Foresight Autonomous Holdings (FRSX): A Game Changing Company Targeting the ADAS and Autonomous Vehicles Market; we set a target price of 1.9 NIS

**Company Overview**

Foresight Autonomous Holdings Ltd. (NASDAQ and TASE: FRSX), is a technology company engaged, through its wholly-owned subsidiaries, Foresight Automotive Ltd. and Eye-Net Mobile Ltd., in developing both “in-line-of-sight” vision systems and “beyond-line-of-sight” cellular-based applications. Foresight’s vision sensor is a four-camera stereo system based on 3D video analysis. Eye-Net Mobile’s cellular-based application is a V2X (vehicle-to-everything) accident prevention solution based on real-time spatial analysis of clients’ movement. The company’s systems are designed to improve driving safety by enabling highly accurate and reliable threat detection while ensuring the lowest rates of false alerts. FRSX is also a 24.12% shareholder in Rail Vision Ltd., a leading provider of cutting-edge cognitive vision sensor technology and safety systems for the railway industry.

**Highlights**

The body of the report includes a comprehensive explanation of the Company’s progress, sales cycle, market, technology, and valuation.

Foresight’s technology is derived from field-proven homeland security technology that has been deployed worldwide for almost two decades in critical international facilities including borders, nuclear plants, and airports.

Foresight’s QuadSight system is a key component that will enable Level 3, 4 and 5 autonomy by solving the two main challenges of detecting any obstacle and allowing autonomous vehicles to safely endure extreme weather and lighting conditions. Foresight’s solution enables 24/7 operation in harsh weather conditions and complete darkness for a complete 3D image of the driving environment. Frost & Sullivan believe that the market opportunity ranges in the hundreds of billions of dollars.

The company targets vehicle manufacturers (OEMs), system integrators (Tier One suppliers) and strategic suppliers, allowing them to adapt Foresight’s core technology to their specific needs in order to enable vehicle autonomy. Foresight has sold 8 systems for testing to leading OEMs and Tier One suppliers in the US, Europe, China, Israel, and Japan.

Taking into consideration the activities of Foresight Automotive, Eye-Net Mobile, and Rail Vision Ltd. we evaluate Foresight at $85.6M / 299.7M NIS; price target range of 1.7 NIS to 2.2 NIS; average of 1.9 NIS (or 2.77 ADS).

Based on our model, operating profit will only be seen in 2023. We present our P&L forecast for 2019-2025 below:

*Comprehensive forecasts with all P&L parameters can be found in the “Equity Valuation” section toward the end of the report.

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</thead>
<tbody>
<tr>
<td>Total revenues</td>
<td>0</td>
<td>1,121</td>
<td>6,576</td>
<td>24,017</td>
<td>84,886</td>
<td>148,290</td>
<td>228,665</td>
</tr>
<tr>
<td>Operating (loss) profit</td>
<td>-31,668</td>
<td>-13,696</td>
<td>-15,617</td>
<td>-12,845</td>
<td>4,864</td>
<td>28,715</td>
<td>58,565</td>
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</table>

*Data presented above is based on non GAAP
Executive Summary

Investment Thesis

Foresight Autonomous Holdings Ltd. (NASDAQ and TASE: FRSX) is a technology company engaged, through its wholly-owned subsidiaries, Foresight Automotive Ltd. and Eye-Net Mobile Ltd., in developing both “in-line-of-sight” vision systems and “beyond-line-of-sight” cellular-based applications. Foresight’s vision sensor is a four-camera system based on 3D video analysis. Eye-Net Mobile’s cellular-based application is a V2X (vehicle-to-everything) accident prevention solution based on real-time spatial analysis of clients’ movement. The company’s systems are designed to improve driving safety by enabling highly accurate and reliable threat detection while ensuring the lowest rates of false alerts. FRSX is also a 24.12% shareholder in Rail Vision Ltd., a leading provider of cutting-edge cognitive vision sensor technology and safety systems for the railway industry.

The autonomous driving market is going through a state of transition, crossing the initial hype cycle into one that is more pragmatic and ROI-centric. OEMs and major investors are re-calibrating their strategies based on identifying technologies that can help address their short-term needs while also fitting in with their long-term vision roadmap for autonomous driving.

In the short term, most major OEMs are looking at business models and use cases that are hyper geo-localized and can bring cost benefits to current operating models that can be displaced. Robo-taxis, shuttles, and urban logistics are expected to be the most lucrative of these geo-localized business models, with Frost & Sullivan valuing these markets at over $200Bn globally by 2030. While the long-term business models are uncertain, the technology selection for these short-term use cases is now considered with scale and reusability in mind.

In order to identify the ROI on any of the future business models in autonomous driving, it is critical to understand the technology cost associated with this, and this is where the biggest challenge with the industry resides. Lack of clear identification of the number of hardware modules required to provide vehicle autonomy along with the growing concern of software costs is mounting the overall estimations of operating autonomous vehicle business models.

It is now a critical point for OEMs and other service providers to identify systems that are robust yet cost effective and capable of operating in varying environments. Beyond these hardware requirements, OEMs will also require a level of flexibility at the software and supply chain level due to the lack of maturity of this value chain. The need of the hour is to have software modules that are cross functional with other sensors in the vehicle while having the flexibility to be procured either as processed information blocks from sensors or as raw data points depending on the overall data fusion strategy of the OEM. In essence, to create software that the OEMs can adapt to their needs and not a “black box” solution.

Addressing the confluence of these two challenges faced by the automotive industry of needing robust and cost effective sensors, along with flexible and cross functional software would be a key value proposition for any autonomous driving technology supplier, and this is where Foresight positions itself as a strategic fit to a diverse set of potential clients. Their combined stereo visible-light and infrared (IR) sensor-based system meets a wide range of vision-related requirements by OEMs that include object detection under diverse driving conditions from fair to harsh weather and provides a 3D point cloud of data that is critical for aspects like localization and object classification. Furthermore, by offering three diverse engagement models, from software licensing, to a system on a chip, as well as a fully integrated model, Foresight provides the desired flexibility to the value chain enabling them to work with a diverse array of clients from OEMs, to chip providers.

Thus we view the investment in Foresight Autonomous as a unique opportunity to invest in a game-changing start up firm in a relatively old school eco-system with three different investment opportunities: autonomous cars, trains, and cellular-based accident prevention solutions.
Timeline of Foresight Automotive significant milestones

<table>
<thead>
<tr>
<th>Event</th>
<th>Significance</th>
<th>Timeline</th>
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</thead>
<tbody>
<tr>
<td><strong>Foresight Automotive</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Commercial order from Elbit to implement Foresight’s technology into Elbit’s solutions and products</td>
<td>High</td>
<td>H1 2020</td>
</tr>
<tr>
<td>2. Initiate a POC with an OEM/ Tier One for tailoring the QuadSight system to the customer’s’ requirements</td>
<td>High</td>
<td>H2 2020</td>
</tr>
<tr>
<td>3. Actualizing the strategic partnership with Wuhan Guide Infrared Co. Ltd. In order to penetrate the Chinese market</td>
<td>High</td>
<td>Q3 2020</td>
</tr>
<tr>
<td><strong>Rail Vision</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Rail Vision 1st commercial order</td>
<td>High</td>
<td>H1 2020</td>
</tr>
<tr>
<td><strong>Eye-Net Mobile</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. SDK development completion for Eye-Net</td>
<td>Med</td>
<td>Q1 2020</td>
</tr>
<tr>
<td>6. Cooperation / integration with a leading mobility application for up to 1 million users for Eye-Net</td>
<td>High</td>
<td>Q3 2020</td>
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</table>

Valuation Methodology

As part of a discounted cash flow (DCF), the accepted method used in financial valuations, there are several modifications to a company’s valuation. In general, there are three primary methods within the DCF method:

1. **Real Options** - valuation method designated for programs/companies where the assessment is binary during the initial phases, and based upon science-regulatory assessment only (binomial model with certain adjustments).
2. **Pipeline assessment** - valuation method used for programs/companies prior to the market stage. The company’s value is the total discounted cash flow, plus allocated costs and assessment of the future technological basis. The assessment of the future technological basis is established based on the company’s ability to “produce” new projects and their feed rate potential.
3. **DCF valuation** - this method applies to companies with products that have or will have in a short time a positive cash flow from operations.

Foresight initiates and develops projects which operate and yield revenue in the long-term. It can therefore be viewed as a property development and holding company with a pipeline of current and future projects. Furthermore, the company’s technology can alter the entire eco-system in which it functions. We choose to be more conservative and to evaluate the company using the DCF method as it will start to produce positive cash flow in the very near future.

Valuation Summary

*For a comprehensive explanation of our valuation see: “Equity Valuation” section toward the end of the report.

Foresight Automotive targets two vertical markets: advanced driver assistance systems and semi-autonomous/autonomous vehicles. It is also engaged, through its wholly owned subsidiary Eye-Net Mobile Ltd, in the design and development of cellular-based V2X (vehicle-to-everything) accident prevention solutions that connect users and infrastructure through smart cellular-based platforms. In addition, it is a 24.12% shareholder in Rail Vision Ltd., a leading provider of cutting-edge cognitive vision...
sensor technology and safety systems for the railway industry. Therefore, our final valuation for Foresight Autonomous Holdings (FRSX) is a sum of Foresight Automotive, Eye-Net Mobile, and Rail Vision Ltd.

**Foresight Automotive:**

Foresight has recently received revenues from Elbit Systems and from prototype sales to OEMs and Tier One suppliers. These revenues have been reducing R&D costs and are not present in the company’s top line. Its current operating expenses consist of three components — research and development expenses, marketing and sales expenses, and general and administrative expenses.

We assume sales during 2020 with a conservative outlook through to 2025. Foresight Automotive’s flagship product, the QuadSight vision system, as a system-on-chip and software (as opposed to a full kit) will constitute the significant portion of sales. The Company’s expenses will be linear to its future sales.

Based on our model, operating profit will only be seen in 2023. We present our P&L forecast for 2019-2025 below (numbers are based on non-GAAP data):

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</thead>
<tbody>
<tr>
<td>Total revenues</td>
<td>-</td>
<td>-</td>
<td>0</td>
<td>1,121</td>
<td>6,576</td>
<td>24,017</td>
<td>84,886</td>
<td>148,290</td>
<td>228,665</td>
</tr>
<tr>
<td>YoY growth</td>
<td></td>
<td></td>
<td>265.2%</td>
<td>253.4%</td>
<td>74.7%</td>
<td>54.2%</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Cost of revenues</td>
<td>-</td>
<td>-</td>
<td>710</td>
<td>0</td>
<td>3,098</td>
<td>10,777</td>
<td>45,104</td>
<td>73,368</td>
<td>113,356</td>
</tr>
<tr>
<td>Gross profit</td>
<td>-</td>
<td>-</td>
<td>-710</td>
<td>1,121</td>
<td>3,478</td>
<td>13,240</td>
<td>39,781</td>
<td>74,921</td>
<td>115,309</td>
</tr>
<tr>
<td>% of revenues</td>
<td></td>
<td></td>
<td>52.9%</td>
<td>55.1%</td>
<td>46.9%</td>
<td>50.5%</td>
<td>50.4%</td>
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**Operating expenses:**

<p>| | | | | | | | | | |</p>
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</tr>
</thead>
<tbody>
<tr>
<td>Selling and marketing expenses</td>
<td>987</td>
<td>1,015</td>
<td>1,939</td>
<td>3,007</td>
<td>4,782</td>
<td>8,082</td>
<td>12,215</td>
<td>16,435</td>
<td>19,116</td>
</tr>
<tr>
<td>% of revenues</td>
<td></td>
<td></td>
<td>73%</td>
<td>34%</td>
<td>14%</td>
<td>11%</td>
<td>9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research and development expenses</td>
<td>8,638</td>
<td>4,089</td>
<td>6,425</td>
<td>9,407</td>
<td>10,852</td>
<td>13,352</td>
<td>16,824</td>
<td>20,983</td>
<td>25,473</td>
</tr>
<tr>
<td>% of revenues</td>
<td></td>
<td></td>
<td>165%</td>
<td>56%</td>
<td>20%</td>
<td>14%</td>
<td>11%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>General and administrative expenses</td>
<td>3,696</td>
<td>3,753</td>
<td>2,378</td>
<td>2,113</td>
<td>3,093</td>
<td>4,149</td>
<td>5,206</td>
<td>7,900</td>
<td>10,264</td>
</tr>
<tr>
<td>% of revenues</td>
<td></td>
<td></td>
<td>47%</td>
<td>17%</td>
<td>6%</td>
<td>5%</td>
<td>4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total operating expenses</td>
<td>13,321</td>
<td>8,857</td>
<td>10,957</td>
<td>14,817</td>
<td>19,095</td>
<td>26,085</td>
<td>34,917</td>
<td>46,206</td>
<td>56,744</td>
</tr>
<tr>
<td>% of revenues</td>
<td></td>
<td></td>
<td>252%</td>
<td>112%</td>
<td>65%</td>
<td>58%</td>
<td>55%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating (loss) profit</td>
<td>-13,321</td>
<td>-8,857</td>
<td>-11,668</td>
<td>-13,696</td>
<td>-15,617</td>
<td>-12,845</td>
<td>4,864</td>
<td>28,715</td>
<td>58,565</td>
</tr>
<tr>
<td>Tax</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-13,470</td>
</tr>
<tr>
<td>Operating after tax</td>
<td>-11,668</td>
<td>-13,696</td>
<td>-15,617</td>
<td>-12,845</td>
<td>4,864</td>
<td>28,715</td>
<td>45,095</td>
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Based on the aforementioned parameters we evaluate Foresight Automotive at $64.3M.

We evaluate Rail Vision based on a very conservative outlook. On March 2019, the Company announced a strategic investment from Knorr-Bremse, a global Tier 2 supplier to the rail industry. Knorr-Bremse invested $10 million in Rail Vision in consideration of 21.34% of the Company’s issued and outstanding capital, representing a post investment valuation of approximately $47 million. As this is a recent valuation of Rail Vision, we based our valuation on this strategic investment, i.e. $11.3M (47M * 24.12% ownership). We remind that strategic investment is, in most cases, lower than the fair value investment as the investor seeks synergism in its investment.

**Eye-Net** is a cellular-based V2X solution in an early stage of capital raising rounds. The company is currently 100% backed by Foresight Automotive. We explored seed and round A capital investments in 2019 for mobility firms. Typical Round A firm value is $10M – $15M. Thus, we assume the current value for Eye-Net Mobile to be similar at the low end, $10M.

Based on the aforementioned parameters we evaluate Foresight at $85.6M.
**Sensitivity Analysis**
The table below presents the company’s equity value in relation to the capitalization rate. Foresight currently has 154.6M outstanding shares. We set a range of 1% change from our CAPM model (see Appendix B).

**Sensitivity Analysis - Capitalization Rate vs. Target Price**

<table>
<thead>
<tr>
<th>Capitalization Rate</th>
<th>Target Price (NIS)</th>
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<tbody>
<tr>
<td>0.15</td>
<td>2.4</td>
</tr>
<tr>
<td>0.16</td>
<td>2.2</td>
</tr>
<tr>
<td>0.17</td>
<td>1.9</td>
</tr>
<tr>
<td>0.18</td>
<td>1.7</td>
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Based on the aforementioned analysis, target price range is 1.7 NIS to 2.2 NIS; average of 1.9 NIS.
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Company, Products, and Strategy

Company

Foresight Autonomous Holdings Ltd. (NASDAQ and TASE: FRSX), is a technology company active in the design, development and commercialization of stereo sensor systems for the automotive industry. The Company was launched as a spinoff of Magna B.S.P., a company that develops and delivers military grade 3D video surveillance solutions for defense, and homeland security/critical national infrastructure customers. The Company’s HQ and principal offices are located in Ness Ziona, Israel.

Ownership & Structure

Foresight Automotive Ltd.

Foresight Automotive provides advanced safety driver assistance and autonomous driving solutions to the automotive industry. Foresight’s unique stereoscopic solution combines stereo visible-light cameras and long-wave infrared cameras to provide near 100% accurate obstacle detection in all lighting and weather conditions (including complete darkness, rain, haze, fog and glare). Stereo technology is an image processing concept which uses two synchronized cameras to achieve depth perception and obtain a 3D view just as our eyes do.

Eye-Net Mobile Ltd.

Eye-Net Mobile’s cellular-based application is a V2X (vehicle-to-everything) accident prevention solution. The core development of the company is an application designed to provide real-time pre-collision alerts to vehicles and vulnerable road users by using smartphones and relying on existing cellular networks. The technology works under all weather and lighting conditions and advanced algorithms compensate for latency. The company is currently financing an A round and has performed successful trials with municipalities.

Rail Vision Ltd.

Rail Vision is a leading provider of cutting-edge cognitive vision sensor technology and safety systems for the railway industry. The Company is developing a first-of-its-kind automated early-warning system (AEWS) for obstacle detection. The system is also designed to collect and analyze imperative big data of railway infrastructure and its environment “on-the-fly” for various uses such as predictive maintenance.
Foresight Automotive

Overview

Foresight Automotive Ltd., a subsidiary of Foresight Autonomous Holdings, is a technology company engaged in the design, development and commercialization of sensors systems for the automotive industry. The company’s systems are designed to improve driving safety by enabling highly accurate and reliable threat detection while ensuring low rates of false alerts. The company is targeting the semi-autonomous and autonomous vehicle markets.

As of October 2019, the company has a total of 60 full and part time employees.

Technology

Foresight Automotive’s solution, QuadSight™, is based on stereoscopic technology, which is an image processing concept that uses synchronized cameras to mimic the human depth perception and obtain a 3D view. The QuadSight™ system consists of four cameras, (2 visible spectrum and 2 long-wave infrared cameras) allowing for both day and night stereo vision enabling 24/7 operation in harsh weather conditions and complete darkness for a complete 3D image of the driving environment. The Company’s proprietary stereoscopic and quad-camera technology is based in part on intellectual property that was transferred from Magna B.S.P. Magna’s field-proven surveillance solution technology has been deployed for almost two decades in critical facilities worldwide.

Foresight has filed several PCT and full patent applications in Israel, China, Europe, and the US. The Company also has an asset transfer agreement with Magna B.S.P, whereby Magna B.S.P transferred to Foresight certain intellectual property rights and assets in the field of vehicle safety. In addition to patent protection, the Company has also filed trademark applications in Israel, China, Europe, Korea, Japan and the US for the purpose of preserving rights to the identity of their products.

On April 1st, 2019, the Company announced that it was granted a US patent titled: “RUNNING VEHICLE ALERTING SYSTEM AND METHOD”.

Following is an example of the benefits of combining visible-light and thermal cameras in detecting objects at night.

Products

The company offers the following products customized to customer needs:

1. **Software license** for generating accurate object detection in harsh weather and lighting conditions based on visible-light cameras and the long-wave infrared camera configuration.
2. **System on Chip (SoC):** consists of an automotive graded board and image processing software.
3. **A complete system:** consists of image processing software, SoC, and 4 cameras.

The system is suitable for L3, L4, and L5 autonomous levels (5 being the highest level of autonomy: full automation).
Key advantages and benefits:

- Detection in harsh weather and lighting conditions
- Advanced algorithms for 3D image analysis
- All obstacle detection on the first frame
- Native detection of humans and animals due to the long-wave infrared camera capabilities
- Passive sensor (does not emit energy like LiDAR, so it does not create potential interference with other systems)
- "3D Point cloud" - a passive 3D visualization of georeferenced points (location and distance)
- Auto-calibration – dynamic automatic calibration software
- Sensor fusion – multispectral stereo channel fusion for accurate detection and reduced false alarms
- Software customization per customer requirements

Award winning technology:

- New Mobility World (NMW) Lab Startup Challenge Award during the IAA Commercial Vehicles Exhibition in Germany, September 2018
- 2019 CES Innovation Awards Honoree in the Vehicle Intelligence and Self-driving Technology category
- Edison Awards Gold winner in the Autonomous Vehicle category, April 2019

Status

The QuadSight™ system was launched at the Consumer Electronics Show in Las Vegas in January 2018. Since then:

- Eight prototype systems were sold to leading OEMs and Tier One suppliers worldwide:
  - Europe – 2 systems were sold to vehicle manufacturers
  - China – 1 system to a leading electrical vehicle OEM + and 1 system to a Tier One
  - Israel – 1 system to Elbit Systems
  - Japan – 1 system to a Tier One
  - USA – 1 system to an OEM + 1 system to a Tier One

- June 2019, announced the first commercial contract with Elbit Systems (NASDAQ: ESLT), an Israeli global defense company targeting vehicles for the defense industry.
Elbit thoroughly tested the QuadSight™ system in comparison with other solutions and chose it for its outstanding performance.

The system was evaluated over a period of two months in both controlled and uncontrolled environments, including testing in off-road driving conditions.

Product sold - software license for several thousand U.S. dollars per license.

Support and maintenance services will be provided for an additional fee.

Additional fees in return for future development agreements in order to accommodate changes to Foresight’s current software version.

Elbit will have exclusive rights to market and sell Foresight’s image processing software in Israel for a period of several years.

Elbit will also have exclusive rights to distribute Foresight’s image processing software globally for an initial period, as determined in the agreement.

In order to maintain exclusive rights in Israel, Elbit committed to issue minimum annual orders for the exclusivity period, with an initial purchase order in the amount of approximately $50,000 due after the execution of the agreement.

June 2019, announced its first technology agreement with a Chinese Tier One supplier that develops safety solutions for Chinese OEMs:

- A multi-phase technological cooperation agreement with a Chinese Tier One supplier to develop smart mobility solutions for the Chinese automotive industry, and specifically for two Chinese vehicle manufacturers.
- The Tier One supplier is currently involved in several projects with the Chinese OEMs for integration of autonomous functions. The cooperation agreement may enable Foresight to integrate its QuadSight™ vision system into these existing projects.
- The multi-phase agreement is based on the following steps:
  - Purchase by the Tier One supplier of a prototype of the QuadSight™ system for evaluation of the system’s capabilities and suitability for the projects.
  - Based on the results of the evaluation of the system and technology, as well as the specific requirements of the Chinese OEMs, the Tier One supplier will formulate a detailed scope of work for development of a specific project integrating the QuadSight™ vision system.
  - Following the completion of the scope of work, the parties may negotiate a commercial agreement for their cooperation in connection with the specific project.
- In addition, both companies approached the Innovation Authorities, each in their respective country, for project funding according to the Israel-China bilateral governmental funding programs. However, realization of the projects is not dependent on funding from the Innovation Authorities.

Sep. 2019, announced a cooperation agreement with Wuhan Guide Infrared Co. Ltd., a leading Chinese infrared camera manufacturer:

- Cooperation in the development, marketing, and distribution of Foresight’s QuadSight™ vision system, incorporating Guide Infrared’s solutions, to potential customers in Greater China.
- Establishing a joint venture in China is under consideration, thus leveraging each party’s competitive strengths.
- Guide Infrared will consider a strategic investment in Foresight.

Business Development Strategy

Company’s strategy is to partner with relevant ecosystem players such as:

- **Vehicle OEMs** – the OEM’s are Foresight’s main focus, mainly teaming up with the innovation groups that are looking for disruptive and advanced technologies for their semi/autonomous vehicles.
- **Tier One suppliers** – the Tier one’s will develop safety functions/features for the OEMs, therefore Foresight engages with specific Tier 1’s of each OEM. In addition, through Tier 1’s, Foresight can access a larger number of OEMs.
- **Leading Integrators** – through Integrators Foresight can access niche markets such as the defense industry or other industries which are not automotive, that are quicker to adapt safety technology in comparison to traditional vehicle...
industries – this supports Foresight’s short/medium terms for revenue. A good example of this is Foresight’s commercial agreement with Elbit Systems Ltd. – a global defense integrator.

- **IR Camera Manufacturers** – IR cameras are critical components within the QuadSight™ system. As such, teaming up with IR camera manufacturers will assist Foresight in various aspects: camera costs, technical improvements, marketing and business development. A good example of this is Foresight’s agreement with Guide IR – China’s leading IR camera manufacturer.

**The typical sales cycle is comprised of the following steps:**

- **Technological demonstrations** – Foresight focuses on increasing public awareness of their unique technology through technological demonstrations. The demonstrations consist of testing the QuadSight system in different predefined scenarios on the customer’s premises. The scenarios simulate obstacle detection in challenging weather and lighting conditions. Foresight has conducted technological demonstrations in the USA, Europe and Far East. The technological demonstrations expose QuadSight™ to a large number of relevant personnel at each client and assist in moving to the next step of a sale of the QuadSight™ prototype.

- **Purchase of a QuadSight™ Prototype** - Foresight has developed a QuadSight™ Prototype (evaluation kit) that is comprised of 4 cameras, a monitor and a mini PC. The purpose of this evaluation kit is for customers to test the capabilities and performance of this unique technology. In addition, it is benchmarked against other technologies. Revenue from a prototype system sale amounts to a total of tens of thousands of dollars.

- **POC stage** – At this stage the customer provides Foresight with feedback based on the tested evaluation kit and both parties enter a Proof of Concept stage in which QuadSight™ is tailored to meet the specific requirements of the customer. Revenue from the POC stage could amount to a total of hundreds of thousands of dollars – mainly as NRE expenses.

- **Design win stage** – entering an agreement for commercial production, with volume ranging in the tens of thousands all the way to hundreds of thousands per year over a period of 8-10 years.

**ADAS and Autonomous Market Overview**

**Introduction to Autonomous Vehicles**

The emergence of Connected and Autonomous Vehicles (CAV) brings unprecedented challenges and opportunities to the global automotive industry, triggering new mobility and ownership models, among others.

SAE International (formerly the Society of Automotive Engineers) classifies automated driving features into five levels, from basic driver assistance (L1) to full automation (L5). These are considered the industry convention for categorizing the driver assistance and automated features provided by Original Equipment Manufacturers (OEMs). Each of the levels has a higher degree of situational awareness that results in more advanced autonomous decision capabilities.

The chart below highlights the clear differences between Levels 1-5.
Autonomous Vehicles Volume Forecast

Currently, vehicles with Level 2 automation are already available on the market. From 2021 onwards, some early generation Level 4 automation features are expected to be introduced and based on current technology roadmaps and real world applications, level 5, is unlikely to be introduced before 2035. One of the primary reasons stated by Frost & Sullivan’s industry experts for this is the cost that is associated in equipping vehicles with a technology that can tackle all possible unusual driving situations under all driving conditions and in all environments. The American Automobile Association (AAA) recently published an alarming report that has found that “the automatic emergency braking systems with pedestrian detection performs inconsistently, and proved to be completely ineffective at night”\(^1\).

And still, more than 18 million new automated vehicles are expected to be sold in 2030, with a penetration rate of about 15%, significantly changing the way people commute.

\(^1\) https://newsroom.aaa.com/2019/10/aaa.warns-pedestrian-detection-systems-dont-work-when-needed-most/
Rise in Sensor Requirements & Sensor Fusion

Fusing multiple sensor data is critical for the vehicle to perceive its surroundings entirely and accurately to make the best decision. Discrete sensor operation is currently replaced by sensor fusion. Discrete sensor operation was used in Advanced Driver Assistance System (ADAS) applications to help drivers perform basic manual driving, mostly for levels 1&2. However, sensor fusion merges the information from various discrete sensors to perceive the environment entirely & accurately and is the standard requirement for performing complex driving tasks in Level 3 and above.

The advantages are

- Data robustness for high speed and long distance applications
- Increased reliability with added redundancy
- Sensor fusion enables OEMs to optimize costs by offering multiple ADAS features compared to sensors working in silos
- Supports achieving 360 degree monitoring

The number of sensors required increase as we go up the levels of autonomy reaching 25 sensors in level 3 and expected to be around 30 in level 5. This further influences the rise in vehicle requirements such as Data processing, communication, software and in vehicle network.

Sensor Fusion Strategies: Levels of Autonomous Driving with Sensors Requirements, Global, 2019-25

<table>
<thead>
<tr>
<th>Functionality</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Level 5</th>
<th>&gt;2030</th>
</tr>
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<tbody>
<tr>
<td>2012</td>
<td>2015</td>
<td>2023</td>
<td>2024</td>
<td></td>
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</tr>
<tr>
<td>Sensor—L1</td>
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<td>ASC</td>
<td>ASC</td>
<td>ASC</td>
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<tr>
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<tr>
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<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Camera (SRR)</td>
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<td>4</td>
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<td>4</td>
<td>4</td>
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<td>2</td>
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<tr>
<td>Camera (Surr)</td>
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<td>1</td>
<td>1</td>
<td>1</td>
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<td>~17</td>
<td>~18</td>
<td>~24-26</td>
<td>~25-28</td>
<td></td>
</tr>
</tbody>
</table>

*Average sensor count in respective levels; µbol: thermal camera/IR sensor for night vision

Source: Frost & Sullivan

Defense Segment

Foresight published that the agreement with Elbit Systems followed an evaluation of QuadSight™ and that the system was evaluated over a period of two months in both controlled and uncontrolled environments, including testing in off-road driving conditions.

It is expected that Elbit Systems will integrate the software with other situational awareness elements to offer a driving assistance and safety solution to defense vehicles. Although the expected unit volumes are low (in the hundreds) the income can reach millions, combining software license fees, support & maintenance and NRE for integration.
Technology key advantages for this segment:

- Detection in harsh weather and lighting conditions
- Passive sensor (camera as opposed to LiDAR)—not detectable
- Native detection of humans and animals due to the long-wave infrared camera capabilities
- Working in off-road conditions
- "3D Point cloud"—for topography visualization
- Sensor fusion—multispectral stereo channel fusion for accurate detection and reduced false alarms
- Software customization per customer requirements

Target markets include:

- Over 300,000 armored fighting vehicles. These include Armored Personnel Carriers (APC), Infantry Fighting Vehicles (IFV) and Mine Resistant Ambush Protected (MRAP) vehicles.
- Some 100,000 Main Battle Tanks (MBTs) in service worldwide of which about half are in active service and half reserve.
- Light utility vehicles (such as the HUMVEE) and military trucks/engineering/logistical vehicles.

**Off-Highway Vehicles Segment**

Foresight also indicates interest in the off-highway segment.

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**Source:** Frost & Sullivan

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Technology key advantages for this segment:

- Detection in harsh weather and lighting conditions
- Native detection of humans and animals due to the long-wave infrared cameras capabilities
- Working in off-road conditions
- "3D Point cloud"—for topography visualization
- Sensor fusion—multispectral stereo channels fusion for accurate detection and reduced false alarms
- Software customization per customer requirements

Frost & Sullivan’s experts indicate that autonomy and enhancing safety are among the key trends influencing this segment. Shipping about 600,000 units each year, key participants include companies such as John Deere, Caterpillar, Terex, JCB, Volvo, Hitachi, Liebherr, Komatsu, Doosan, Sany and Zoomlion.

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2 https://www.globalfirepower.com/armor-apc-total.asp
To allow cars to drive themselves, in part or in full, requires complete trust in the capabilities of the driving system to identify and act correctly per any incident and in any environmental conditions. Sensing for automated cars can be compared with our own, and other living beings’ sensing - there is no one sensor that can do it, even more so, when budget considerations are involved.3

OEMs seek technological solutions that can provide sensor fusion and data fusion that meet driving use cases at a sensible commercial cost. Foresight competes with individual and combinations of sensors on a range of parameters and for various use cases/applications. Following is a list of some of the key parameters. Below are also two charts comparing QuadSight™ to the main sensor types and to the most common combination of radar and lidar. As anyone can see, QuadSight™ out-performs the competition.

- FOV
- Range
- Accuracy
- Frame rate
- Contrast Resolution
- Color perception

Comparison of Individual Sensor Performance

- Glare
- Harsh Weather
- Lane Detection
- Low Light/Darkness
- Human / Animal Detection
- Object Classification

Comparison of Combined Suite Vs. QuadSight™ Performance

Source: Frost & Sullivan

3 https://autonomous-driving.org/2019/01/25/positioning-sensors-for-autonomous-vehicles/
Interestingly, a recent publication from Cornell University research claims that using two inexpensive cameras on either side of the windshield as a stereo system, can detect objects with nearly LiDAR’s accuracy and at a fraction of the cost. The researchers wrote that despite their drawbacks, most industry experts have considered LiDAR sensors as the only solution for self-driving vehicles. However, after analyzing the captured images, researchers found that accuracy of a stereo camera is superior and can be a viable and low-cost alternative to LiDAR⁴. In conclusion the researchers stated that “… one could imagine a setting where high-end cars are shipped with LiDAR hardware and continuously train the image-based classifiers that are used in cheaper models.”

Eye-Net Mobile

Company

Eye-Net is a software-based cellular V2X (vehicle to everything) solution, designed to provide real-time pre-collision “in-line-of-sight” and “beyond-line-of-sight” alerts to vehicles and vulnerable road users (pedestrians, cyclists, scooter drivers, etc.) by using smartphones and relying on existing cellular networks. Essentially, our mobile devices are virtually always in our proximity as we travel. This is true for drivers as well as pedestrians, cyclists, and scooter riders. Eye-Net uses sophisticated methods to prevent collisions between all of these players.

The Eye-Net solution is agnostic to cellular infrastructure, seamlessly adapting to the cellular network generation. Eye-Net uses proprietary algorithms to compensate for latency that each mobile device suffers from in order to optimize alert timing for each of the road users involved.

The solution is designed to provide a complementary layer of protection beyond traditional ADAS. Eye-Net extends protection to road users who are not in direct line of sight, and not covered by other alerting systems and sensors. The Eye-Net solution aims to solve three main limitations of conventional ADAS capabilities:

1. Conventional ADAS analyze threats and monitor potential hazards that are within the sensor’s field of view. Eye-Net is the first available solution today which aims to predict collisions much before any sensor, when the threat is still beyond line of sight.
2. Conventional ADAS systems alert the driver and provide autonomous indications to the vehicle. Eye-Net alerts the driver and other vulnerable road users (pedestrians, cyclists, scooter drivers) that today have no available safety aid in real time about oncoming vehicles and allow them to take an active part in preventing accidents.
3. While conventional ADAS sensor performance is compromised by harsh weather conditions (glare, snow, fog, rain, etc.), Eye-Net uses cellular infrastructure that is not affected by weather or lightning conditions, thus allowing uninterrupted operation and continuous road user protection.

The core development of Eye-Net Mobile had been running within Foresight Automotive for almost 2 years prior to establishing their activity as a designated independent company in May 2018.

Eye-Net Mobile’s strategy is to offer the solution as an add-on service to existing applications with an existing substantial user base.

Source: Eye-Net
**Products**

Eye-Net Mobile’s solutions aim to increase pedestrian, cyclists, scooter riders, and car driver’s safety, by foreseeing beyond line of sight collisions, under all weather and lightning conditions, by providing real time alerts using smartphones and relying on existing cellular infrastructure.

The company develops 3 software-based products:

- **Eye-Net Protect** (Market penetration readiness - Jan 2020)
  A mobile client or mobile SDK providing real-time pre-collision alerts to vulnerable road users and vehicles by using smartphones, relying on existing cellular networks. This is the core development of the company.

**Eye-Net Protect**’s unique features and capabilities:

- Works under all weather conditions
- Designed for minimal system resources consumption (average battery consumption <1% per hour, <1.9 MB/hour)
- Runs as a background process on iOS and android mobile phones
- Requires no special certification
- Compatible with android-based car infotainment systems

- **Eye-Net Analyze** (availability for trial - Q4 2020)
  - A standalone application tailored for infotainment systems providing real-time alerts and notifications about road safety events, enhanced map information and automatic e-call service.

- **Eye-Net Predict** (availability for trial - Q2 2021)
  - A state-of-the-art artificial intelligence system predicting safety trends and providing actionable insights based on big data collected from Eye-Net users.

**Status**

- The company has 25 employees (about half on payroll + half outsourced)
- The company is backed financially by Foresight Autonomous Holdings and aims for a capital raise (round A) during 2020
- Feasibility & POC have been completed
- Dozens of successful demos (Israeli police command, National Road Safety Authority, Municipalities)
- Patent –(PCT) “System & method for preventing accidents & collisions (vehicles & pedestrians)”
- 4 Trials / Integrations –2 local municipalities + 1 Integration + 1 large-scale trial
- The large-scale trial was conducted between 24-29 July 2019 in Israel. It included 8,551 participants (with a peak usage of 3,431), over 754,000 Km and 35,000 hours (in movement). Over 2,600 correlation points (intersections where 2 objects arrived at trajectories that could have led to collisions) and 5 system alerts with a high possibility that 1 actual accident was prevented.

**V2X and Accident Prevention Market Overview**

Vehicle-to-everything, or V2X, communication is a wireless technology that enables communication between vehicles, to the rest of the road eco-system (vehicles, infrastructure, pedestrians, cyclists, scooter riders, and all road users in general).

V2X technology is expected to enable better traffic management and improve traffic congestion. It is segmented based on the communication medium: vehicle-to-vehicle (V2V), vehicle-to-infrastructure (V2I), vehicle-to-pedestrian (V2P), vehicle-to-grid (V2G), vehicle-to-cloud (V2C), vehicle-to-device (V2D).

V2X is a new and developing market; it is difficult to forecast the market size opportunity. Predominantly, the V2V segment is the largest, comprised of hardware and software that are embedded in the connected car. It is expected that by 2022 there will be nearly 6 million V2X-equipped vehicles worldwide.

**The global burden of road traffic deaths**

The number of road traffic deaths in 2017, globally, totaled 1.35 million.
Vulnerable road users – pedestrians, cyclists and motorcyclists – represent 54% of all global deaths. Pedestrians and cyclists represent 26% of all deaths, while those using motorized two- and three-wheelers comprise another 28%.

According to the US National Safety Council, cell phones are involved in an estimated 27% of all car crashes and the National Highway Traffic Safety Administration published that some 3,450 deaths and over 391,000 serious injuries resulted from distracted driving in the US alone. Cell phone use was reason for 30% of the cases.

Distribution of deaths by road user type, by WHO Region, 2018

**Competitive Landscape**

There are many companies competing in the V2X communication market, including vehicle manufacturers and automotive Tier-1 suppliers, the majority of which are pushing for CV2X (hardware-based) protocols.

As least two other companies are attempting to develop a similar solution to Eye-Net a V2X cellular-based solution that relies on application and cellular infrastructure.

**Waycare Technologies** (https://waycaretech.com) develops an artificial intelligence-based transportation management service that aggregates historical and real-time data from various sources, including vehicle systems, weather monitors, video cameras, and road sensors, to allow first responders to act before accidents develop into traffic jams. Founded in 2016 with offices in Tel Aviv and Los Angeles, the company announced a successful $7.3 million series A funding in early October 2019. The round was led by North Carolina-based SJF Ventures, with participation from Frankfurt-listed Innogy SE, and other investors.

The company has a partnership to share data with Waze and its service is currently available in Nevada, Ohio, and Florida.

**Vizable Zone** (www.vizible.zone) is developing a solution by transforming mobile phones into accident prevention devices. The solution implements several AI layers for car/pedestrian risk probability prediction processes, to maximize data transfer reliability, and to minimize false alarms rates. The company is participating in Our Crowd’s seed-stage incubator.

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6 https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812517
Market Opportunity

A recent report published by Ovum titled “The opportunity for MNOs in driver safety initiatives” views that the “greater opportunity for driver safety services lies with entirely smartphone-based solutions that do not require additional hardware”.

The global smartphone-based driver safety market is expected to grow at a compound annual growth rate (CAGR) of 19% to reach $30 billion by 2022. According to the research, mobile network operators (MNOs) are in a strong market position to capture this opportunity.

Forecasted revenues from smartphone-based driver safety services, by region, 2018–22

[Graph showing revenues from smartphone-based driver safety services by region from 2018 to 2022]

Source: Ovum

Rail Vision

Company

Rail Vision is a privately held Israeli company engaged in the design, development, and manufacture of cognitive vision and safety systems for the railway industry. The Company is developing an automated early warning system (AEWS) based on a thermal imaging camera system and the Company’s proprietary software. The Company’s workforce numbers about 60 and its offices are located in Ra’anana, Israel.

On March 2019, the Company announced a strategic investment from Knorr-Bremse, a global Tier 2 supplier to the rail industry. Knorr-Bremse invested $10 million in Rail Vision in consideration of 21.34% of the Company’s issued and outstanding capital, representing a post investment valuation of approximately $47 million.

Products

Rail Vision’s system is comprised of high-quality video cameras, an infrared thermal imaging camera, on-board monitors, advanced image processing algorithms and short and long-distance object classification technologies.

The system will enhance operational safety, security, and enable predictive maintenance.

The system is designed to detect, classify and alert train operators of real-time rail obstacles, allowing the train operator to make educated decisions in operating the train, including whether to stop to avoid a collision.

Rail Vision’s system monitors the short and long-distance region of interest in front of the train, at an operational range of up to 2,000 meters. The average stopping distance of a train is 800 to 1,200 meters, so long-distance obstacle identification is critical to railway safety.

The Company currently offers two products and one service:

- The main line product is based on a three-step process – scene segmentation, rail detection, and object detection and classification. The system generates real-time critical alerts to the driver and the operator’s command-and-control center.
- The shunting yard / switchyard product combines advanced vision sensors with deep learning technologies. The system automatically detects, classifies objects, and delivers visual warnings to operators or drivers within a 200-meter range.
- Predictive maintenance is an add-on module for real time and offline analysis of rail infrastructure and its surrounding ecosystems.

Status

Rail Vision has conducted more than 15 field trials, testing its technology with leading European railway operators. The Company has gained the experience needed to effectively operate the systems across main lines and switch yards.

Rail Vision participated in Deutsche Bahn’s startup accelerator program, DB-MinDBox in Berlin. Deutsche Bahn is Europe’s largest rail operator. Another operator the Company is working with is SBB Switzerland (Europe’s most prestigious operator, in terms of quality and innovation).

The synergy and strategic importance of the Knorr-Bremse investment is significant as Knorr-Bremse’s strategy is to expand their own technology leadership by the “Introduction of ADAS, HAD, and connected systems”. Knorr-Bremse is a 114 year old German manufacturer of braking systems and other components for rail and commercial vehicles. The company employs 28,500 people across 100 locations worldwide, generating revenues of EUR 6.6 billion in 2018.

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8 Knorr-Bremse 2018 Annual Report, page 35
Market Overview & Key Trends

The Association of the European Rail Industry estimated that the global installed base of locomotives in 2017 was about 114,000 units, with about 32% in Asia Pacific, about 25% in North America and about 18% in Russia-CIS. Wabtec, a leading supplier of critical components, locomotives, services, signaling and logistics systems and services to the global rail industry estimates that about 2,600 new locomotives were delivered worldwide in 2017, and expected deliveries were about 2,700 in 2018⁹.

Locomotives are at risk of collisions and derailment due to obstacles on the track. Trains are confined to the track and do not have the ability to steer around obstacles. They therefore depend on stopping in advance of collision. These accidents typically result in loss of life and revenue. Due to the great momentum of the locomotives, stopping distance required exceeds the operator’s sight distance.

In 2017, 1,855 severe railway accidents were reported in the EU-28. A total of 977 people were killed in these accidents, while another 763 people were seriously injured. 62% of fatalities involved unauthorized people on the tracks and 31% occurred at level crossings¹⁰. The total number of accidents is much higher. For example, during 2018/9 there were 517 accidents in the UK alone¹¹ (and 17 fatalities).

In the past 10 years Japan had an annual average of 8 derailment incidents. In the US, the rail fatalities for 2017 were 761 of which rail transit accounted for 77, freight, passenger, and commuter rail accounted for 684 (512 were trespassing).

In recent years, rail operators have started to explore adding advanced driver assistance safety systems, a shift from a previous perception of infrastructure-based systems (such as on tracks, crossings, etc.). Examples of recent activities and tenders that express this trend:

- In May 2015, the Massachusetts Bay Transportation Authority conducted a Train Protection System “Proof of Concept” for several lines¹².
- European Union’s Shift2Rail program coordinates and manages the Union’s R&I investments in the European rail sector. On Jan 15, 2019 the S2R published a tender for “Advanced obstacle detection and track intrusion system for autonomous freight train” and received 50 applications. It is interesting to note that the 2019 annual plan and budget book of S2R states that “The future of rail freight will be fully automated”¹³.
- Indian Railways is testing TRI-NETRA, an advanced collision avoidance system in development. The system is made up of a high-resolution optical video camera, a high sensitivity infra-red video camera and a radar-based terrain mapping system. The system aims is to assist locomotive drivers in identifying obstructions on tracks, especially in foggy conditions¹⁴.

Competitive Landscape

There are multiple methods, approaches and competitors in the domain of collision avoidance and obstacle detection for trains. Some are focused on infrastructure (such as sensors around level crossings) while others are locomotive-mounted. Only a handful are rail-focused, as most are focused on another industry such as automotive or defense. Key competitors include:

Positive Train Control ("PTC") by Wabtec, a collision-avoidance system that uses GPS to monitor and control the movement of passenger and freight trains. In 2008, the US mandated the use of PTC on a majority of the locomotives and track in the US. The Federal Railroad Administration approved the use of Wabtec’s Electronic Train Management System® as the on-board locomotive standard for the deployment of this technology. The system includes an on-board locomotive computer and related

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⁹ Webtec 2017 Annual Report
¹⁰ https://ec.europa.eu/eurostat/statistics-explained/index.php/Rail Accident Fatalities_in_the_EU
software. The original deadline to implement this technology was December 31, 2018, and was extended. In 2017, Wabtec recorded about $322 million of revenue from freight and transit train control and signaling projects, which include PTC15.

Continental’s ADAS Radar Sensor solution is a modification of their ADAS automotive functionalities for railway applications aiming to address crossings, tracks and other relevant areas16.

Bosch is applying automotive sensor expertise to rail vehicles and developing a forward collision warning system for light rail vehicles that is comprised of radar and video sensors17.

Siemens is also developing ADAS for rail applications as part of their interest to be part of the autonomous train trend. However, they admit that the automotive sector takes priority due to volumes and market size18.

SeeFar - Railway Obstacle Detective & Warning System by IAI Elta, a major Israeli defense and aerospace manufacturer, is an all-weather radar and multispectral optical sensors that identifies hazards on and around the rail tracks such as cars, boulders, humans or animals over 1.0 Km away, as well as automatically recognizing traffic lights and signs19.

Bombardier has the Obstacle Detection Assistance System (ODAS) and Collision and Overspeed Monitoring and Prevention Assistance System (COMPAS). COMPAS is designed to prevent derailing and increase safety for tram drivers and passengers and builds on Bombardier’s ODAS, which was introduced in Germany in 2017. According to publications ODAS has been selected by five light-rail vehicle operators20.

Market Opportunity

Moving slowly towards autonomous trains, the key trends that drive the rail industry are digitization, safety, and efficiency. Key limiting factors are the huge government-funded investments that are required to achieve the objectives.

The rail industry is known to be slow-moving and low-tech but like automotive, aerospace, and other industries it is going through major undoubtable changes in becoming digitized, data driven and finally, autonomous. It is expected that startups and their technologies will dramatically contribute to this process as they are the forerunner of innovation. With over 110,000 locomotives in use and 2,500-3,000 new shipped annually, the market opportunity for collision warning systems is over $5 billion and for predictive maintenance is possibly even larger.

Rail Vision has emerged in perfect timing to offer rail-focused innovative solutions to the industry. With a strategic partner such as Knorr-Bremse it is well positioned to become a category leader and capture a significant market share in this new domain.

The key challenge that Rail Vision is facing has to do with the very long sales cycle and slow adoption rates. Most competitors are very large companies that can endure long term investments. In contrast, Rail Vision is a small company with limited financial and operational capacity. However, once completing an evaluation process, most projects are well funded and significant in size.

Rail Vision is in contact with several operators and following the trials can expect to win tenders for commercial supply in 2021/2022.

15 Wabtec 2017 Annual Report
17 https://www.bosch-engineering.com/de/highlights/kollisionswarnsystem/
19 https://www.iai.co.il/p/seefar
Financial Valuation

Foresight is a technology company engaged, through its fully owned subsidiary Foresight Automotive Ltd, in the design, development and commercialization of stereo/quad-camera vision systems for the automotive industry based on three-dimensional (3D) video analysis, advanced algorithms for image processing, and sensor fusion. The Company develops advanced systems for accident prevention, which are designed to provide real-time information about a vehicle's surroundings while in motion. The systems are designed to improve driving safety by enabling highly accurate and reliable threat detection while ensuring the lowest rates of false alerts.

Foresight targets two vertical markets: advanced driver assistance systems and semiautonomous/autonomous vehicles. It is also engaged, through its wholly owned subsidiary Eye-Net Mobile Ltd, in the design and development of V2X (vehicle-to-everything) cellular-based accident prevention solutions that connect users and infrastructure through smart cellular-based platforms.

Foresight’s current operating expenses consist of three components — research and development expenses, marketing and sales expenses, and general and administrative expenses.

Research and development expenses, net for the six months ended June 30, 2019 amounted to approximately $4,460 (all amounts here and below are in thousands), similar to the six months ended June 30, 2018.

Marketing and sales for the six months ended June 30, 2019 amounted to approximately $1,097, lower than the six months ended June 30, 2018. General and administrative expenses totaled approximately $1,773 for the six months ended June 30, 2019, representing a decrease of approximately $168k, or 8.7%, compared to approximately $1,941 for the six months ended June 30, 2018. The decrease was primarily attributable to a decrease of approximately $114k in expenses related to share-based payments to service providers.

Operating loss for the six months ended June 30, 2019 was approximately $7,330, as compared to an operating loss of approximately $6,743 for the six months ended June 30, 2018, an increase of approximately $587k, or 8.7%.

Net cash used in operating activities of approximately $5,706 during the six months ended June 30, 2019 was primarily used for payment of subcontracted work, salaries and related personnel expenses, payments for professional services and travel, patent, directors’ fees, rent and other miscellaneous expenses. Net cash used in operating activities of approximately $5,120 during the six months ended June 30, 2018 was primarily used for payment of subcontracted work, salaries and related personnel expenses, payments for professional services and travel, patent, directors’ fees, rent and other miscellaneous expenses. As for the six months ended June 30, 2019, the company holds cash and short term deposits of approximately $16,300.
Equity valuation

We start our evaluation with Foresight Automotive which we evaluate with the DCF model as presented below.

We based our revenue forecast for the years 2020 – 2025 on company’s future line of services as presented below:

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<td>Quad sight System</td>
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<tr>
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<td>84,886</td>
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</table>

We assume sales during 2020 with a conservative outlook through to 2025. The Company’s expenses will be linear to its future sales. Based on our model, operating profit will only be seen in 2023. We present our P&L forecast for 2019-2025 below:

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<td></td>
<td>0</td>
<td>1,121</td>
<td>6,576</td>
<td>24,017</td>
<td>84,886</td>
<td>148,290</td>
<td>228,665</td>
</tr>
<tr>
<td>YoY growth</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>265.2%</td>
<td>253.4%</td>
<td>74.7%</td>
<td>54.2%</td>
</tr>
<tr>
<td>Cost of revenues</td>
<td>-</td>
<td>-</td>
<td>710</td>
<td>0</td>
<td>3,098</td>
<td>10,777</td>
<td>45,104</td>
<td>73,368</td>
<td>113,356</td>
</tr>
<tr>
<td>Gross profit</td>
<td>-</td>
<td>-</td>
<td>-710</td>
<td>1,121</td>
<td>3,478</td>
<td>13,240</td>
<td>39,781</td>
<td>74,921</td>
<td>115,309</td>
</tr>
<tr>
<td>% of revenues</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>52.9%</td>
<td>55.1%</td>
<td>46.9%</td>
<td>50.5%</td>
<td>50.4%</td>
</tr>
<tr>
<td>Operating expenses:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Selling and marketing expenses</td>
<td>987</td>
<td>1,015</td>
<td>1,939</td>
<td>3,098</td>
<td>4,782</td>
<td>8,082</td>
<td>12,215</td>
<td>16,435</td>
<td>19,916</td>
</tr>
<tr>
<td>% of revenues</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>73%</td>
<td>34%</td>
<td>14%</td>
<td>11%</td>
<td>9%</td>
</tr>
<tr>
<td>Research and developement expenses</td>
<td>8,638</td>
<td>4,089</td>
<td>10,425</td>
<td>9,407</td>
<td>10,852</td>
<td>13,352</td>
<td>16,824</td>
<td>20,983</td>
<td>25,473</td>
</tr>
<tr>
<td>% of revenues</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>165%</td>
<td>56%</td>
<td>20%</td>
<td>14%</td>
<td>11%</td>
</tr>
<tr>
<td>General and administrative expenses</td>
<td>3,696</td>
<td>3,753</td>
<td>2,378</td>
<td>2,113</td>
<td>3,093</td>
<td>4,149</td>
<td>5,206</td>
<td>7,900</td>
<td>10,264</td>
</tr>
<tr>
<td>% of revenues</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>47%</td>
<td>17%</td>
<td>6%</td>
<td>5%</td>
<td>4%</td>
</tr>
<tr>
<td>Total operating expenses</td>
<td>13,321</td>
<td>8,857</td>
<td>10,957</td>
<td>14,817</td>
<td>19,095</td>
<td>26,085</td>
<td>34,917</td>
<td>46,206</td>
<td>56,744</td>
</tr>
<tr>
<td>% of revenues</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>252%</td>
<td>112%</td>
<td>65%</td>
<td>58%</td>
<td>55%</td>
</tr>
<tr>
<td>Operating (loss) profit</td>
<td>-13,321</td>
<td>-8,857</td>
<td>-11,668</td>
<td>-13,696</td>
<td>-15,617</td>
<td>-12,845</td>
<td>4,864</td>
<td>28,715</td>
<td>58,565</td>
</tr>
<tr>
<td>Tax</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>-13,470</td>
<td></td>
</tr>
<tr>
<td>Operating after tax</td>
<td>-11,668</td>
<td>-13,696</td>
<td>-15,617</td>
<td>-12,845</td>
<td>4,864</td>
<td>28,715</td>
<td>45,095</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Other parameters in our valuation:
• Tax – company has carry forward taxes. We assume statutory tax payment in 2025.
• Discount rate – we assume 17% discount rate (see our CAPM model in appendix B).
• Change in working capital – we assume 15% based on balance sheet forecast.
• CapEx – we assume similar expenses to depreciation during our cash flow model.

As for the six months ended June 30, 2019, the company holds approximately $16,300 in cash and cash equivalents and short term deposits with no loans.

Based on the aforementioned parameters we evaluate Foresight Automotive at **$64.3M**.

We evaluate **Rail Vision** based on a very conservative outlook. On March 2019, the Company announced a strategic investment from Knorr-Bremse, a global Tier 2 supplier to the rail industry. Knorr-Bremse invested $10 million in Rail Vision in consideration of 21.34% of the Company’s issued and outstanding capital, representing a post investment valuation of approximately $47 million. As this is a recent valuation of Rail Vision, we based our valuation on this strategic investment, i.e. $11.3M (47M * 24.12% ownership). We remind that strategic investment is, in most cases, lower than the fair value investment as the investor seeks synergism in its investment.

**Eye-Net** is a cellular-based V2X solution in an early stage of capital raising rounds. The company is currently 100% backed by Foresight Automotive. We explored seed and round A capital investments in 2019 for mobility firms. Typical Round A firm value is $10M – $15M. Thus, we assume the current value for Eye-Net Mobile to be similar at the low end, $10M.

Based on the aforementioned parameters we evaluate Foresight at **$85.6M**.

**Sensitivity Analysis**

The table below presents the company’s equity value in relation to the capitalization rate. Foresight currently has 154.6M outstanding shares. We set a range of 1% change from our CAPM model (see Appendix B).

**Sensitivity Analysis - Capitalization Rate vs. Target Price**

<table>
<thead>
<tr>
<th>Capitalization Rate</th>
<th>Target Price (NIS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.15</td>
<td>2.4</td>
</tr>
<tr>
<td>0.16</td>
<td>2.2</td>
</tr>
<tr>
<td>0.17</td>
<td>1.9</td>
</tr>
<tr>
<td>0.18</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Based on the aforementioned analysis, target price range is 1.7 NIS to 2.2 NIS; average of 1.9 NIS.
Appendices

Appendix A - Capitalization Rate

Cost of equity capital (ke) represents the return required by investors. The capitalization rate is calculated using the CAPM (Capital Asset Pricing Model). It is based on a long-term 10-year T-bond with a market risk premium, and based on Professor Aswath Damodaran’s (NY University) commonly used sample (www.damodaran.com). As of January 2019, the US market risk is estimated at 5.69%. A three-year market regression unleveraged Beta is 1.09, according to a sample of 355 companies representing the US Software (System & Application). We used an unleveraged beta of this sample, which is higher than a leveraged beta, due to high rate of cash versus debt. The implied CAPM is 6.7%.

The CAPM model (ke) is estimated as follows:  

\[ ke = rf + \beta (rm - rf) + P \]

Foresight is a small cap company, under $2b, in which marketability and size premiums need to be considered. Duff and Phelps’ data research in the years 1963-2018 indicates that a 10.24% premium needs to be added to the CAPM for small cap companies. We therefore estimate the company’s CAPM to be 17.0%.

<table>
<thead>
<tr>
<th>CAPM Model</th>
<th>Value</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long-term (20 years) T-bond</td>
<td>R(f)</td>
<td>0.52%</td>
</tr>
<tr>
<td>Market risk premium</td>
<td>R(m)-R(f)</td>
<td>5.69%</td>
</tr>
<tr>
<td>Beta unleveraged</td>
<td>( \beta )</td>
<td>1.09</td>
</tr>
<tr>
<td>Cost of Capital</td>
<td>Ke</td>
<td>6.7%</td>
</tr>
<tr>
<td>Size Premium</td>
<td>10.24%</td>
<td>Duff and Phelps data, 10dz.</td>
</tr>
<tr>
<td>CAPM</td>
<td>CAPM</td>
<td>17.0%</td>
</tr>
</tbody>
</table>

Appendix B – Team Bios

**Dr. Tiran Rothman** is the Lead Analyst at Frost & Sullivan Research & Consulting Ltd., a subsidiary of Frost & Sullivan in Israel. He has over 10 years of experience in research and economic analysis of capital and private markets, obtained through positions at a boutique office for economic valuations, as chief economist at the AMPAL group, and as co-founder and analyst at Bioassociate Biotech Consulting. Dr. Rothman also serves as the Economics & Management School Head at Wizo Academic College (Haifa). He holds a PhD (Economics), MBA (Finance), and was a visiting scholar at Stern Business School, NYU. He is licensed as an Investment Advisor in Israel.

**Nadav Ofir** is a Senior Consultant at Frost & Sullivan in Israel. He has over 12 years’ experience in consulting and providing research and economic analysis for companies in various industries, including in the energy and real estate sectors. Nadav holds a Master’s degree in Entrepreneurship and Innovation (MEI) from Swinburne University of Technology (Australia) and a B.A in International Relations from the Hebrew University of Jerusalem, Israel.

**Arunprasad Nandakumar** is the Autonomous Driving team leader at Frost & Sullivan’s Mobility practice. He has over 5 years’ experience in tracking the ADAS and autonomous ecosystem, writing industry reports and supporting consulting process. He has an instrumental role in developing Frost & Sullivan’s global thought leadership position in this domain. He holds a Masters in Automotive Engineering from the University of Bath, Bath, UK and a Bachelors in Mechanical Engineering from the University of Kerala, India.

**Chen Yakar** is a consulting analyst at Frost & Sullivan Israel. He has deep knowledge of startup financing and mechanics and is a graduate of the Hebrew University as well as the IDC Beyond Program for Entrepreneurship and an IDC Global MBA candidate. He has studied industry leading companies and startups first hand in the US, China, Germany, and Israel.
Appendix C – Financial Statements

Balance Sheet

<table>
<thead>
<tr>
<th></th>
<th>June 30, 2019</th>
<th>December 31, 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Unaudited</td>
<td>Audited</td>
</tr>
<tr>
<td>ASSETS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash and cash equivalents</td>
<td>$4,647</td>
<td>$3,158</td>
</tr>
<tr>
<td>Short term deposits</td>
<td>$12,280</td>
<td>$12,506</td>
</tr>
<tr>
<td>Marketable equity securities</td>
<td>31</td>
<td>23</td>
</tr>
<tr>
<td>Other investments</td>
<td>345</td>
<td></td>
</tr>
<tr>
<td>Other receivables</td>
<td>569</td>
<td>471</td>
</tr>
<tr>
<td><strong>Total current assets</strong></td>
<td><strong>16,867</strong></td>
<td><strong>16,503</strong></td>
</tr>
<tr>
<td>Non-current Assets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Operating lease right of use asset</td>
<td>1,417</td>
<td></td>
</tr>
<tr>
<td>Investment in affiliate company</td>
<td>7,584</td>
<td>7,568</td>
</tr>
<tr>
<td>Fixed assets, net</td>
<td>690</td>
<td>787</td>
</tr>
<tr>
<td><strong>Total Non-current assets</strong></td>
<td><strong>9,700</strong></td>
<td><strong>8,355</strong></td>
</tr>
<tr>
<td><strong>Total assets</strong></td>
<td><strong>26,567</strong></td>
<td><strong>24,858</strong></td>
</tr>
<tr>
<td>LIABILITIES AND SHAREHOLDERS’ EQUITY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Liabilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trade payables</td>
<td>$308</td>
<td>$344</td>
</tr>
<tr>
<td>Operating lease liability</td>
<td>408</td>
<td>-</td>
</tr>
<tr>
<td>Other accounts payable</td>
<td>897</td>
<td>947</td>
</tr>
<tr>
<td>Derivative warrant liability</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total current liabilities</strong></td>
<td><strong>1,655</strong></td>
<td><strong>1,291</strong></td>
</tr>
<tr>
<td>Operating Lease Liability</td>
<td>1,125</td>
<td></td>
</tr>
<tr>
<td><strong>Total liabilities</strong></td>
<td><strong>2,780</strong></td>
<td><strong>1,291</strong></td>
</tr>
<tr>
<td>Shareholders’ Equity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ordinary shares, NIS 0 par value;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Authorized 1,000,000,000 shares;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Issued and outstanding: 153,988,262 and 131,935,194 shares as of June 30, 2019, December 31, 2018 respectively</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Additional paid-in-capital</td>
<td>64,879</td>
<td>57,521</td>
</tr>
<tr>
<td>Accumulated deficit</td>
<td>(61,692)</td>
<td>(33,964)</td>
</tr>
<tr>
<td><strong>Total stockholders’ equity</strong></td>
<td><strong>23,187</strong></td>
<td><strong>23,567</strong></td>
</tr>
<tr>
<td><strong>Total liabilities and stockholders’ equity</strong></td>
<td><strong>26,567</strong></td>
<td><strong>24,858</strong></td>
</tr>
</tbody>
</table>

Profit Loss Statement

<table>
<thead>
<tr>
<th></th>
<th>Six months ended</th>
<th>Three months ended</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>June 30, 2019</td>
<td>June 30, 2018</td>
</tr>
<tr>
<td></td>
<td>Unaudited</td>
<td>Unaudited</td>
</tr>
<tr>
<td></td>
<td>2019</td>
<td>2018</td>
</tr>
<tr>
<td>Operating expenses:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Research and development, net</td>
<td>$(4,460)</td>
<td>$(2,390)</td>
</tr>
<tr>
<td>Marketing and sales</td>
<td>$(1,097)</td>
<td>$(499)</td>
</tr>
<tr>
<td>General and administrative</td>
<td>$1,773</td>
<td>$(865)</td>
</tr>
<tr>
<td><strong>Operating loss</strong></td>
<td>$(7,330)</td>
<td>$(3,754)</td>
</tr>
<tr>
<td>Equity in net gain (loss) of an affiliated company</td>
<td>16</td>
<td>106</td>
</tr>
<tr>
<td>Financing income (expenses), net</td>
<td>176</td>
<td>$(175)</td>
</tr>
<tr>
<td><strong>Net loss</strong></td>
<td>$(7,138)</td>
<td>$(3,823)</td>
</tr>
</tbody>
</table>
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For further inquiries, please contact our lead analyst:

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