

**Request for Information (RFI) and
Request for Demonstration (RFD)**

**Subject: Urban Mobility in the Aerial
Dimension**

Naama Venture

In cooperation with:

**The Ministry of Transport and Road Safety, Civil Aviation Authority of Israel (CAAI),
Israel Innovation Authority and Fuel Choices and Smart Mobility Initiative**

February 2020



1. **General:**

- 1.1. Ayalon Highways Co. Ltd. (hereinafter: "**the Company**" or "**Ayalon Highways**") in cooperation with The Ministry of Transport and Road Safety, Civil Aviation Authority of Israel (CAAI), Israel Innovation Authority and Fuel Choices and Smart Mobility Initiative are issuing a Request for Information (RFI) on the need for regulation, use, and management of potential demand for light cargo transportation by low-altitude unmanned aerial vehicles (UAVs) in the metropolitan area and a Request for Demonstration (RFD) of feasibility.
- 1.2. As part of this request, information and a demonstration of feasibility are requested, which will be performed as set forth herein below, under a plan that will be predefined for examining the ability to perform the tasks that will be defined, and pursuant to the operating procedures of the Ayalon Highways Testing Center. UAVs' operation will be performed pursuant to the Aviation Law, 5771-2011, its regulations, and related procedures.
- 1.3. To dispel any doubt, this request is not a request for proposals (RFP) and is not part of a tender process; therefore, it does not create any commitment towards and of the respondents. The request is intended to obtain information, after which the Company and the other parties involved will pursue its activity based on professional and purposeful considerations.

2. **Background:**

- 2.1. Ayalon Highways Co. Ltd. (hereinafter: "**the Company**" or "**Ayalon Highways**") is a government company which serves as the operational arm of the Ministry of Transport, operating the Testing Center and managing innovative transportation projects related to smart transportation.
- 2.2. As part of a process to optimize the use of a range of transportation options in this crowded urban area, the Company is interested in examining the need and financial feasibility of commercial or other (medical, emergency, etc.) demand for low-altitude aviation by utilizing the advanced technological capabilities of Ayalon Highways to perform the required tests and studies at the company's Testing Center.
- 2.3. Therefore, the Company is hereby issuing the RFI and RFD on **Light Cargo Transportation by UAV**, as set forth in this request (hereinafter: "**the RFI**").
- 2.4. The purpose of the RFI is to develop an operating concept, learn, understand, and solve the challenges inherent to this subject and promote all the infrastructures needed, while performing the physical, land, and air tests by the company's Test Center, and the principles of the necessary future regulations, with the objective of enabling the sustainable operation of drones over time, as soon as possible, if it turns out that such a need exists.

3. **Motivating Background:**

- 3.1.1. Development of UAVs¹ in general and aircraft with hovering capability² in particular in the context of the consumer world.
- 3.1.2. The planning certainty is that the Dan Region³ will have about nine million people daily in about 30 years (around 2048) and it will not be possible to comfortably support the traffic capacity of passenger vehicles of so many people with current and currently planned solutions.
- 3.1.3. Efforts to develop scores of types of passenger carrying vertical takeoff and landing aircraft⁴ (helicopters in the near future and air taxis if and when suitable platforms are developed), with the intention of achieving a situation in which it will be possible to fly for a "reasonable price" in urban areas, without disturbing the public, with the proper safety, and to take off and land in or near the urban area (along the coastline, for example) are expected to mature in around 2030.
- 3.1.4. Numerous economic analyses and many developments on the use of UAVs for deliveries in the urban space, as well as other uses.
- 3.1.5. A supportive regulatory world, like what is being developed around the world in general and in the United States⁵ and European Union⁶ in particular.
- 3.1.6. Development of an ability to test all the elements (land, air, and control).

4. **Objective of the RFI:**

- 4.1. To obtain information about all the aspects with respect to the operation of UAVs for transporting light cargo in the urban space, in particular with respect to the operating outline of light cargo carrying UAVs, the operation of which is performed in a defined area and along authorized routes.
It should be noted that, in the future, irrespective this RFI, there is also an intention to support scenarios that require flight outside defined routes, such as drones whose primary contractual purpose is monitoring and traffic direction, a range of municipal services, emergency response, etc.
- 4.2. Evaluate the scale of the effort needed to obtain the permits to operate the network, with all that that implies (establishing a company, aircraft, operators, permits and authorization from the different ministries).
- 4.3. Obtain information about the possible business models and commercial need to transport light cargo in the space.
- 4.4. Obtain information about the need for adapting and development regulations to allow the permanent and safe operation.
- 4.5. A proposal to establish the necessary physical infrastructure – a logistics center that includes a landing pad, drone rechargers, landing points for different kinds of cargo, etc.

¹ Unmanned Aerial Vehicles

² The intention in this document is aircraft with hovering capability, irrespective of the question whether or not it has fixed wings.

³ From Netanya in the north; Modiin, Rosh Ha'AYin, and Nitzanei Oz in the east; to Ashdod in the south.

⁴ electric vertical take-off and landing (eVTOL) vehicles

⁵ Unmanned Traffic Management (UTM)

⁶ U-Space

- 4.6. Map the aviation infrastructures needed and the restrictions required for operation, such as routes, Approach slopes to/from the landing pads and to/from the cargo landing points, obstacles.
- 4.7. The proposal for the possible different architectures for the automated command and control system, which will enable planning and supervision of the low-altitude air operations and the synchronization between the different bodies that will operate in this space, *inter alia*:
 - 4.7.1. Obtain information about the control system with respect to the **safe** flight by the UAVs in the airspace.
 - 4.7.2. Present the ability or obtain information about **coordination and synchronization** between the different operators that are simultaneously using the same air space and/or the same air routes (in open architecture), and a translation aviation picture by the control center; for example, a metropolitan command and control center that Ayalon Highways is developing, a civil command and control center, military command and control centers, packages orders system, and billing etc.

The Company intends to enable tests and demonstrations to prove the feasibility of the proposed services. The demonstrations/tests are intended to validate the technological capabilities, develop the infrastructures and regulatory principles needed, support and examine the business organization ability of the companies with the intention that, following 24 months of flights, it will be possible for the companies to operate profitably shipping light cargo by drones in the urban space in Israel. This stage is due to be a foundation for turning the urban mobility sector in the aerial dimension into a sector that will be an important component in the future urban lifestyle, as set forth hereinbelow.

5. **Operational format:**

- 5.1. The operations format proposed below will be based on proffering maximum assistance in different aspects by the relevant regulators so that the respondents to the RFI can focus on presenting the need and distribution of the relevant information, while reducing the barriers as much as possible, in accordance with the following principles:
 - 5.1.1. Ayalon Highways and the CAAI will help the respondents find (subject to the appropriate security restrictions) a test area and aviation infrastructure to carry out the demonstration flights or perform the tasks that they will prescribe in response to this RFI in a defined geographical area and setting a Concept of Operations (CONOPS) (hereinafter: "**the test site**").
 - 5.1.2. "Test site" will be defined in accordance with the different options described hereinbelow as dependent on the SORA⁷ analysis and meeting the safety requirements:
 - (1) **Designated "UAV bubbles"** – prioritization and option to establish additional bubbles to those present⁸/designated for low-altitude in areas

⁷ SORA - Specific operation risk assessment

⁸ Appendix B09 for aviation information publication/UAV bubbles map

convenient for the tests (sites not in settled areas and also in settled areas, etc.)

- (2) **"Predefined" operating areas** – such as university campuses or hospitals or large factories
- (3) **Delivery air routes network** – a concrete site that includes a connection to an entity interested in making deliveries ("the shipper"), support in establishing a "landing pad", support in cargo landing areas, their characterization and establishment (if necessary), and the air routes linking the landing pads with the cargo landing pads.
- (4) **Infrastructure layer for the low-altitude airspace** – Ayalon Highways and the CAAI will help entrepreneurs draw up an infrastructure of routes in the low-altitude airspace; the routes will comply with the regulations.

5.1.3. Ayalon Highways and the CAAI will promote all the planning, air control, flight briefing, safety reports and other infrastructures in accordance with the road map that will be set forth hereinbelow, including methods for allocating bubbles/flight areas/"air delivery routes networks", flight coordination methods, mechanisms for obtaining weather reports, coordination with the Airspace control units/control towers (per the relevant area), separation from civil flights/Air Force flights, etc.

5.1.4. Ayalon Highways will help contact delivery entities (shippers) and/or local authorities and/or manufacturers for the purpose of building an array of companies for demonstration needs.

5.1.5. The option to integrating current routes in the innovation routes will be considered, including plans for amalgamation and financial support for pilots.

5.2. The operating concept described hereinabove is only a proposal, and the respondents may offer a different operations format in order to achieve the purpose of the RFI. If the respondent presents a different operating concept, the Company will consider allowing a demonstration in the format that the respondent proposes, on the condition that the operating format meets all the safety, regulatory, and other requirements that will be presented and included in this RFI.

6. **Definitions**

- 6.1. **Small UAV** – a UAV with a takeoff mass, including any payload and attachments is larger than 250 grams and smaller than 25 kilograms.
- 6.2. **Light cargo** – a cargo that a small UAV can carry
- 6.3. **Metropolitan control center** – Ayalon Highway's Tel Aviv metropolitan traffic management and control center
- 6.4. **Sortie** – a flight from the engine start stage to the engine turn off stage
- 6.5. **Supplier** – companies that respond to this document or part of it
- 6.6. **Shipment** – a company/organization that is interested in making shipments
- 6.7. **Manufacturer** – anyone who manufactures the aircraft, ground station, control unit (in contrast to an operating company)

- 6.8. **Operating company** – as the default option, is the company that is also the Supplier. A company that will operate the UAVs, is responsible for providing end-to-end service, including operators/pilots
 - 6.9. **Landing pad** – the physical infrastructures where the UAVs land and take off. As a default option, the place where the cargoes are loaded, from which the flight command and control functions are performed, the commercial/command and control function, where, as a default option, the operators/pilots are located, a place with maintenance capability, etc.
 - 6.10. **Cargo landing pad**
 - 6.11. **Naama Venture** – the current activity, promoting aerial dimension urban mobility
7. **"The Vision":**
 - 7.1. Towards 2030 and afterwards, there is an intention to integrate special aircraft for flights in the urban space – vehicles which can carry passengers. The intention is to build all the ground and air infrastructures needed for this, from "today" and establish a "proper" capability dependent on the platforms (and the business model that will be developed in the US/EU).
 - 7.2. As a first step, from next July and lasting 24 months, a review of the delivery UAV flight capability in the urban space, as specified in this document.
8. **Road map for the current RFD - operating UAVs in the urban space**
 - 8.1. Review of the response received to this RFI and performance of the demonstrations.
 - 8.2. **The process for obtaining permits will be completed before the demonstrations are performed**, including flights in the designated UAV flight bubbles (for companies that already licensed).
 - 8.3. **Proof of basic flight capability in the urban space**
 - 8.3.1. **Proof of technological feasibility in the designated UAV bubble** at the development site (loading packages, charging batteries, continuous carrying of packages to a defined cargo landing pad in the operator's line of sight, beyond the operator's line of sight, proof of package landing accuracy, reliability, ability for one operator/pilot to operate several vehicles, etc.
 - 8.3.2. **Flights in the urban space** – pursuant to the SORA per the illustration in section 5 hereinbelow, with each company operating in a separate area (without the need to coordinate between the companies). Each company will have one landing pad and Two cargo landing pad.
 - 8.3.3. **Proof that the command and control system can handle the UAVs – control unit/ground operations station**
 - 8.3.4. **Proof of the business application** that enables placing an order of the package, selection of the aircraft, and allocation of the package to a particular vehicle, preparation of the aircraft for flight, connecting to the end-customer, landing the package at it, and the appropriate billing.
 - 8.3.5. **Stage 1:** providing a response to compliance with current UAV operating laws.
 - 8.3.6. **Stage 2:** flight capability characterization, not as part of the designated UAV bubbles – a separate bubble for each company – but on the basis of "automatic

coordination" between the company and the UAVs of other users of the aerial space and all stakeholders. A special RFD will be published for this purpose, separate from this document, at a target date of 1 July 2020.

- 8.3.7. **Stage 3:** testing of the wideband data communications capability between all the vehicles in the airspace to make possible all of the following functions:
- (1) Keeping distance/formation flight/maximum traffic density/management of queues to/from the landing pad/cargo landing pad, etc., even when the flight is BVLOS
 - (2) "Sense and avoid"⁹ between all the types of vehicles with cooperative capabilities – If needed.

9. **Information security and privacy specifications**

9.1. Pursuant to the law.

10. **Definition of requested information (i)/requested demonstration (d)**

10.1. (d) The Supplier will estimate the effort for *obtaining a permit as a "UAV/drone without line-of-site operating company"* in terms of time/money, including details of all the required processes with the CAAI¹⁰, *inter alia*, an estimate of the number of sorties needed.

10.2. (d) The Supplier will estimate the effort for *obtaining an aircraft flying permit* in terms of time/money, including details of all the required processes with the CAAI. The Supplier will state whether this is an existing aircraft or aircraft under development, and if under development – the estimated time and budget needed to do so. Special details are requested with respect to the process for obtaining a permit on the basis of a SORA. If relevant, the Supplier will describe the permits already issued it by foreign civil aviation authorities.¹¹ The Supplier will provide an estimate of the number of sorties required to "certify" the aircraft.

10.3. (i) *The Supplier will describe the number of vehicles it intends to operate to provide a response to the "operating scenario" throughout the operating period.*

10.4. (d) The Supplier will estimate the effort for obtaining pilot/operator permits, their experience (if relevant), how long and how much money the process is expected to take, in particular *how many operators it intends to train and/or allocate for the purpose of operating what is requested in this document*, including specific reference to the issue of the number of operators versus the number of vehicles, including the degree of the vehicles' independence.

10.4.1. If each vehicle has a pilot, or if the same pilot operates several vehicles, with reference to the process of obtaining permits for this issue.

⁹ The precise definition will be distributed in a separate RFD. Do not attribute formal meanings to this term especially before the sense and avoid specifications, which the EU and/or the US are clarified, etc.

¹⁰ Civil Aviation Authority of Israel

¹¹ Permits requiring European Union Aviation Safety Agency (EASA), US Federation Aviation Authority (FAA), the UK Civil Aviation Authority (CAA), Australian Civil Aviation Safety Authority (CASA), and Transport Canada Civil Aviation (TCCA) have preference.

- 10.4.2. Estimate of the number of training sorties required for training, separately for each skill.
- 10.5. (i) The Supplier will describe the "**drone landing pad**", which in its opinion is worthwhile establishing, including:
- 10.5.1. The necessary area, including a blueprint.
 - 10.5.2. Aspects of flight take off/landing obstacles.
 - 10.5.3. Methods and procedures for loading and unloading packages to/from the drone.
 - 10.5.4. Methods and procedures for electric charging of the batteries.
 - 10.5.5. Building/preparing the infrastructures necessary to support the test operations crew, including aspect of battery charging, office equipment, and means of communications.
 - 10.5.6. How, in its opinion, to solve the issue of ground uses, including a list of proposals for the location on a map, the issue of land ownership, the issue of environmental protection, etc.
 - 10.5.7. Safety issues, with an emphasis on the question of how to prevent the entry of people/children/animals onto the cargo landing pad when landing a package in it.
 - 10.5.8. Distance from the customer of the service (package delivery).
 - 10.5.9. Landing pad operating method (such as personnel, shifts, and distribution of roles).
 - 10.5.10. Test outline for "opening the site – first flight testing".
 - 10.5.11. Evaluating Cost/Time.
- 10.6. (i) The Supplier will propose **airspace regulations in coordination and at the guidance and approval of the CAAI**, including:
- 10.6.1. **Flight routes to/from the drone landing pad**, with an emphasis on flight obstacles/building restrictions, etc.
 - 10.6.2. **Flight routes** – in the specific space where it intends to operate. Build an airspace assessment for the airspace (preferably along Eurocontrol methodology). State the "reasonable minimum risk operating concept", in particular how to respond to the following subjects:
 - (1) **The required route width** enough to ensure that the drones will "always" be within the defined route.
 - (2) **Refer to the navigation accuracy and lack of GNSS** (GPS, GLONASS and similar) – is it advised to demand reception from at least two different satellite constellations systems, navigation by visual means, etc.
 - (3) **Refer to loss of command and control communications**
 - (4) **Injury to people** resulting from a crash
 - (a) From the aspect of **the vehicle's reliability**
 - (b) From the aspect of the planned route on which the flight was made, taking the "population density| beneath the route" i.e. as far as possible, not over kindergartens, schools, mass-crowd events in open areas, etc.
 - (c) Show detailed calculations of the area that the drone may reach dependent on the flight's altitude and wind speed.

- (5) "Flight Termination System (FTS) mechanisms, if the Supplier recommends them.
- 10.6.3. **Approach slopes to/from the cargo landing pad**
- 10.6.4. **Concept of the airspace management (open system for different companies).**
- 10.7. (d) The Supplier will describe the landing pad/routes/cargo landing pads that it intends to operate in the tests/demonstrations.
- 10.8. (d) The Supplier will propose the establishment of **at least two cargo landing pads**, and, if possible, of two different kinds, as follows:
- 10.8.1. **Private cargo landing pad** – a cargo landing pad on private land with the landholder's permission.
- 10.8.2. (i) **Municipal cargo landing pad** – a cargo landing pad on land owned/ responsibility of the municipality or Traffic Lights Authority, including breakdown by types, which in the opinion of the Supplier should be defined, such as:
- (1) C-argo landing pad in a parking lot near multistory buildings
 - (2) Cargo landing pad on the roof of a multistory building
 - (3) "Temporary" cargo landing pad on the roof of a multistory building
 - (4) Cargo landing pad on a lawn/empty area
 - (5) Other cargo landing pad, which the Supplier believes will provide it a planning response
- 10.9. (i) **The Supplier will prepare the scope of the cargo landing pad planning and realization**, including details for which cargo landing pads they will be required, what is their deployment on a map/GIS, and what "kinds of cargo landing pads" are required. Refer in this planning to wind regimes near buildings: what is known, how to deal with it, and how it will be possible to prove UAV use capability near buildings.
- 10.10. (d) The Supplier will **refer to weather aspects**, including –
- 10.10.1. From whom it will obtain weather data certified for "flight approval".
- 10.10.2. How the risks plan integrates with the different kinds of weather.
- 10.10.3. (i) Do the vehicles have on-board ability to send/receive alerts about unusual winds, shear, etc.
- 10.11. (d) The Supplier will refer to avoiding entry to "prohibited areas" (Geofencing).
- 10.12. (d) The Supplier will refer to aspects for avoiding collisions with fixed obstacles (such as buildings). The Supplier will refer to an anti-collision proof plan, including with mirror/glass clad buildings, etc.
- 10.13. (d) The Supplier will refer to aspects for avoiding collisions with mobile objects (such as construction cranes)
- 10.14. (d) The Supplier will refer to aspects for avoiding collisions with aircraft that have mistakenly entered the airspace where it is operating, including all types of possible aircraft that are operating, including at least large passenger planes, passenger planes, helicopters, small aircraft at low altitudes, other UAVs, and hang gliders. The Supplier will refer to aspects to the sense and avoid system, global regulations drawn up on this matter, and whether they are required during the test stage and/or at all.
- 10.15. (i) The Supplier will refer to aspects to dealing with birds, both from the aspects of bird strikes and birds attacking the drone.

- 10.16. (d) The Supplier will refer to aspects of privacy protection during and after operations.
- 10.17. (d) The Supplier will refer to safety aspects.
- 10.18. (d) The Supplier will refer to communications aspects – frequencies, technologies, and the required licenses.
- 10.19. (d) The Supplier will refer to aspects of cyber defenses.
- 10.20. (d) The Supplier will refer to identification aspects that it intends to operate to avoid being identified as a hostile element.
- 10.21. (d) The Supplier will refer to control aspects, documentation and briefings that it will operate for mission control and briefings.
- 10.22. (d) The Supplier will refer to aspects of environmental quality and the protection of nature.
- 10.23. (d) The Supplier will refer to noise aspects.
- 10.24. (i) The Supplier will refer to aspects of potential vandalism (attempts to bring down a drone near a cargo landing pad).
- 10.25. (d) The Supplier will prepare a list of all the technical standards that it intends to comply with in a way that the recipient of the information will be able to read the standards.
- 10.26. (d) As part of the writing of the SORA, the Supplier will refer to aspects of BVLOS flights and flights over people.
- 10.27. (d) The supplier will refer to all safety aspects and damage avoidance in case of critical faults.
- 10.28. (d) The Supplier will prepare a *skeleton business plan* at a level that will show the feasibility of sustainable profitable operations over many years, even after the test period is completed and without government support for operations. The business plan will include aspects of the entire life cycle of the system and all its components (include a depreciation/reduction in value model, maintenance, software upgrades, and acceptance of upgrades).
- 10.29. (d) The Supplier will propose which documents it will submit during the entire process, including details of the contents and scale of the effort in writing each document, including at least:
 - 10.29.1. Systems manual
 - 10.29.2. Operations reference manual
 - 10.29.3. Aircraft maintenance manual (list of malfunctions and permits)
 - 10.29.4. Operators training syllabus
 - 10.29.5. Technicians training syllabus
 - 10.29.6. Description of the operating concept
 - 10.29.7. Safety concept, including a SORA pursuant to the Joint Authorities for Rulemaking on Unmanned Systems (JARUS)
 - 10.29.8. SMS use procedures
 - 10.29.9. Accident and irregular incident reporting procedure

11. Research and development elements

- 11.1.(i) The Supplier will explicitly state every activity that includes R&D and running (pilot) elements as defined by Innovation Authority: hardware, firmware, software, and regulatory elements such as monitoring, documentation and proof tools, and running elements (conducting the actual tests).
- 11.2. The Supplier will present a development plan, including a risks, time, and budget assessment for developing the information system, which will include the following:
 - 11.2.1. (i) Obtain the automated "**fixed, flight prohibition areas**" to its planning/control station/ operations box, including the means to take these areas into account, to include update for Geofencing or other enforcement.
 - 11.2.2. (i) Obtain automatic "**closed airspace**" as above
 - 11.2.3. (i) Obtain relevant Notice To Airmen (NOTAMS)
 - 11.2.4. (i) Upload its **flight plan** so that everyone in the relevant airspace will receive it, in particular the Israel Airports Authority/flight intelligence/Ben Gurion Airport and CAAI/ Air Control Unit 509 and 506.
 - 11.2.5. (i) Obtain the relevant **weather** data.
 - 11.2.6. (i) Mark the **drone landing pad**, the flight route, and the **cargo landing pad** graphically on a map that can be shared with every stakeholder.
 - 11.2.7. (i) Obtain **flight obstacles**.
 - 11.2.8. (i) Obtain factors influencing the risk to people on the ground, **including land uses and incidents, including mass-crowd events in open spaces**.
 - 11.2.9. (i) Show relevant data on **other users** in the airspace, without disclosing sensitive data to others.
 - 11.2.10. (i) Obtain flight routes of **hazardous planes** from the **Israel Air Force**, if the Air Force is prepared to do so.
 - 11.2.11. (i) Obtain data of **hazardous planes** from the CAAI, if the CAAI is prepared to do so.
 - 11.2.12. (i) Calculate/present/request a dynamic flight route against the aforesaid data, including the ability to change it in real time if necessary, in case of a threat or changing priority.
 - 11.2.13. (i) Dynamically mark online the **locations of aircraft (drones) that it operates**, so that at any given moment the Supplier can submit the aerial picture of the vehicles that it is operating to the CAAI and Air Force at a frequency that will not be less than once every twelve hours (design target – once per second).
 - 11.2.14. (i) The Supplier will refer to the open standard and redundancy of this system, including the proposed technical standards, such as DO-178 Avionics Certification – yes, no, and why.
 - 11.2.15. (i) The Supplier will state similar developments carried out in the world with respect thereto, including U-Space, UTM, and software and app architecture by Google Wing, Amazon, and any other company that, in the opinion of the Supplier, wishes to recognize its developments.
 - 11.2.16. (i) The Supplier will state the conformity of the system that it is proposing to the systems operating the world and the interfaces under development for this purpose.

- 11.3. (i) The Supplier will propose options for "scalability" for the maximum number of 2-kg packages per time unit/volume unit/cargo landing pad, including reference to use by a number of companies on the same route etc.
- 11.4. (i) How to join the flight route from the "landing pad", even when the flight route is "occupied" (what is the minimum margin and what is the traffic density).
- 11.5. (i) How to exit from the flight route to the cargo landing pad, and how to rejoin it.
- 11.6. (i) Basic calculation for maximum "rounds" for a distance of two kilometers between the landing pads and the cargo landing pad, assuming that there is only one authorized flight route for use (what is the lateral separation of the flight route that enables greater vehicle density? What is the required altitude separation for the density and what does this mean with respect to measuring accuracy, how to arrange "queues" for landing, and to lay down the packages, etc. Is communications needed between the vehicles? Is it possible to reach a carrying capacity "on the scale of vans/trucks"?)
- 11.7. (i) The Supplier will propose ways to regulate the airspace, so that more than one operator may operate an automated service, inter-operability principles between operators etc.
- 11.8. (i) The Supplier will propose ways to regulate the airspace so that it can support helicopter flights in the airspace (in the distant future); for example, limiting the UAV altitude to 50-100 meters (up to 400 feet) above the ground, and allocating altitudes between 800 feet and 1,200 feet to helicopter traffic, or a similar proposal.
- 11.9. (d) The Supplier will refer to its preparations for the response:
- 11.9.1. As part of a group of companies that includes an aviation operator, aircraft manufacturer, a company that specializes in the development of automated systems (c2), and, if possible, a commercial customer interested in drone deliveries, as well as a municipality interested in operating the service in its jurisdiction, so that the Supplier can begin commercial delivery service immediately following the end of the test period.
- 11.9.2. If it is not possible to offer a response as part of the aforesaid group, how it intends to prepare and what support it expects to receive from the company (air traffic management) and government parties (see section 4.2 on page 5 hereinabove, "Operations format").

12. **Illustration of the expected scope of activity in the present RFD (baseline operations scenario – packages carrying drones). The scenario includes 24 months of flights¹²**
(d)

Section	Main subject	No. of sorties per company	Comments
Preliminary stage	Flights to obtain permits		Pursuant to CAAI requirements as part of the obtaining of permits processes
1	Takeoffs and landings	3 x "Site first flight" 3 x different platforms	
2	Opening a flight route	2	
3	Opening a cargo landing pad	6	
4	Demonstrations	24	
5	Opening types of packages	24	
6	Flight route precision without GPS	24	
7	Landing packages precision and characterization of the different kinds of cargo landing pads	24	
8	FTS operation	24	It is desirable to refer to the ASTM, pursuant to this standard, the FTS proof process requires about 70 sorties and apparently, per CAAI definitions, a company that wants such a system will have to prove its compliance with the standard (or any other CAAI definition)
9	"No comm", "return home" proof	9	
10	Wind gusts resilience proof	3	
11	Mobile obstacles update proofs	3	

¹² (d) means that the company intends to provide the relevant information and **also** is interested in demonstrating/undertaking the section in practice. (i) means that the company is only being asked to provide the relevant information, without an actual demonstration.

Section	Main subject	No. of sorties per company	Comments
12	Malfunction response capability proof	48	
13	Information sharing tests between operating companies	48	
14	Information sharing tests with the IAA and Air Force	48	
15	Communications coverage and radar/IFF/WAM/remote ID tests	48	
16	Altitude class and navigation accuracy proof, and aspects of replacing information entities, including closed areas and airspace closures	48	
17	Fast evacuation proof following Air Force, CAAI alert	12	
18	Incident/accident reporting drills	3	
19	Proof of documentation and recording systems	3	
20	Practical test for operators (depends on the no. of operators required)	12	
21	Test flights following changes in aircraft/software	24	
22	Proof of ability to operate more than one aircraft by a single operator	7	
23	Commercial and non-commercial demonstration flights	Per demand	
Total		450	Not including commercial demonstrations

Note: the table is solely for illustration; the companies may submit another proposal, provided that it covers at least the following aspects:

- Proof of flight without GNSS
- Proof of flight without command and control communications
- Proof of safety measures in case of critical malfunctions (such as a parachute)
- Proof of resistance to weather conditions
- Proof of delivery and cargo acceptance mechanisms
- Demonstration of the business process
- Night flight demonstration as needed
- The submitted plan should cover at least 450 sorties over two years

13. **How to manage the RFI**

13.1. **Stage 1: provision of information** – after receiving the information as specified in this RFI, Ayalon Highways will establish a special steering committee to examine the response to the RFI and analyze the responses in accordance with its needs.

13.2. **Stage 2: demonstration stage** –

13.2.1. It is made clear that, following the examination and preliminary filtering of the responses received from the respondents, the Company will contact the relevant respondents to undertake the demonstration stage

13.2.2. For the purpose of the demonstration stage, the Company will prioritize respondents that will present in the response to the RFI the option of undertaking a demonstration as a one-stop-shop in a way that they know to present a **"delivery flight routes network"** between the customer or specific shipper that will build a landing pad on or near its premises and end-customers that will have a cargo landing pad on or near their premises, *inter alia*, for the purpose of the permits, the aircraft manufacturer, the local authority, customer/shipper, and the company specializing in command and control aspects.

The air traffic management company, in coordination with the CAAI, will advise the companies on everything required to obtain the necessary operating permits, if possible.

13.2.3. Without derogating from the general guidelines herein below (section 15), the company will decide on the manner of the future contract, if any, which may change, be postponed, or cancelled. In any event, the Company will bear no expense or payment for said decision.

14. **The response to the RFI**

14.1. As part of the response, the Supplier shall submit the response to each section separately, while preserving the numbering. The Supplier shall provide the following information in the response to the RFI:

14.2. **Appendix A – General information about the respondent:** respond in the form attached as **Appendix A** to the RFI.

14.3. **Appendix B – Technical specifications of the proposed solution:** the specifications will be written in accordance with and with reference to the list of subjects set forth in **Appendix B**. Add catalogues, links to websites, or any other material that provides the requested information (if any).

15. Timetable

Publication of the RFD	2 February 2020
Suppliers meeting*	25 February 2020, 10:30
Deadline for questions for clarification	3 March 2020
Deadline for answering the questions	19 March 2020
"Naama" Conference	25 March 2020
Deadline for submitting the response to the RFI	15:00 on 2 April 2020
Examination of the response and contacting the respondents	By 1 May 2020
Demonstrations	1 July 2020

*Meeting participants should arrive on time.

The meeting will take place on the company's offices, 2 Nim Blvd., Rishon LeZion, Azrieli Business tower, 7th floor.

Please make sure to register until 48 hours before the meeting: lirone@ayalonhw.co.il.

Please send full name, company name and contact details.

16. General guidelines

- 16.1. This RFI is also published in English to obtain responses from respondents and manufacturers that do not speak Hebrew. It is made clear that the Hebrew-language version is the binding version on the Company.
- 16.2. The response to the RFI shall be submitted in Hebrew or English, together with the documents and particulars required as stated hereinabove, *inter alia*, all relevant information, such as a presentation, video, pictures, documents, and tests.
- 16.3. The response shall be submitted by email reutb@ayalonhw.co.il not later than 15:00 on 2 April 2020.
- 16.4. Questions or requests for clarification with respect to this RFI may be submitted no later than 3 March 2020 to the aforesaid email.
- 16.5. This RFI is **not an RFP or part of a tender process**. Therefore, it does not establish any commitment towards any of the respondents to it. The RFI is solely to obtain information on the basis of what is set forth therein. Following receipt of the information, the Company will consider its next steps, if any, in the matter of the RFI.
- 16.6. This RFI creates no commitment of any kind by the Company to publish a tender in the subject therein, or to share with any party in a future tender, if published, and this process does not establish any commitment or promise towards the participants and/or person and/or any entity.

- 16.7. Responding to the RFI does not grant any advantage in said tender, if published, and it does not ensure compliance with the threshold conditions or any other condition in the matter of said tender.
- 16.8. If the Company decides to publish said tender, it shall have the right to demand different services in the tender from those presented in this RFI, and it shall have the right to set additional or different conditions from those presented in this RFI, at its discretion.
- 16.9. The Company shall have the right to ask for clarifications, completions, or additional information from any party that responds to this RFI or from other entities, everything as it deems fit.
- 16.10. The Company has the right to summon any of the respondents for a presentation of the response to its representatives. It is made clear that the Company is not obliged to summon all of the respondents.
- 16.11. Any respondent to this RFI declares that it agrees that the Company may use the information that it will provide, in whole or in part, for the purpose of writing a tender or for any other purpose that it deems fit.
- 16.12. The respondents to this RFI are requested to state which data and/or documents included in the response that they submitted are, in their opinion, commercial secrets subject to any law. Ayalon Highways will keep confidential and will not disclose and/or send any information that is a commercial secret that comes into its possession as part of this RFI, except to Ayalon Highways employees and consultants on its behalf who need this information for the purpose of fulfilling their duties. It is also made clear that the respondents to this RFI may submit documents and references in which they redact particulars that are not relevant to this RFI.
- 16.13. The respondent to this RFI declares that it waives in advance any claim, *inter alia*, in the matter of intellectual property and/or suit and/or demand from the Company or anyone on its behalf and/or from the Ministry of Transport for information included in its response to this RFI or in the requests for clarification following it, if any.
- 16.14. All the expenses involved in writing and submitting the response to this RFI are the sole responsibility of the respondents and at their expense. The respondents will not be eligible for any refund or indemnification or payment from the Company for submitting the response to this RFI, and the Company shall bear no liability with respect thereto. Everything is also true even if the process ends without entering into a contract or if the Company decides for various reasons not to pursue the tests or go to the demonstration stage.
- 16.15. A respondent that submits information in the response to this RFI undertakes that the information that it submits and/or any use made thereof will not infringe the rights, *inter alia*, copyrights or commercial secrets of any third party. The respondent alone shall bear liability for any demand and/or suit originating in a claim that third party rights were infringed, as mentioned.
- 16.16. The Company may cancel this RFI at any stage for any reason.
- 16.17. It is made clear that Ayalon Highways does not undertake to choose any technology that will be presented under this RFI, and it may not implement any technology that is proposed in this RFI, everything at its sole discretion.

Appendix A – Profile of the respondent to the Request for Information

Name: _____ Company no./authorized enterprise _____

Year founded: _____ Address: _____

Name of the respondent's contact person: _____ position: _____

Telephone: _____ email: _____

Names of the respondent's owners: 1. _____ I.D. _____

2. _____ I.D. _____

3. _____ I.D. _____

(If any company owner is a corporation, list the owners of that corporation)

Fields of business: _____

Main technologies on which the respondent's activity are based: _____

Controlling parties of the respondents (state the parties that own 25% of more of control in the respondent)

Key personnel: CEO, VOs, and development staff: _____

- Additional documents and any relevant information may be added

