Mobile Traffic Management

SCATS Interface - Hamilton NZ

SMUG – Feb 2026

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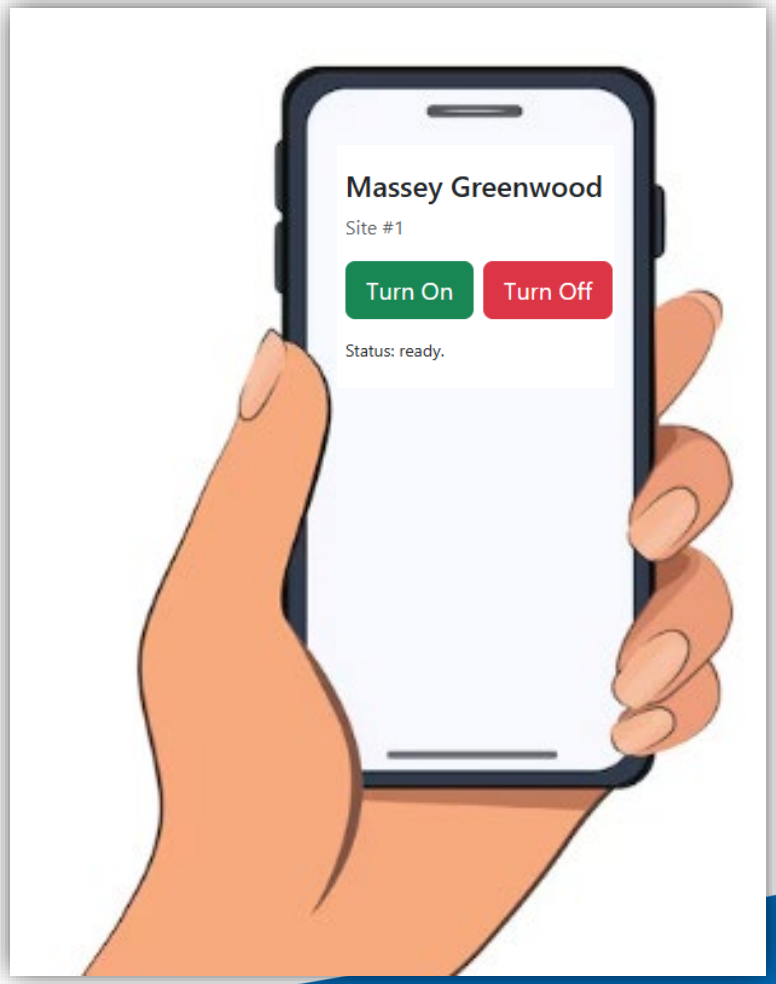
Simple SCATS Interface – where it started

- **STMS text link for lamps on/off**
  - We wanted to allow contractors to easily turn OFF/ON the lamps themselves during road works
  - Considered safer since they can decide the best time
  - We send contractors a simple unique weblink
  - It works by a virtual site raising MSS bits to SCATS
    - They get live status on their smartphone
    - We can control when it's permitted to run
    - We also get a text alert every time it's used
  - We now use it frequently:
    - 27 text links provided in the last 6 months.
    - Traffic Management crews use it for road reseals, manhole inspections, emergency works, etc.



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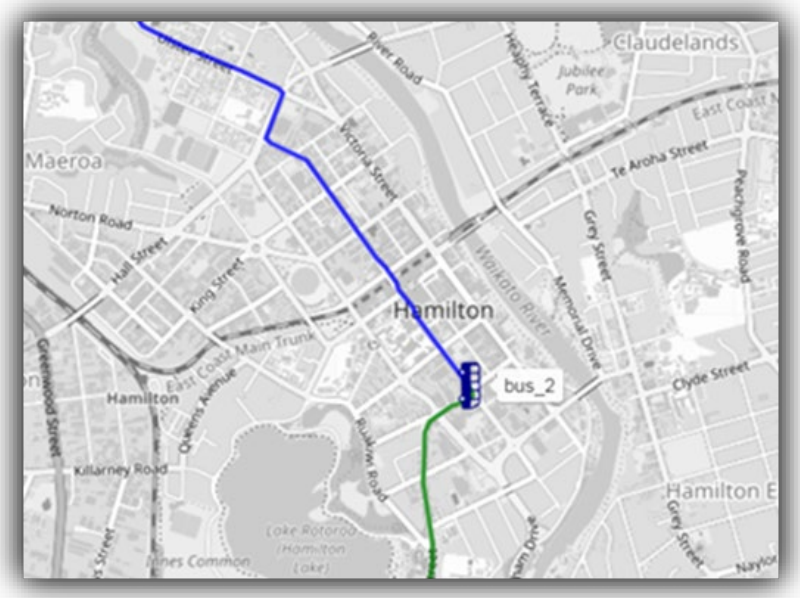
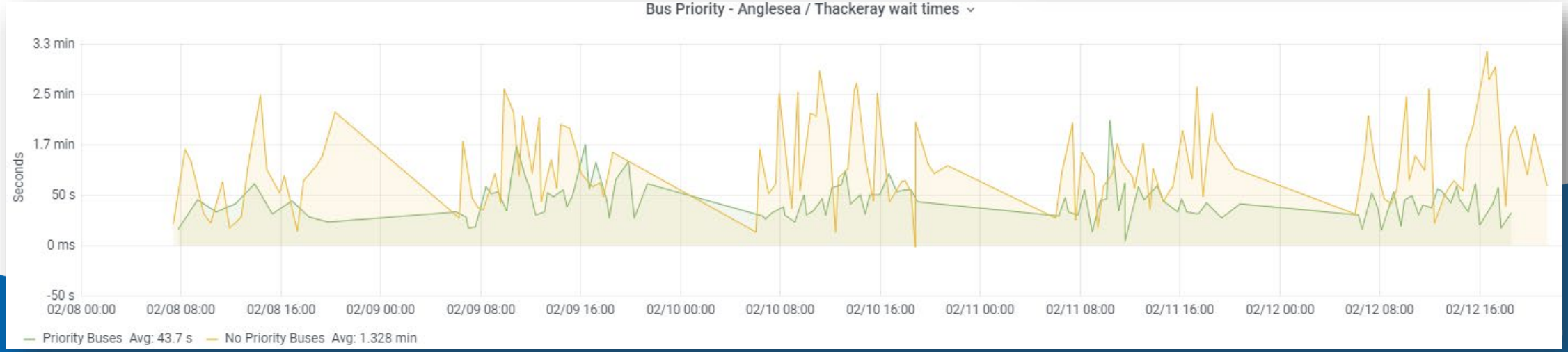
Simple SCATS Interface – Bus Priority

- **Bus Priority**
  - Uses the bus GPS and virtual detection zones and simple rules
  - Activates a dwell via our custom SCATS interface (no skip other phases)
  - Holds Right Turn phase until bus crosses limit line
  - Halves the delay for buses being given priority
  - Very simplistic compared to SPE, and it is only considered appropriate for non-coordinated sites, where bus frequency >5min





Simple SCATS Interface – Fire Truck Priority

- **Fire Truck Priority**
  - Push button in fire station for green wave
  - Button uses 4G to our SCATS interface
  - Live feedback via green LED on the button (SCATS acknowledges with an XSF bit)
  - GPS priority being added (similar to bus priority)

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Simple SCATS Interface – Influencing a Split Plan

Proof of Concept

- Could travel time (via “Addinsight”) be used to influence traffic signal timing?
- Chosen intersection has characteristics that limit SCATS effectiveness:
  - > 1km queues, unbalanced and don’t match road hierarchy
  - River bridge constricts flow and SCATS data (DS) is not representative
  - Non-adaptive in peaks - timings are fixed (SCATS adaptive struggles due to the bridge)

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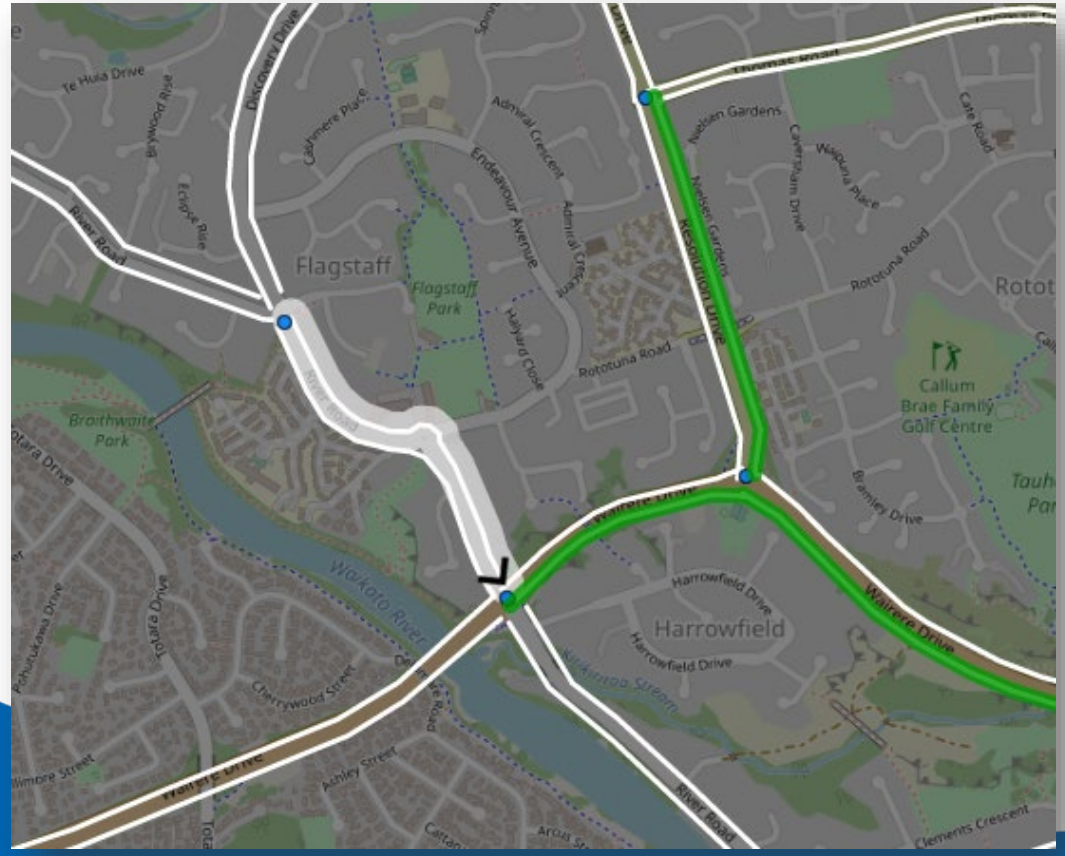
Simple SCATS Interface – Influencing a Split Plan

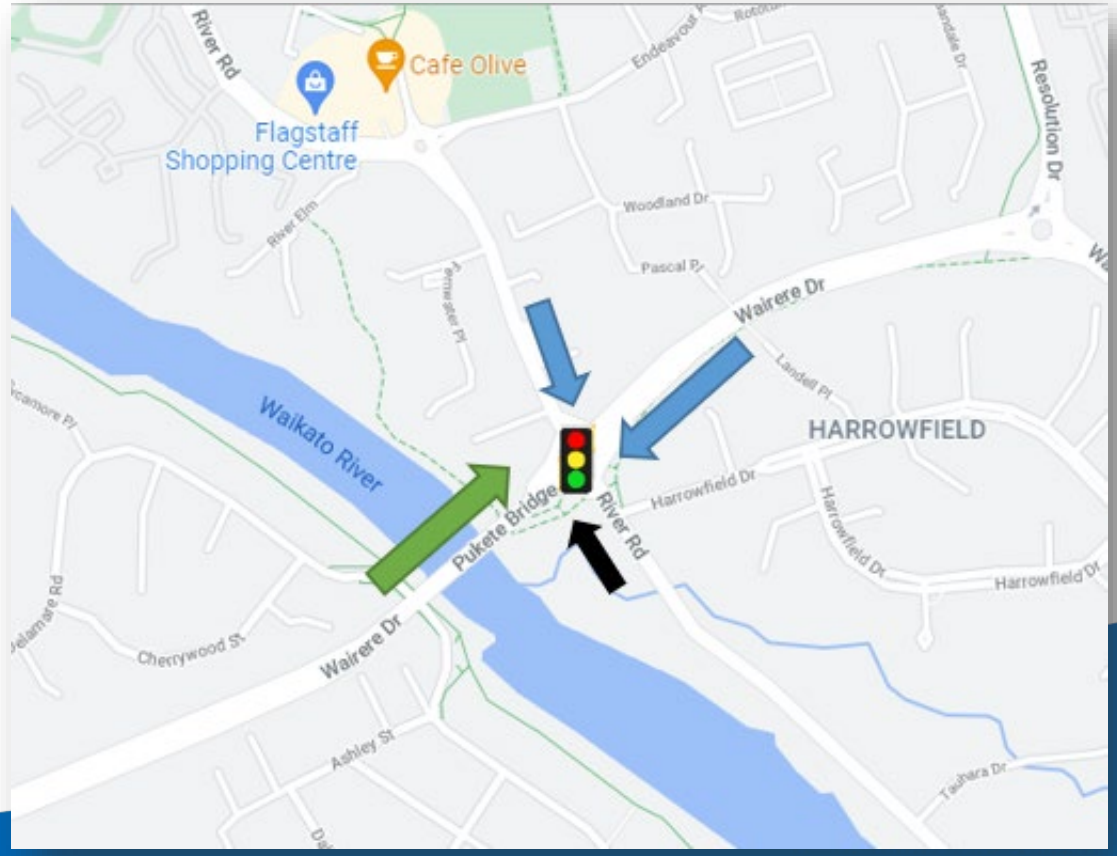
Objectives: Morning peak

- Balance delay between:
  - White arrow link
  - Total of green links

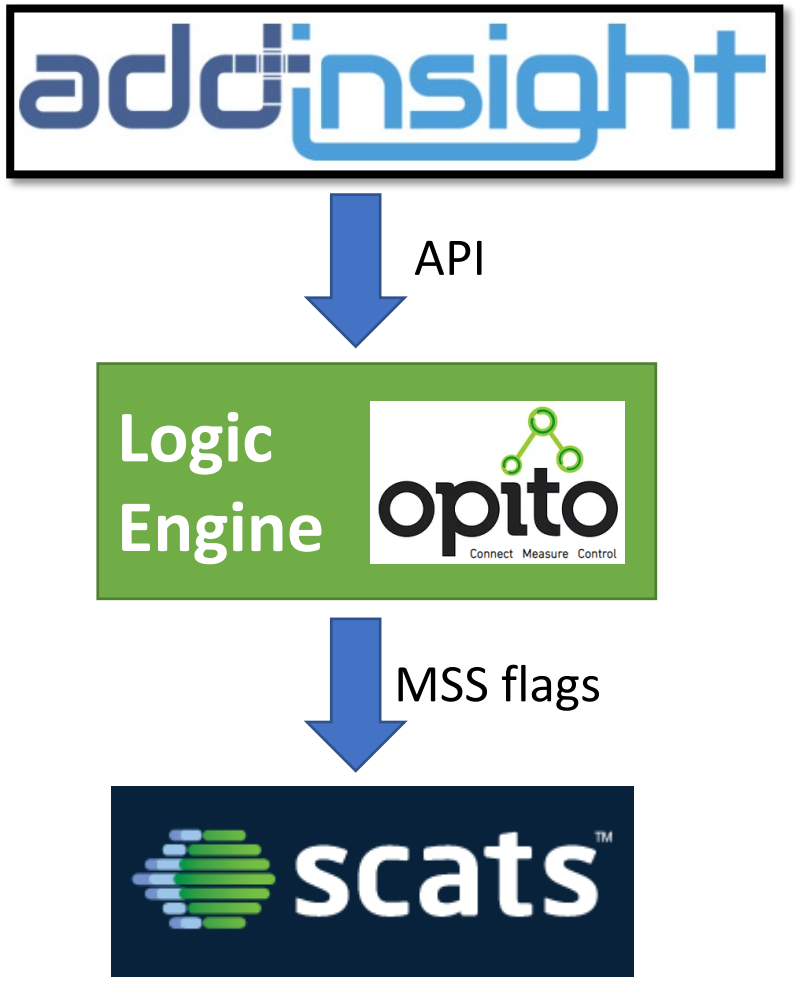


Objectives: Evening peak

- Maximise throughput in Green direction
- Use delay rather than time of day, to lock SCATS timings



Simple SCATS Interface – Influencing a Split Plan



- Normal SCATS control occurs during off-peak (low delay)
- When the delays exceed a threshold, we then "take over" the choice of split plan timings
- A custom logic engine processes the delays from Addinsight (Bluetooth travel time) and chooses the best SCATS timing plan
- SCATS sees which of the 8 flags are raised and locks the respective plan (from 8 split plans)

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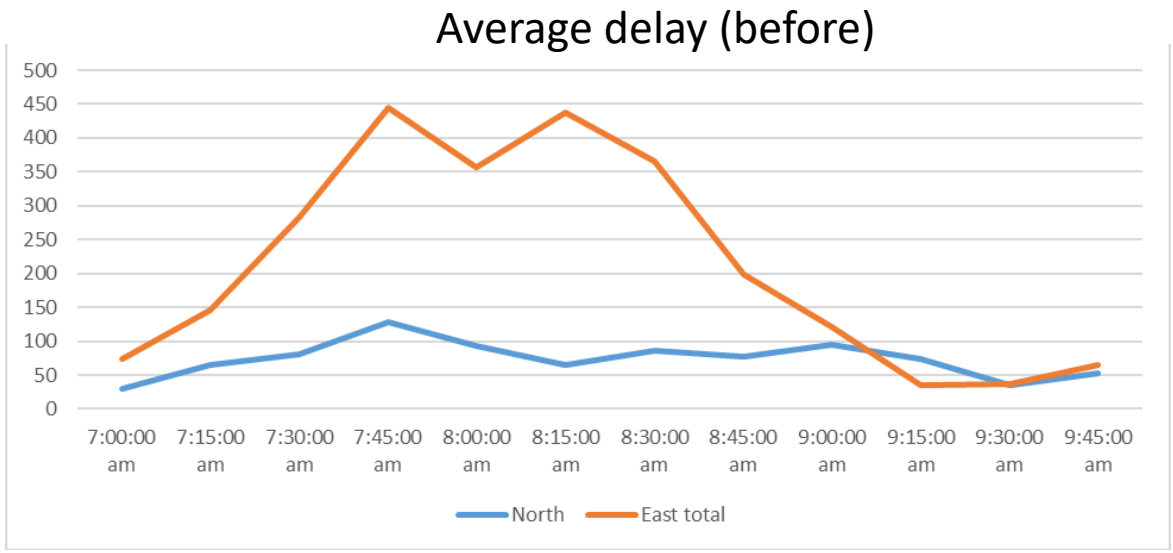
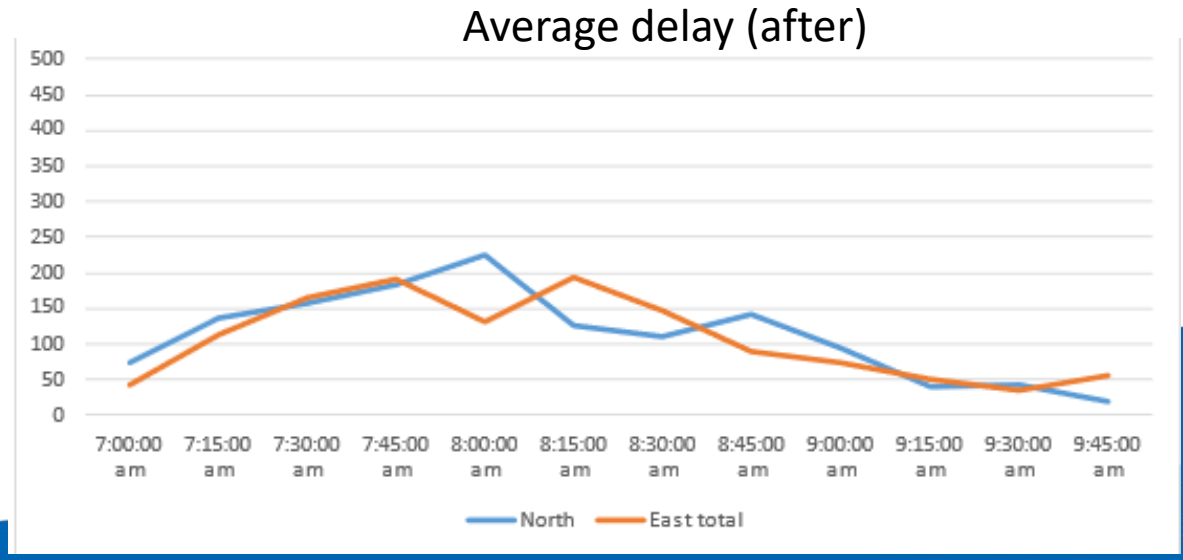
Simple SCATS Interface – Influencing a Split Plan

Results: Morning peak

- Under SCATS scheduled time locks, long queues would sometimes vary between legs (inconsistent)
- Under Addinsight control, the travel times are better balanced and road hierarchy can be better maintained
- For comparison, with Addinsight control the morning peak had:
  - +1% traffic volume
  - -8% total travel time
  - -14% total delay (56 hrs saved)

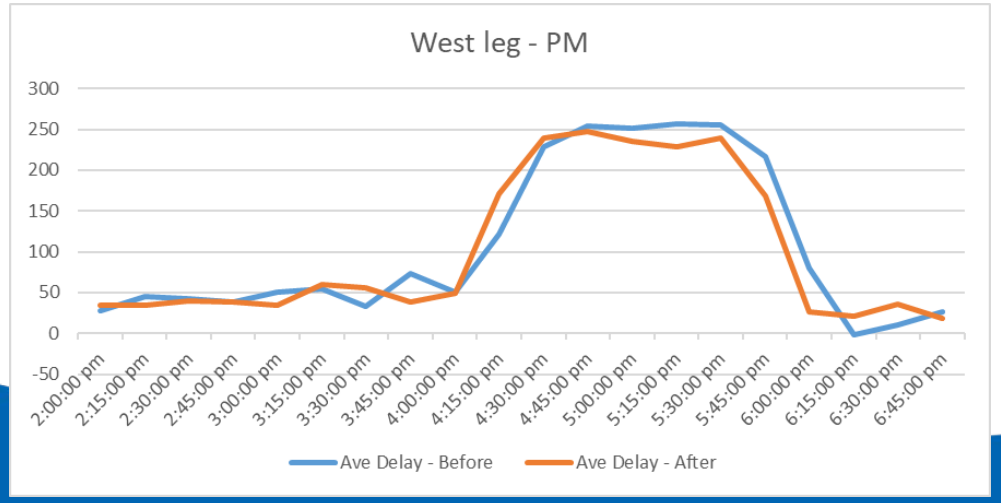


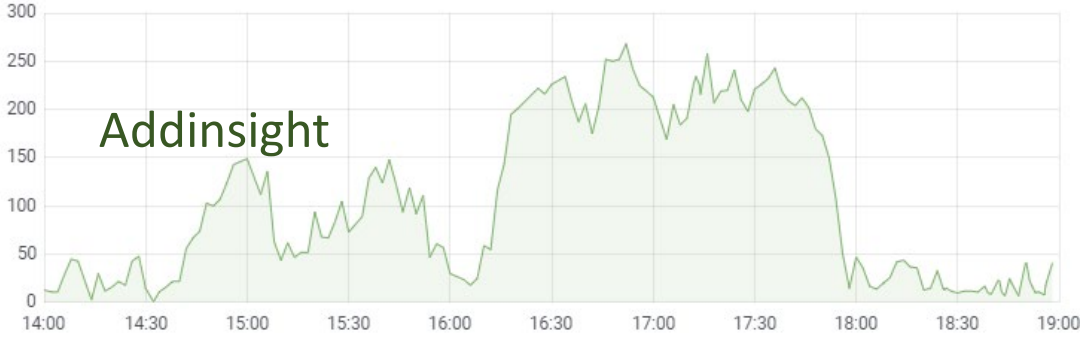


Simple SCATS Interface – Influencing a Split Plan

Results: Evening peak

- Due to the bridge, fixed time control has always been used (by time of day)
- Addinsight control initially caused large fluctuations (overshoot), this was improved by adding trend logic to react quicker and reduce overcorrection
- Overall delay no worse than before, but now it's semi-adaptive





Simple SCATS Interface – Influencing a Split Plan

Trial Conclusions

- Using virtual inputs such as Travel Time appears to have potential to offer:
  - An additional input for adaptive traffic signal control that considers the whole approach or route
  - Ability to influence traffic signal timings by using travel time rather than stop line detectors
  - Improved journey time reliability (particularly relevant for PT routes)
  - Easier implementation of road hierarchies
- In oversaturated scenarios it can take a while (e.g. 10+ mins) before SCATS changes are reflected in Addinsight (due to queue lengths and the nature of measurement)

Further work

- Methods to improve prediction and reduce “hunting” should be explored, such as the use of reinforcement learning or a predictive model
- Ideally the Addinsight output should feed directly into SCATS as a “virtual” DS or similar

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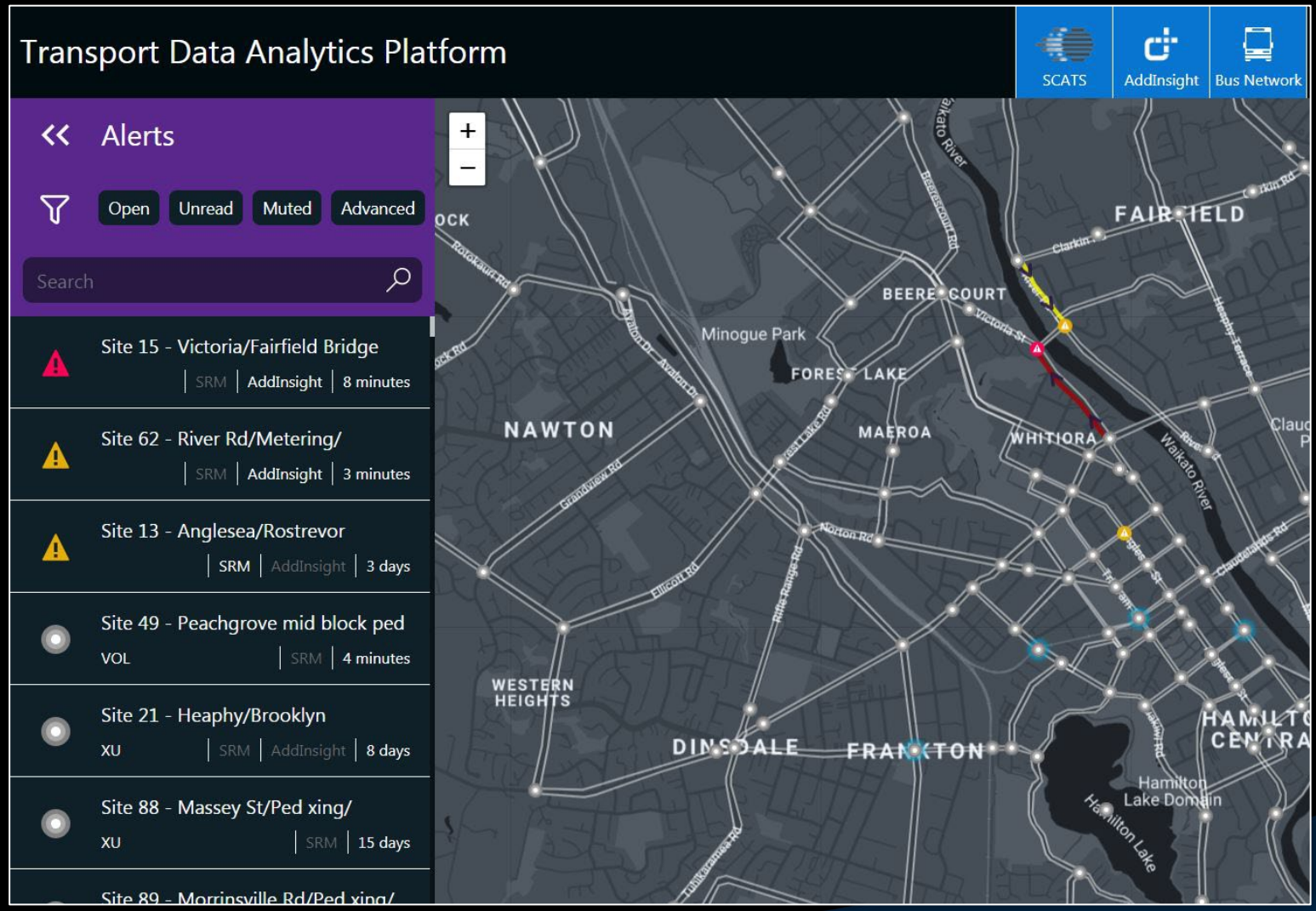
Simple SCATS Interface – TDAP

Alert system for incidents

Features:

- Combines many live data sources
- Removes the need to monitoring multiple windows
- Looks across the data sources for issues at the same location
- Remote monitor via mobile phone
- Automatic text alerts after hours
- Significant cost saving over video wall
- *Winner: 2022 Smart City Asia-Pacific award (transport category)*



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Questions?

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