



Tender No. 36/17

**For the Design, Acquisition, Installation,
Integration, Training, Support and Maintenance
of an
Automated Vehicle Occupancy Detection System**

Statement of Work

Volume C

October 2017

1. **GENERAL**

- 1.1. Unless specifically stated otherwise herein, all capitalized terms, definitions, abbreviations and acronyms used herein shall bear the same meaning as ascribed in the Tender conditions and instructions and the Agreement.
- 1.2. In the event of any contradiction between the terms of this SOW and the provisions of any of the Tender Documents, the provisions of the Tender conditions and instructions and/or the Agreement shall prevail.

2. **PURPOSE**

- 2.1. Ayalon Highways Co. Ltd. (The Company) has published a tender for the design, acquisition, installation, integration and support of an Automated Vehicle Occupancy Detection System (AVOD System). This Statement of Work (SOW) provides detailed information with regard to the work necessary in order to implement such system(s) in Israel in several Public Transportation ("PT") dedicated lanes.
- 2.2. The purpose of this project is to enable the utilization of such lanes by vehicles defined as HOV X+, where X represents any integer between 0 and 4, inclusive. Accordingly, this system will detect the number of vehicles' occupants, and provide means to enforce the HOV X+ rules by automatic reporting the identity of the HOV X+ rule violators to the appropriate authorities, as will be required.
- 2.3. It should be noted that the requirements and criteria provided in this document constitute "minimum", and parties are welcome to propose solutions that exceed these criteria if they so can and desire.
- 2.4. The proposed system shall constitute a full turnkey solution (except for the works detailed in section 11 below, which are under Company's responsibility) that, once implemented, tested and commissioned to the Company, will be ready and capable for immediate and full use.
- 2.5. The information provided in this document is a general description of the System requirements and capabilities and does not constitute a design document of any kind. It is the Contractor's responsibility, where applicable (in accordance with the two approaches itemized in Section 3 below), to submit to the Company, in writing, sufficiently detailed design documents and schedules (including, but not limited to, system architecture, specific design plans, QA and QC procedures, test plans and installation procedures), to enable a thorough review and understanding.
- 2.6. The Company reserves the right to demand and receive explanations, verifications, and modifications that are required, to the best of its professional judgment, in order to satisfy their needs. The Contractor will submit such documents in order to allow for discussions and iterative submissions until Company approval is granted, such that

installation will commence according to the original time schedule. Actual work will commence only after such approval will be given by The Company.

3. **GENERAL DESCRIPTION**

- 3.1. There are several Public Transportation dedicated lanes in Israel, along highways as well as in urban areas, where HOV X+ rules may be implemented (in most cases as HOV 4+ or, possibly HOV 3+, at the discretion of The Company). These lanes are of various lengths, and their separation from the General Purpose (GP) lanes is expected to be marked by short, flexible posts.
- 3.2. It is expected that the proposed AVOD System will identify the occupancy level of vehicles that enter/exit the PT Lanes at designated entry/exit points, identify and collect information regarding legitimate HOVs, and identify, collect information, and report vehicles that violate the HOV guidelines. The AVOD system will have the ability to generate several reports, as will be referred to later in this document.
- 3.3. In general, in today's marketplace there are two approaches to automatically identify the occupancy level of vehicles:
 - 3.3.1. An approach which is based on stationary road-side equipment that "looks" into vehicles and counts/takes picture of their occupants, identifies the vehicles' license plate, and reports its findings to a central system which then can be transferred to the enforcement authorities.
 - 3.3.2. An approach which is based on On Board Units (OBU) such as dedicated electronic chips/receivers/transmitters, etc. by which the AVOD System detects the number of human beings vehicles' occupants in specific vehicles, verifies their being on the PT Lane, marks the timing, and determines whether they constitute valid HOV that comply with the occupancy requirements. This information is gathered by a central system which can report it, to the enforcement authorities.
- 3.4. Both these approaches, as well as any other valid approach, may be acceptable, subject to satisfactorily meeting, or exceeding, all the requirements stated in the Tender Documents. The Company does not have any preference to one approach over another, whether mentioned above or not, and this document attempts to entertain any approach that will be submitted.
- 3.5. As stated in the Tender Documents, Qualified Bidder(s) will have to conduct an on-site Proof of Concept (POC) experiment in which they will be expected to demonstrate some of their proposed AVOD System capabilities. Information regarding this POC may be found in a Section 16 below.

4. **ROAD-SIDE SUB-SYSTEMS/EQUIPMENT (WHERE APPLICABLE)**

- 4.1. General: Subject to the specific system design, road-side stations will identify and report, among others, location, vehicles' license plate numbers, and the occupancy level of each vehicle. In order to do that, each station has to include all the equipment necessary for performing these tasks including, but not limited to (if applicable), vehicle sensors, LPR cameras, light sensors and light fixtures, all weather cameras capable of producing readable pictures of vehicle's occupants and distinguish between human beings and other vehicle's content, Optical Character Recognition (OCR) software/hardware (unless this task is to be performed by the Central System, subject to the specific system design), servers, data storage devices, fiber-optics and/or cellular communication infrastructure, structures, cabinets, air-condition units, etc. Road-side sub-systems will transmit and provide information, according to specific system designs, to a central Management and Control sub-system which will process information and interface with external systems for reporting purposes.
- 4.2. Storage: Road-side storage devices must be capable of automatically storing locally at least 12 hours worth of vehicle occupancy data, in case of electric power failures and/or communication stoppage.
- 4.3. Usage of existing structures: While Contractor may be able, subject to the concession of the PT Lane operator, to make use of existing infrastructures (e.g. bridges) for the sake of his equipment installation and operation (e.g. hanging cameras off existing bridges), it is his responsibility to study the existing and future environmental, structural, and other local conditions and to provide all necessary means to ensure proper, continuous and reliable service and functioning as committed to by him
- 4.4. Usage of communication infrastructure: The Company will provide, and maintain, communication infrastructure of fiber optic cables to a single point, such that data can flow from Road-side stations to the Central Management System. It is the Contractor's responsibility to design and execute the appropriate connections into this infrastructure, including the provision and use of hardware and software as necessary, and to maintain them in good, working order, to ensure sound functionality according to the availability requirements specified in this document. For the removal of any doubt, should the Contractor utilize other communication means like cellular, it is his responsibility to acquire such services and carry their cost.
- 4.5. Equipment characteristics: All road-side equipment will be designed for extreme weather conditions that may occur under Israeli climate conditions, including temperature range between -30°C and +70°C and relative humidity between 10% to 95%. LPR systems will be able to recognize all license plate types that are used in Israel, including the upcoming 8-digit license plates. Cameras and LPR systems will be able to

function and identify vehicles and their occupancy levels at vehicles' speed of up to at least 160 km/h. Vehicle identification reliability will be no less than 99.8%. All equipment must comply with local standards, rules and regulations and will not be affected by high voltage conditions and operation (e.g. from a close-by electric trains) that may exist in its vicinity.

4.6. Traffic interruptions: All road-side equipment will be installed in such a way that it will not interrupt the flow of traffic and will not endanger any vehicles, pedestrians, or by-passing wildlife, in accordance with applicable Israeli Law and the approved planning. In addition, it will be installed in such a way that will enable easy and safe access for maintenance and repair purposes, without endangering maintenance personnel and with minimum traffic interruptions and/or lane closures.

5. **OBU BASED AVOD SYSTEMS (WHERE APPLICABLE)**

5.1. General: OBU based systems is a general name used in this document for systems that collect information regarding vehicles identity, their position, and occupancy level at specific times directly from devices installed in the vehicles or possibly from electronic devices/transponders in the vehicles. The gathered information is collected by a central Management and Control sub-system into which it is transmitted, and which will then process it and interface with external systems for reporting purposes.

5.2. Compliance: All OBU devices must comply with the highest and most restrictive standards set under international and/or local rules and regulations with regard, but not limited to, communication methods, broadcasting frequencies, and radiation emissions. The sound functioning of the OBU devices and related system components may not be interrupted by external conditions such as weather, other RF activity in the environment, high voltage environment, etc. The OBU must have built in power supply that will last for at least 5 years, assuming two usages per day, should have MTBF above 400,000 hours, and should be operable in the temperature range of -30°C to +70°C. It is the Contractor's responsibility to clear their usage and obtain all necessary permits for the usage, and import to Israel, if applicable, of the OBU units within the State of Israel.

5.3. Customer Database: The Contractor must maintain an accurate database which enables the identification of specific vehicles based on the data transmitted from OBUs. It is the Contractor's responsibility to ensure that maintenance and operation of such data base are made in compliance with the Company requirements, the legal requirements and regulatory requirements. This system must allow for one OBU to be associated with more than one vehicle license plate numbers, and for more than one vehicle license plate number to be associated with more than one OBU. The Contractor must develop, manage and maintain a customer database, into which respective license plate numbers and OBU identifications will be inserted upon customers' registration, and updated upon customers' notifications of car ownership and/or OBUs changes. For that purpose the

Contractor is expected to maintain a Customer Relationship System (CRM) which will be customer friendly and easy to use, which enable customer self registration.

- 5.4. Distribution System: Should the system be based on electronic devices/transponders, it will be the Contractor's responsibility, at his own cost, to build distribution and registration systems which will handle all customers' such affairs, including battery replacement (if needs to be done by technical personnel), at no cost to the customers, and device replacement in cases of damage or loss. If smart phones are or can be used, it will be the Contractor's responsibility to distribute and promote smart phone Apps, which will meet at least the standards of the Government ICT (Information and communications technology) Authority (known in Hebrew as "*Mimshal Zamin*" standards), at no cost to the customers, for all major operating systems (i.e. with market share in Israel of 5% or more), as well as to implement reliable customer affairs and registration systems that will entertain such option. All such Apps will be kept current with up to date operating systems, and will be updated for improvements and bug fixing at reasonable frequency.
- 5.5. Safety: The design of the OBU system will be made such that their on board usage will not constitute any interruption to the driving of vehicles. Operating the OBU must be in line with Israeli laws with regard to what drivers are allowed or disallowed to deal with, while driving. Furthermore, their usage should not require any intensive in-vehicle discussion, or unusual physical activities such as bending over for collective picture taking, etc., nor will it require the drivers to issue any outgoing messages/inquiries while driving.

6. MANAGEMENT & CONTROL (M&C) SUB-SYSTEM

- 6.1. General: The Contractor will position a Management & Control system (M&C System) at a place to be designated by the Company, in their headquarters office in Tel Aviv or in another location to be determined by the Company. This M&C system will contain the following components/abilities:
 - 6.2. Communication equipment, software and hardware, as necessary for data transfer between the road-side and/or OBU units and the M&C system, as applicable, for control, monitoring and data processing purposes.
 - 6.3. Computer equipment, hardware and software, for performing all the necessary analyses, generating detailed reports as may be defined by the Company, interfacing with external systems (e.g. enforcement systems, police systems, etc.), presenting pictures taken by the road-side cameras, where applicable (with and without facial coverage), and preparing the data for storage.
 - 6.4. Long term computerized data storage where all the data collected from road-side units and/or OBUs will be stored in such a manner that will enable fast data recall by

specifying either license plate number, OBU id, or location, date and time, all in accordance with applicable Israeli Law and the Company requirements.

- 6.5. Monitoring sub-system: All critical equipment, components and sub-systems (e.g. communications equipment, cameras, LPR cameras, sensors, light and laser fixtures, etc.) must be automatically monitored at all times, to enable system operators to identify failures quickly and efficiently, and act upon them for fast repair. Monitoring results are to be reported at the M&C system. For the sake of clarification it is not mandatory to monitor the OBU units status, where applicable, as it is expected that if failed, these failures will be reported/handled by their holders.
- 6.6. Interfaces and Reports: The M&C system will include an Application Program Interface (API) that will enable easy access and data transfer to/from other systems, as will be specified and authorized by the Company. In addition, the Contractor will prepare, test, and ensure reliable data transfer to two Government agencies, as will be specified by the Company. The Contractor will prepare for automatic generation of up to 8 different reports for the use of the Company (soft or hard copies, as will be determined by the Company). In addition, the Contractor will purchase, connect to the data base, and maintain (including, but not limited to, software license fees) a commercially familiar report generator for use by the Company in conjunction with the system's database. If needed, the Contractor will assist the Company representative, should he face difficulties in accessing the database for the sake of report generation. In addition, the Contractor will provide the Company with pictures of vehicles' occupants in specific vehicles, time and date, with or without facial coverage, as may be required and authorized by the local authorities.

7. **STAFFING**

- 7.1. No later from submission of purchase order of one or more AVOD System, the Contractor will employ and shall ensure that it is represented at all times by a competent and authorized Project Manager, that will be pre-approved by the Company, to oversee, manage and coordinate all Contractor's activities and Company related affairs including, but not limited to, system installations, system enhancements and upgrades, system normal, routine operation, QA/QC activities, maintenance, etc. This Project Manager will be the immediate contact point for the Company and will be available on site at least during normal Israeli business hours and available as may be necessary during off hours (himself or someone he nominates) for handling emergencies. Additional staffing responsibilities are included in some of the items below.
- 7.2. Maintenance staffing will be performed in accordance to Section 15 below.

8. SAFETY, CYBER SECURITY AND PRIVACY

It is the Contractor's responsibility to maintain the safety, security and integrity of the data collected, stored and analyzed throughout the AVOD system in compliance with any and all information security, cyber security and privacy requirements and restrictions set forth in the Agreement and under any and all applicable Laws. The Contractor will utilize software, hardware, and physical means as necessary, at his own expense, in order to abide by this requirement. In addition, privacy of road users is considered to be extremely confidential information. Therefore exposure of facial pictures of road users, or their identity otherwise, will only take place by a specific request of authorized Company employees, and will be executed by a limited number of Contractor's employees that will be pre-authorized for such exposure, in writing, by the Company. The Contractor will maintain different authorization levels to different employees that will entertain this requirement.

9. SYSTEM PERFORMANCE¹

9.1. General: The following parameters are used for the sake of calculating the performance levels of the AVOD System:

9.1.1. A vehicle on the PT Lane can either be an HOV or a Violator. Considering the identification of a Violator as a positive event, the following situations are defined:

- A Violator is defined by the AVOD System as a Violator: True Positive (TP)
- A Violator is defined by the AVOD System as an HOV: False Negative (FN)
- An HOV is defined by the AVOD System as a Violator: False Positive (FP)
- An HOV is defined by the AVOD System as an HOV: True Negative (TN)

9.1.2. Based on the above definitions, three AVOD System parameters (over pre-defined period of time) are defined as follows:

- False Positive (percentage) = number of HOVs wrongly identified as non HOVs/total number of vehicles
- False Negative (percentage) = number of violators wrongly identified as HOVs/total number of vehicles
- Total System Accuracy (percentage) (TSA) = $(TP+TN)/(TP+FN+FP+TN)$

9.1.3. Performance Criteria:

¹ In this Section the term "vehicle" is relevant only to vehicles that are subject to occupancy detection activity. Thus buses, shuttles, etc., for example, will not be considered as part of the population analyzed here.

At any given time the above performance parameters must be equal to, or exceed the following levels, at each of the PT Lanes where the AVOD System is in use:

False Positive $\leq 0.5\%$

False Negative $\leq 2.0\%$

Total System Accuracy $\geq 98\%$

Total number of vehicle sampled $\geq 98\%$

9.2. The Contractor will propose to the Company a sampling/verification method by which it will be tested, at least twice in a calendar year per site, at locations and durations to be determined by the Company, whether the actual System performance meets the above required levels. The number of vehicles to be sampled will be determined by the Company in accordance with existing lane usage and conditions. Should the AVOD System not meet these minimum criteria, the Company may instruct Contractor, and he will abide, to use supplement resources, manual or automatic, at Contractor's discretion and subject to Company's approval, which will bring these parameters to the desired levels. Such supplement resources will be in use, at Contractor's cost, until such time that he proves, and the Company agrees, that the System achieves the required parameter levels without them. In addition, upon receiving requests from the Company, the Contractor will conduct tests and statistical analyses in which he will demonstrate, at statistical confidence level of 95% or more, that the number of vehicles examined by the system exceed 98% of the actual number of vehicles on the lane within the tested periods. The duration of such tests will be derived from statistical sample size calculations, as necessary to support the confidence level of 95%. The Contractor will submit for confirmation and approval all the data collected and the statistical analyses performed, for approval by the Company.

9.3. System's availability and down time

Excluding unavoidable events (e.g. general power failure) the System must be available 99% of the time, or more, on an annual basis. Preventive maintenance or non urgent repairs that require shutting down the system, traffic interruptions or road closure will be executed at night, at frequency that will not exceed one night per month, between Sunday night to Wednesday night. All such shut downs must be coordinated in advance, and approved, by the Company.

10. PLANNING, INSTALLATION AND IMPLEMENTATION

10.1. AVOD Systems as per the Tender will be installed and implemented (including, where applicable, distribution of electronic devices and/or Apps in sufficient quantities) at times when sites will be released for such actions, and directed by the Company. Such release of sites for installation and implementation may be done by the Company, at its own discretion, one at a time, or in groups of sites. It is the Company's responsibility

to provide the Contractor with sites' plans and information as they become available for implementation.

- 10.2. The Contractor will, within time frame that will not exceed 6 weeks, deliver in writing to the Company for approval, each site's complete design information including, but not limited to, engineering design documents and drawings, an SOW that will cover in detail all system installation activity, System communication resource needs, QA plan including testing procedures, detailed, computerized Gantt program, personnel and sub-contractors involved in the installation and implementation of the system, any coordination of the works which may be necessary and compliance with technological and information security requirements.
- 10.3. For the removal of any doubt it is hereby clarified that this 6 weeks period includes site surveys, questions and answers, and any other activities the Contractor may desire to execute for the sake of submitting a complete and comprehensive implementation documents as described above. Upon receiving the installation and implementation documents the Company will review them and may, at its own discretion, ask the Contractor to review, improve, modify or update its plans, in consideration of various resources or physical constraints and/or professional considerations. In such cases the Contractor will continue to work with the Company and update his plans as also provided in Section 1 above, until approved by the Company. Unless specifically approved by the Company in writing, no installation work will commence prior to the Company's approval.
- 10.4. It is the Contractor's responsibility to seek approvals and coordinate all works he intends to perform on the roads/highways with the Company and/or anyone on its behalf, in sufficient time in advance, all according to the common practices, rules, and regulations in Israel. It is further his responsibility to assume all costs associated with taking all safety precautions as necessary for the execution of his work.

11. **WORKS PERFORMED BY THE COMPANY**

The Company shall be responsible only for the execution of the following provisions:

- 11.1. Electricity and communication services, feeds and related payments.
- 11.2. Statutory approvals.
- 11.3. Coordination with the relevant authorities for the purpose of installation and maintenance (lane closures, police, etc.).
- 11.4. For the avoidance of doubt, the Company will not be required to perform any other obligation with respect to the Project that is not specified in this Section 11, and all other obligations with respect to the Project will be the sole responsibility of the Contractor.

12. QUALITY PROGRAM

The Contractor shall be responsible for developing policy and procedures necessary to create a quality product. A Quality Program will be documented and submitted at three levels:

- Level I: Quality Assurance Plan
- Level II: Standard operating procedures that describe the conduct of activities considered necessary to ensure conformance of the systems to specific requirements
- Level III: Process, product and support documentation that details instructions relating to the design and production of specific products and processes. These documents will include the results of the formal and informal reviews, audits, and test results.

13. CONFIGURATION MANAGEMENT AND ENGINEERING CHANGES

In order to ensure a quality system, the Contractor shall perform Configuration Management activities throughout the life of the Systems from the specific System design activities through their end-of-life point of time. Configuration management shall pertain to System design, implementation, integration, testing, documentation, software, firmware, hardware, and all COTS equipment. Change control procedures shall be employed for all engineering changes processes.

14. TESTING

14.1. COC Requirements:

All Commercial Off The Shelf (COTS) components and sub-systems which are to become parts of the AVOD System will be accompanied by manufacturers' Certificate of Completion (COC).

14.2. Site Acceptance Tests (SIT) and System Acceptance Tests (SAT):

14.2.1. The Contractor will submit to the Company test plans and procedures. These plans will be subject to Company approval, and will be submitted sufficiently early prior to the planned conduct of the tests, to allow for appropriate review and response by the Company.

14.2.2. Site Acceptance Tests (SIT) and System Acceptance Tests (SAT) will be conducted following the installation of each site sub-system (where applicable) associated with specific PT Lane or section. SITs are aimed at performing on-site tests of the sub-systems upon their installation and SATs will be conducted to ensure overall sound functionality of the fully integrated system throughout all its locations. The Contractor will invite the Company to send representatives to witness and participate in these tests.

14.2.3. Upon completion of these tests and the issuance of a written approval by the Company to that effect the System will be considered fully operational.

14.2.4. SITs and SATs will be repeated with the appropriate modifications, if any, and additional stations/sites (where applicable) will become fully operational after receiving written approval by the Company, following the installation of additional sites.

15. **TRAINING**

The contractor will conduct operational training sessions for the Company Control Room Operators twice a year, which will cover all the required knowledge for overseeing the normal operation of the System including, but not limited to identification of failure indications, report issuing, information gathering for failure reporting, etc. In addition, when necessary, as will be determined by the Company, the Contractor will provide Company's IT personnel with the necessary information that will enable them to design and produce current and newly designed reports, connect with the System via the provided API, etc.

16. **MAINTENANCE**

16.1. General: it is the sole responsibility of the Contractor to warrant a proper and efficient maintenance operation. The Contractor or his representative will perform Preventive Maintenance Program in order to prevent failures to the extent possible, and Corrective Maintenance Program under which repair operations will be conducted according to the Company approved SLA Schedule. The Contractor will submit for Company approval a Preventive Maintenance Program, and a Corrective Maintenance Program, including SLA Schedule.

16.2. The Contractor will maintain a technical contact person 24 during normal business hours, who will be qualified to receive notifications and calls from the Company's Control Room Operators regarding trouble reports, failures and malfunctions of the System and its components, provide advice, and schedule necessary corrective maintenance according to the SLA.

16.3. To the extent possible maintenance operations should be conducted with minimum interruptions to the flow of traffic on the PT Lanes and the lanes adjacent to them. All work that require traffic interruptions will require Company approval, will be coordinated with the Company by the Contractor in sufficient time in advance and will only be executed at times permitted by the Company (See also Section 9.4 – System availability and down time).

16.4. SLA Guidelines

16.4.1. Road-side Sub-system

16.4.1.1. Road-side corrective maintenance may or may not require road closure and/or traffic interruption. In addition, road-side malfunctions may be Critical or Non Critical, as follows:

- 16.4.1.2. Critical malfunction is a malfunction that prevents a road-side station from performing its critical missions (e.g. occupants detection, data storage, data processing, communications, etc.)
- 16.4.1.3. Non Critical malfunction is a malfunction that interrupts a full sound functioning of the road side station, yet all of its critical missions are performed without interruption.

Guidelines for response times will be as provided in the table below. Repair will be considered complete upon receiving Company approval.

	Require Road Closure/Interruption	No Road Closure/Interruption Required
Critical	At the earliest closure arranged by the Company. Work, once started, will be continuous until malfunction is resolved	Within 3 working hours
Non Critical	At the earliest acceptable time by the Company. Work, once started, will be continuous until malfunction is resolved.	Within 8 working hours

16.4.2. Management & Control Sub-system

All malfunctions, hardware and software, will be attended to within 3 working hours of discovery, and will be handled on a continuous basis, until resolved.

16.4.3. Maintenance Policies: The Contractor will submit to the Company for approval a complete maintenance plan that will include, but not limited by, the following items:

- 16.4.3.1. Preventive Maintenance plan (including software upgrade plan)
- 16.4.3.2. Corrective Maintenance plan (software and hardware)
- 16.4.3.3. Proposed Service Level Agreement (SLA), subject to the guidelines set forth in this Section 16.
- 16.4.3.4. Spare parts and inventory levels policy

16.4.3.5. Obsolescence handling methodology

- 16.5. Maintenance Staff: The Contractor will nominate a full time, local (Israel) reference point which will manage, and supervise professionally, all the maintenance activities performed on the System. In addition, the Contractor will provide a senior contact point at its main operational facility which the Company will be able to approach for further assistance.
- 16.6. All the technical personnel that will handle maintenance operations will have the appropriate technical education and background that is necessary for executing their tasks. The Contractor will provide these people with the necessary material and training that are necessary to conduct their work in an efficient and expedited manner. The Contractor will employ sufficient number of maintenance technicians, appropriately educated and capable of providing systems, communications, software and hardware maintenance, to ensure continuous and sound operation of the System and all its components at all times. Subject to the locations of the various PT Lanes where the AVOD System will be deployed, the maintenance technicians will be stationed at such locations that will enable them arrival to sites and performance of the necessary maintenance within the requirements of the Company approved SLA. The Company will have the right to demand the immediate removal of any of the Contractor's maintenance personnel from its staff, for a reasonable cause, and replacing such employee with another.
- 16.7. Spare Parts and Obsolescence: It is the Contractor's responsibility to maintain locally, on hand, sufficient spare parts inventory to ensure that the continuous sound functioning of the AVOD System is not interrupted by lack of spare parts. It is further the Contractor's responsibility to plan ahead for obsolescence of parts, components or sub systems, such that there will be no interruptions in the continuous sound functioning of the System or any of its parts.
- 16.8. Tooling: The Contractor or his maintenance representative is responsible to the availability of all the necessary equipment and tools required for conducting all maintenance work in a most efficient and precise way. In addition, it is the Contractor or his maintenance representative's responsibility to provide appropriately marked and customized vehicles, in sufficient quantities, as necessary for the performance of the maintenance work.
- 16.9. Safety: All personnel working on the road must be pre-trained for such work including, where applicable, working above ground, all in accordance with Israeli rules and work safety regulations.

17. PROOF OF CONCEPT (POC)

- 17.1. Bidders may be selected to perform a POC in Israel, in order to demonstrate the functioning, quality, and ability to meet specified requirements of their proposed systems.
- 17.2. General: The POC will be executed on the 13 km long Fast Lane, on Highway 1 in Israel, between Shapirim Interchange and Tel Aviv. This Fast Lane is actually a bus lane where HOV 3+ vehicles travel for free and others pay toll (at certain times the Lane operates as HOV 2+ yet this is irrelevant to the POC under discussion).
- 17.3. Road-side equipment, where applicable, will be installed at the entrance to the Fast Lane at Shapirim as well as towards the end of the Lane, at the entrance to Tel Aviv.
- 17.4. Installation and Services: Bidders may install their road-side equipment, where applicable, on existing structures at the locations designated above, which needs to be coordinated with and cleared by The Company.
- 17.5. Power and Communications: The Company will provide 220V 50Hz 30 Amps electrical power at the designated locations. The Company will also provide means of communication between these locations and The Company's headquarters offices in Tel Aviv, where the bidder's Management & Control sub-system will be placed, data will be stored and processed, reports will be generated, etc.
- 17.6. Bidder's responsibility: It is solely the bidders responsibility to provide all the road-side equipment, if applicable, OBUs, if applicable, processors and data storage devices - hardware and software, as well as means to install, distribute, and maintain the System as needed for the conduct and success of the POC. In addition, Bidder will be responsible to maintain The System in good working conditions, to ensure continuous sound operation, so that it yields its best performance results.
- 17.7. POC Duration: The POC duration, including installation and dismantling of equipment will not exceed 3 months. Unless otherwise stated in writing by the Company, it is the bidder's responsibility to dismantle and remove all road-side equipment, if any, as well as all the equipment positioned in The Company's offices within that time frame. The actual System experiment will last as long as necessary within the said 3 months to sample at least 1,000 vehicles. Sampling will be conducted at different hours and light conditions, day and night.
- 17.8. Output: Aside from the need to meet the performance criteria stated below, the bidder will have to provide reports in which each vehicle will be identified by its license plate number, location, date, time, and the number of occupants. These reports are to be provided in MS Excel format.
- 17.9. Comparison base: Currently an attendant at the Lane entrance designates manually these vehicles which are HOV 4+ and keeps record of occupancy levels of the

vehicles. This information will be used to evaluate the accuracy of the proposed AVOD Systems under test.

17.10. Performance Criteria: The POC results should meet the following criteria:

False Positive \leq 1.0%

False Negative \leq 2.0%

Total System Accuracy \geq 98%