

December 15, 2020

## Annex 1

### General Description of the HN LRT Project

#### 1. General

1.1. The HN LRT Project is promoted under National Infrastructure Plan (“Tatal”) 56, in line with the policy set by the GOI in Governmental Decision no. 1838 (the “**Decision**”), in which it ascribed the HN LRT Project the status of “National Infrastructure Project”. It is a key strategic national mega-project, which is intended to:

- Promote the use of public transportation in Israel;
- Strengthen the connection between the Haifa Metropolitan Area and the peripheral region to the east of it;
- Support investment in the development of Israel’s northern regions;
- Support development of the Galilee;
- Increase access to employment; and
- Stimulate economic growth.

1.2. The Decision stipulates that TRI shall lead the HN LRT Project pursuant to an agreement to be signed between the GOI and TRI, including with respect to securing a governmental budget for the execution of the HN LRT Project.

1.3. The HN LRT Project is to include the finance, design, construction, operation and maintenance of the LRT Project in the Haifa Metropolitan Area between Haifa and Nazareth. The exact terms of the PPP Tender shall be as determined in the Tender Documents at the Tender Selection Stage. Currently, it is expected to include a development phase for design and financing, a construction phase, and an Operation and Maintenance phase.

1.4. The concession period is currently expected to be for up to 25 years.

1.5. The Decision further stipulates that the HN LRT Project is to be delivered in two discrete stages:

1.5.1. “**Infra 1**”: a suite of construction contracts primarily comprised of civil engineering works, including, *inter alia*, earthworks, utility relocation, roads, streetscapes, bridges, retaining walls and underpasses, in order to clear and prepare the LRT path.

1.5.2. “**Infra 2**”: a Public-Private Partnership Concession for the Finance, Design, Construction, Operation and Maintenance of the LRT system, including, *inter*

alia, power and electrification, communication and control systems and rolling stock, all works not included in Infra 1.

- 1.6. Operation of the HN LRT Project is planned to commence in 2027 with an option of partial operation beforehand. TRI is collaborating with leading domestic and international companies to achieve this goal.

## **2. HN LRT Project Location**

- 2.1. The city of Haifa is the main economic center and most populous city in the northern region of Israel. As of 2018, Haifa's population reached almost 300,000, with an additional 200,000 in the "Krayot" boroughs on the city's outskirts (Kiryat Bialik, Kiryat Ata, Kiryat Yam, Kiryat Motzkin, Kiryat Haim). Haifa is very economically attractive, and commuters come to work there from 30 to 40 km away.
- 2.2. The most populated area in the surroundings of Haifa is the city of Nazareth, which is located 30 km south-east of Haifa and has a population of 150,000.

## **3. Description of the Route**

- 3.1. The line consists of approximately 40.5 km, extending from the west at the Mercazit HaMifrats station in Haifa, eastbound to the Tawfiq Ziad stop in Nazareth. The line runs through both urban and interurban areas, and its composition is as follows:
  - Interurban segment - Exclusive right-of-way; 80% of the total length; operation with railway signaling control; maximum speed 100 km/h.
  - Urban segments - On-street running; 20% of the total length; operation with highway Line of Sight control; maximum speed 50 km/h.
- 3.2. The project is expected to include approximately 20 stops, 10 of which are to be integrated with the street and the other 10 are elevated at varying levels from the access to the platform, with access provided by means of stairs, lifts or escalators.
- 3.3. The project will be delivered as a twin track light rapid transit system, designed to provide high frequency and reliable and safe journeys, and to enhance the urban environments through which it runs.
- 3.4. For the purpose of describing the LRT route, it is divided below into 4 distinct segments, as follows:
  - 3.4.1. Segment 1: Interurban: Lev HaMifrats - Ata (South)

Starts at a stop adjacent to Mercazit HaMifrats station and proceeds eastward through an exclusive right of way adjacent to Highway 22 for about 6 km until the planned Ata North Interchange. It includes three stops.

The Depot is planned to be located in this section, on land adjacent to the LRT strip in Kiryat Ata, between the Dayan and Ata South stops. The Depot will provide stabling, servicing and all levels of Maintenance for the entire LRV fleet. The Operational Control Center and administrative buildings for the system are expected to be located at the Depot site.

### 3.4.2. Segment 2: Future Urban: Ata (Ha'Atsma'ut) - Ata (Gil'am)

From the planned Ata North Interchange to Gil'am Interchange running along the center-median of the planned Road 781 within the planned Kiryat Ata development. Total length of 4 km. with 8 signalized intersections. This section includes 3 stops.

### 3.4.3. Segment 3: Interurban: Ata (Tal) - Raina

The LRT continues from Gil'am Interchange running approximately 23 km along the center median of Road 79 up to the Raina stop, where the corridor runs 2 km along the side of Road 6400 and then turns east to reach Har Yona stop. The alignment follows the road level contours of Roads 79 and 6400 to minimize cost, thus necessitating the LRT to operate over gradients of approximately 8% for extended lengths. There are two signalized level crossings and 6 stops in this section.

### 3.4.4. Segment 4: Urban: Har Yona to Tawfiq Ziad Terminus

The total length of this section is 5.5 km with gradients approximately 8% and 11 signalized intersections. This section includes 8 stops.

## **4. Operational Characteristics**

- 4.1. It is currently expected that the line will serve approximately 30 million passengers annually. Ridership is predicted to be high, with intense Peak Hour loads **exceeding**

~~10,000~~ around 12,000 – 15,000 passengers per hour ~~per direction~~.<sup>1</sup> As a consequence of the physical limits on train lengths, headways more typical of heavy urban Metro/LRT systems are expected to be required to meet the forecasted demand.

- 4.2. The LRT system, both stops and LRVs, will be designed to meet Israel's current statutory requirements and industry best practice for access to public transport
- 4.3. The following are the current general characteristics of the line:

#### 4.3.1. Light Rail Vehicles

The LRVs will operate either singly or ~~in multiples~~ coupled<sup>2</sup> to form trains of sufficient length to meet capacity requirements. Trains will be Low or Partial Low Floor, ~~66 m long~~, and capable of sustained operation which can achieve a maximum speed of no less than 80 km/h, at speeds of up to 100 km/h sustainable for distances of 5-6 km along the entire inter-urban section.<sup>3</sup> TRI considers service level to the future LRT customers to be of the highest priority and seeks for the state of the art solutions combining the technical capabilities of the LRV (higher maximum speed, acceleration, number of entrances, etc.), technical capabilities of the systems (such as Signaling System, traffic light system, etc.) and efficient operation and maintenance etc.) Therefore, TRI reserves the right, when assessing Bid Submission at the Tender Selection Stage, to award points to reflect its preference for shorter journey times.<sup>4</sup> The trains will also be required to operate on continuous gradients of approximately 8% over distances of 1-2 km

The length of the trains shall ensure that all passenger doors open onto the level section of the platforms; platform length is limited to 65 meters, excluding ramps.<sup>5</sup>

The LRVs will be built to meet the latest standards and best practice for health, safety and welfare of staff, passengers and 3rd parties, and to achieve “best in class” sustainable and energy-efficient operational performance. The LRVs will be self-propelled with level boarding at all doors, and will offer a high-quality customer experience featuring a secure, quiet, temperature-controlled passenger environment with real time passenger information and state-of-the-art passenger facilities.

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<sup>1</sup> Addendum 6, Item 1.

<sup>2</sup> Addendum 6, Item 2.

<sup>3</sup> Addendum 6, Item 2.

<sup>4</sup> Addendum 6, Item 2.

<sup>5</sup> Addendum 6, Item 2.

#### 4.3.2. Control of Train Movements

Interurban train movements will be controlled using railway signaling technology designed to ensure the safe and efficient delivery of the service in line with the operational performance requirements set out above. The overall control of the movement of the LRV on the interurban segment is expected to remain with the driver and automated operation is not required.

Movement of trains in the urban segments of the LRT route will be controlled by the driver following highway rules and under the “Line of Sight” principle. Over-speed detection, obstacle detection and other driver aids may be provided either by the signaling system or by vehicle sub-systems.

The alignment is double track on exclusive right-of-way along the interurban segments.

#### 4.3.3. Traction Power

Traction power will be supplied at a nominal 1500V DC by means of an overhead catenary system. A limited use of catenary-free is still under consideration by TRI.

#### 4.3.4. Fares & Ticketing

Details of the fares policy and ticketing system will be decided at a later stage by the Ministry of Transport and will be introduced with the documents included in the Tender Selection Stage.