



SOR Next Generation Robotic Security Vehicle

Western Australia - February 18th 2021 - Strategic Elements Ltd (ASX:SOR) is pleased to report that development of a 'Sensor Fusion' stack has commenced for integration into a new generation of autonomous robotic security vehicles. Sensor fusion makes autonomous systems more intuitive and more responsive to their environment – more human-like in the way they can perceive their surroundings. The Sensor Fusion stack is designed to equip the ASV with more advanced sensory capabilities than human security guards, significantly enhancing the patrol and surveillance functionality of the Company's Autonomous Security Vehicle (ASV).

The Sensor Fusion stack is also a key enabler in the technology roadmap towards the ASV achieving advanced Artificial Intelligence capabilities. Further information on focus and timing can be found at the back of this announcement.

The ASV is being designed to automate perimeter security. The Global Perimeter Security Market is forecast to be growing quickly at CAGR of 12.0% over the forecast period 2020-2026 (reaching USD 282.26 Billion by 2025)¹.

ASV Sensor Fusion Stack

The ASV Fusion Stack will include additional sensors such as LiDAR, radar, GPS, sonar, thermal imaging and different types of cameras, with each sensor adding different strengths to the fusion data generated. Sensor fusion is an important upgrade to the design of autonomous systems and requires a complex assortment of sensors and the real-time software to enable local processing of raw sensor data.

Sensor fusion combines data from multiple sensors in real time to create an accurate picture of the local environment. The ASV can use this to enable higher level tasks to understand, plan, and interact autonomously with its environment - for example not just to detect humans, but to interpret why they may be there and what they are doing. It can enable environmental information to drive robot behaviour.

Fusion is the ultimate form of sensor integration, combining multiple sensor technologies in a single application. This makes new applications possible by facilitating 'more difficult detections' not possible with any single sensor. Each sensor has individual strengths that when combined can eliminate the weaknesses of the others.

For example, when it is dark, LiDAR, Radar and thermal imaging can 'see' whilst cameras and humans cannot. In addition the ASV will be able 'see' around corners, view from an elevated position, focus with much longer range and apply greater attention to detail than human security guards.

Integration with Collaborative Work

Planck AeroSystems

The Sensor Fusion stack will also include integration with ongoing collaborative² work with Planck AeroSystems enabling Autonomous Drones to launch and land autonomous surveillance flights from a moving ASV platform. Planck is a global leader working with the United States Department of Defense's Combating Terrorism Technical Support Office (CTTSO), the United States Department of Defense and Department of Homeland Security on various aspects of its technology.

CSIRO Wildcat SLAM

In addition the CSIRO Wildcat SLAM technology will also be integrated with the Sensor Fusion stack. The Company has licensed world leading CSIRO technology that enables robots to work together in teams³. The Wildcat SLAM technology leverages more than ten years of research and development at CSIRO's Data61. Wildcat is a key enabling technology in 'robot perception', a system that endows the robot with the ability to perceive, comprehend and reason about the surrounding environment.

Autonomous Perimeter Security Testing

The Company is also exclusively collaborating with giant US Company Honeywell to build autonomous security vehicles for the **correctional justice sector**⁴. Honeywell is a Fortune 100 technology company with a market value of approx. USD 100 billion that operates total asset and facility management operations globally.

The parties are currently working with the WA Department of Justice⁵ to build a fully autonomous robotic security vehicle for the Eastern Goldfields Regional Prison in Kalgoorlie to inspect, **test and confirm the integrity of the secure perimeter**.

The Company has developed custom robotics built on top of its autonomous mobile platform to provide **automated perimeter security testing** 365 days a year, 24 hours a day including at night. This enables automated testing of multiple technologies including microphonics, microwave, buried electromagnetic cable and photoelectric beams. The ASV is being deployed to increase the security of the perimeter and reduce the amount of human involvement in testing and patrols, freeing those staff up for more skilled tasks.

As development progresses certain ASV Fusion Stack features will be assessed for applicability in the correctional justice sector. However, under the agreement with Honeywell, the Company can independently market the ASV into other sectors such as transport, energy, defence, government and utilities. These sectors will be the initial focus for the new generation of the ASV with Fusion Stack.

Focus and Timing

- The collaboration with Honeywell and the working relationship with the WA Department of Justice **remains the priority focus** for the Company. An ASV is currently under live testing at the Eastern Goldfields Regional Prison in Kalgoorlie which is **on track to be completed in Q1 of 2021**. Further facilities and deployments of the perimeter testing focused vehicle will be assessed upon successful completion of the testing program.
- The Company has commenced discussions with potential Early Adopter Program participants for the ASV in non-correctional sectors such as mining and transport. The Company is seeking to work closely with early adopters to deeply understand their use case, solve their problems and continuously upgrade and improve the ASV. Discussions are ongoing and no agreement has been entered into to date.
- Sensor placement and development, integration with the Stealth Autonomous Operating System and real-time software to enable local processing of raw sensor data will be developed over the next 2-3 months. Live trials of the new generation ASV with Sensor Fusion is expected to commence in **the first half of 2021**.
- **Further upgrades** to the ASV technology stack are being assessed and if a decision is made to commit to the integration of the technology the Company will communicate this as appropriate.

Company Comment

Managing Director Charles Murphy said “We have undertaken a significant amount of work to plan and design the next generation of the ASV. In our view, the Sensor Fusion stack is just the start of showing how we can add advanced intelligence into our mobile robotics platform”.

“We are generating significant momentum across our technology projects, including the Electronic Battery and Memory Inks and look forward to communicating these developments as they occur. We can see how we can develop, test and validate the technologies to potentially attract significant interest from industry participants. Our technologies are by design highly innovative and seek large global markets and as a Company we are highly leveraged to technology development success”.

Strategic Elements Background

Investors in SOR potentially **pay no tax on capital gains from selling their SOR shares** as the Company operates under a Federal Government program setup to encourage investment into innovation. Strategic Elements operates as a ‘venture builder’ where it generates high risk-high reward ventures and projects from combining teams of leading scientists or innovators in the technology or resources sectors. More information Charles Murphy, Managing Director Phone: +61 8 9278 2788 admin@strategicelements.com.au www.strategicelements.com.au

This announcement was authorised for release by Strategic Elements’ Board of Directors.

¹<https://dataintel.com/report/perimeter-security-market/>
²announced 04/11/20

³announced 12/11/20
⁴announced 16/10/20

⁵announced 19/06/20