1.   **Provide a plan for improvements**

What is your overall rationale for interventions? Is your primary aim to address obsolete equipment or general maintenance? Include future plans for traffic signal operation and maintenance, including whole life operating cost reductions, preparations for emerging technologies and services and wider Authority objectives, priorities and policies. If you intend to include an element of expenditure not at traffic signal sites, (such as VMS replacement or UTC maintenance), describe it here (max 500 words).

The A329/A322 corridor is the one of the region's busiest and most important routes, passing through Bracknell's urban areas, carrying in excess of 60,000 vehicles per day. Although the route serves as a primary means of access into Bracknell, it is also used by through traffic between the M3 and M4 motorways, with up to 25% of the total vehicles in the PM peak travelling from the M3 and onwards to the M4.

The corridors were included in the recent M25 SW quadrant study produced by Highways England (Page 30 - Para 5.4.8), that listed the A322 / 329 as an alternative outer radial route that could remove traffic from M25, benefitting strategic developments such as Heathrow expansion and adding resilience during major SRN works / disruption. The corridor is also included within the Transport for South East (TFSE) Transport Strategy and Strategic Investment Plan

This high percentage of through traffic puts a tremendous strain on the Borough's highway network and creates delays at major junctions for both residents of Bracknell and commuters travelling further afield.

In an effort to address this, Bracknell has invested significantly in upgrading junctions and applying Intelligent Transport Systems to key junctions along the corridor over the past 10 years (see corridor plan PDF) resulting in journey time and reliability improvements. However, further investment is required to allow us to realise the full potential of what can be achieved to this vital corridor, helping the network cope better during periods of increased demand and in turn reducing congestion.

We therefore propose to use the GLF to link these key junctions allowing us to manage the corridor better through the use of MOVA, FUSION, and also completing full corridor-specific validations – on the A322, A329, and A3095 (which is also part of the DfT's Major road Network)). This will facilitate enhanced real-time monitoring and adaptive control, and will allow Bracknell to get greater network capacity out of the existing assts without the need for large equipment / civil upgrade works. Where there are faulty loop detectors or a need for more detection, smart-micro MLR detectors will be added, reducing physical hard loop infrastructure and associated maintenance, and overall bringing improved resilience to the region.

This bid seeks funding to carry out improvement works on Bracknell's main corridors consisting of 24 junctions in total. All junctions will be re-validated to ensure they are running optimally. The sites have been reviewed to determine if MOVA linking or FUSION is the most appropriate control strategy. Four routes will be set up with MOVA linking and two routes on FUSION. The work includes:
- I/O boxes: £40,000 – to link the sites on the wireless MESH network
- JTM links: £25,000 – creation of 10 journey time links within Stratos
- MLR detectors: £10,000 – MOVA detection, above ground at 3 sites
- FUSION: £270,000 - deployment on all main corridors (11 junction sites, 21 nodes)
- MOVA validation including health checks (24 junctions) - £85,000
- Controller configurations & hardware for linking - £40,000

Total £470,000

2. Prioritised upgrade plan

Do you have a methodology used to assess and grade traffic signal locations and select those to be maintained or upgraded? Show the mechanism you use for managing and prioritising traffic signal maintenance over future years. Describe the general maintenance and / or upgrading issues you must address (max 500 words).

Bracknell Forest Council's UTMC Asset Management plan sets out how the Borough's traffic signals and ITS equipment will be deployed, managed, maintained, and replaced, and why specific solutions have been used. It allows the authority to prioritise its limited funding to renew traffic signal equipment at failing junctions.

Each site is rated against the following criteria: age, condition, faults, operational impact, complaints, and safety. The council has 120 sites which are remotely monitored and go through periodic inspections. All periodic inspection (PI) data is populated on InView and provides a condition report of each junction and their assets.

The council annually reviews the asset management plan and based on allocated funding develops a programme of works for the next financial year. Each year many sites reach the top of the list based on one of the above criteria. However, each year the funding is not sufficient to resolve all the schemes which require attention. The council therefore must manage the funding very strictly fixing and maintaining old equipment rather than looking to the future and embracing available new technology.

All of the junction upgrades achieved on the busy A322 / A329 /A3095 corridors over the past 10 years have been funded using grants such as the National Productivity Investment Fund, Local pinch point funding and Local Growth Funds. Whilst this has made an improvement to our assets, the application of FUSION and MOVA, coupled with our strategy management system, will allow us to significantly further improve overall efficiencies. One of our key goals is that the daily routine management of the network should be automated such that engineers time can be utilised more effectively in optimisation, solution development and involvement with wider schemes which often is not possible due to time constraints.

The upgrades proposed in this GLF bid would put us firmly on the path to achieving this goal, future proofing both operations and maintenance.

We currently have £133k for reactive maintenance, £125k for contracts services (including CCTV, RTPI, VMS maintenance), and approximately £150k capital for signal upgrades and day-to-day running of the whole UTMC network. The spend varies every year and can be impacted by RTCs taking out assets. This is under constant review.

3. **Links to carbon reduction and Air Quality (AQ) targets**

Show any methodology you have for linking traffic signal improvements to carbon reduction and AQ targets. Show anticipated improvements from interventions and contribution to overall authority targets. Demonstrate ranking of intervention sites by carbon and AQ gains (max 500 words).

Many studies have shown the air quality issues associated with stationary traffic, and one of the core aims of the full-corridor approach we have carried out over the past 10 years – and propose to capitalise on through this bid – is to improve traffic flow, further reduce stationary traffic and therefore improve local air quality.

We have seen this occur first hand on Downshire Way, a bottleneck on the A322 which was widened in 2020 using the National Productivity Investment Fund. Until 2022 this section of road was a designated AQMA, but levels of pollutants have fallen such that it has had its designation removed. See ASR report.

Whilst this can be viewed as a success, it is still a busy route with planned growth in the region, and further improvements to the signalised junctions at each end of the Downshire Way using FUSION and re-validation will further improve efficiencies here and along the wider corridors.

Most of our junctions now have LED heads, reducing power consumption and improving reliability. 4G (IP) communications upgrades will further future-proof our systems, as working communications will ensure we can receive fault information and remotely connect to perform maintenance and operational activities. This can help with carbon reduction as remote fault finding reduces the need for an engineer to attend the site unless required, and problems can be rectified more quickly reducing the risk of congestion.

IP communication also enables sites for compatibility with future more environmentally friendly technology – comms and monitoring of sites provides enhanced data across the ITS sector to facilitate evidence-based decisions to improve congestion, bus priority, and air quality. This feeds into our strategy management system, to improve the quality of the road network and day-to-day operation – being able to change VMS signs, signal timings and enable bus priority. With improved journey times and traffic flows, the emissions from vehicular movements will be reduced.

Furthermore, if successful we will carry out full health checks on each site, which will look for faulty detectors, configuration changes, special condition changes and rectify any issues on site that will improve the operation and overall efficiency of the junction, helping to reduce congestion and in turn carbon emissions.

This package will significantly improve the efficiency of the corridors, allowing more traffic to be channelled through, especially during M25 works, and benefitting residents making local journeys across the junctions resulting in air quality and safety improvements as traffic flows more smoothly. This will have far reaching benefits and will continue to help attract major businesses to the area and support the adopted site allocations plan.

This approach reflects a core objective of the Bracknell Forest emerging Local Transport Plan, Climate Change Strategy and TFSE Transport Strategy to create a smart, linked corridor and road network, embracing the newest technologies to allow us to better use our existing road network. This is in line with regional and national policy to move away from a 'predict and provide' approach to traffic growth.

4. **Monitoring plan, including indicator selection and targets**

Indicate proposals for monitoring improvements due to traffic signal maintenance. Described selected indicator set, and how this links to wider authority policies and targets. Indicate methodology for before and after assessment and evaluation of the financial and traffic impacts of interventions and how this will drive future years maintenance programming (max 500 words).

There are numerous ways in which we will effectively monitor the impacts of our proposed interventions, which will in themselves help us to better monitor the network.

We will use automatic traffic count data from our permanent sites located along the routes (which have just been upgraded to telemetry 'live data' units), to assess overall levels of traffic and patterns on an hour-by-hour basis. We have this data stretching back over many years. MOVA is installed on the majority of our sites, and last year we enabled count and SCOOT on all our MOVA sites which complements ATC data by providing counts through each junction and can be used for basic journey time monitoring. The FUSION upgrades proposed as part of this bid will allow us to capitalise on this through collection of accurate journey time data on a constant basis (floating vehicle) - safely and cost effectively - reducing our dependence on driven surveys, or costly ANPR journey time surveys.

Our 2019 transport model provides further background data to reference against, although again the proposed upgrades will help in a rebuild in coming years. Furthermore, whilst the AQMA and its associated monitoring station has been removed from the A322 Downshire Way, diffusion tube monitors close to the road corridors will continue to provide data for monitoring purposes.

This valuable additional data will also provide more specific benefits in terms of information for gritting, resurfacing schedules and traffic management arrangements for road works, ensuring these are timed to minimise disruption, or have maximum benefit wherever possible.

With regards to the infrastructure itself, new equipment will be more reliable, more resilient, more energy efficient, and we can monitor any faults and issues using the InView fault management system, which provides a monthly report. KPIs are set within the UTMC contract and follow set criteria such as fix times to keep the network running as smoothly as possible. The proposed upgrades will allow remote diagnosis and fixes wherever possible.

Indicators of success will be improved journey times over 2023 / 24, and 2019 (pre-pandemic) levels; further reductions in pollutants at AQ diffusion tube monitoring sites; a reduction in faults with sites and faster response times.

We also receive accident stat data from the police which will be used to ensure our junctions and corridors are operating at optimum safety.

To assist us in our future plans (and bringing this all together) we are in the process of completing a fault asset register of all our equipment on street (with a complete on-site survey), that will give us the equipment type, age, condition, firmware, and configurations – this will give us a 10 – 15 year plan of action to investigate options for upgrades and prioritising failing sites, bringing them up to modern standards.

5. **Technology vision**

Outline wider authority technology vision and the role traffic signal upgrading will play in this. Describe technology strategy and aims. Describe policy for ensuring increased reliability and reduced maintenance and operating costs for upgraded assets and plans for preparing for increased availability of data and readiness for connected vehicles (max 500 words)

The very essence of our bid is about making the most of the technology we have and installing new complimentary technology to create a smart, efficient strategic corridor that will benefit road users across the entire region. This aligns with the core aims of our Traffic Management Strategy, and TFSE Transport Strategies.

Better communications across connected assets will mean a more effective and comprehensive monitoring system, improving the reliability of sites, and reducing maintenance and operational costs.

The FUSION technology will also allow more extensive monitoring of traffic flows and journey times, for continuous learning, development and adaptation to traffic patterns and characteristics, which can vary day-to-day.

As opportunities arise through maintenance, we will upgrade with new equipment utilising Plus+ to significantly reduce cabling and complexity (thus future-proofing) whilst reviewing what a site could do to its best potential, including MOVA, counts and SCOOT or FUSION on associated detectors.

Where possible, we will replace loops with overhead SmartMicro detection as this will reduce our maintenance liabilities through re-cutting of loops on damaged roads or because of resurfacing works, reducing our wider maintenance costs year on year.

We will increasingly use Strategy Manager to improve performance of the corridor – this is technology solving the problem rather than staff taking time to create new strategies. Count, VMS, RTPI journey time data, roadworks information, weather (One.Network) and JTM Journey time monitoring can and will all go in to STRATOS.

An open data server will allow third parties to tap into our data and use this info, including neighbouring authorities, nurturing cross boundary working to create better informed and more efficient connected corridors for the benefit of the region. This should also allow VMS signs to be linked so road users are better informed over more of their journey, and allowing them to make route decisions as they go. The data we collect and use is not just available for our network but can be utilised for other authorities to plan or manage any emerging issues and link into their own systems.

Many cars are already connected through live data information which can influence journey planners and navigation systems. The proposed technology we are looking to install will also have the potential to link with our own systems via FUSION to give drivers (and potentially in future, autonomous vehicles) an informed choice to act upon via our created strategies.

6. Support to public transport, vulnerable road users and active travel

Demonstrate ways in which the opportunity presented by upgrading traffic signal sites will align with your policies and / or plans for Public Transport, Pedestrians, Mobility and Visual Impaired, Active Travel; and benefits realised for these users (max 500 words).

Partly as a result of its 'new town' planned construction in the 50s onwards, Bracknell has an excellent dedicated cycling and walking network, along with a comprehensive system of local and regional bus services. Much of the cycling infrastructure around the strategic road network is segregated with little need to interact with the road. However, where this is not possible, the proposed upgrades will provide safe, direct crossing opportunities (such as those installed in 2021 at the A3095/B3430 junction where there were no facilities previously). Greater overall junction and corridor efficiencies will provide benefits to all users.

This will be achieved with the integration of FUSION AI detection, FUSION will allow us to adapt and update multimodal prioritisation, with the use of multi modal data such as floating vehicle data and connected cars coupled with the MOVA validation we estimate at least a 15% improvement in our journey times, helping to improve public transport travel times. We always ensure that crossings are safely located with appropriate desire lines for vulnerable users. This ties in with the aims of our Local Cycling and Walking Investment Plan (LCWIP), which also aims to make more of our already good network, adding high-quality missing links to make it more attractive wherever possible. Confidence at crossing points is key to gaining the confidence of users and making active travel appealing and rewarding.

There is existing bus priority on the A3095 corridor allowing buses to quickly and efficiently cross this corridor to serve key residential areas, whilst we are proposing to install bus priority at signals initially at the A3095 'Meadows' junction (upgrades already programmed) with further roll out across other key junctions on the A322 / A329 corridors. This uses 'Ticketer' data linking bus locations with triggers within the Stratos monitoring system and will give priority to buses on approach to junctions whilst developing an understanding of bus journey times. This would give us and the bus companies excellent information and insight in developing more accurate timetables, further increasing the attractiveness of public transport as an alternative to the car.

Moreover, advanced detection and back-office systems will provide us with valuable count and travel habit data, informing our active travel and public transport investment decisions in future.

7. Future proofing

Demonstrate plans to ensure traffic signal upgrading can add flexibility to policy and technological changes, support for new mobility ideas and open publishing of data (max 500 words).

Again, future proofing is a key objective of this bid, as part of our overall aim to have a modern, resilient and efficient transport network not just for Bracknell but recognising the importance of these major and strategic corridor links.

The equipment that we have installed to date, and the equipment proposed to complement and capitalise on this will be newer, more durable, more reliable, longer-lasting, lower voltage and simpler (for example through Plus+ the amount of cabling is far reduced, and our upgraded dome camera CCTV systems have less hardware, less metal and are lighter). This applies across all proposed infrastructure.

Until recently, more advanced technology often meant more costs and complications, impacting reliability. However, we and the industry are confident that the opposite is now true giving us confidence in future proofing the network. The newer equipment is also designed to be easily upgradable and compatible with other systems on the network and future solutions. This increases likelihood that new emerging technologies can be added as they are introduced.

In-road infrastructure such as detection loops will also be phased out and replaced with overhead SmartMicro MLR detection wherever possible, reducing maintenance, costs and disruption associated with re-cutting of loops in damaged roads or those requiring resurfacing – thus reducing costs for overall highway maintenance.

The infrastructure will be more adaptive to changes in travel patterns, traffic growth and indeed changes in how people travel, with the ability to learn from collected and analysed data. This in turn will inform more efficient strategies and policies across the authority, influencing future budget spend and ensuring it its prioritised to the right places. Introducing FUSION will add increased adaptability to traffic signal control across Bracknell. FUSION also has the capability for multimodal optimisation and prioritisation, providing flexibility to the control strategy implemented.

Our current systems are:
Stratos (strategy manager, traffic signals module, network performance module (JTaas)
InView fault monitoring
MyCity Swarco VMS
C2 Cloud data
RTPI systems Ticketer Bus Priority
UTC & UTC-UX

We are looking to combine these into one central database for ease of access, data sharing and simplicity.