A Risk Framework for Real-time Adaptive Safety and Control in Temporary Traffic Management.

The shift toward risk-based safety in transport is gaining momentum. But what kind of technology can truly support this, especially in Temporary Traffic Management (TTM), where disruption, complexity, and competing demands intersect, and risk evolves by the minute?

This submission presents a systems-based framework for adaptive safety and control in TTM environments. Grounded in transport engineering and workplace safety principles, it supports dynamic monitoring and real-time optimisation—not just through data collection, but by:

- Simulating rapidly changing conditions that affect risk,
- Recommending best-fit changes without exceeding the agreed risk profile, and
- Creating intelligent feedback loops to sustain both safety and network flow.

Unlike traditional models, safety here is not the product of a single role, rule, or tool—but an emergent outcome of a system's ability to perceive, respond, and adapt. The framework redefines risk and control as dynamic, socio-technical constructs shaped by multiple actors and perspectives.

Using sensors, camera technology, AI, and machine vision, we capture driver and worker interactions with the TTM layout. Combined with real-time simulation and predictive modelling, the system can assess and optimise layouts while maintaining the approved risk profile. Proposed changes are instantly communicated to stakeholders in a customised, easy-to-understand format—ensuring confidence that risk remains controlled.