

1) Question: GLOSA on cellular - has this been tried elsewhere or proven to work?

Answer: We believe GLOSA over cellular has been trialled in the USA. However, we don't believe GLOSA utilising a dynamic realtime optimiser has been proven yet, but this is the purpose of the Pilot and we are trying to see what is possible. From what we know of other projects, like NordicWay, they have done similar messaging over cellular and so we think we are going to be able to do the same. There are many ways to run this and we are confident that there will be something we can do, but we also need to see if what we can do is not only good enough but offers a business benefit - is there a justification for doing this over cellular? The expectation is that we trial it. The following is a list of the current deployments of GLOSA:

- Somerset (WSP project and is based on SCOOT) – ITS G5
- Birmingham (SCOOT and MOVA) - Cellular
- Newcastle – ITS G5
- Las Vegas (fixed timing) – 4G
- Germany – ITS G5

The above are all trials.

In Los Angeles, Audi have nearly implemented GLOSA as an actual service.

2) Question: How does this integrate into the CHARM project?

Answer: This project is standalone as to avoid any co-dependencies. We have designed the architecture of the A2/M2 so that when CHARM comes along, it could be integrated.

3) Question: You mention using off the shelf solutions due to time, but are also asking for open source. Can you give more details on what you want and what you don't?

Answer: We recognise that there are suppliers who already have products in this space, we recognise that standards are developing and are at different levels of maturity, and we acknowledge that the government wishes to have open source software. A mix of these three elements is what we need, it's getting the balance between them; we don't want to be locked into a single vendor or single proprietary system. COTS will be used for the well-established functional aspects of the services, whereas development using open standards will be undertaken to integrate the COTS elements.

4) Question: There could be a problem with IPR. We have partners and this could cause issues.

Answer: Please refer to Option 2 on page 25 onwards in the Prospectus and identify any specific issues with the clauses.

5) Question: A number of speakers mentioned about simulation, this is used in research. Do you envision the simulation you run to be like this or is it different?

Answer: Our primary aim is to simulate the C-ITS services in a real-time environment. Traffic modelling is outside of the scope of this contract.

6) Question: Hybrid Communications- do you expect it at RSU level and/or split between 3G, 4G and ITS-G5

Answer: It is not a mandatory requirement to use RSUs to provide cellular services; commercially available networks can be used. Suppliers may want to propose using cellular for backhaul prior to connection to fixed networks (e.g. NRTS) being ready for future phases.

7) Question: As a technology supplier, we would be popping up in different consortia, do we have limitations on this? Can companies only show up once?

Answer: We understand that the only constraint is that the primary TMT2 contractor has to register any new sub-contractors with Crown Commercial Service (CCS). We are not aware of any constraints in the Public Contracts Regulations that prevent a supplier being part of more than one tender. However, we are awaiting a final response from CCS on this and will respond fully in due course.

8) Question: The contract won't include civil installation on roadside- how will this work?

Answer: We decided to use our pre-existing civils contractor in the South East as it allows us to commence construction planning prior to this contract being awarded, allowing us to meet the InterCor timescales. We expect to procure roadside units from this contract and have them be installed by our local contractor, with training provided to them. This aligns with our business strategy of making roadside assets maintainable without specialist knowledge; it is how UK CITE is being delivered. As part of the tender in January, a governance structure will be provided which shows how the overarching project governance, which this tender is a sub-component of, will be managed.

9) Question: The budget for the contract - is it £3 million for the 3 years?

Answer: The budget of £3m is for the first two years of the contract and does not include the 2,000 development days.

10) Question: You have a project, UK- CITE committed in the Midlands, how are the projects connected, what are the differences between them and are there shared lessons between them?

Answer: UK CITE is another project that falls under Highways England's Connect and Autonomous Vehicle Trials programme; the project has successfully deployed ITS-G5 technology. UK CITE is an industry led project where we are working with vehicle manufacturers as part of an InnovateUK project. That testbed will continue as our interest continues in understanding how the commercial relationships work to deliver connected vehicles. On A2/M2, we will actually own the data and services platform which we can develop for future CAV trials; it will be adaptable to partner requirements. This project has the additional benefit of being aligned to European standards as this is something that is progressing quickly and the UK must be involved in. Looking to how they will work together, Meridian is the front door and platform that brings it all together. If a manufacturer comes and asks to test a certain technology, we can point them to the best testbed for their requirements - be that UK CITE or A2/M2. We will pursue them equally.

11) Question: CAV PIP - what is its scope? It references that they do evaluation and support, does this mean governance, technical oversight etc?

Answer: As to avoid a conflict of interest, the CAV-PIP is prohibited from tendering for any Highways England opportunities whereby they would lease, sell or tender their own CAV and C-ITS software, hardware, equipment and infrastructure on the A2/M2, UK CITE, and Freight Platooning projects. The CAV-PIP is far reaching, undertaking all of the tasks required to support an operational pilot. On the question of governance, this is a good question and when the tender is issued, there will be a clear definition of roles and responsibilities of the parties and how we see them, and the accountability between them.

12) Question: Does this tie into, or going to impact or have any synergy with any of the other significant TFL projects?

Answer: We have looked at other TfL projects and where they have synergies with the A2/M2 project, then we will see whether they can be utilised without impacting either project.

13) Question: Is it expected that there will be no chance to take control of the network or junction when we look at GLOSA? I.e. Do we just take the data we are given.

Answer: Part of the purpose of undertaking the GLOSA pilot is to assess whether we can provide this service without changing or constraining the existing dynamic control.

14) Question: What does everyone think the biggest risk to the project is?

Answer: One of the biggest risks is the speed at which the technology moves. There are lots of progressions being made, a lot of unknowns on what the winning technology will be. We have attempted to mitigate this in the system architecture; we have split back office systems and RSU's and this will help us to be technology agnostic between the data and service system, and communication technology. It is a brave new world for road operators where we are no longer setting standards but working collaboratively with car manufacturers to do so. We need to be flexible to

changes in the market and we believe that our architecture should help with mitigating this risk.

From other projects, the first lesson we have learnt is in first understanding risk: establishing an equal risk appetite across the partners. We have multiple partners with different attitudes to risk, alongside the supplier organisations that are providing services. We therefore need to have a common understanding of risk across the project.

The supply chain is our biggest risk. Most cyber security incidents happens in the depth of the supply chain and we need to look deep into it from end to end delivery of the solution.

This is quite a complex project, it is a European project and there are dependencies and risks that relate to the InterCor project which are outside the scope of the A2/M2 project, but which could affect it. But in meeting regularly with our European counterparts, we are maintaining communications and ensuring that all of these are identified and that appropriate measures are in place.

15) Question: Do the partners feel the timescales are too short for forming consortia?

Answer: The project has been in the public domain for several years, with the prospectus and PIN published on 16th November. This would allow for 2 months to find partners before the ITT publication, which we believe this is long enough.

16) Question: Please provide a list of the exempt suppliers

Answer: WSP, KPMG, White Willow Consulting, Actica, Bristol Uni, University of West England, Cadzow Communications Consulting, Harrod-Booth Consulting, Horiba Mira.

17) Question: How is the project funded?

Answer: The proposed funding is circa: £300k KCC, £500k TfL, £2.2m HE. 50% of costs are reimbursed through a European grant.

18) Question: What will be the roles of TfL, Kent and HE and how will the project be governed.

Answer: TfL, Kent and HE are delivery partners responsible for agreed deployment within their road authority areas. They are working in partnership with DfT under a partnership terms of reference, which sets out the governance arrangements.

19) Question: Who will be the lead out of the above.

Answer: Department for Transport are the project lead, with Highways England acting as the Contracting Authority. However, in terms of project governance, all parties (HE, TfL, KCC) are working in partnership with DfT under a partnership terms of reference, which sets out the governance arrangements.

20) Question: What role will be undertaken by WSP and will there be any other advisors

Answer: See Q11. There will be other advisory work (e.g. Atkins and Capita are currently supporting individual organisations in some capacity) but NDAs and Conflict of Interest prevention measures are in place.

21) Question: We noted Kent were represented by Atkins - is this a conflict or are they not bidding?

Answer: NDAs and Conflict of Interest prevention measures are in place. Atkins are not prohibited from bidding.

22) Question: Will Meridian role be clarified in the ITT?

Answer: There is no role for Meridian in the procurement process.

23) Question: Should RSU communication be ITS-G5 only or hybrid?

Answer: The RSU should accommodate ITS-G5 wireless communications for V2I. It is anticipated that by phase 1 the RSU will communicate with the back office system through a wired IP network. Commercial cellular networks can be used to provide cellular services to vehicles and for backhaul to RSUs in phase 0 if required.

~~The RSU should accommodate both Cellular and ITS-G5 wireless communications for V2I. It is anticipated that the RSU will communicate with the back office system through wired IP network.~~

24) Question: What are your expectations from start-ups in terms of financial robustness?

Answer: The TMT2 framework agreement determines requirements for financial standing. Please check with your TMT2 contact.

25) Question: Will our kit need to support V2V DSRC

Answer: The kit will support ITS-G5 802.11p based on European standards.

26) Question: Current focus is very much on Autonomous Vehicle operations and support functions. We would suggest to adopt to an autonomous environment approach (especially for corridors with the importance of the A2/M2): exploring what information and services can be provided by the infrastructure and road operators to the vehicles to help them better operate (e.g. helping with risk identification in harsh weather conditions)

Answer: Thank you for your advice.

27) Question: It would seem sensible to include the infrastructure installation as this will probably be sub contracted out by the Asset Support Contractor (ASC) providers (Highways England's road maintainers) in any case and there will be issues in quality control and assurance if undertaken by ASC.

Answer: FYI civils works have always been out of scope (see Prospectus para 24). We are considering amending the specification to allow the equipment manufacturers to go on site under supervision of the road maintainer.

28) Question: Will TfL, Kent, DfT or HE be seeking commercial gain from any of the software developments.

Answer: We wouldn't be able to seek any commercial gain from any of the software development as we don't own the IPR, just a license.

29) Question: In subsequent discussions with potential team members, following the market engagement event, it has been said that only 'consortia' would be acceptable to HE rather than a 'team arrangement of prime and a number of subcontractors'. Could you clarify this please?

Answer: We are content with a consortia of TMT2 suppliers, or a TMT2 prime with any number of subcontractors (who could be both TMT2 and non-TMT2),

30) Question: The costs and timescales appear tight, particularly when you compare it with other C-ITS projects (e.g. UK CITE) and recent testbed announcements. Whether it can be delivered with the time and cost needs further analysis. Could you please provide greater clarity to the £3M plus 2000 days statement? Is there any flexibility on interim timescales and requirements?

Answer: The 2,000 days is included in the assessment but is not part of the £3m maximum budget for the initial 2 year period. There is little flexibility on timescales due to InterCor dependencies. We believe this contract is deliverable for the budget of £3m over the first two years.

31) Question: Is it acceptable for one supplier to run more than one Testbed?

Answer: Yes.

32) Question: Could you please provide further information on specific vehicle types and if CANBUS integration is required?

Answer: No CANBUS integration is required and fleet is now out of scope (as per Scope Refinements presentation at the market engagement event).

33) Question: Could you provide further clarity on off-road TESTFEST location requirements?

Answer: The TESTFEST location is out of scope of this contract. In any case, the (Stage 0) TESTFEST off road location ideally will be located in close proximity to the M2 and will provide suitable facilities to enable the on road TESTFEST to take place. This includes setup and configuration areas, briefing rooms, working spaces, refreshment and welfare facilities. It is anticipated that between 20 and 40 suppliers could attend the TESTFEST.

34) Question: MIRA are part of CAV PIP - does this exclude them from being an off-road test location?

Answer: Off road test locations are excluded from this tender.

35) Question: Could you provide more clarity on the role of CAV PIP from an evaluation and support perspective?

Answer: At this stage it is envisaged that CAV PIP will be responsible for providing all evaluation and support activities related to the delivery of the test bed up to the end of Phase 1a. Both elements will work together to deliver the requirements of the project.

36) Question: Is the consortium to gather the evidence in a suitable format and present to the CAV PIP for evaluation?

Answer: Yes.

37) Question: Could you provide greater clarity on parties involved in market engagement event (conflict of interest)? e.g. Can BAE Systems be a cyber security provider within a consortium? Are Atkins conflicted due to representation on behalf of Kent County Council or will the assessor be different?

Answer: See Question 18.

38) Question: Could you provide further guidance on governance, roles and responsibilities of the four main sponsors (DfT, Highways England, TfL and KCC) and support partners please?

Answer: See Question 8 and 11.

39) Question: Could you provide clarity on your position on open source software versus cyber threat?

Answer: The existence of open source software in the technology estate is increasingly common for all types/sizes of organisations. Whether this is a security benefit or not is a topic that has been discussed by the security industry for some time. Publishing the code base provides an equal opportunity for both attackers and defenders (e.g. security researchers) to review, identifying pros and cons to both approaches. Ultimately, both open and closed software products can contain vulnerabilities and need to be appropriately managed. It is expected that risk management activities are conducted in selecting of any software, which includes:

- Ensuring that the software will be supported for the duration of the project. (Is there an active open source community that will maintain the software?).
- Ensuring that software used is locked down such that only services and functions that are necessary for the operation of the system are installed/running.

- Ensuring that there are software asset registers maintained that record all installed software components and version numbers
- The existence of a patch management process ensuring that vulnerabilities affecting the installed software can be fixed in a timely manner

40)Question: Do you have any intention in running another supplier event, focused on supplier interaction and collaboration? And is there scope for further dialogue on the requirement (ideally mid tender) between consortium and customer to help guide and shape proposals?

Answer: This sounds like a very positive idea; however, it all boils down to funding to accommodate the event and scheduling. We may be able to accommodate a session once the ITT is published, but assumed that suppliers would be arranging their own interaction and collaboration sessions in order to establish their consortium, since the event on the 11th December was primarily for suppliers to network (albeit we were rather hampered by the British weather!).

41)Question: Is the additional 2000hrs set aside for agile included in the price evaluation?

Answer: Yes the 2,000 days is included in the assessment but is not part of the £3m maximum budget for the initial 2 year period.

42)Question: Can you advise why car manufacturers have not been more involved to date? We would expect OEMs to have a large part to play in CAV and I think they need to be an integral part of the process rather than being involved once decisions are made.

Answer: We have, and will continue to engage, OEMs through various forums (C-CAV, SMMT, London Automotive Council, Crown Commercial Services' fleet frameworks).

43)Question: The grey area for IPR that is likely to cause problems is around any development of existing COTS products or IPR, which must be retained by the original owner / supplier and no transfer of such enhancements could be risked under the contract. We would be grateful for some clarification on this issue.

Answer: Suppliers should refer to Option 2 on page 25 onwards from the Prospectus. Clause Z48.3 confirms the status of background IPR, software IPR and specially written software IPRs. Z48.10 also makes provision for how to deal with enhancements to existing software.

44)Question: Please explain the drop in estimated value from £15m to £3m.

Answer: The public announcement of £15m is for all goods and services (e.g. CAV-PIP, civils works, this contract, peripheral requirements etc.) related to the full operation of the Pilot (including Phases 2 and 3).

45)Question: Should OBU communication be ITS-G5 only or hybrid?

Answer: The OBU should accommodate both cellular and ITS-G5 wireless communications for V2I. The OBU can be made up of one or multiple devices, preferably with one HMI.

46)Question: Would you accept tenders from a company acting as a coordinator of a wider supply chain?

Answer: See Q29. There are no constraints on the types of companies from TMT2 that can tender.

47)Question: What type of drivers are the in-vehicle services delivered to?

Answer: It is likely that the initial fleet will be a local authority fleet with an ambition to expand to other fleet (e.g. logistics, Traffic Officer Service, general public etc.) over time.

48)Question: How do you see mapping and navigation suppliers participating?

Answer: We would anticipate these suppliers participating by providing their mapping and navigation solutions to companies then integrating the new data feeds into their applications for display to drivers, as to encourage near-to-market solutions to be developed.

49)Question: Please can you clarify the role of the partners in the design of the solutions?

Answer: For the civils works, WSP is the Principal Designer and the successful supplier is the Designer (in accordance with CDM Regulations). For the technology aspects, the successful supplier is the design authority.