

## TR201721 Leader-Follower TMA Questions and Answers

Q1: Does MoDOT have a budget range for this project? If so, are you able to disclose the amount?

*A1: We are unable to disclose the budget range. It is our opinion that this project provides great value to Offerors in respect to MoDOT providing trucks, TMAs, drivers and a live work zone to test and prove their technology.*

Q2: The system we develop, will we be producing it as an aftermarket add on, or will we be working with your vehicle manufacturers to incorporate it?

*A2: The selected team will work with the manufacturing contacts listed below:*

### **Freightliner contact**

David Snyder

803-578-3256

[david.snyder@daimler.com](mailto:david.snyder@daimler.com)

### **Western Star contact**

Ted Werner

803-578-3578

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### **International/Navistar contacts**

Darren Gosbee

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Chad Conley

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### **Mack contacts**

Rod Brearman

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Danielle Rodrigues

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Q3: Will not having previous local government projects preclude us from being considered for this RFP?

*A3: Please see section 3.C.1.A for rating criteria. Previous experience with local government projects is not considered a factor, but experience with the requested technology is a factor.*

Q4: Not clear who is actually building up the baseline (non-automated) TMA Truck; MoDOT or the contractor? Meaning who physically attaches the TMA to the truck and adds all the “TMA” associated gear to the MoDOT vehicle making it an actual “TMA Truck”.

*A4: MoDOT will be responsible for building up the TMA truck with the exception of ballasting (see question #4 below). These tasks may be done through our normal processes or through a separate agreement with the Offeror.*

Q5: Will multiple functions listed in the solicitation that include; snow removal and salt spreading be part of the Leader-Follower TMA function or is the customer simply stating that the trucks (non-automated/non-TMA) need to be able to still support those functions?

*A5: This means LT and FT must still be able to perform these other functions when not being used in an automated capacity.*

Q6: Who is responsible for providing the arrow board and installation?

*A6: MoDOT will provide the arrow board and installation through our normal processes or through a separate agreement with the Offeror.*

Q7: Who is responsible for ensuring the vehicle weight and, if underweight, who will be providing the ballast?

*A7: The Offeror will need to provide all necessary ballasting and associated certification.*

Q8: Task 6 requires 32-hours of continuous operation. I am assuming this consists of four 8-hour days of operation; correct? Meaning, what if the vehicle needs gas, safety rider needs a break, etc. Can clarification be provided regarding how the 32-hours is divided up?

*A8: Yes, this is better explained by saying 32 consecutive hours of successful operation. It is expected these hours will be split up over approximately 4-5 days. Breaks, fueling, etc., do not count towards the required hours.*

Q9: Task 7 requires 250-hours of continuous operation. I am assuming this consists of 1 month of 8-hour days of operation; correct? Meaning, what if the vehicle needs gas, safety rider needs a break, etc. Can clarification be provided regarding how the 250-hours is divided up?

*A9: Yes, this is better explained by saying 250 hours of successful operation. It is expected these hours will be split up over multiple days and weeks. Breaks, fueling, etc., do not count towards the required hours.*

Q10: We would like to request clarification regarding the types of road conditions the Leader-Follower TMA truck will be operating on (i.e. improved highway, snow, rain, dirt/gravel road, etc.)

*A10: The Leader-Follower TMA trucks will be operating on paved divided highways in generally good weather. The equipment should be capable of withstanding snow, salt and rain since the vehicles will be used for snow and ice removal operations when not being used in automated capacity.*

Q11: What happens if an event unrelated to the Leader-Follower TMA causes an interruption to operations therefore requiring an operator to take control of the vehicle through no fault of the Leader-Follower TMA system (i.e. the TMA gets hit, leader vehicle driver makes an error, etc.)

*A11: Instances like these will not be considered a failure since the Leader-Follower system did not fail.*

Q12: With the requirement of the Follower truck blinker signals and sign board to mirror the leader sign board, we will have to interface to the blinkers in the truck and the sign board and will need MoDOT to specify those electrical interfaces or provide information from the vendor so we know how to get the data.

*A12: MoDOT or our truck vendors will provide all necessary information to the successful Offeror.*

Q13: Will CM10 Research Agreement be used for the post-award contract?

*A13: Yes, the CM10 will be used unless the winning proposer already has a Memorandum of Understanding with MoDOT in which case a task order document will be used.*

Q14: Is the customer willing to accept a milestone payment scenario? There is a lot of work and effort required leading up to tasks 6 and 7 and contractor is supporting that entire labor effort. Our recommendation is to allow the contractor to invoice for a milestone payment upon the successful completion of Task 4 or Task 5.

*A14: In the taxpayer's interest, we are not willing to accept a milestone payment other than explained in response 19.*

Q15: In Section 1.D Contract Period and Budget the contract period for the performance of services is listed as running from date of Resulting Agreement through December 3, 2018. However, Section 1.F Project Schedule indicates deliverables beyond the December 3rd date and a contract end listed as March 29, 2019. Is this a discrepancy or can you clarify the period of performance?

*A15: The correct contract end date is March 29, 2019. We have updated the RFP to reflect this end date.*

Q16: Under the Task 4 description on p.9, the second bullet indicates that MoDOT will provide the NCHRP350 Level 3 Compliant TMA and that MoDOT will provide and install all working lights. The requirements are then provided in a .pdf for the arrow board. Will MoDOT be providing a compliant arrow board as well or is the Offeror required to procure and install the arrow board?

*A16: Correct. MoDOT will provide and install the video camera and the successful Offeror is welcome to review footage at any time.*

Q17: Please clarify number of units to be delivered. In Section 4.A.2 Method of Payment we see reference to two units being delivered but no specific quantity listed anywhere else.

*A17: Section 1.B defines the Leader-Follower TMA system as a Lead Truck (LT) and a Rear Advanced Warning Truck called the Follow Truck (FT). Section 2.B, Task 4, also describes the Leader Follower TMA System as consisting of a LT and FT. As stated elsewhere, MoDOT will provide these trucks, associated TMAs, and arrow boards.*

Q18: Section 5.Q indicates that all documents, reports, exhibits, etc. produced by the Offeror remain property of the MHTC. What are the rules for any intellectual property either applied or developed during the course of the delivery of this project? Our assumption is that the IP rights remain with the Offeror but we request clarification if MoDOT expects IP rights as a result of this program.

A18: *An example contract can be found here:*

[https://library.modot.mo.gov/RDT/forms/CM10\\_Standard\\_Research\\_Agreement.docx](https://library.modot.mo.gov/RDT/forms/CM10_Standard_Research_Agreement.docx)

*This addresses proprietary rights and patents. Intellectual property is a broad term so we cannot answer this without knowing specifics.*

Q19: In section 4.A.2 Method of Payment it indicates that full payment will be made upon successful delivery of tasks 1-8. If tasks are not completed successfully, no compensation will be provided. Is success or failure judged on an individual task basis and is compensation awarded on an individual task basis? Or is it really that compensation will only be awarded upon successful delivery of all tasks and not until March of 2019 when the contract is complete? Can you provide additional clarification regarding compensation and potential for interim billing, etc.?

A19: *A 95% payment can be made upon successful completion of Task 1-7 and the remainder upon completion of Task 8.*

#### **NEW as of June 26, 2017**

Q20: The RFP states "*The FT shall have lateral accuracy of 6 inches or better. Follow distance accuracy shall have an accuracy of 2 feet or better when the LT is operating at the consistent speed or at typical acceleration and deceleration rates.*"

However, the trucks provided by MoDOT could have mechanical "slop" that exceeds these requirements (for both long, and lateral accuracy). For example, as the transmission switches gears, it will usually account for speed changes in the vehicle (while switching), that will significantly exceed the "along the path" error budget. Also, it is not uncommon to have "slop" in the steering column that accounts for significant sideways tracking errors, that once again, exceed the error budgets. How is the government going to measure these errors in the vehicles themselves, before providing them to the Offeror?

A20: *See the answer to question #2 regarding 'along the path' accuracy. It is highly desirable for the lateral accuracy to be 6" or better. If an Offeror is unable to meet this requirement, they should provide the anticipated accuracy of their system and consider mitigation strategies such as right/left offset options to ensure the FT won't encroach into the open lane of traffic. Offerors should contact the truck vendors directly to discuss steering column issues and incorporate this information into their design and proposal.*

Q21: It is not uncommon for the transmission to take 1 to 2 second to change. If the first vehicle decides to change speed while the second vehicle is in between gears, the following distance error is likely to be higher than the 2 feet allotted. Is the 2 feet an average number, or NTE / CEP? Though 2 feet is achievable, also, it can add complexity and cost, and is currently not achievable by manned operations. Distance accuracy may be more usefully expressed as a percentage?

*A21: The two foot requirement will be measured when both vehicles are traveling at similar speeds with no gear changing. It is understood during acceleration and deceleration the accuracy will degrade.*

Q22: The RFP states: the FT shall have lateral accuracy of 6 inches or better." Is this NTE / CEP? When a truck turns, the front wheels and back wheels follow trajectories that deviate from one another. Is the lateral accuracy measured from the front tire of the front vehicle to the front tire of the back vehicle; back tire to back tire; or average to average?

*A22: We can work with all of those measuring options.*

Q23: The following accuracy numbers required for side-to-side and "along the path" are very stringent, and difficult to achieve with commercial equipment that is not designed to follow that level of accuracy. Is this the threshold, or an objective requirement?

*A23: Please see question #1.*

Q24: What should the following vehicle do if a moving obstacle (human, vehicle, or otherwise) decides to go between the leader and follower? Should the follower stop/avoid/drive around, or is this outside of the scope of this RFP? Also, would there be other vehicles in between the leader and follower trucks?

*A24: Task 4 states "Provide only frontal collision avoidance on the FT by braking. No collision avoidance is required on the LT." No vehicles are planned to be between the LT and FT.*

Q25: Does the follow truck need to the ability to be manually operated (by a human) as well as leader-follower?

*A25: Yes. The FT will be manually driven to the job site at highway speeds. It will only be placed into autonomous mode during moving operations that are typically around 10 mph. It shall have the ability for a driver to immediately take over control during the testing.*

Q26: Is the complete system a single pair of vehicles (one Lead Truck, one Follow Truck)?

*A26: The complete system is a single pair of vehicles consisting of one Lead Truck and one Follow Truck.*

Q27: The RFP states: "installation should not void the truck manufacturer's warranty." Is this a strict requirement?

*A27: It is not required, but preferred.*

Q28: What is the maximum speed during autonomous operations (i.e., the max speed for the vehicle to "catch up" in the event that it is "dropped," momentarily?)

*A28: The maximum speed during autonomous operations should be approximately 20 mph.*

Q29: Does the TMA provide digital/analog feedback that is collision occurred?

*A29: A standard TMA does not provide any feedback when a collision occurs.*

Q30: Would a teleoperation capability be beneficial?

*A30: Possibly with the right concept and design.*

Q31: If alternate vehicles (not listed in the RFP) are found to be more suitable for B-Kit applique, may they be considered?

*A31: MoDOT is currently restricted to acquire only vehicles on our bid list. We have listed all satisfactory vehicles in the RFP.*