scats™

Sydney Coordinated Adaptive Traffic System (SCATS)

For today's and tomorrow's challenges, move smarter with SCATS

NSW GOVERNMENT

Cities around the globe face growing challenges in the management of their transportation networks. These challenges require a modern traffic management platform that optimises road network capacity.

SCATS products allow cities to be aware and proactive in response to changing network conditions and events, balancing different road users' mobility needs, and supporting cities to achieve desired smart city outcomes of liveability, sustainability, and reliability.

SCATS Core

SCATS Core product is an intelligent real-time traffic management platform for monitoring, controlling, and optimising the movement of people and goods in cities. Core enable cities to:

- dynamically manage their road network in all conditions to keep traffic flowing
- prioritise and optimise different road user movements
- improve road user journey times
- achieve sustainability goals by lowering emissions and reducing energy consumption

Save Time

With more green lights and less stops

Save Money

Through increased productivity and reduced traffic management costs

Save Lives

With technology that makes roads safer

Trusted expertise

Established in the early 1970s by the New South Wales Government in Australia, SCATS has a long history of using research and data to deliver efficient and reliable traffic management.

SCATS is considered the best proven adaptive traffic solution and the most widely used intelligent traffic management platform globally. SCATS is adopted in over **200 cities**, across **30 countries**, and installed in more than **60,000 intersections** across the globe.

SCATS keeps traffic in these cities moving **24 hours a day, 7 days a week**.

Representation of SCATS global footprint

How does it work?

SCATS Core uses a range of strategies to manage the dynamic timing of traffic signals to improve traffic flow and reduce congestion. Core collects real-time data from detectors as a measure of current traffic conditions and uses this to determine the optimum combination of cycle length, phase splits, and offsets, for each site (intersection) across a city's road network.

Core is deployed in a hub-and-spoke model and consists of four key components:

Central Manager is the central hub and connects to one or more SCATS Regions. SCATS Central Manager provides a system-wide view, particularly for complex cities consisting of multiple regions that require:

- extensive functionality to monitor traffic conditions
- comprehensive fault reporting
- automated data collection for performance improvement

Region manages and controls traffic signals by communicating with the SCATS software (TRAFF) installed in the traffic signal controllers. SCATS Region provides:

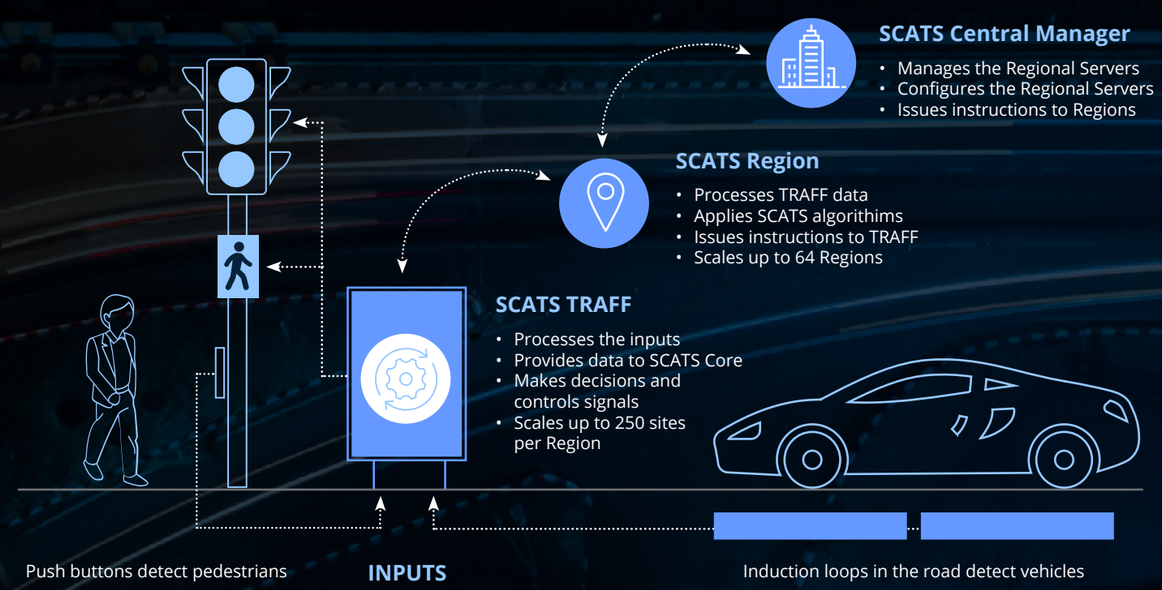
- traffic signal coordination for traffic signal sites as specified
- extensive real-time monitoring of traffic signals
- an audit trail of all user data changes, plan changes, and manual intervention

Access is the user interface that provides configuration, monitoring, and when necessary, manual intervention. SCATS Access provides:

- extensive configuration of SCATS Region traffic control
- real-time monitoring of traffic signals
- planned and unplanned incident management
- ability to activate green light corridors

TRAFF is a SCATS software installed in the traffic signal controller. TRAFF uses detectors in each lane, or other locations at each site to detect vehicles and measure traffic conditions. TRAFF supports numerous vehicle detector technologies that provide the necessary measurement, including inductive loop, video, and radar detectors. TRAFF in conjunction with the traffic signal controller provides:

- control of the traffic signal displays
- collection of real-time detector information
- detection and reporting of alarms and events



Traffic signal coordination

SCATS Core operates in real-time, adjusting signal timings in response to detected changes in traffic demands. For vehicular traffic, Core measures traffic volume and non-occupancy data from detectors and uses this to determine the optimum combination of cycle length, phase splits, and offsets. For pedestrian traffic, SCATS receives requests for specific pedestrian movements, usually via a push button.

SCATS Core utilises the three fundamental concepts of traffic signal coordination:

Cycle length

Cycle length is the length of time to complete a cycle of all phases. All sites in a coordinated area must have a common cycle length to provide coordination within that area, which may be a route or a network.

Phase split

Phase split is a set of vehicle and pedestrian movements at traffic signals that can operate simultaneously without conflict. Movements are controlled by groups of traffic signal lanterns known as signal groups.

Offset

Offset is the time difference between a defined point in the cycle of one site to a defined point of another site, where those sites are coordinated. The offset can therefore provide green light progression from one site to an adjacent site, and this can be start-to-start or end-to-end. However, other forms of offset strategies can be specified as long as the coordinated sites share a common cycle length (or sub-multiple).

SCATS Core architecture

SCATS Core is scalable and flexible and can be used to manage individual sites, major road corridors, small road networks, large road networks, and entire cities.

External systems

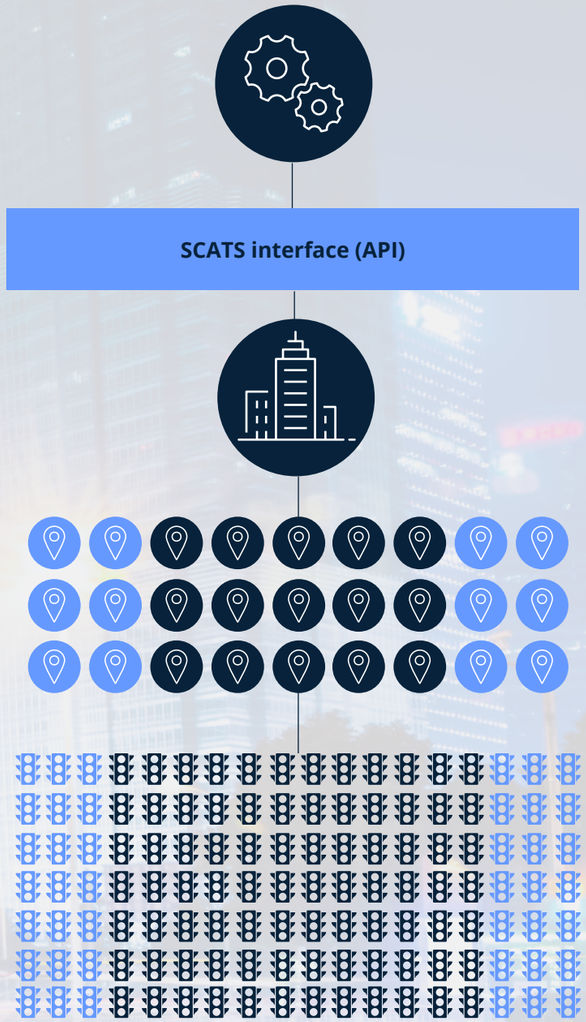
Central Manager

SCATS Regions

Allows for up to **64** Regions per Central Manager

Traffic signal controllers

Allows for up to **250** traffic signals per Region



The benefits of SCATS Core

Lower emissions

SCATS Core improves traffic performance through smoother traffic flow which helps reduce the harmful vehicle and greenhouse emissions. It can help cities improve air quality with:

- **6% reduction** in carbon dioxide (CO_2)
- **5% reduction** in nitric oxide (NO)
- **10% reduction** in particulate matter 10 micrometres and smaller (PM_{10})

Reliability and improved traffic performance

SCATS Core along with its supporting applications can provide an average of:

- **28% reduction** in travel time
- **25% reduction** in stops
- **12% reduction** in fuel consumption
- **15% reduction** in emissions

More efficient journeys

SCATS Core uses intelligent algorithms and real-time data to make intelligent decisions on changing traffic conditions, such as providing priority to emergency service vehicles. It can be configured for different modes of operation at different times of day or year, such as:

- peak periods
- holidays such as public and school holidays
- major events, such as patrons leaving a sports stadium

Continuous adaptive control

As SCATS Core operates in real-time, it can adjust traffic signal timings to suit prevailing traffic conditions and measure utilisation at each site. Core adjusts the cycle length, phase splits, and offsets each cycle to maximise efficiency by responding in real-time to traffic demand and traffic conditions measured by detectors.

Low operational and maintenance costs

Once a site is configured, SCATS Core can manage sites without further manual intervention. Each site is self-calibrating and does not require periodic traffic surveys or timing plan updates.

Modular and flexible system dimensions

SCATS Core can support up to **100 connections** for the exchange of data with third-party ITS applications. It also allows for:

- up to **200** user accounts
- ability for a user to monitor the system without the need for a privileged user account
- centralised monitoring of up to **100 simultaneous users**
- one user can monitor up to **10 sites simultaneously**, either in the same region or different regions

scats™
Move Smarter

www.scats.nsw.gov.au

For more information, contact **scatshelp@transport.nsw.gov.au**

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