



# PROJECT THEIA - SMART CAMERA

Theia provides traffic data that is accurate, current, and meaningful to enable informed decision-making for design and delivery teams. The smart camera (Figure 1) is configured to categorise traffic type, vehicle speed, vehicle count, and lane distribution. It also provides high resolution images and enables real-time site monitoring.



Figure 1: Project Theia camera

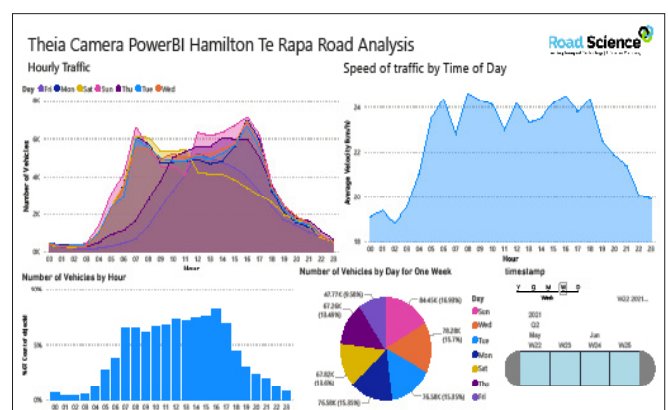


Figure 2: Live monitoring analysis

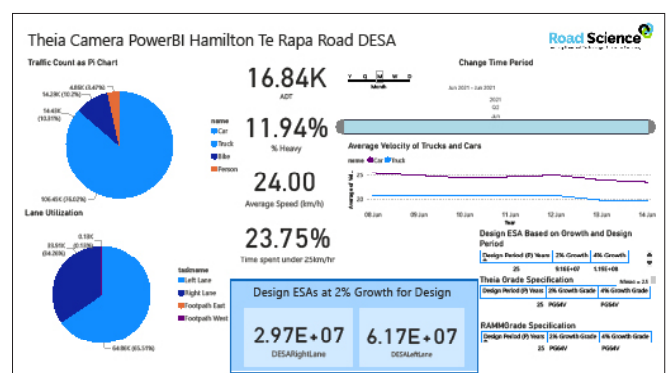


Figure 3: Pavement design analysis



## The challenge:

Frequently, pavement design teams and asset engineers use out of date, inaccurate, and incomplete traffic data to enable best for network management strategies. For example, 42 of the 127 sites (33%) in Auckland programmed for renewals in the 2019/2020 financial year had no traffic data available and the average date of available data was from October 2013.

## The solution:

Road Science undertook a six-month trial of the smart camera on Te Rapa Road in Hamilton to monitor traffic usage (including cyclists and pedestrians). The trial provided valuable data and insights on multimodal traffic demand. For example, the traffic count was 53% higher than what was expected, with an average of 19,950 VPD. The camera is solar powered, with minimal site set up required (power socket and 6 m pole in the berm).

**Theia vs RAMM Grade Specifications for 1050 Te Rapa Road**

**Theia Grade Specification**

Design Period (Years)	0% Growth Grade	1% Growth Grade	2% Growth Grade	3% Growth Grade	4% Growth Grade	5% Growth Grade	6% Growth Grade	8% Growth Grade	10% Growth Grade
5	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH
10	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH
15	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH
20	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH
25	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH
30	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH
35	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH
40	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH

**RAMM Grade Specification**

Design Period (Years)	0% Growth Grade	1% Growth Grade	2% Growth Grade	3% Growth Grade	4% Growth Grade	5% Growth Grade	6% Growth Grade	8% Growth Grade	10% Growth Grade
5	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH
10	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH
15	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH
20	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH
25	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH
30	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH
35	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH
40	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH	FGH

Figure 4: Theia vs RAMM analysis for grade specification



## Images







## Use case: Lane usage by vehicle type

Set up and install camera for 1 week to gather data, input into model, and then report on likely impact of works on congestion or future planning.

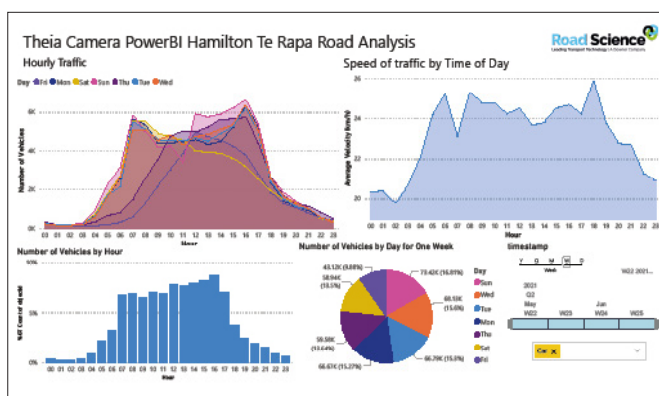


Figure 5: Lane usage analysis

## The results:

Set up and install camera for one week to gather data, input into model, and then report exact traffic volumes, ESAs, lane utilisation, and traffic speed for design purposes.

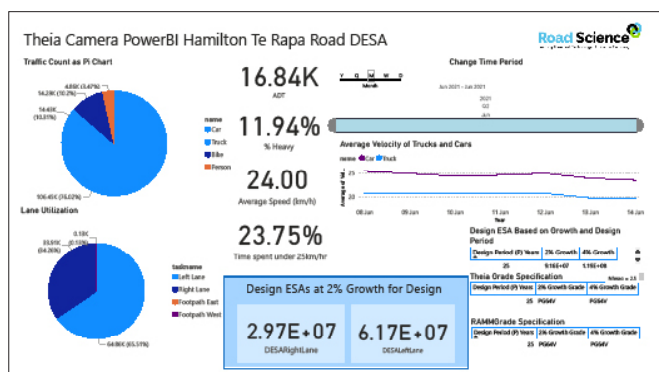


Figure 6: Pavement design analysis

## Key benefits

- A data rich solution for evidence based decision-making (e.g. traffic management effects, detour routes, best time to avoid cyclists, etc.).
- Multiple use cases, depending on client needs, including capital works and pinch point areas on maintenance works
- Maximises use of internal supply chain (third party traffic modelling technology is expensive and relatively poor)
- Cost effective installation, with minimal resource required
- Provides insights on multimodal traffic demand to inform design decisions, traffic management planning, and method development