REQUEST FOR PROPOSALS
FOR AUTO OCCUPANCY DETECTION AND VERIFICATION TECHNOLOGY

April 8, 2016
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INTRODUCTION

The North Central Texas Council of Governments (NCTCOG) is issuing a Request for Proposals (RFP) to implement technology to automatically detect and verify vehicle occupancy for users of tolled managed lane facilities in the Dallas-Fort Worth region. Occupancy verification will be used to apply a toll discount for qualifying high occupancy vehicles consistent with the Regional Transportation Council’s (RTCs) Toll Managed Lane Policies. Technology procured through this RFP should have the ability to be implemented not only in the Dallas-Fort Worth region, but in a seamless fashion on TxDOT managed lane and express facilities throughout the State of Texas. This RFP is being issued in consultation and with the support of the Texas Department of Transportation (TxDOT). Respondents may be requested to demonstrate proposed products by way of a technology demonstration.

NORTH CENTRAL TEXAS COUNCIL OF GOVERNMENTS

NCTCOG is a voluntary association of, by, and for local governments, and was established to assist local governments in planning for common needs, cooperating for mutual benefit, and coordinating for sound regional development. NCTCOG’s purpose is to strengthen both the individual and collective power of local governments and to help them recognize regional opportunities, eliminate unnecessary duplication, and make joint decisions. Since 1974, NCTCOG has served as the Metropolitan Planning Organization (MPO) for transportation in the Dallas-Fort Worth (DFW) metropolitan area. NCTCOG’s Transportation Department is responsible for regional transportation planning for all modes of transportation. The Department provides technical support and staff assistance to the Regional Transportation Council (RTC) and its technical committees, which compose the MPO policy-making structure. In addition, the Department provides technical assistance to the local governments of North Central Texas in planning, programming, coordinating, and implementing transportation decisions.

TEXAS DEPARTMENT OF TRANSPORTATION

The Texas Department of Transportation is responsible for maintaining 80,000 miles of road and for supporting aviation, rail, and public transportation across the state. TxDOT and its 12,000 employees are committed to working with others to provide safe and reliable transportation solutions for Texas by maintaining a safe system, addressing congestion, connecting Texas communities, and being a Best in Class state agency. TxDOT is governed by the Texas Transportation Commission consisting of five commissioners appointed by the Governor with the advice and consent of the Texas Senate.
POLICY BACKGROUND

The RTC has established policies\(^1\) (RTC Policies), which provide for a toll discount for high-occupancy vehicles. The occupancy requirement for the discount is two or more occupants (2+) and may go to three or more occupants (3+) on or before June 1, 2018. A 50% discount is available during the peak periods for HOV users for Tolled Managed Lanes. A 100% discount is available at all times for HOV users for Express/HOV Lanes. The HOV discount during the peak period is currently implemented through an app-based pre-declaration method and enforced manually through officers in the field. The RTC Policies provide that over time more advanced technology verification equipment will be phased in to replace manual enforcement. The goal of this procurement is to secure a technology solution to replace the current app-based and manual enforcement system.

The RTC is seeking a technology solution to provide for automated occupancy detection and verification to seamlessly implement the HOV discount element of the RTC Policies consistent with the following principles:

1. The technology solution may be in-vehicle, out-of-vehicle technology, or a combination thereof;
2. The technology should be designed as an occupancy verification mechanism to provide the HOV discount, not as an enforcement mechanism (e.g., users as violators);
3. The technology should be as seamless as possible to the user and require little to no user interaction beyond initial setup;
4. The technology should be able to determine occupancy in front row, second row, third row (optional) seats with varying levels of accuracy;
5. Technology implementation costs should be balanced against occupancy verification accuracy and ability to disregard animals and non-human surrogates;

\(^1\)http://www.nctcog.org/trans/committees/rtc/13.06.13TollManagedLanePolicy_RTCRevised_June2013.pdf
6. The technology should be expandable to address existing as well as future managed lane facilities; and
7. The technology should be compatible with and support integration with current toll collection system.

While the DFW region has an immediate need, any technology solution secured under this solicitation should have the ability to be implemented in a seamless fashion across the State of Texas on TxDOT managed lane facilities. Respondents should specifically address each of the above principles as well as the ability to implement statewide in their Proposals.

PROJECT OVERVIEW

By the year 2017, the DFW region will have a network of 300 lane-miles of high occupancy vehicle (HOV) managed lanes, increasing to 602 lane-miles by the year 2040. A map of these facilities is provided below.
The existing HOV facilities are part of an interim system based on a two-plus vehicle occupancy requirement. The Texas Department of Transportation (TxDOT), North Texas Tollway Authority (NTTA), and NCTCOG are evaluating the current HOV system to determine the feasibility of evolving these facilities to managed lanes. To facilitate efficient operation and toll collection of the managed lanes, the region desires that a technology-based system be implemented to verify auto occupancy.

**PROCUREMENT HISTORY**

In May 2015, TxDOT issued a Request for Offers for an Automated Vehicle Occupancy Detection Solution. The solicitation was cancelled in November 2015. Although no award was made, the TxDOT solicitation process confirmed that technology exists that meets the intent of the RTC Policy and recommended that the solicitation be refined and reissued under the leadership of the RTC with TxDOT support. In addition, in May 2012 and May 2013, the North Central Texas Council of Governments (NCTCOG), in coordination with transportation partner agencies, issued a Request for Information (RFI) seeking letters of interest and product information on equipment capable of automatic vehicle occupancy detection and verification. As part of the May 2013 RFI, NCTCOG hired the Texas Transportation Institute to perform an independent in-vehicle auto occupancy technology demonstration. Details regarding this demonstration can be found at the following link: [www.nctcog.org/trans/mtp/managed/documents/VODTechnologyTestReportFinal.pdf](http://www.nctcog.org/trans/mtp/managed/documents/VODTechnologyTestReportFinal.pdf)

**SCOPE OF WORK**

This solicitation is to provide services, technology solutions, potentially including Vendor provided device(s) and/or equipment in various managed and express lanes in the Dallas-Fort Worth region to accurately detect and report vehicle occupancy for the purposes of applying financial discounts for HOV customers traveling these priced lanes. The solution shall eliminate the need for an ‘honor system’ approach used in many HOV discount programs where the customer ‘self declares’ without any verification. Services and work include documentation, design, testing, integration support services to the existing toll system, installation, and maintenance and warranty of the solution provided.

NCTCOG recognizes this is a new and innovative application of technology and is interested in any and all solutions. The goal is to provide an acceptable performance and accuracy standards with minimal cost. Vendors are encouraged to indicate whether their solution meets all or only a portion of the requirements outlined in the scope of work.

1.1. **DEFINITIONS OF TERMS AND ACRONYMS:**

1.2. **Allowable Vehicles** – Vehicles that are allowed to use the managed/express lanes; primarily cars, SUVs, pick-up trucks and common two-axle passenger type vehicles. (Motorcycles will be classified as HOV by the toll system and commercial trucks are not entitled to HOV discounts).

1.3. **API** – Application Programming Interface – A set of commands, functions, and protocols which programmers can use when building software for a specific system.
1.4. **HOV** – High Occupancy Vehicle – A vehicle occupied by two or more people.

1.5. **ICD** – Interface Control Document – Describes the interfaces between systems. Documents all possible inputs to and outputs from a system.

1.6. **Managed Lanes** – A lane or a set of lanes within a roadway that are apart from the general-purpose lanes and are actively managed using a combination of pricing, vehicle eligibility, and/or access control, to continuously achieve an optimal traffic condition, such as free-flow speeds. For specific information regarding managed lanes in the DFW Metropolitan Area, NCTCOG provides a managed lanes fact sheet at the following location: [www.nctcog.org/trans/outreach/factsheets/ManagedLaneFactSheet.pdf](http://www.nctcog.org/trans/outreach/factsheets/ManagedLaneFactSheet.pdf)

1.7. **Over Count (Over Counting)** – The condition in which the solution provided indicates that there are more occupants within a vehicle than is actually correct.

1.8. **RFID** – Radio-Frequency Identification – A technology that uses electronic tags placed on objects, people, or animals to relay identifying information to an electronic reader by means of radio waves.

1.9. **SOV** – Single-Octancy Vehicle – A vehicle occupied by only one person.

1.10. **Under Count (Under Counting)** – The condition in which the solution provided indicates that there are fewer occupants within a vehicle than is actually correct.

1.11. **UPS** – Uninterruptible Power Supply – A power supply that includes a battery to maintain power in the event of a power outage.

2. **VENDOR REQUIREMENTS**: The vendor shall:

2.1. Provide all labor, materials and equipment necessary to meet requirements of the specified services throughout the term of the agreement.

2.2. Provide a project manager who will serve as the primary point of contact.

2.3. Provide all key personnel with verifiable qualifications.

2.4. Use technology already developed for the purposes outlined herein, which is available and ready for installation and/or implementation.

2.5. If shortlisted, the Proposer(s) may be required to demonstrate the proposed solution prior to executing an agreement, at no cost to NCTCOG, and prior to any formal design and/or testing.

2.6. Prior to performing work, obtain written approval from the designated NCTCOG representative for all work and material required to correct any identified problems.
2.7. Provide project management services and dedicated project management support including, but not limited to:

2.7.1. Regular project communications

2.7.2. Regular status meetings with agendas published prior to meeting start time and meeting minutes published within 3 business days of the meeting

2.7.3. Tracking and follow-up of action items

2.7.4. Monthly project summary reports

2.7.5. Monthly invoices and invoice review meetings/resources as requested by NCTCOG

2.7.6. Project schedule development and tracking using a gated approach, and clearly illustrating critical path and task dependencies. The project schedule shall also clearly define each task and deliverable with the associated resource/staffing requirements.

2.7.7. Project meetings at major milestones

2.7.8. Monthly actual spend versus projected budget

2.8. Provide all services associated with the design, testing, integration, installation, maintenance and warranty of the provided solution.

2.9. Provide services, as necessary and when requested, of knowledgeable and qualified staff to support NCTCOG and TxDOT with the implementation and operations of occupancy detection solution.

2.10. Provide installation services in accordance with the following requirements:

2.10.1. The vendor shall remove, from any installation site, and dispose of all defective and surplus materials resulting from the performance of the service and in strict accordance with all applicable rules, regulations, codes, laws, ordinances, and statutes.

2.10.2. Use of existing infrastructure (e.g. toll gantries, poles, structures, electrical and communications)

2.10.2.1. No assurances that use of existing infrastructure, electrical service or communication networks will be permissible at all sites.

2.10.2.2. May be permitted assuming the agency responsible for the structure allows for it; the installation does not damage or impact the existing infrastructure integrity; equipment does not interfere with the performance of existing toll collection equipment; and the vendor provides all plans, drawings, calculations, permits and other required documents; and approval is provided.
2.10.3. All external vehicle occupancy detection equipment installations on toll gantries or other structures shall be performed in accordance with an approved set of installation drawings. Installation plans and infrastructure related (civil, structural, electrical, and mechanical) engineering design documentation shall be prepared under the direct supervision of a licensed engineer of the appropriate discipline. All licenses must be in the State of Texas. All designs must be approved by the Texas Department of Transportation (TxDOT), or other applicable agency if installed on a non-TxDOT roadway, prior to installation.

2.10.3.1. The vendor shall furnish and install vendor’s equipment, including all devices, sensors, illuminators, brackets, mounting hardware and cables. All stationary devices shall be installed inside the TxDOT (or other applicable agency) right-of-way, either overhead on existing gantries, or if roadside units are required, the vendor will be responsible to furnish and install the necessary support poles and infrastructure, including safety measures to protect workers, drivers, equipment, and structure. The vendor shall comply with TxDOT (or other applicable agency) roadway design guidelines.

2.10.3.2. Equipment installation shall be scheduled so as not to disrupt or delay traffic during the installation process. The vendor shall request approval of allowable site work hours and/or lane closure hours from TxDOT (or other applicable agency) prior to scheduling any installation work that could impact traffic.

2.10.4. Any device internal to the vehicle shall be able to be installed by the vehicle occupant without any special tools, training, or expertise.

2.11. Provide necessary maintenance service to maintain the solution throughout the life of the project, from the time the solution is put into operation through the completion of the agreement. Maintenance service shall include:

2.11.1. Delivery of a Maintenance Plan describing the vendor’s maintenance process and monitoring plan for:

2.11.1.1. Constant real-time monitoring of the behavior of devices and software to detect errors, faults, and failures.

2.11.1.2. Routine inspection and maintenance of devices and software to occur no less than quarterly, or at the interval recommended by the vendor to maintain optimal performance.

2.11.1.3. Monthly reporting of maintenance actions and resolutions, and open work orders.

2.11.2. Troubleshooting faults and errors detected in association with the devices, software or interfaces provided by the vendor, TxDOT or third parties integrating to the solution.
2.11.3. Creating work orders and tracking and responding to faults in a timely manner based on a priority rating to be developed by the vendor and NCTCOG jointly.

2.11.4. Provide sufficient spare devices for replacement of defective devices without impact to operations, committed inventories, or scheduled installations.

2.11.5. Provide a software tool, maintenance on-line management system (MOMS), which shall monitor the system and components, providing alerts for equipment anomalies, as well as create and track maintenance work orders.

2.11.6. Dedicated staff available as needed to support maintenance needs and address system faults in a timely manner.

2.11.7. Ensure all software and devices remain current and supported, and upgrades are performed in a timely manner following version releases.

2.12. Develop and supply various project documents throughout the duration of the project in electronic format (MS Word, PDF, or other format requested by NCTCOG). Documentation will include (but not be limited to):

2.12.1. Project Management Plan - describing methods of communication, milestones including schedule, approach to developing the ICD(s), installation, and coordination with other agencies, contractors and NCTCOG.

2.12.1.1. Listing contact information for project team and team organization.

2.12.1.2. Describing approach to project phases and phased delivery of the project.

2.12.2. Conformance Traceability Matrix – enumerating all requirements in a matrix indicating at least the following:

2.12.2.1. Traceability from requirements to design documentation.

2.12.2.2. How each requirement will be verified (i.e. through testing, inspection, or certification).

2.12.3. Preliminary Design Document (PDD) – indicating project design details for how hardware, software, communication, and interfaces work together to provide the occupancy detection and reporting for this project.

2.12.4. Bill of Materials – indicating hardware devices, model numbers, quantities, manufacturer, and serial numbers once purchased.
2.12.5. Final Design Document – final edits and detailed completion updates of the PDD to include any software design document and the resolution of any open items from the PDD.

2.12.6. Installation Plan and Drawings – detailed sequence of installation activities, permit process, coordination process, and any installation drawings necessary to install any devices or communications.

2.12.7. Training Manuals and Documentation – all documents associated with the use of the provided service or services.

2.12.8. Test plans as defined under section 2.14.

2.13. Provide interface control documents (ICDs) and services to support integration with the toll collection system.

2.13.1. Interface Control Document (ICD) – the vendor in consultation with NCTCOG and TxDOT (and its toll system contractor(s)) shall include definition of files, format of data and integration descriptions necessary to support the integration of the solution to the existing toll system at the lane, or host level. In addition, the vendor should describe their approach for linking an HOV read to the specific transaction.

2.13.1.1. This may include network diagrams, sample data sets, APIs and any software drivers, and all associated user documentation to support integration efforts.

2.13.1.2. All ICDs and APIs shall be open protocols to the extent possible and allow for third party use without any unreasonable restriction.

2.13.2. Services will include all necessary meetings and tasks to support integration efforts with TxDOT, other entities, and other contractors supporting the integration of the occupancy counting device to the toll system.

2.13.2.1. Integration with the toll system must be ready for testing during Factory Acceptance Testing.

2.14. Provide testing documentation and services including:

2.14.1. Master Test Plan – complete test plan for the various phases of testing which must include, but not be limited to:

2.14.1.1. Test Scripts and Procedures – documenting steps, processes, tools used, and expected outcomes of each test.

2.14.1.2. Testing Materials and Resources – documenting all testing facilities, documents, software, equipment, vehicles, drivers, devices, and staff resources to conduct the various stages of testing.
2.14.1.3. Interface Test Plan – multiple testing stages will be necessary for supporting the integration of the solution to the toll system. Interface testing documentation and activities will be in conjunction with other contractors supporting the toll system.

2.14.1.4. Testing stages shall be executed in the order listed below. Each stage shall be successfully passed before the next stage is started.

2.14.1.4.1. Factory Acceptance Test – component and system level testing of the solution to validate it meets the requirements. The test will be conducted with controlled tests and will be conducted at the vendor's facility. This test will include a device test and integration test.

2.14.1.4.2. Pilot Test – demonstration of an operational location with the solution installed to demonstrate it meets the requirements and to address any anomalies found through interactions with the devices, customers, and systems using actual operational conditions on a limited test basis. The test will be conducted with controlled tests, at a pilot test site, and will use live operational data from a limited pool of customers not to exceed 1000 users.

2.14.1.4.3. Commissioning Test – validating all requirements are complete, all installation activities are complete, and the solution is ready to be used in operations at each installation site. The test will be conducted with controlled tests and repeated at each installation site following installation. In the event the test has to be stopped due to a failure of the solution, at the discretion of NCTCOG and TxDOT, the test may be restarted or started from the beginning at no additional cost.

2.14.1.4.4. Acceptance Test – end-to-end testing of all software and device features and functionality to ensure all requirements are met. The test will be conducted with controlled tests and live operational data over a 90-day period of operations. Every location will be tested after all lanes and associated equipment for the identified corridor is installed at each specific site so the system can be determined to be operating per the requirements. In the event the test has to be stopped due to a failure of the solution, at the discretion of NCTCOG and TxDOT, the test may be restarted or started from the beginning at no additional cost.
2.14.1.4.5. The Acceptance Test must be successfully completed and the solution determined to be operating per the requirements at the pilot site before commissioning can begin at other sites.

2.14.2. Test Reports - detailed and comprehensive test reports shall be provided for all test stages, indicating all test cases, outcomes, action items, and results related to requirements.

2.15. Provide labor, equipment, and all materials necessary to install and test the provided solution, so it is verified as meeting the requirements of this agreement.

2.16. Interface to TxDOT or its partners’ communication networks where available and existing capacity is sufficient. In all circumstances, the vendor shall provide all required networks and communication.

2.17. Provide all commercial grade equipment (computer servers, cables, and associated equipment) consistent with all TxDOT equipment guidelines.

2.18. Include UPS with sufficient capability to provide for two (2) hours of standby battery power in the event of loss of electrical power for all equipment that is operating in a real-time role, with the exception of internal to the vehicle devices.

2.19. Provide a solution that does not store or forward human readable images of the vehicle and/or occupants or use them in any way in the determination of the number of occupants.

2.19.1. Use of images shall be consistent with Texas Statute Section 228.058 and may not be used for automated enforcement.

2.20. Provide an occupancy detection solution that performs to at least the following performance and accuracy standards. Not meeting specific standards does not automatically disqualify the vendor, please provide an explanation why the proposed solution doesn’t meet the standards or why the standard might not be applicable for the proposed solution.

2.20.1. The solution shall accurately determine the number of persons at the appropriate time and location, so as to allow for the trip to be associated with use of the managed/express lane transaction at the toll point location.

2.20.1.1. Minimum front row seat accuracy – the solution shall accurately determine the number of front seat persons approximately 95% of the time without Under Counting occupants in Allowable Vehicles, at the appropriate time or location, so as to be associated with use of the managed/express lane.

2.20.1.2. Minimum second row seat accuracy - the solution shall accurately determine the number of second row seat persons approximately 80% of the time without Under Counting occupants in Allowable Vehicles, at the appropriate time or
location, so as to be associated with use of the managed/express lane.

2.20.1.3. Type 1 Allowable errors – The solution shall be permitted to Over Count occupants with approximately 15% of the sample a false positive. Over Counting occupants will lead to reduced revenue for TxDOT. Type 1 error, over counting, is preferred over Type 2 error, under counting.

2.20.1.4. Type 2 allowable errors – the solution shall be permitted to Under Count occupants at 0% or as close as possible of the sample a false negative. It is more important to not Under Count occupants as to avoid over charging to customers.

2.20.2. To meet the accuracy requirements, the customer shall not be required to self-declare the number of occupants in the vehicle, and enforcement personnel shall not be required.

2.20.3. Accuracy shall be measured on all Allowable Vehicles passing the tolling point, in all weather conditions, in the defined lane locations.

2.20.4. Accuracy measurements apply to Allowable Vehicles at vehicle speeds ranging from 0 miles per hour to 100 miles per hour, including stop and go traffic.

2.20.5. The solution shall be able to accurately detect vehicle occupancy in single, double, or triple lanes configurations, as well as configurations with managed lanes adjacent to general use (non-tolled) lanes.

2.20.6. The solution shall accurately detect a range of person size (e.g. children), including forward facing infant booster seats.

2.20.7. The device must be able to accurately determine, and remove from the occupancy count, inflatable devices, mannequins and other items and mechanisms used to impersonate a human being, or that could be mistaken for a human being from occupancy detection and determination.

2.20.8. The solution shall not be affected by, or interfere with, RFID devices.

2.20.9. Accuracy performance shall not be affected by various weather conditions, as example; sun reflection on window, rain, fog, lighting conditions, and temperatures up to 130 degrees Fahrenheit and -20 degrees Fahrenheit, humidity or other internal or external environmental conditions.

2.20.10. Accuracy performance shall not be affected by vehicle characteristics including, but not limited to, window tint, vehicle size, window glass composition, etc.

2.21. Provide an occupancy detection solution that meet the following requirements:
2.21.1. The solution must be able to be deployed on permanent managed facilities as well as current HOV facilities which have been or will in the future be converted to managed lane operation.

2.21.2. For each HOV detected, the number of vehicle occupants is to be registered into the system along with the date, time (to millisecond), toll plaza identifier, and lane number. Information shall be transmitted in sufficient detail to the toll collection system and in a format such that it can be integrated into the toll system messaging and associated with a specific transaction.

2.21.3. Vehicle occupancy shall be transmitted in real-time or near real-time to the roadside toll collection equipment or host system.

2.21.4. Depending on a particular managed lanes business rules for occupancy discounts, the vehicle occupancy shall be reported as one or more of the following HOV classifications:

2.21.4.1. SOV – single occupant
2.21.4.2. HOV 2 - two or more occupants
2.21.4.3. HOV 3 – three or more occupants

2.21.5. The solution shall not emit lights or sounds that would be distracting to the driver of the vehicle or other vehicles at the toll collection points.

2.21.6. The solution shall meet any and all FCC licensing requirements specific to the solution’s intended use and intended operational environment.

2.21.7. The solution provided should have optional configuration to detect third row (or more) occupants and rear-facing infants in car seats. If not included in base configuration, additional cost information should be provided.

2.21.8. The solution provided should have an optional configuration to remove animals from the occupancy count. If not included in base configuration, additional cost information should be provided.

2.21.9. If the solution is external to the vehicle the HOV detection technology’s clock shall be synchronized to the time of the lane controller associated with the toll collection system.

2.21.10 If the solution is internal to the vehicle:

2.21.10.1. The vendor shall implement HOV detection technology that synchronizes the HOV classification with the specific toll transaction generated by the vehicle containing the equipment.

2.21.10.2. If mounting is required:
2.21.9.2.1. The device shall be mountable to where it does not interfere with the driver's vision or an in-vehicle transponder used for toll collection purposes and it shall not violate any Texas statute related to obstruction of the windshield.

2.21.9.2.2. The device shall be properly secured so as not to become a safety hazard in the vehicle or in the event of an automobile accident.

2.21.9.3. The solution shall not require the user to interact with the device while the vehicle is moving or approaching the tolling location.

2.21.9.4. The device shall operate using commonly available, off-the-shelf batteries.

2.21.9.5. The device shall provide low-battery warnings.

2.21.9.6. Replacement of batteries shall be accomplished by the user of the detection device, using common household tools, and shall not require replacement of the device in part or in full, nor shall it require replacement of the batteries by a technician.

2.21.9.7. The device shall have the battery type and installation orientation graphically denoted on the device.

2.21.9.8. The device shall be delivered with power cables, initial battery, or any other accessories necessary to operate the device. The device shall be delivered with all instructions necessary for initial installation, operations and to remove and replace any battery.

2.21.9.9. The device shall comply with any and all current U.S. and international safety standards to permit unrestricted shipment by mail and commercial carriers with appropriate documentation and in the recommended packaging.

2.21.9.10. Utilization of a user owned device, such as a smart phone, is acceptable if the solution meets the requirements stated herein.

2.21.10. Environmental Requirements:

2.21.10.1. If internal to the vehicle devices are provided by the vendor, they shall:

2.21.10.1.1. Be designed to operate from -40° F to +185° F.

2.21.10.1.2. Be able to be subjected to and operated in 95 percent humidity, non-condensing environments.

2.21.10.1.3. Withstand thermal shocks and gradients associated with dashboard or window mounting and
temperature gradients of up to 20° F per minute, and continue to meet the environmental requirements herein.

2.21.10.1.4. Operate as specified while undergoing the recommended shock and vibration of SAE J1211 for the proposed mounting/presentation location.

2.21.10.2. External to the vehicle devices and equipment shall:

2.21.10.2.1. Be designed for operation from -40° F to +150° F.

2.21.10.2.2. Operate in 100% humidity, condensing environments.

2.21.10.2.3. Be designed to be resistant to penetration of fluids, dust, and other elements expected in exterior roadside environment.

2.22. Provide an integrated reporting solution capable of producing at least the following reports:

2.22.1. Summary Report(s): Summarized by HOV type, location, date range, and any additional data elements or unique identifiers requested by NCTCOG.

2.22.2. Detail Report(s): To include key data elements for each transaction detected by the device/system.

2.22.3. Daily Transmittal Report(s): With requirements as established between the vendor and NCTCOG.

2.22.4. Performance/Maintenance Report(s): To substantiate actual device performance.

2.22.5. Ad Hoc Report(s): Ability to create queries or reports against the data collected by the device/system. This will include audit reports to support state, federal, or other audits as needed.

3. RETAILING OF DEVICES, EQUIPMENT AND COST:

3.1. All devices and materials delivered as part of this contract shall be packaged according to their use and distribution including cost.

3.2. Cost shall be provided by item and separated into capital, operating and maintenance costs.

3.3. NCTCOG estimates at least 250,000 HOV users in the DFW Metropolitan Area will need devices by 2018, if in-vehicle devices are part of the solution. Proposers with an in-vehicle solution must demonstrate the ability to meet this demand.
3.4. In the event an internal to vehicle provided device is defective within the first 90 days of issuance to a customer, the vendor shall replace the device at no charge.

3.5. Device intended for use by driver or customers shall be appropriately packaged with marketing materials, instructions, and contact information for distribution directly to customers by NCTCOG or other entities.

3.6. For devices intended for use by driver or customers, an instructional video shall be produced by the vendor, with review and approval of NCTCOG, clearly demonstrating the instructions for operations of the device and accessible via the internet without the need to provide a log-in or supply other credentials to view the video.

3.7. All devices and equipment provided as part of this agreement shall be provided as furnished and installation provided for unless otherwise directed.

3.8. All devices and equipment provided as part of this agreement shall be new equipment and be in suitable working order per the manufacturer's specifications.

4. **VENDOR DELIVERABLES:**

4.1. The vendor shall submit the following deliverables for review and approval by NCTCOG and TxDOT:

4.1.1. Prior to Factory Acceptance Test commencement:

4.1.1.1. Project Kick-Off Meeting
4.1.1.2. Project Management Plan
4.1.1.3. Performance Plan
4.1.1.4. Traceability Matrix
4.1.1.5. Requirements Document
4.1.1.6. Preliminary Design Document
4.1.1.7. Interface Control Document(s)
4.1.1.8. Final Design Document
4.1.1.9. Master Test Plan

4.1.2. Prior to Pilot Test commencement:

4.1.2.1. Bill of Materials

4.1.3. Prior to Commissioning Test commencement:

4.1.3.1. Maintenance Plan
4.1.3.2 Installation Plan
4.1.3.3 Training Manuals

The vendor's proposal shall include milestone dates proposed for each deliverable and testing phase that ensures the Acceptance Test for the pilot location is successfully completed and accepted by NCTCOG and TxDOT no later than 12/31/2016.

4.2. Facilities are included in the map in Section 5.

5. LOCATION(S):

5.1. Location(s) are specified in the map below.
NCTCOG reserves the right to add or delete location(s) serviced under the procurement.

5.1.1. NCTCOG anticipates additional locations will be added to this list in the future.

5.2. The initial pilot test site shall be the DFW Connector in the Dallas Fort Worth area.

**SCHEDULE**

This project will be conducted in two (2) Phases. Phase I (Pilot Test) will be the DFW Connector implementation and acceptance. Phase II will be implementation and acceptance for any other locations. Phase II is contingent upon the successful completion and acceptance of Phase I. NCTCOG anticipates a Notice to Proceed date for Phase I on or before August 1, 2016.
VENDOR SELECTION CRITERIA

The Vendor Selection Committee (VSC) will review all proposals and select a firm it considers qualified to undertake the project. The following criteria will be used to evaluate the proposals:

1. Technical  60 percent
2. Project Cost  40 percent

If the VSC determines that interviews will be required before a final decision can be made, the interviews will take place at the NCTCOG offices in Arlington, Texas, the week of June 6, 2016. Proposers should be willing and able to attend these interviews, if necessary. Vendors who are invited to an interview will be notified the week of May 30, 2016 that an interview has been scheduled. Costs for developing the proposal and costs attributed to interviews, subsequent negotiations, and any product demonstrations are at the proposer’s own expense and will not be reimbursed by NCTCOG. NCTCOG reserves the right to request a Best and Final Offer (BAFO) from selected respondent(s) and to consider the terms of such BAFO in the award.

NCTCOG has a 25 percent Disadvantaged Business Enterprise (DBE) participation goal for USDOT-funded contracting opportunities and requires an Affirmative Action Plan to be included in the proposal. Proposers are encouraged to identify DBE contracting opportunities for this initiative.

Following final negotiations of the work plan and costs satisfactory to NCTCOG, the selected vendor(s) will be asked to execute a contract with NCTCOG. A Notice to Proceed will be issued upon execution of the contract. NCTCOG reserves the right to reject any and all proposals, to contract for any or all portions of the project with the selected vendor, or to hire multiple vendors. The successful responder(s) to this Request for Proposals is expected to provide qualified personnel to accomplish each portion of the work in this study. NCTCOG will maintain the right to request the removal of any personnel found, in its opinion, during the course of work on this project, to be unqualified to perform the work.

The Sample Contract, provided in this transmittal, contains federal requirements which must be included with all proposals submitted. If awarded, Proposers will be asked to review the terms identified in the sample contract. Proposers should identify in their response any revisions to the terms or conditions they would like NCTCOG to consider. NCTCOG may consider alternate contracting instruments from Proposers but any such instruments must satisfy all applicable federal, State and local requirements. Appendices C through K of the sample contract contain compliance requirements and certification forms which must accompany the proposals. Failure to comply with these requirements may result in finding the Proposal non-responsive.

All questions regarding the services required shall be directed in writing by email to TransRFPs@nctcog.org by the close of business on Friday, April 22, 2016. A pre-proposal conference will be held on Wednesday, April 27, 2016 at 2:00 pm at the NCTCOG offices. All questions and responses will be posted on NCTCOG’s website at www.nctcog.org/rfp by the
close of business on **Friday, April 29, 2016.** NCTCOG reserves the right to respond to inquiries as it deems necessary.