1. Do you have a 5G strategy?

The Scottish Government <u>does not</u> currently have a 5G Strategy but we are currently developing one. We will write to you to alert you to its publication when that is ready .

1.1 If yes, I request to see the complete strategy, its ambitions and its objectives in PPTX, Word, PDF or picture format.

N/A

1.2 If yes, has the public had the opportunity to read and understand the Scottish governments 5G strategy? Where was this information published?

N/A

1.3 I also request a supplementary document that includes the highest level of detail on all 5G technology that's planned to be used and currently in use in public spaces within the Scottish governments districts:

(a) Companies and entities involved and the names of the company/entity officers.
<u>The Scottish Government does not hold information on all 5G plans and trials in Scotland.</u> However, we are aware that <u>Cisco</u> is progressing 5G trials on Orkney as part of the UK Government-funded 5G Rural First project. <u>Broadway Partners</u> are trialling Television White Space (TVS) in the Highlands and in parts of Perth and Kinross. See <u>https://www.5gruralfirst.org/</u> for further details about the Programme.

(b) Specification sheets of all 5G technology.
We do not hold this information.

(c) What technology e.g. units and arrays are not currently 5G, but can be 5G enabled e.g. with current software, future software, hardware upgrades or retrofitting?
The Scottish Government has no 5G technology in use or planned use of 5G technology at this time.

(d) What UK, EU and International safety standards is the Scottish government complying with for the 5G strategy and existing 5G technology. Public Health England's (PHE's) Centre for Radiation, Chemical and Environmental Hazards (CRCE) takes the lead on public health matters associated with radiofrequency electromagnetic fields, or radio waves, used in telecommunications. The Scottish Government would seek alignment with their standards. The Scottish Government does not currently have a 5G Strategy but of course any strategy we publish will ensure that appropriate and relevant standards and legislation is adhered to.

(e) I request proof e.g. a certificate from the Scottish government that confirms that UK, EU and International safety standards for workers and the public have been met.

The Scottish Government has no 5G technology in use at this time.

1.4 If no, I request all documentation, memos, emails and communication on companies and entities you're in talks with regarding the formulation of a 5G strategy.

As noted in the cover letter, providing all documentation, memoranda, e-mails and communications with companies and other entities regarding 5G will breach the £600 threshold provided under FoISA.

The current Programme for Government (PfG) sets out a commitment to develop a 5G Strategy. Policy activity on 5G was first articulated by the Scottish Government in our Mobile Action Plan published in 2016. Arising from this Mobile Action Plan, working with industry and academia, we created the Scotland Innovation Partnership to identify opportunities for collaboration and the development of potential 5G use cases. This work continues in our current 5G Strategy policy formation. We are working with partners including the mobile industry, UK Government and the regulator, Ofcom, as well as public sector partners, to understand the likely shape of commercial deployment but also opportunities for collaboration. You can find details of our work and the plan at
https://www.gov.scot/binaries/content/documents/govscot/publications/advice-and-guidance/2016/06/mobile-action-plan/documents/97bbe9e1-62e6-4f8d-a544-362577df1680/97bbe9e1-62e6-4f8d-a544-362577df1680/govscot%3Adocument

2. I request the name/s of the Officer/s in charge of the 5G strategy and roll out including their CV and qualifications in 5G and Smart Cities; and who their subject area expert or consultancy is, their CV and qualifications on 5G and Smart Cities.

As noted within the cover letter, this information is withheld under section 38(1)(b) of FOISA (personal information). This constitutes personal data of a third party, i.e. names of individuals, and disclosing it would contravene the data protection principles in Article 5(1) of the General Data Protection Regulation and in section 34(1) of the Data Protection Act 2018. This exemption is not subject to the 'public interest test', so we are not required to consider if the public interest in disclosing the information outweighs the public interest in applying the exemption.

3. Are you in talks with any experts, companies or entities about autonomous vehicles (AV) for public transport and/or private use on Public Highways?

There are no Highways in Scotland. However Transport Scotland has been in discussions relating to Motorways and trunk roads in Scotland.

We held a Connected and Autonomous Vehicle (CAV) Scotland Summit, on 31 December to 1 November 2018 at the Royal Highland Conference Centre in Edinburgh. The web address for this, with speaker details can be found at
www.CAVScotland.co.uk .

We are represented in a European funded programme called EU EIP. One of the sub-programmes within the Harmonisation Cluster is Activity 4.2 – Facilitating Automated Driving. Details of the partners, presentations and other material involved

in this programme can be found at https://eip.its-platform.eu/activities/sa-42-facilitating-automated-driving#Par . There is a related sub-activity that Transport Scotland is not actively involved in, but may be of interest. This is Activity 4.4 – Cooperative ITS Services Deployment Support. The web pages for this activity can be found at https://eip.its-platform.eu/activities/sa-44-cooperative-its-services-deployment-support .

We are in the early stages of developing a CAV Strategy report for Scotland. Once this has been developed we aim to publish this on the Transport Scotland and/or Scottish Government website.

We are also a partner in Project CAV Forth, led by Fusion Processing. The project will convert five full-size Alexander Dennis single decker manually driven busses into autonomous vehicles. These self-driving buses will provide a service capable of carrying up to 42 passengers 14 miles from Ferrytoll Park and Ride across the Forth Road Bridge to Edinburgh Park Train and Tram interchange. Please see the following for further information https://www.gov.uk/government/news/from-science-fiction-to-reality-people-in-london-and-edinburgh-set-to-be-the-first-to-trial-self-driving-vehicle-services

3.1 If yes, I request to see the complete strategy, its ambitions and its objectives in PPTX, Word, PDF or picture format.

 See above answer to 3.

3.2 I also request a supplementary document that includes all levels of detail on:

(a) Companies and entities involved and the names of the company/entity officers?

Transport Scotland has contracted KPMG to help develop the CAV strategy and they are gathering views from the following companies and entities to inform the strategy.

Academy (A9)
Transport Systems Catapult
Kier
Confederation of Public Transport
City of Edinburgh Council Dundee City Council
IBI Group
Universities - Edinburgh - Heriot Watt - Aberdeen - Edinburgh Napier
University of West Scotland AESIN

Innovation group: - Cubic - Jacobs - Amey
Manufacturers & Technology companies: - Traak Systems - Konrad - TomTom - BP - Cognigital - Viaqqio
Technology Scotland (inc. MaaS Scotland)
CENSIS
Urban Foresight & Dundee MILL
Scottish Council for Development and Industry (SCDI)
Brodies
BEAR Scotland
Teletrac Navman
INRIX
Fusion Processing
WSP
The Road Haulage Association
Clearview Intelligence
FirstGroup
Allied Vehicles
Energy Savings Trust
Scottish Law Commission
Highland Regional Transport Partnership (HiTrans)
Mobility and Access Committee for Scotland (MACS)
Strathclyde University
SCOTS / Traffic & Road Safety Group
Dynniq
Glasgow City Council
Skills Development Scotland
Scottish Gaming Network
Traveline Scotland
Alexander Dennis Limited
Jaguar Land Rover
Gray & Adams
Volvo / Terex
Machines with Vision
Association of British Insurers

Scottish National Investment Bank
ScotRail
National Farmers Union of Scotland
Abertay University
Perth and Kinross Council
IAM Road Smart
Scottish National Investment Bank
Scottish Government Advanced Manufacturing Group

The partners involved in Project CAV Forth are Fusion Processing (lead), University of West of England, Alexander Dennis, Edinburgh Napier University & ESP Systex and Stagecoach.

(b) Specification sheets of all technology.

We do not hold this information.

(c) What type of communication system will the Scottish government be utilising to control the vehicles?

We do not hold this information.

(d) What UK, EU and International safety standards does your AV strategy and rollout comply with?

We do not hold this information.

(e) I request proof e.g. a certificate from the Scottish government that confirms that UK, EU and International safety standards for workers and the public have been met.

We do not hold this information.

3.3 If no, I request all documentation, memos, emails and communication on companies and entities you're in talks with regarding the formulations of an autonomous public and private vehicle technology strategy.

Not required given responses above.

4. Do you have a strategy for smart roads and smart signage on Public Highways and Public spaces?

We do for motorways and trunk roads in Scotland for which we are responsible, but not for all public roads or spaces. We published our Transport Scotland Future ITS Strategy in November 2018. A copy of which can be found at:

https://www.transport.gov.scot/publication/future-intelligent-transport-systems-strategy/ Local Authorities are responsible for local roads in Scotland.

4.1 If yes, I request to see the complete strategy, its ambitions and its objectives in PPTX, Word, PDF or picture format.

The strategy is available to download at: https://www.transport.gov.scot/publication/future-intelligent-transport-systems-strategy/

4.2 I also request a supplementary document that includes all levels of detail on:

(a) Companies and entities involved and the names of the company/entity officers?

Jacobs were contracted to support Transport Scotland in preparing the Future ITS Strategy.

There was a Research and Consultation document that provides information on the companies and entities involved in the preparation of the Future ITS Strategy. This can be found at: https://www.transport.gov.scot/publication/future-intelligent-transport-systems-strategy/ .

(b) Specification sheets of all technology.

We do not hold this information. Such information is normally held by Highways England.

(c) What technology e.g. units and arrays will not be 5G, but can be 5G enabled e.g. with current software, future software, hardware upgrades or retrofitting etc (you must be specific on anything here)?

We do not hold this information.

(d) What UK, EU and International safety standards does your 5G strategy and rollout comply with?

Public Health England's (PHE's) Centre for Radiation, Chemical and Environmental Hazards (CRCE) takes the lead on public health matters associated with radiofrequency electromagnetic fields, or radio waves, used in telecommunications. The Scottish Government would seek alignment with their standards. The Scottish Government does not currently have a 5G Strategy but of course any strategy we publish will ensure that appropriate and relevant standards and legislation is adhered to.

(e) I request proof e.g. a certificate from the Scottish government that confirms that UK, EU and International safety standards for workers and the public have been met.

We do not hold such information.

4.3 If no, I request all documentation, memos, emails and communication on companies and entities you're in talks with regarding smart roads and smart signage.

See answer to question 4.

5. Are you planning to rollout or have rolled out LED street lighting?

Yes we are planning to roll out more conversions to LED upgrades on Trunk Road Network in Scotland.

5.1 If yes, please answer these questions:

(a) What is the CMS and specification of the software and hardware of the LED street light system?

CMS suppliers for Transport Scotland (TS) include PHILIPS, Harvard Engineering and Zodion.

Transport Scotland does not specify specific hardware and/or software apart from asking for compatibility with Highway England's MORLICS requirements for adaptive and intelligent lighting.

(b) What type of waveform is the LED? e.g. Square wave?

We do not hold this information.

The information may be available in manufacturers' or suppliers' datasheets, catalogues or web-site.

(c) Can you control the Pulse Width Modulation (PWM) of the streetlight system using the CMS?

We do not hold this information.

This may be available in manufacturers' or suppliers' datasheets, catalogues and/or web-sites.

(d) Can you control the PWM of each streetlight that's connected to the system?

Each LED luminaire on the trunk road network can be controlled separately via CMS suppliers' host.

(e) What restrictions do you have in place for the control of the PWM?

We do not hold this information.

However, safeguards and restrictions are provided and managed by the CMS supplier as part of service level agreement between TS Operator and the supplier.

(f) What is the UK, EU and International safety limit (low and high) for the amount of 'flicker' (Hz) the Human Body and eyes can be exposed to and for how long?

We do not hold this information.

(g) I request to see the training manual and safety operation manual for the CMS and the LED streetlight system.

We do not hold this information.

(h) Who is the company who is or has installed the CMS LED streetlight system?

CMS providers for the trunk road network include PHILIPS, Harvard Engineering and Zodion.

Installers of CMS on the trunk road network are Transport Scotland's Operating Companies (OCs) information on which can be found at https://www.transport.gov.scot/transport-network/roads/the-trunk-road-network/#45651 This includes BEAR Scotland, Amey and Scotland Transerv along with CONNECT (M77 DBFO), Scottish Roads Partnership (M8 DBFO), Highway Management (Scotland) Limited (M80 DBFO), Auto-Link (M6 DBFO) and Aberdeen Roads Limited (Aberdeen Western Periperhal Route – Balmedie-Tipperty).

(i) What company maintains and repairs the CMS and LED streetlight system?

Maintenance and repair works on LED luminaires are carried out by Transport Scotland's Operating Companies (OCs) and DBFOs as outlined in 5 (h) above.

Maintenance and repair works on CMS are carried out by CMS providers for Transport Scotland's Operators on the Scottish trunk road network.

CMS providers for the Scottish trunk road network include PHILIPS, Harvard Engineering and Zodion.

(j) What entity and Officer is responsible for the safety standards for the CMS and LED streetlight system?

Transport Scotland's Operating Companies (OCs) and DBFOs are responsible for safety of assets installed on the trunk road network.

(k) I request proof e.g. a certificate from the Scottish government that confirms that UK, EU and International safety standards for workers and the public have been meet.

We do not hold this information.

(l) What is the amount of Blue Light leakage that's safe for the public and workers during the LED streetlights operation?

We do not hold this information.

(m) What level of LED streetlight exposure is safe for the public at daytime and night time?

We do not hold this information.

(n) Is there a legal requirement for diffusers to be fitted to LED streetlights?

We are not aware of a legal requirement, however diffusers or shields are installed where appropriate to minimise discomfort glare.

(o) How have you addressed the amount of Oxidative Stress on Human and Animal cells that's produced from LED?

We do not hold this information.

5.2 If no, then I request a declaration from the Scottish government that you will not be installing LED streetlights in the future. If you cannot provide a declaration, I would like the following answered in the future tense:
Transport Scotland is rolling out the installation of LED lighting on the Scottish motorway and trunk road network.

(a) What is the CMS and specification of the software and hardware of the LED street light system?

(b) What type of waveform is the LED? e.g. Square wave?

(c) Can you control the Pulse Width Modulation (PWM) of the streetlight system using the CMS?

(d) Can you control the PWM of each streetlight that's connected to the system?

(e) What restrictions do you have in place for the control of the PWM?

(f) What is the UK, EU and International safety limit (low and high) for the amount of 'flicker' (Hz) the Human Body and eyes can be exposed to and for how long?

(g) I request to see the training manual and safety operation manual for the CMS and the LED streetlight system.

(h) Who is the company who is or has installed the CMS LED streetlight system?

(i) What company maintains and repairs the CMS and LED streetlight system?

(j) What entity and Officer is responsible for the safety standards for the CMS and LED streetlight system?

(k) I request proof e.g. a certificate from the Scottish government that confirms that UK, EU and International safety standards for workers and the public have been met.

(l) What is the amount of Blue Light leakage that's safe for the public and workers during the LED streetlights operation?

(m) What level of LED streetlight exposure is safe for the public at daytime and night time?

(n) Is there a legal requirement for diffusers to be fitted to LED streetlights?

(o) How have you have addressed the amount of Oxidative Stress on Human and Animal cells that's produced from LED?

6. I request all memos, presentations, documents, plans, rollouts, emails and details regarding 2G, 3G, 4G, 5G,WiFi and WiGIG in public spaces.

As noted in the cover letter, this question breaches the £600 threshold for enquiries.

Telecommunications policy is reserved to the UK Government and regulated by Ofcom. Public Health England's (PHE's) Centre for Radiation, Chemical and Environmental Hazards (CRCE) takes the lead on public health matters associated with radiofrequency electromagnetic fields, or radio waves, used in telecommunications. Although the Scottish Government seeks to create policy and influence commercial deployment decisions, we do not hold technical information on mobile infrastructure (eg specification sheets for equipment). This would be a matter for mobile network providers or equipment vendors.

The majority of mobile rollout in Scotland has been commercially led. Whilst the Scottish Government does not collect data pertaining to commercial mobile coverage, Ofcom publishes this coverage data on a quarterly basis in connection with their Connected Nations reporting.

The UK Government is leading the rollout of a 4G-based network for the emergency services. Known as the Emergency Services Mobile Communications Programme (ESMCP), this is largely being rolled out by EE using their own commercial 4G network. In areas where EE has no plans to deploy infrastructure, the UK Government is leading a project called Extended Areas Services to ensure there is maximal coverage of the UK's motorways, A Roads and B Roads. Wherever possible, the UK Government has agreed that masts built for ESMCP will be available for commercial service.

Our 2016 Mobile Action Plan (See https://www.gov.scot/publications/mobile-action-plan/) sets out a series of actions aimed at improving mobile coverage across

Scotland. A core initiative arising from the Mobile Action Planis the Scottish 4G Infill (S4GI) programme, designed to extend access to mobile services over and above commercial rollout. The Scottish Government is investing £25 million (including £10 million from the European Regional Development Fund for the Highlands and Islands) to deliver future-proofed mobile infrastructure and services in selected complete mobile "not spots" (no outdoor 4G coverage on any network). You can access a range of information, including public consultations, at https://www.gov.scot/policies/digital/broadband-and-mobile/

In terms of Wi-Fi, the Scottish Government has had little involvement in outdoor Wi-Fi. Through our Public Wireless Programme, the Scottish Government sought to stimulate greater access to free Wi-Fi in public buildings (eg libraries, community halls and sports centres) through the provision of procurement and design guidance along with capital grant funding. Programme guidance can be found at https://www.webarchive.org.uk/wayback/archive/20170104121903/www.gov.scot/Topics/Economy/digital/action/WC2020/PWP

In 2016/17, the programme awarded just under £1M in grant funding LAs for localised Wi-Fi rollout. As a direct result of this investment, every library in Scotland provides free Wi-Fi. Although the Scottish Government funded projects, these were designed, procured and operated by individual local authorities. These are listed below. To the best of our knowledge, there has been no deployment of Wi-GIG in Scotland.

City of Edinburgh Council
Aberdeen City Council
Perth and Kinross
Fife
Falkirk
Midlothian
West Lothian
Dumfries and Galloway
Renfrewshire
North Ayrshire
East Ayrshire
Glasgow

On 5G, widespread commercial deployment is not expected until around 2020. To prepare for 5G, the UK Government is running a programme designed to incentivise investment in testbeds and trials to develop and prove the new technology and help build skills in the UK to help exploit it. No projects wholly based in Scotland have yet been successful in securing funding, although one project, 5G Rural First, includes a 5G test case in Orkney. The project involves multiple partners including Cisco, Nokia, Strathclyde University and Faroese Telecom. Broadway Partners Ltd is leading a trial of TV White Space in Inverness-shire and Perthshire as part of a separate project (5GRIT) which was also successful in securing UK Government funding.   These trials are expected to end during2019.