentage uptake of ULEV registrations in Gloucestershire, user feedback and air quality data will be monitored.

Next steps and The Future

As might be expected, not all trials are successful but the Gloucestershire Highways collaboration is taking the view that it is important to carry out trials, learn what needs to be improved and what will/won't work as we move forward. It is also helpful to engage with the suppliers and commercial markets to help develop solutions for the future. Whilst a number of exciting steps forward have been taken, there is more planned for the future and some of the key areas are highlighted below:

- Progress detailed mapping of highway verges in order to optimise grass cutting and better understand how we can contribute to biodiversity.
- Trialling a topsoil strip back on central reservations to reduce grass cutting frequency and encourage biodiversity.
- Taking a closer look at gully waste dewatering to find ways to manage locally and reduce our travel footprint.
- Further roll out of electric fleet vehicles across the business.
- Using the investment opportunities for highways depots to look at green energy. power and footprint.
- Further develop work with other local authorities on how we measure the baseline and our impacts.