

## **TRANSPORT TECHNOLOGY SECTOR**

**Organisation:** The SMART Infrastructure Facility

**Date Received:** 28 May 2021

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The Chair  
Committee on Transport and Infrastructure  
Parliament House,  
Macquarie Street  
Sydney NSW 2000.

Via [transportinfrastructure@parliament.nsw.gov.au](mailto:transportinfrastructure@parliament.nsw.gov.au)

Dear Committee Chair

The SMART Infrastructure Facility welcomes the opportunity to contribute to the inquiry and thanks the members of the Legislative Committee for their invitation.

This contribution focuses on **Improving safety for traveller using AI**.

Surveillance cameras are the most common sensors in the world: It estimated that there will be more than 1 billion cameras installed worldwide by the end of 2021 (<https://www.wsj.com/articles/a-billion-surveillance-cameras-forecast-to-be-watching-within-two-years-11575565402>). In NSW, Sydney Trains operate more than 10,000 to monitor its infrastructure and the anti-social behaviour happening on its network.

Nonetheless, the footage captured by this extensive network is typically only used for manually investigating incidents, after the fact. Unfortunately, according to a recent survey (<https://www.plan.org.au/~media/plan/documents/resources/a-right-to-the-night.pdf>), the majority of users, and in particular women, do not feel compelled to report the incidents, violence and abuse they experience in the city during the night, as much of it is a routine occurrence. This leads to an incomplete picture of the public transport network safety and anti-social behaviours.

There is thus a need to automate the analysis of this video footage, either offline or in real-time, to better understand the current safety situation. A real-time alert system supporting the surveillance task of CCTV operators and security officer has the potential to significantly speed up the response time to incidents, while offline analysis can help identify the incident hot spots.

There is indeed a lot of research currently underway by the scientific community on processing images and video to recognize activities. But this theoretical research produces AI's and methods that are only validated on a set to benchmark datasets in

a controlled environment. Taking these works from the lab to the real world represents a huge challenge, which has yet to be solved, and requires strong collaboration between transport agencies and universities.

For instance, the work currently being conducted at the SMART Infrastructure Facility, at the University of Wollongong, in partnership with TfNSW and Sydney Trains, is investigating how the latest development in artificial intelligence can address those challenges, while preserving the privacy of the users of the public transports networks.

The outcome, which is world first, is an AI-based solution alerting a human operator that an incident might be happening in a given location, can only be achieved when the researchers can access real-world data (including video footage, which might be sensitive) held by the public transport operators.

Initiatives like The Transport Digital Accelerator (TfNSW), The Safety After Dark Innovation Challenge facilitates the collaboration between NSW public transport operators, start-ups and researchers. It aims to rapidly test and trial new ideas with privileged access to data which is crucial to helping transfer the academic knowledge into solutions that can impact positively on our community and place NSW as a technological leader in the smart mobility space.

More information on the UOW Safety After Dark Solution can be obtained by contacting the SMART Infrastructure Facility or Chief Investigator Dr Johan Barthelemy on [johan@uow.edu.au](mailto:johan@uow.edu.au).

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