

**Document Details:** UTT Questions and Answers

**Challenge:** Underground Tunnelling Techniques

**Version:** v0.1

Q: Can you please confirm the intent with regard to the number of what I understand £60k initial tasks to be funded. Is it one in total as the text suggests?

A: To confirm this is one £60k task in total.

Q: Please could you advise if underground imaging/sensing is within scope here?

A: The Challenge Sponsor would also welcome submissions which address some, if not all of, the Project scope, so long as they support the overall tunnelling challenge described. Underground mapping would be in scope if it supports optimal route finding and tunnelling. The Challenge Sponsor is seeking an innovative solution to the Challenge which go beyond demonstrations of existing off the shelf unmodified industrial practices.

Q: The document states paper exercises are not in scope. How much of a system would need to be demonstrated in this project? A full proof of concept demonstrator is difficult on this budget. Would a preliminary CAD design of a system, backed up with calculations, reasoned description and justification of the concept, be acceptable for this funding round?

A: We are interested in any proposal that develops and demonstrates possible solutions by whatever means, although we will prioritise experimental over theoretical proposals e.g. that develop technology demonstrators. We don't expect full system demonstration and would be happy with exploration of sub-systems or components.

Q: Is there already a budget for the value of follow-on funding?

A: Although we cannot at this point commit to funding beyond the current call, we have aspirations to pursue promising technologies and approaches.

Q: Is it acceptable for different solutions for different formations (concrete, top soil, sand etc), or is a single product for all applications desired?

A: Yes different solutions can be proposed for different formations.

Q: Are steering requirements specified, for example in terms of dogleg severity?

A: No steering requirements are specified.

Q: The example 'case' discusses a 250m long hole requirement, what is the maximum distance required for this project?

A: We have no set requirement for minimum or maximum dimensions of the hole, we are interested in what you think and what you can demonstrate can be achieved.

Q: Has a target drilling speed been set?

A: No target drill speed is specified.

Q: Is there a specification for positional accuracy? Would an DD (directional drilling) style increasing zone of uncertainty model be acceptable?

A: There is no specification for positional accuracy. Although this is a critical factor for any end capability, our interest for this call is providing opportunity to test ideas that enhance the efficacy of the tunnelling process rather than its accuracy. We would envision that challenges around positional accuracy and uncertainty modelling are steps that we would aspire to in the future for any technologies that progress.

Q: Are there already 3rd party sensors/payloads in mind, or will these also need to be developed?

A: Sensors/payloads are not being considered for this challenge.

Q: Does limited scope for detection only apply during the tunnelling phase?

A: Detection is of concern for the drilling stage only. Although we are interested in ideas for beyond the drilling stage - but it's not our immediate priority.

Q: Is there a requirement to hide the tunnel, or mask the tunnelling method afterwards?

A: Yes, the Project Scope section of the Challenge document includes the requirement for a small or concealable footprint. Note, we are interested in proposals that meet some of the requirements if it is deemed not possible to meet all requirements.