

Traffic Signal Management

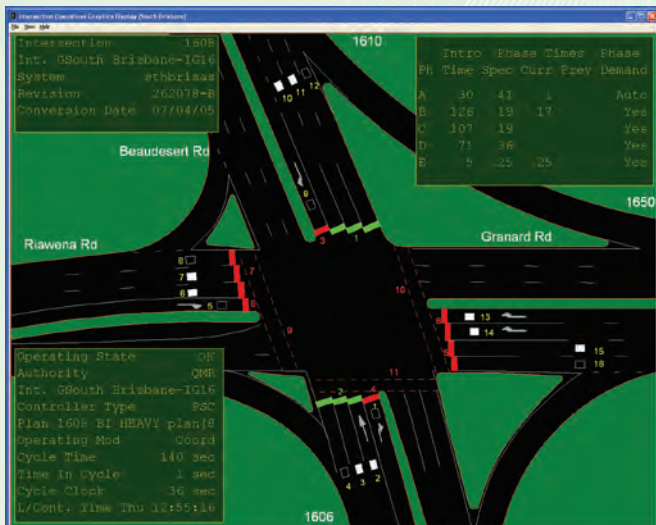
STREAMS optimises the management of traffic signals by ensuring the routes, intersection groups, intersections and movements within the surface street network operate in synergy. It is an adaptive system that automatically responds to changes in traffic conditions.

The system is designed to support existing traffic signal infrastructure at minimal cost. STREAMS can replace many older systems without any changes to the existing data communications and field equipment hardware.

BENEFITS

The use of traffic signal management systems has been shown to offer a number of benefits to motorists, road authorities and the community at large. Benefits that result from installing the STREAMS traffic signal management system include the following:

- » Improved coordination
- » Coordination over longer distances
- » Reduced travel times
- » Reduced stops, delays and queuing
- » Improved level of service at intersections
- » Increased fuel efficiency
- » Reduced exhaust emissions



Real-Time Intersection Display

FEATURES

Control Hierarchy

STREAMS manages traffic signal networks by organising the entities controlled into the following hierarchy:

- » Routes
- » Intersection Groups
- » Intersections
- » Movements

STREAMS is fully adaptive as it applies the process control principle of measure, evaluate and adjust to each level of the hierarchy, from the top down. The control parameters are adjusted continuously in real time to optimise coordination and minimise delay.

Coordination Policy

Traffic engineers nominate the coordination policy required for each route to influence the length of the coordination segments. The policy options available for each route are:

- » Maximise coordination. This policy setting will produce long coordination route segments.
- » Minimize side street delays. This policy setting will result in shorter coordination route segments with shorter side street delays at some intersections.
- » Balanced coordination. This policy setting produces an optimal balance between the above two policies.

Intersection Groups are formed adaptively to support the current coordination route segments. The intersection group cycle times are adjusted continuously to ensure they are optimised to minimise delays.

Vehicle and pedestrian movement demands are calculated in real time and movement green times and intersection cycle times are adjusted continuously to ensure the efficient allocation of capacity for the current demands.

Performance Measurement

STREAMS continuously measures system performance to optimise current operations and provide historical reports. The following measurements are made continuously for all traffic movements:

- » Stops
- » Delays
- » Queue length
- » Throughput
- » Degree of saturation

Priority and Pre-Emption

Priority can be provided for public transport vehicles behind schedule. Pre-emption is available for VIP and emergency vehicles when required.

Modern Communications Networks

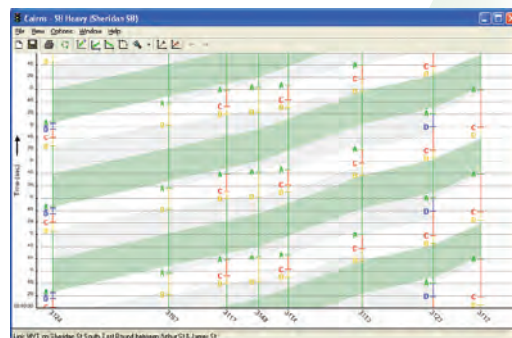
In addition to supporting traditional networks, STREAMS can also use modern communications networks including xDSL, fibre and wireless technologies. These links can be shared with other ITS equipment such as CCTV without impact on intersection operations.

REPORTING

A full range of reports is provided for operators and engineers. Both real-time and historical reports can be generated for individual intersections, intersection groups and routes. These include:

- » A real-time intersection operations display with a comprehensive list of operational information including cycle and phase data, as well as signal group and detector states.
- » Full historical intersection operations reports with a 1-second resolution for all hardware and software state changes.
- » Intersection operations analysis tools, including full analysis of cycle lengths, phase lengths and sequences, and pedestrian demand profiles and wait times.

- » A map-based display showing the location of traffic signals and colour-coded links indicating traffic conditions.
- » Space-time diagram that can be used to develop coordination plans with wizards to auto-generate appropriate settings. It may also be used to display historical performance data.



Space-Time Diagram

- » Route performance measurement reports showing various performance measures in tabular or graphical form.
- » 2-D and 3-D bar graphs displaying the value of selected traffic variables at detector sites.



Coordination Performance and Simulation