

2025 CUSTOMER VALUE LEADER

Maximizing the Price/Performance ROI for Customers

RECOGNIZED FOR BEST PRACTICES IN THE GLOBAL VISION-BASED AUTONOMOUS DRIVING SYSTEMS INDUSTRY

FROST & SULLIVAN

Best Practices Criteria for World-Class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each award category before determining the final award recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. Imagry excels in many of the criteria in the vision-based autonomous driving systems space.



Imagry

Headquartered in San Jose, California, and founded in 2015, Imagry is one of the few companies working toward an autonomous driving (AD) system for passenger vehicles, buses and shuttles using only a vision-based sensor suite. The solution keeps costs low by relying on inexpensive sensors and provides an easier fusion of the data collected from the set of cameras placed around the vehicle. The company's artificial intelligence (AI)-based AD software solution enables self-driving vehicles to understand the road comparable to a skilled human driver, reacting to dynamic contexts, unexpected events, and environments to ensure driving efficacy and safety. The software's easy deployment and reliance on low-cost cameras allows for mass deployment of autonomous passenger vehicles and public transportation applications, making Imagry a leader across the largest sectors seeking AD solutions.

A Commanding Technology Strategy

Traditionally, autonomous vehicle software leverages high-definition (HD) maps, using 5-centimeter level resolution to position and guide vehicles on the road. However, this approach constrains the vehicle's operation to areas that are mapped with high granularity and requires vehicles to have high bandwidth connectivity for map updates, making it an expensive affair and ineffective for widescale use. Recognizing the shortcomings of HD maps, Imagry designed its AD system to be mapless, instead relying on visual cameras and sensors to interpret and react to the surrounding environment. This strategy removes the need for high bandwidth connectivity and eliminates geographical constraints to mapped areas, making the company's software stack more efficient for mass market use.

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Imagry installs three forward-facing, one rear wide angle, and two cameras on each side of the vehicle, providing a complete 360-degree view with overlapping fields and up to 300 meters of view ahead of the vehicle. Cameras are installed with a protection hood, protecting them from adverse weather effects to minimize potential damage. The company's AI-based AD software solution takes visual data from cameras and allows vehicles to understand the road just like a skilled human driver. The software has neural networks tailored to identify and react appropriately to obstacles that vehicles encounter, such as pedestrians, poles, roadwork, lane changes, crosswalks, traffic lights and signs and trees. The software functions in various environments (such as low light or weather events like rain) and identifies and reacts to unknown objects, thereby establishing its safety and effectiveness.

> *"Frost & Sullivan previously recognized Imagry's leadership position in 2023 and continues to believe that its technology showcases the extensive value of vision-based AD solutions. Moreover, the company's unmatched flexibility and agility position it as a premier partner and safeguards its sustained growth."*
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> ***- Thirumalai Narasimhan***
> ***Industry Analyst, Mobility***

Imagry can also integrate additional sensors, such as four-dimensional radar, to support deterministic controller features that function as an additional safety mechanism layer, bolstering its software's safety in areas that experience heavy rain or severe weather. Finally, the company's hardware-agnostic software caters to current-generation vehicles and next-generation software-defined vehicles that can be customized over the air (OTA), allowing for easy updates and future-proofing of its technology. The value of Imagry's mapless solution garners widespread recognition from automotive Tier 1 suppliers, original equipment manufacturers (OEM), and public transportation operators (PTO) making the company a premier partner for AD capabilities.

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Meeting Various Needs of Autonomous Passenger Vehicle and Bus Applications

Imagry's AD software's flexibility enables it to serve two primary sectors: passenger vehicles and autonomous buses. The company works closely with participants throughout the autonomous vehicle value chain to ensure that its solutions meet the needs of its specific applications, including cost constraints and alignment with strict and shifting regulations.

Passenger Vehicles

Imagry works closely with OEMs, integrating its Level 3 (L3) and Level 4 (L4) AD software stack into passenger vehicles. Its mapless AD solution is hardware agnostic and integration-ready, making it easily deployable across vehicle OEMs regardless of the vehicle's platform, model, trim level, chip, or systems used. This strategy also preserves OEMs' ability to leverage the hardware of their choice, making it effective for use in a mass market release. The company's advanced software stack also performs a wide range of L3 actions that support the transition to L4 capabilities. OEMs can choose which capabilities (i.e., safe driver overwatch, traffic jam assist, autonomous parking spot detection, lane-keeping assist, etc.) to

leverage, allowing them to customize the vehicle's functionality to fit with their pricing or model goals. As a result, drivers are more confident and comfortable with AD features.

In addition to preserving options for OEMs, Imagry recognizes the pricing constraints of the mass-market passenger vehicle industry. The company prices the overall system cost between $2,000 and $3,000, ensuring that it can be installed in vehicles without significantly increasing the cost, thus making them affordable and appealing to potential buyers. This price point is also practical for vehicle OEMs, as many charge drivers a monthly subscription to activate AD features, thereby safeguarding overall profitability to vehicle OEMs. Finally, Imagry's mapless software architecture enables driving on either side of the road, making it effective for mass-market vehicle integration for OEMs with global distribution.

Autonomous Buses

Initially, public transportation operators transitioning to autonomous buses chose small vehicles with six or nine seats, which could only drive up to 20 kilometers per hour (km/hr) and were unable to handle inclines more than 16°, and/or used dedicated lanes, limiting their overall effectiveness. The company's AD solution overcomes these issues, allowing operators to leverage large M3-class electric buses and drive on public roads with mixed traffic. Furthermore, its technology's flexibility and reliance on visual data provide operators with multiple ways to design routes and stops to pick up or drop off passengers. AD bus stops can include a logo, which triggers the bus to stop at that location when identified by the camera. Operators can also integrate more passenger-specific stop features, such as an application where riders can choose the stop to be picked up and dropped off at or indicator buttons at bus stops that passengers can press when they need to be picked up. This flexibility allows operators to design routes that best fit their specific rider volume and application needs, making Imagry a beneficial partner regardless of project application or route type.

2023 witnessed a strong market acceptance for pilots of L3 autonomous buses used in operational zones or designated lanes. Imagry helps to expand this acceptance by beginning L3 AD bus projects on public roads in areas around the world, including Germany, Japan, Israel, and Portugal. For example, the company partnered with a public transportation operator in Nahariya, Israel, providing an autonomous bus for an 8 km route of a commercial line service, with 21 total stops along the entire route.

With the growing acceptance of L3 AD buses used to conduct technology and service trials, public transportation operators are looking to transition to L4 autonomy, which allows fully autonomous buses to mix with normal traffic. As a result, many countries are extending their legislation to define regulations supporting the transition to L4 AD. For example, in Europe, L4 regulations include:

- AD buses must be homologated (i.e., achieve specific safety and mechanical requirements under the Whole Vehicle Type Approval system).
- Pass New Car Assessment Program (NCAP) testing with a score of 100. NCAP performs on a testing location for the Ministry of Transportation, tests autonomous buses driving 30 to 60 km/hr on 90 scenarios (including on-road and occluded pedestrians, interacting with surrounding vehicles driving, and other road conditions).

- Connect to a control room, providing monitoring inside and outside the bus, enable voice communication with the passengers, and help support minimal risk maneuvers for any unexpected issues or problems.
- Align with the cybersecurity framework (UNR155) to ensure buses cannot be remotely controlled or hacked.
- Drive autonomously at least 100,000 km on the designated route with a safety driver in the vehicle before a bus can operate without a driver.

To date, Imagry is the only autonomous bus provider to pass NCAP testing and align with the extended L4 regulations, showcasing its leadership position and commitment to meet AD needs preemptively. As a result, the company expects to have AD buses in normal traffic patterns in Israel, Japan, and a few European countries by the end of 2025.

Global Brand Recognition Supporting Long-term Growth

With its unique value proposition, Imagry experiences continuous growth, expanding to two main offices (San Jose, California and Israel) and around 130 employees. The company also holds six patents, with four additional patents pending. Imagry has multiple project wins, including a 10-year contract with Continental (the world's third largest Tier-1 supplier) and a full-stack AD software integration with leading Japanese and European OEMs. Furthermore, because of its successful AD bus projects, the company experienced high response from operators globally, including Austria, Germany, France, Japan, and Portugal. Notably, Imagry was recently selected by Transdev, the world's largest public transportation operator, to provide it with autonomous buses, with plans to expand across Transdev's 21 markets.

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Imagry's unmatched global brand recognition and technology leadership make it a premier partner for PTOs and OEMs alike. Moreover, its reputation allows the company to collaborate to help countries define their AD regulations, particularly regarding AD buses. Imagry works closely with multiple regulators, including the German Kraftfahrt-Bundesamt, Dutch Netherlands Vehicle Authority, and French Transport Regulatory Authority, helping them to define their AD regulations. These close relationships also give the company unique insights into evolving regulations, enabling it to align its technology with new requirements before they take effect and ensuring relevance and future-proofing its global expansion.

Frost & Sullivan remains impressed with the company's market strategy and believes that Imagry will remain a leader in vision-based AD solutions.

Conclusion

Imagry sets itself apart from the competition with its mapless autonomous driving (AD) solution based on vehicle camera data in real-time instead of high-definition (HD) maps, removing the geographic and cost constraints of HD maps. Furthermore, the solution's deep neural networks empowered by artificial intelligence enable it to identify objects (such as road signs, traffic lights, pedestrians, and other vehicles) and react effectively, facilitating a seamless driving experience that mirrors a human driver's reactions to preserve driving safety and accuracy.

The company's AD software stack is highly flexible and agile, making it practical for mass-market passenger vehicle applications and autonomous bus scenarios. Furthermore, Imagry is the only company to align with all European regulations for level 4 (L4) autonomous buses, including passing New Car Assessment Program testing with a score of 100, supporting the transition from Level 3 to L4 autonomous driving capabilities and future-proofing its leadership position as L4 adoption spreads globally. As a result, the company has experienced vast success, including partnering with both Japanese and European OEMs to integrate AD capabilities into standard models and partnering with Transdev to begin integrating autonomous buses into its transportation services.

With its strong overall performance, Imagry earns Frost & Sullivan's 2025 Global Customer Value Leadership Award in the vision-based AD systems industry.

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What You Need to Know about the Customer Value Leadership Recognition

Frost & Sullivan's Customer Value Leadership Award recognizes the company that offers products or services customers find superior for the overall price, performance, and quality.

Best Practices Award Analysis

For the Customer Value Leadership Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

Business Impact

Financial Performance: Strong overall financial performance is achieved in terms of revenues, revenue growth, operating margin, and other key financial metrics

Customer Acquisition: Customer-facing processes support efficient and consistent new customer acquisition while enhancing customer retention

Operational Efficiency: Company staff performs assigned tasks productively, quickly, and to a high-quality standard

Growth Potential: Growth is fostered by a strong customer focus that strengthens the brand and reinforces customer loyalty

Human Capital: Commitment to quality and to customers characterize the company culture, which in turn enhances employee morale and retention

Customer Impact

Price/Performance Value: Products or services provide the best value for the price compared to similar market offerings

Customer Purchase Experience: Quality of the purchase experience assures customers that they are buying the optimal solution for addressing their unique needs and constraints

Customer Ownership Experience: Customers proudly own the company's product or service and have a positive experience throughout the life of the product or service

Customer Service Experience: Customer service is accessible, fast, stress-free, and high quality

Brand Equity: Customers perceive the brand positively and exhibit high brand loyalty

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The Growth Pipeline Engine™

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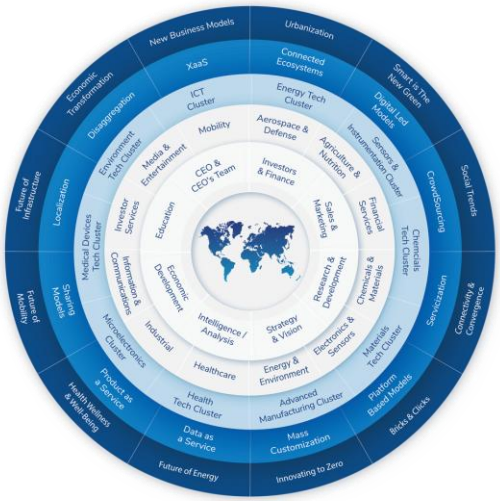
Key Impacts:

- **Growth Pipeline:** *Continuous Flow of Growth Opportunities*
- **Growth Strategies:** *Proven Best Practices*
- **Innovation Culture:** *Optimized Customer Experience*
- **ROI & Margin:** *Implementation Excellence*
- **Transformational Growth:** *Industry Leadership*

The Innovation Generator™

Our 6 analytical perspectives are crucial in capturing the broadest range of innovative growth opportunities, most of which occur at the points of these perspectives.



Analytical Perspectives:

- Mega Trend (MT)
- Business Model (BM)
- Technology (TE)
- Industries (IN)
- Customer (CU)
- Geographies (GE)