

Case Study Project: Rest on Red

Client: Main Roads Western Australia

Overview

Rest-on-Red (RoR) signal phasing is a localised intersection operation where the red light is turned on for all approaches (including pedestrians) and the green light is only activated when a vehicle approaches and is detected by the signal loops (or a pedestrian pushes a button). The philosophy behind Rest-On-Red signal phasing is that it is only in operation during certain times of day, predominantly late in the evening and into early morning.

Research has shown that Rest-on-Red (also termed "Dwell-on-Red") reduces vehicle speeds at intersections and that this has the potential to reduce not only the number of crashes but also the severity of crashes. It also has a potential of reducing the probability of a collision as a result of "red light running" behaviour.

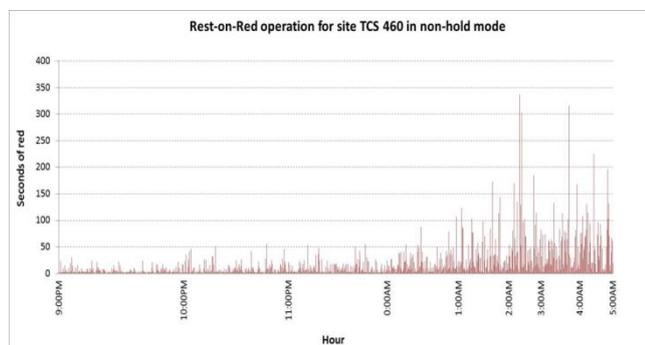
Urbsol were engaged by Main Roads Western Australia to undertake an analysis of candidate sites and identify suitable locations for consideration of a Rest-on-Red trial.

The Study

6 traffic signal locations were identified as suitable candidates for RoR – these were selected predominantly for 2 reasons:

- The number and severity of accidents experienced at the locations; and
- Traffic volume levels at relevant times of day

Urbsol developed special traffic signal personalities for six candidate sites using NGEN software and demonstrated that SCATS was capable of operating in a Rest-on-Red state with no major side effects.



Monitoring of Rest-on-Red activations frequency (9pm-5am)

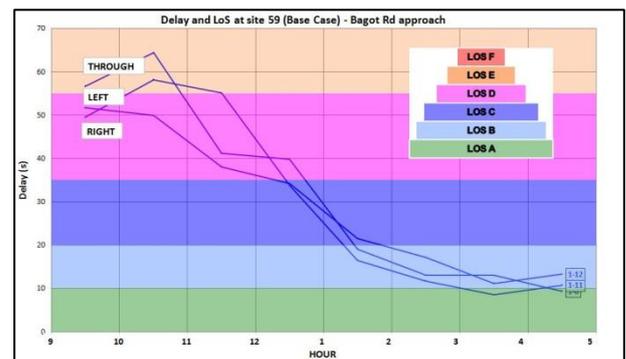
Each intersection was modelled for 8 hours continuously between the hours of 9pm and 5am.

The intersections were then monitored and their performance recorded in terms of key statistics such as:

- Activations per hour
- Mean activation duration

- Level of service (LOS) for each movement
- Number of stops (total and per hour)

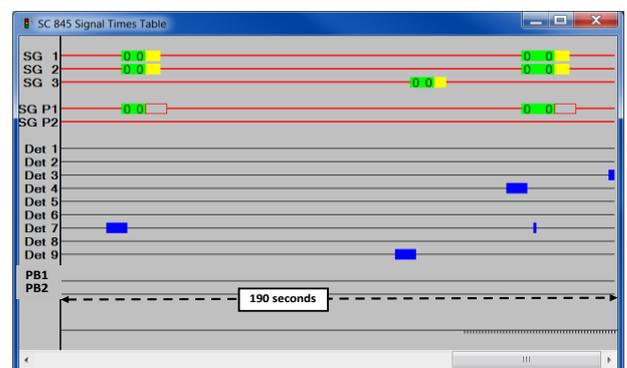
Comparison in performance between current and the "Rest-on-Red" mode of operation was reported and used as one of the criteria for ranking the suitability of sites for implementation.



Monitoring of LOS performance during simulation (9pm-5am)

Simulation

Urbsol used VISSIM microsimulation software connected to SCATSIM to test the operation of Rest-on-Red.



Monitoring of signal and detector groups operation in RoR mode

As a relatively new form of road safety initiative implementing Rest-on-Red directly in the field would represent too great an operational and safety risk – it was therefore critical to have a synthetic environment to test this mode of operation in. A number of issues were identified related to SCATS alarms and solutions provided as an aid to SCATS operators.

VISSIM was chosen as the most suitable tool for this work for a number of reasons:

- SCATSIM interface.
- Accuracy of delay per vehicle modelling.
- Robust data collection and extraction.
- Good traffic signal operation monitoring tools.