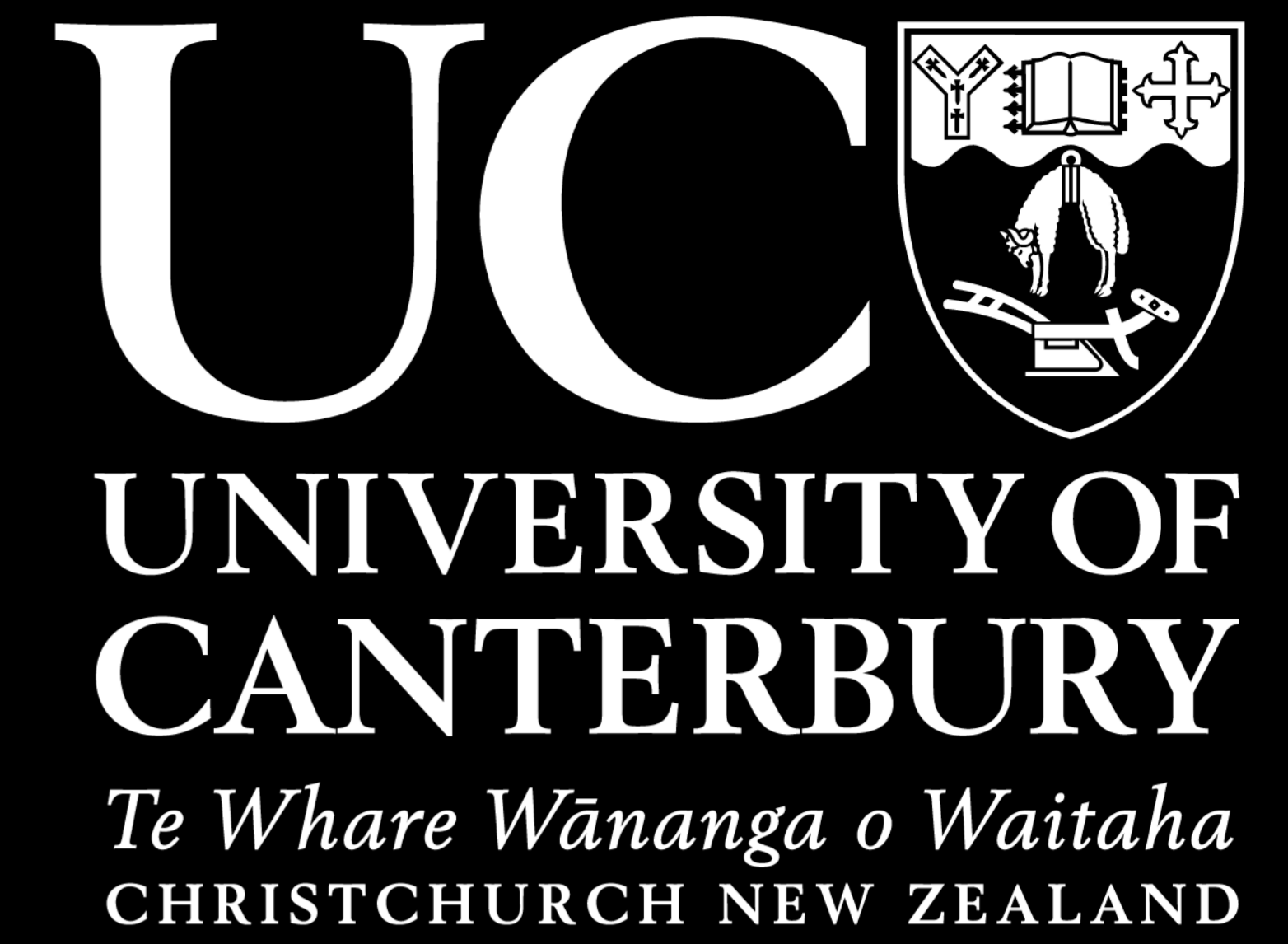


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Techniques for Using SCATS As an Incident Management Tool

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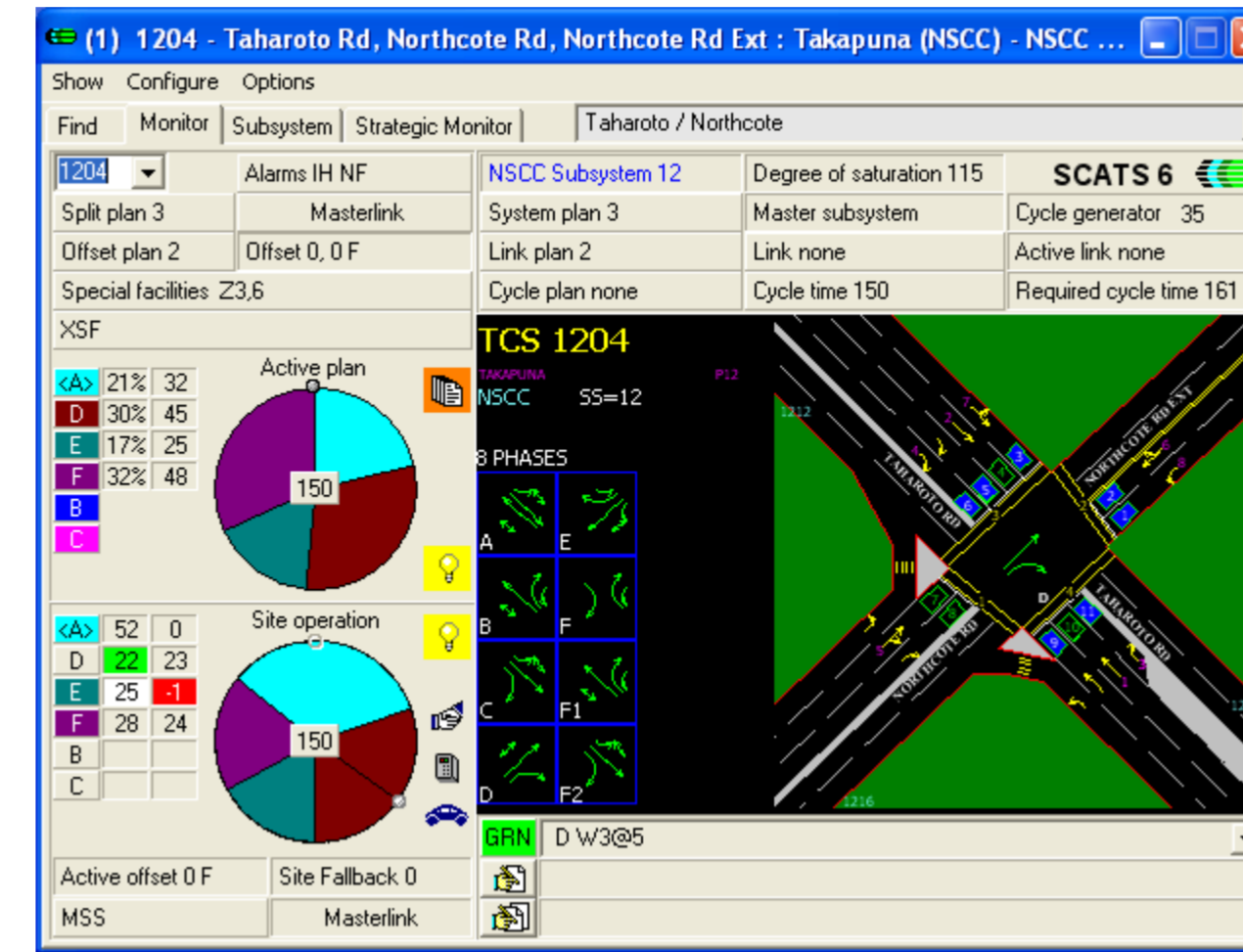
Summary

SCATS (Sydney Co-ordinated Adaptive Traffic System) can be used to manage the sudden change in traffic demand resulting from incidents on the transport network. SCATS is an adaptive traffic signal control system that uses real time traffic information (vehicle detectors) to adjust phase splits, cycle times and offsets to optimise a signalised traffic network, resulting in reduced delays to motorists. SCATS can also be used to detect and respond to traffic incidents.

Congestion

There are two types of congestion:

Recurring Congestion	Occurs on an average day, generally due to peak period traffic demand
Non-recurring Congestion	Unusual or unexpected congestion due to incidents, weather, road works, events, etc.



SCATS Access Interface

- Split plans – determine phase times, phase sequence and special features such as gapping off
- Cycle plans – determine cycle length, maximum and minimum cycle times
- Link plans – determine offsets used for coordination with adjacent intersections



Stop Line Vehicle Detectors

Stop line vehicle detectors measure:
flow and occupancy
to calculate:
SCATS degree of saturation (DS)

Incident Management

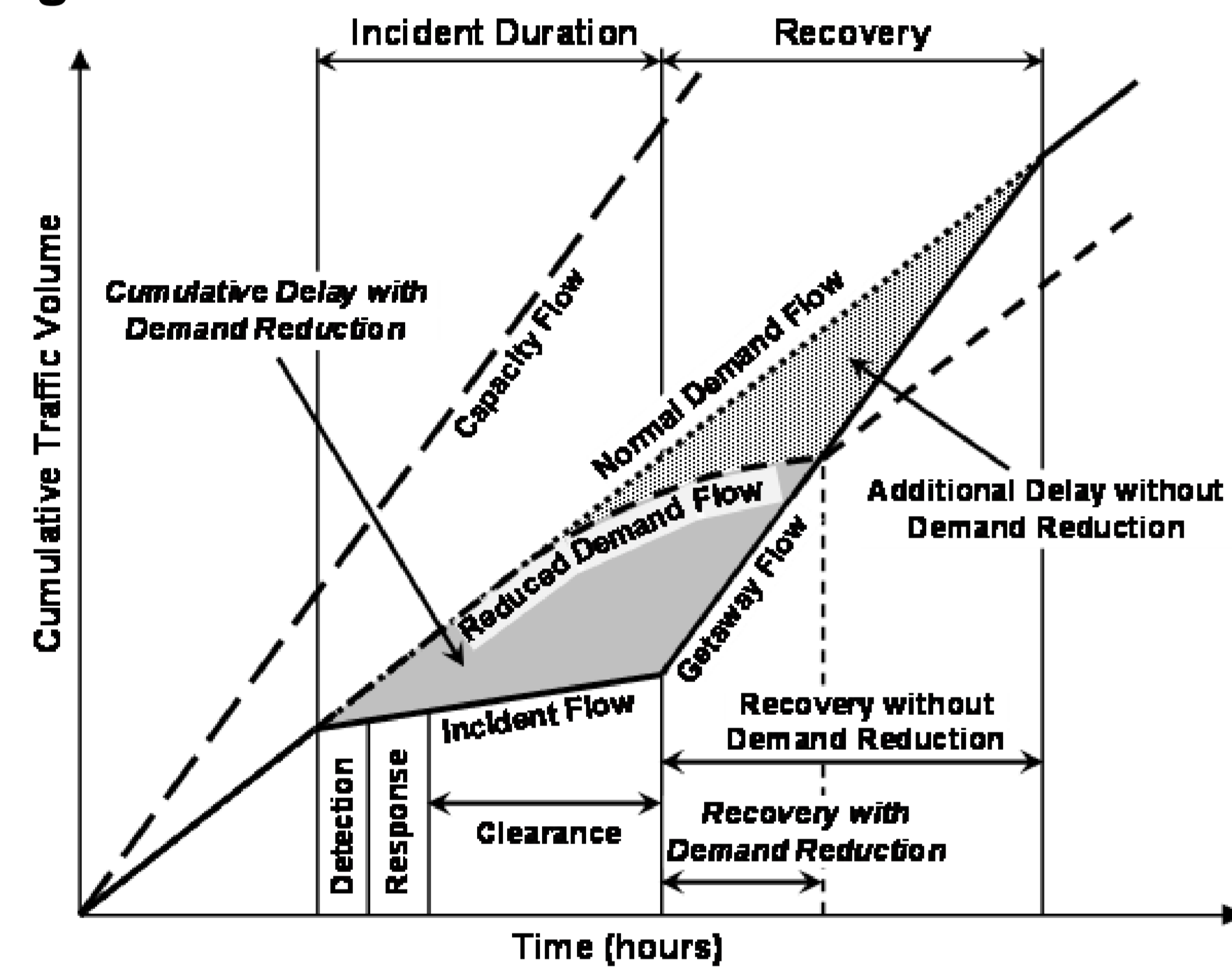


Illustration of traffic delay during incident and recovery

It is estimated that over 50% of total motorist delay in urban areas can be attributed to crashes and breakdowns.

Factors affecting impact of incidents include:

- Time to detect incident
- Time to respond to incident
- Duration of incident
- Severity of incident
- Spare capacity in network
- Secondary incidents



How SCATS Works

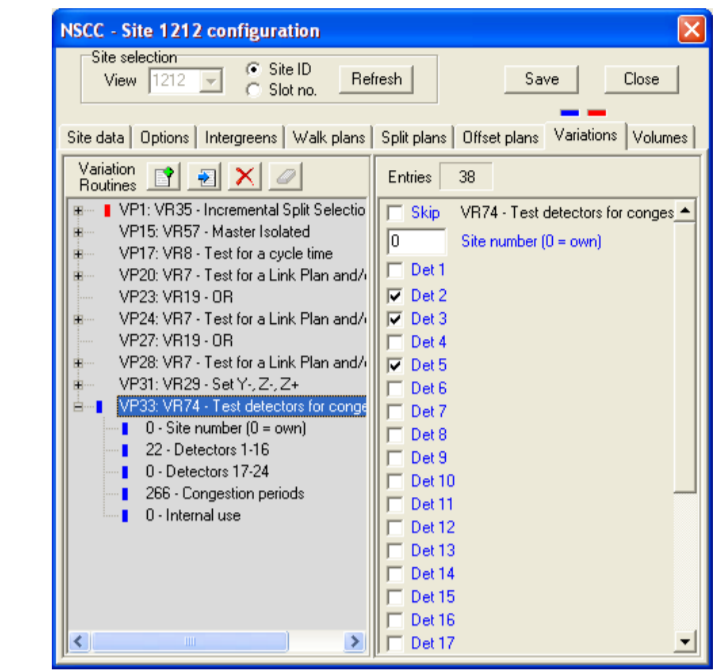


SCATS is a real time adaptive traffic signal control system that uses stop line vehicle detectors to detect changes in traffic demand and adapts the signals accordingly.

Variation Routines

SCATS has many built in variation routines that can be used to modify the signal operation at an intersection if certain conditions are met.

- Test detectors for congestion
- Test strategic approach for congestion



Action Lists

Action lists are another feature of SCATS that can be used to make specific changes to an intersection operation. For example, changes can be made to the cycle time, split plan or intersections can be linked. Action lists can be implemented by time of day through the SCATS Scheduler, or can be called through variation routines. A series of actions could be created to provide priority for a diversion route.

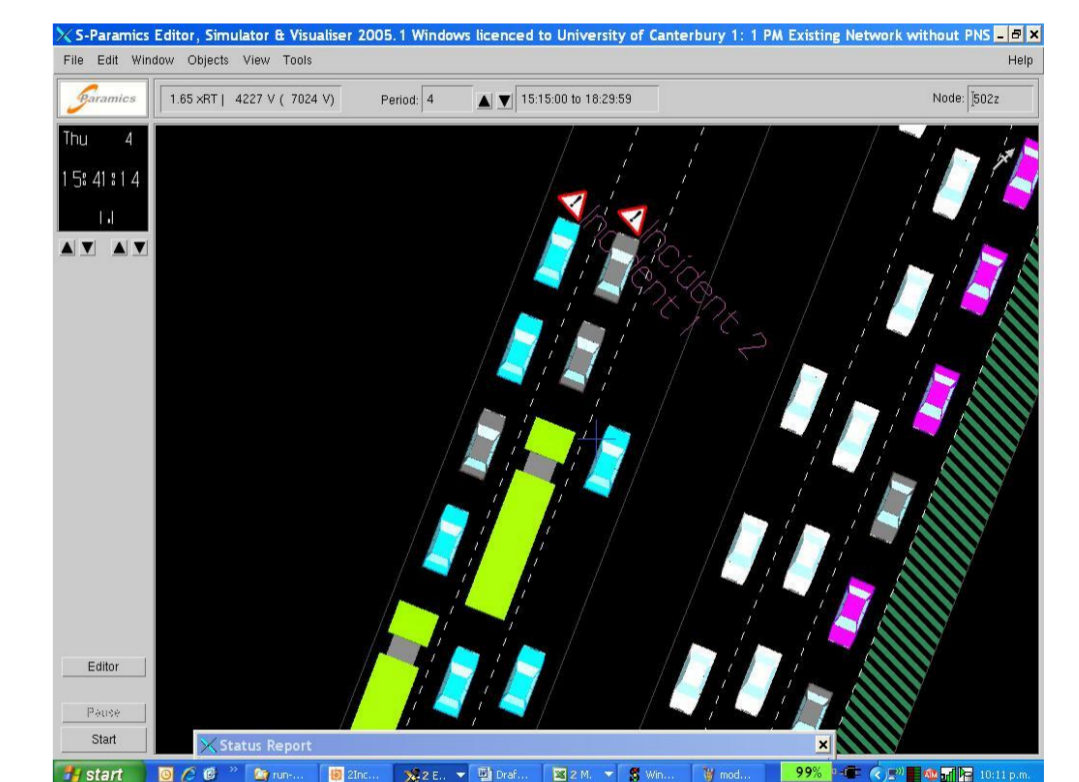
Detect unusual congestion → unusual congestion monitor

Confirm Incident

Provide priority along the diversion route → using variation routines or action lists

Case Study

Microsimulation offers a test bed for evaluating the impacts of incidents on a transportation network as well as testing and evaluating various incident management strategies.

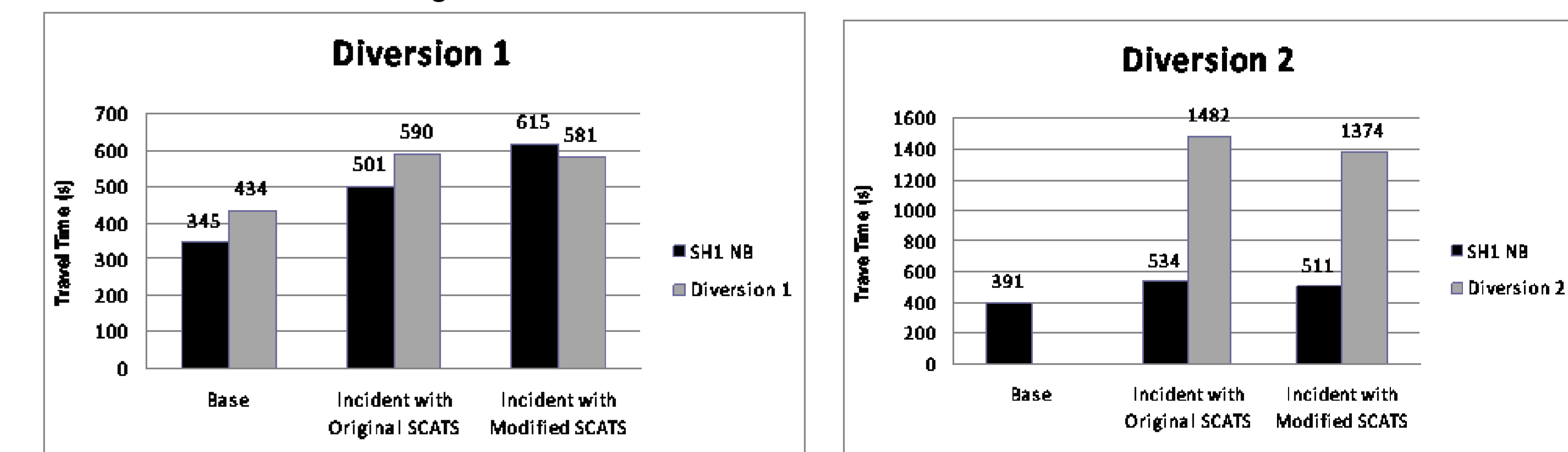


Three different scenarios were modelled:

- Base scenario with no incident
- Incident on the motorway with traffic diverting to the arterial route. SCATS was left to adapt as per normal (incident with original SCATS)
- Incident on the motorway with traffic diverting to the arterial route. Changes were made to SCATS at all ten signalised intersections along the diversion route to give priority along the diversion route (incident with modified SCATS).

Manual SCATS changes made included:

- Changes to split plans to provide more green time along the diversion route
- Increased cycle times
- Linked intersections along the diversion route in the direction of the diversion route



A decrease in travel time was shown along the diversion routes when SCATS was modified to priorities the diversion

Conclusions

Incident management strategies can help mitigate the congestion caused by incidents. Adaptive signal control, such as SCATS, can be used as an effective incident management strategy. Although normal SCATS operation can adapt in real time to the change in demand resulting from incidents, additional features of SCATS can be used to provide a targeted approach to increasing capacity on a traffic network.

SCATS as an Incident Management Tool

SCATS has various tools for detecting and responding to incidents.

Unusual Congestion Monitor

The unusual congestion monitor can be configured to detect when flow over detectors is not what is expected.

Site	Det	Dir	Approach	Congestion - last 30 minutes	Dur	Streets
60	6	E	Liverpool Rd			9 Liverpool Rd, Homebush Rd
88	12	E	Falcon St			15 Falcon St, Miller St
88	15	W	Falcon St			1 Falcon St, Miller St
139	12	S	Memorial Av			2 Mona Yale Rd, Memorial Av
227	8	E	Bridge St			5 Bridge St, Young St
235	3	W	Park St			20 Pitt St, Park St
251	16	E	Park St			3 Elizabeth St, Park St
276	6	W	Prince Albert Rd			3 Macquarie St, St James Rd
292	1	N	College St			13 College St, Francis St
292	2	N	College St			2 College St, Francis St
298	9	E	Bridge St			9 Bridge St, Phillip St
299	2	S	Macquarie St			1 Macquarie St, Bridge St
310	11	E	Erskine St			4 Sussex St, Erskine St
315	1	E	Park St			21 College St, William St
315	2	E	Park St			15 College St, William St
351	2	S	Elizabeth St			12 Elizabeth St, Phillip St
351	7	W	Phillip St			3 Elizabeth St, Phillip St
364	15	W	Captain Cook Dr			4 Taren Point Rd, The Boulevard

Unusual Congestion Monitor – shading indicates how long each detector has been congested