



Identification of High Risk Metropolitan Intersection Sites in Perth Metropolitan Area

C-MARC

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Abstract

As convergence points for drivers and other road users, intersections have higher crash risk than other parts of the road network. Given the limited resources available, it is important to identify high risk intersections so that they can be prioritised for infrastructure improvement. This report aimed to use a three-stage approach to identify high risk intersections: using Road Trauma Risk Analysis, then Comparative Safety Performance Analysis and finally ranking the intersections by the KSI (killed and seriously injured) metric. The results identify the high risk intersections for each intersection type (by speed environment and control type). The report recommends extensions to this process to improve identification of high risk intersections, and the use of a taxonomy to identify candidate treatments.

Keywords

Metropolitan intersection crashes, KSI crashes, risk factors

Disclaimer

This report is disseminated in the interest of information exchange. The views expressed here are those of the authors and not necessarily those of Curtin University or Monash University.

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EXECUTIVE SUMMARY

Introduction

In 2009, the Government of Western Australia adopted the *Towards Zero* strategy (Office of Road Safety, 2009) which is based on the *Safe Systems* approach to road safety (Corben, Logan, Fanciulli, Farley, & Cameron, 2010; Langford, 2009). As part of the strategy, the *WA Safe System Matrix* was created to set identify road safety initiatives in line with the *Safe Systems* paradigm. In metropolitan Perth, one of these initiatives was the “Safe System intersection transformation” (Langford, 2009). This initiative addresses the higher crash risk at metropolitan intersections, which represent convergence points for all road users.

This second report in the Metropolitan Intersection Safety project builds on the first report “*Risk Factors for Killed and Seriously Injury Intersection Crashes in Metropolitan Perth: 2005-2015*”(Chow, Manners, & Meuleners, 2016), which identified risk factors for killed and seriously injured crashes at intersections.

The second phase of the study aimed to use a three-stage approach including the use of the Road Trauma Risk Analysis and the Comparative Safety Performance Analysis, which were developed by Main Roads Western Australia, to prioritise intersections which have a high crash risk for infrastructure improvements.

The specific objectives of the project were to:

1. Perform a Road Trauma Risk Analysis on intersections where at least one casualty crash occurred in the Perth metropolitan area between 2011 and 2015.
2. Identify high crash risk intersections, by speed and control type, in the Perth metropolitan area between 2011 and 2015, based on the results of the Road Trauma Risk Analysis.
3. Perform a Comparative Safety Performance Analysis on the identified high crash risk intersections to compare the relative safety performance of intersections of the same type.
4. Illustrate the geographic location of the identified intersections in built-up speed environments using the Geographic Information Systems methodology.
5. Using the KSI metric, rank the intersections, which were identified using the Road Trauma Risk Analysis and the Comparative Safety Performance Analysis, in order of risk.

Method

A retrospective population-based study was undertaken using crash data from the Integrated Road Information System from 2011 to 2015 on intersections which reported at least one casualty crash in the Perth metropolitan area. Traffic volume data was obtained from Main Roads Western Australia.

Selected intersections were grouped by:

- *Speed environment*: built-up, open or low-speed; and
- *Traffic control type*: traffic signal, roundabout or no traffic signal

This created nine possible intersection types:

1. Built-up speed environment with traffic signals
2. Built-up speed environment with roundabout
3. Built-up speed environment with no traffic signals
4. Open speed environment with traffic signals
5. Open speed environment with roundabout
6. Open speed environment with no traffic signals
7. Low-speed environment with traffic signals
8. Low-speed environment with roundabout
9. Low-speed environment with no traffic signals

Statistical analysis

Each intersection type was then assessed using the *Road Trauma Risk Analysis*. This methodology compared crash density or collective risk (a count of killed and seriously injured crashes plus factored-up medical crashes, i.e., the KSI metric) to crash rate or personal risk (KSI metric divided by product of flow, a measure of exposure to traffic at intersections) for each intersection. Based on this, each intersection was allocated to one of four quadrants (black, red, orange and green). Intersections which were identified to be in the black quadrant reported both high crash density and crash rate. Intersections in the red quadrant reported high crash density but lower crash rate. Intersections identified to be in the orange quadrant reported lower crash density but high crash rate, and in the green quadrant identified intersections reported both low crash density and low crash rate. Maps were also created which visually demonstrated both the location and quadrant of each intersection in the built-up speed environment.

The high risk intersections (those falling in black and, in some cases, red quadrants) were further analysed using the *Comparative Safety Performance Analysis*. This methodology compared each intersection to other intersections within the same speed environment by the KSI metric. Each intersection was assigned a percentile score and ranked into a category from I (most safe intersections) to V (least safe intersections). Maps were again created for intersections in the built-up speed environment plotting the location of each intersection by CSP category.

Following this, the identified high risk intersections were ranked by the KSI metric. Intersections with any structural changes since 2011 were noted, using aerial photography.

Results

- *Built-up speed environment with traffic signals:* 310 out of 996 (31%) intersections were in this category. A total of 52 (17%) intersections were in the black quadrant and were categorised as high risk intersections, and 19 (6.1%) of the intersections were in both the black quadrant and CSP V. The top ranked intersection had a KSI metric of nearly 17.
- *Built-up speed environment with roundabout:* None of the 23 (2.3%) casualty intersections of this type were in the black quadrant. A total of 3 (13%) intersections were in the red quadrant of which one each were in CSP categories III, IV and V. The top ranked intersection had a lower KSI metric of 2.2.
- *Built-up speed environment with no traffic signals:* The 425 (43%) intersections in this category included 16 (3.8%) in the black quadrant, which were divided between CSP categories IV (8, 1.9%) and V (8, 1.9%). The top ranked intersection had a KSI metric of 7.1.
- *Open speed environment with traffic signals:* Sixty-three (6.3%) intersections were in this category of which 25 (40%) were in the black quadrant; 4 (6.4%) were in CSP category IV with the remainder in category V. The top ranked intersection had a KSI metric of 13.
- *Open speed environment with roundabout:* Of the 19 (1.9%) intersections in this type, all high risk intersections were in the red quadrant (4, 21%) and in either CSP category IV or V. The top ranked intersection had a KSI metric of 2.6.
- *Open speed environment with no traffic signals:* A total of 135 (14%) of all casualty intersections were of this type. Of the 18 (13%) intersections in the black quadrant, 12 (8.9%) fell in CSP category IV, with the rest in CSP category III (4, 3.0%) and II (2, 0.02%). The top ranked intersection had a KSI metric of 15.

- *Low-speed environment with traffic signals*: Of the 9 (0.90%) intersections of this type, 2 (22%) were in the black quadrant and 5 (56%) were in the red quadrant. These high risk intersections were across a range of CSP categories (from I to IV). The top ranked intersection had a KSI metric of 7.
- *Low-speed environment with roundabout*: No casualty intersections were of this intersection type.
- *Low-speed environment with no traffic signals*: Of the 12 (1.2%) of casualty intersections in this group, one intersection was classified as high risk and fell in red quadrant in CSP category IV. The intersection had a KSI metric of 2.

Discussion and Recommendations

Most intersections which reported at least one casualty crash in the Perth metropolitan area fell into three intersection types: i) intersections in the built-up speed environment, with traffic signals, ii) intersections in the built-up speed environment without traffic signals, and iii) intersections in the open speed environment without traffic signals. The majority of intersections falling into the black quadrant were in the built-up speed environment and had traffic signals. The top-ranked intersection in this category also had the highest KSI metric across all intersection types. Intersections with roundabouts in all speed environments had the lowest number of casualty intersections and lowest KSI metrics of all intersection types.

Recommendations include:

- Performing the analyses by crash type, as well as by speed environment and traffic control.
- Using GIS to supplement these methods (simple mapping, as well as clustering of high risk intersections across the metro area).
- Use of Devlin and colleagues' (Devlin, Candappa, Corben, & Logan, 2011) taxonomy to allocate treatments to high risk intersections.

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1. INTRODUCTION

In 2009, the Government of Western Australia adopted the *Towards Zero* strategy (Office of Road Safety, 2009), based on the *Safe Systems* approach to road safety, combining aspects of Sweden's Vision Zero and the Netherlands' Sustainable Safety approaches (Corben et al., 2010; Langford, 2009). The four cornerstones of the Western Australian Safe Systems approach are i) *Safe roads and roadsides*, ii) *Safe speeds*, iii) *Safe vehicles* and iv) *Safe road use* (Langford, 2009).

As part of the strategy, the *WA Safe System Matrix* was created to identify road safety initiatives in line with the *Safe Systems* paradigm, targeting the three major geographic regions of Western Australia (WA): metropolitan Perth, regional WA and remote WA (Corben et al., 2010). In metropolitan Perth, the program associated with *Safe roads and roadsides* in the *Safe System Matrix* is "Safe System intersection transformation" (Langford, 2009) which would involve the use of measures such as roundabouts, control of right-turns at signals and combination red light/speed cameras to improve the safety of intersections (Corben et al., 2010). A survey using a representative sample of the West Australian population demonstrated that 95% of respondents supported or strongly supported improving intersections (Corben et al., 2010).

Intersections represent convergence points for all road users (motorised vehicles, as well as vulnerable road users such as pedestrians and cyclists). Because road users' paths cross the road network at intersections, the risk of a crash is higher, despite road users spending a relatively short time travelling through them (Chen, Cao, & Logan, 2012; NZTA, 2013). There are several reasons for this higher crash risk at intersections: i) vehicles and pedestrians travel on conflicting paths; ii) road users are required to make successful gap judgements; iii) intersections are located at points of traffic congestion and can cause congestion (Chen et al., 2012).

Safety improvement measures at high-risk intersections need to focus on reducing the number of killed and seriously injured crashes, concentrating on high risk movement types at intersections. Busy environments in urban areas place high demands on road users, particularly vulnerable road users such as pedestrians and cyclists (NZTA, 2013). In Perth metropolitan area, nearly 21% of serious injury crashes between 2005 and 2009 occurred at intersections, while only 10% and 5% of serious injury crashes involved

intersections in regional and remote Western Australia respectively (Palamara, Kaura, & Fraser, 2013).

This report forms part of the Metropolitan Intersection Safety project. The first report, *“Risk Factors for Killed and Serious Injury Intersection Crashes in Metropolitan Perth: 2006–2015”* (Chow et al., 2016) identified risk factors for killed and serious injury (KSI) intersection crashes (compared to crashes involving merely medical treatment or property damage) in the Perth metropolitan area between 2006 and 2015. Risk factors identified with significant increased risk of a KSI intersection crash were i) temporal factors (crashes occurring at weekends and at night-time), ii) occurrence at non-level intersections, and iii) three-way, or four or more-way intersections (compared to roundabouts). The report suggested the increased use of traffic lights and roundabouts, while recommending that the safety benefits of non-signalised intersections (compared to intersections with no traffic controls) be investigated further.

This report describes the results of the second stage of the Perth Metropolitan Intersection Safety project. A three-stage approach to identify and rank high risk intersections in the Perth metropolitan area was undertaken. An assessment of intersection risk was undertaken using methodologies developed by Main Roads Western Australia: the Road Trauma Risk Analysis and the Comparative Safety Performance Analysis, which was followed by a ranking of the identified high risk intersections using a KSI metric. By using three different methods to identify high risk intersections, risk to both individuals entering intersections and collective risk to all vehicles entering intersections could be used to rank the intersections with the poorest safety records. The results of this study will inform authorities which casualty crash intersections require the most urgent attention. This will aid road safety authorities to make informed decisions about the management and investment of road safety resources.

1.1 Aims and objectives

The aim of the project was to assist in prioritising candidate intersections for road safety improvements, using the existing Road Trauma Risk Analysis and Comparative Safety Performance Analysis methodologies of Main Roads Western Australia.

The specific objectives of this phase of the project were to:

1. Perform a Road Trauma Risk Analysis on intersections where at least one casualty crash occurred in the Perth metropolitan area between 2011 and 2015.
2. Identify high risk crash intersections, by speed and control type, in the Perth metropolitan area between 2011 and 2015, based on the results of the Road Trauma Risk Analysis.
3. Perform a Comparative Safety Performance Analysis on the identified high risk intersections to compare the relative safety performance of intersections of the same type.
4. Illustrate the geographic location of the identified intersections in built-up speed environments using the Geographic Information Systems methodology.
5. Using the KSI metric, rank the intersections, which were identified using the Road Trauma Risk Analysis and the Comparative Safety Performance Analysis, in order of risk.

1.2 Significance

The results of this report will provide Main Roads, WA and other responsible agencies with reliable and objective information for future investments in developing road safety strategies.

2. METHODS

2.1 Study design

A retrospective population-based study was undertaken using crash data from the Integrated Road Information System from 2011 to 2015 on intersections which reported at least one casualty crash in the Perth metropolitan area. Traffic volume data was obtained from Main Roads Western Australia.

2.2 Study environment

The study included all metropolitan intersections where at least one casualty crash occurred in the Perth area (Table 12, Appendix). The Main Roads region code 7 was used to identify intersections located in the metropolitan area of Western Australia.

2.3 Databases

2.3.1 Integrated Road Information System (IRIS)

The Integrated Road Information System (IRIS) is a large dataset reported crashes (Police and self-report) in Western Australia which is maintained by Main Roads Western Australia. This includes fatal, hospitalisation and medical treatment crashes that occurred at intersections in the metropolitan area of Perth, WA, during a five year period from 1 January 2011 to 31 December 2015.

2.3.2 Traffic volume data

Data on traffic volumes (annual average daily traffic - AADT) at intersections were obtained for use in the analysis. AADT is the annual average daily traffic experienced by each leg of an intersection, and is recorded and maintained by Main Roads Western Australia. If traffic data for 2015 was available, this was used for this project. If traffic data was only available from an earlier year, an annual growth rate of 2.18% was used to estimate the 2015 AADT. This is the most recent estimate of growth, using the Australian Bureau of Statistics estimates of Million Vehicle Kilometers Travelled - MVKT (ABS, 2015)

2.4 Operational definitions

The definition of a crash used throughout this report is the definition used in the annual publication *Reported Road Crashes in Western Australia 2014* (Road Safety Commission, 2016). That is, a crash is “*any unpremeditated incident where in the course of the use of any vehicle on a road that was not temporarily closed off to the public, a person is injured or property is damaged. The crash must involve vehicle movement and does not include collisions that occur due to a medical condition, deliberate acts (e.g. suicide attempts) or police chases*”.

The severity of a crash is derived from “*the most serious injury in a crash*”. A fatal crash is “*a road crash in which at least one person was killed immediately or died within 30 days of the crash, as a result of the crash*”. A hospitalisation crash is a road crash that involved at least one admission to hospital but “*no fatalities within 30 days of the crash*”. A crash requiring medical treatment is “*a road crash in which the most serious injury resulted in a person requiring medical treatment, but without being admitted to hospital*”. A property damage only crash (PDO) involved no or unknown injuries.

For the purpose of this report, a killed or seriously injured (KSI) crash was defined as a road crash that resulted in at least one person being either killed (“*killed immediately or died within 30 days of the day of the road crash as a result of the crash*”) or seriously injured (“*admitted to hospital as a result of the road crash and who does not die from injuries sustained in the crash within 30 days of the crash*”). KSI crashes include all fatal crashes, and hospitalisation crashes. Non-KSI crashes included all crashes requiring medical treatment and PDO crashes.

In WA, it is mandatory for the driver of a vehicle to report a traffic crash when the incident occurred on a road or any place commonly used by the public, e.g. car parks, and:

1. The incident resulted in bodily harm to any person; or
2. The total value of property damaged to all involved parties exceeds \$3000; or
3. The owner or representative of any damaged property is not present.

2.5 Criteria for ascertainment of an intersection crash

All metropolitan intersections with at least one casualty crash (fatal, hospitalisation, or crash requiring medical treatment) from 2011 to 2015 were investigated, resulting in a total of 996 intersections. These included state road/state road intersections and state road/local road intersections but excluded local road/local road intersections (Main Roads, 2016). The full list of intersections used in this report is contained in Table 12 in the Appendix.

Intersections were categorised based on:

1. Speed Environment (highest approach speed):
 - a. Built-up: all legs of the intersection were less than 80km/hour and at least one greater than 50km/hour
 - b. Open: at least one leg of the intersection was 80km/hour or more
 - c. Low-speed: all legs of the intersection were 50km/hour or less
2. Intersection Control:
 - a. Traffic Signals (i.e., has traffic control lights)
 - b. Roundabout
 - c. No traffic signals (i.e., has no traffic control lights)

This created nine possible intersection types:

1. Built-up speed environment with traffic signals
2. Built-up speed environment with roundabout
3. Built-up speed environment with no traffic signals
4. Open speed environment with traffic signals
5. Open speed environment with roundabout
6. Open speed environment with no traffic signals
7. Low-speed environment with traffic signals
8. Low-speed environment with roundabout
9. Low-speed environment with no traffic signals

2.6 Analysis of crashes

The safety of each of the nine types of intersections was first assessed using Road Trauma Risk Analysis (Section 2.6.1). High risk intersections were then identified and

assessed using the Comparative Safety Performance Analysis methodology (Section 2.6.2). Finally, high risk intersections were ranked by the KSI metric (Section 2.6.3).

2.6.1 Road Trauma Risk Analysis

The Road Trauma Risk Analysis was used to assess Road Trauma Risk (RTR) and to allocate each intersection into one of four quadrants of the RTR tool: black, red, orange and green – Figure 1 (Main Roads, 2016). The measure of the horizontal axis of the tool is crash density (the KSI – killed or seriously injured - metric) while the measure of the vertical axis is crash rate (the KSI metric divided by the level of exposure to traffic – product of flow). For each intersection, both crash density and crash rate were rated from low to high (Table 1), and then the intersection was allocated to the correct quadrant according to the ratings demonstrated in the horizontal axis (crash density) and vertical axis (crash rate) in Figure 1.

Figure 1: Road Trauma Risk Analysis tool

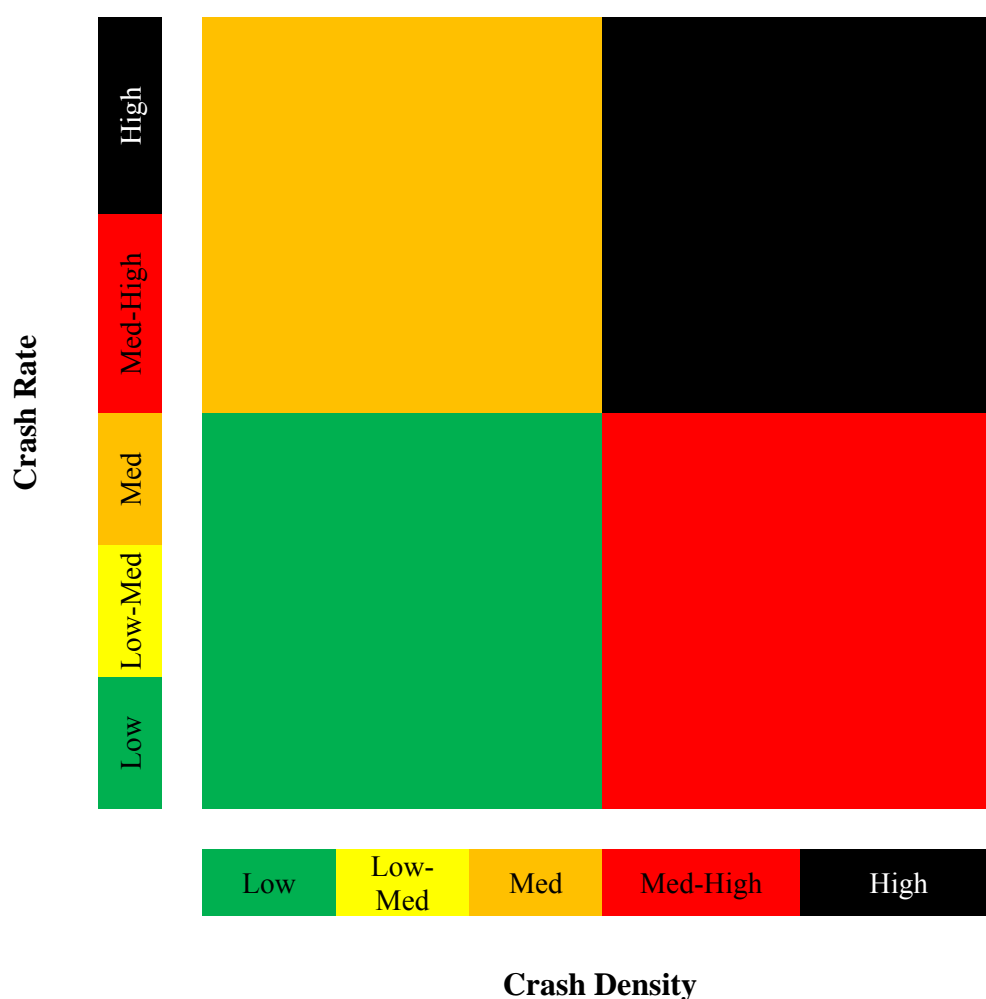


Table 1: Thresholds for categories of crash density and crash rate¹

	Density	Rate
High	Greater than 2.786	Greater than 106.339
Med-High	1.366 to 2.7867	51.826 to 106.339
Med	1.000 to 1.366	29.450 to 51.826
Low-Med	1.366 to 0.371	11.443 to 29.450
Low	Less than 0.371	Less than 11.443

Intersections falling in the black quadrant were characterised by both high crash density and crash rate (a high number of KSI crashes at the intersection). Intersections in the red quadrant had high crash density but lower crash rate (higher number of KSI crashes at intersections which may also have high traffic volumes). Intersections in the orange

¹ Thresholds are percentile cut-offs provided by Main Roads Western Australia, based on their list of high risk intersections in 2013 calculated from 2009-2013 crash data.

quadrant had lower crash density but high crash rate (lower KSI crash numbers per intersection). Intersections in the green quadrant have both low crash density and low crash rate.

For intersections with a Road Trauma Risk (RTR) in the black quadrant but with less than 3 KSI crashes, the following exceptions applied:

1. If the intersection was on a main or major road (road ID beginning with “M”), the RTR quadrant was downgraded to orange.
2. If the intersection was on a highway or freeway (road ID beginning with “H”), the RTR quadrant was downgraded to red.

2.6.2 Comparative Safety Performance Analysis

High risk intersections identified by the Road Trauma Risk Analysis were compared by KSI metric at different product of flow levels, and each intersection was assigned a percentile score according to the intersection’s safety record relative to other intersections of the same type. The percentile cut-offs of all intersection control/speed environment combinations were provided by Main Roads Western Australia. This enabled the definition of each intersection into one of five Comparative Safety Performance (CSP) categories (Table 2). Percentile cut-offs by intersection type are indicated in the Appendix (Table 11). The CSP Analysis highlights which intersections are performing worse in terms of the KSI metric for their traffic control type, speed environment and product of flow.

Table 2: Comparative Safety Performance percentile scores and definitions

Comparative Safety Performance		Percentile band	Definition
V	Extremely poor	90 to 100th	Crash rate in the worst 10% band. Higher than expected in 90% of intersections of similar speed environment and signal type.
IV	Very poor	70 to 90th	Crash rate in the worst 10% to 30% band. Higher than expected of 70% of similar intersections but better than the worst 10%
III	Poor	50 to 70th	Crash rate in the worst 30% to 50% band. Higher than expected of 50% of similar intersections but better than the worst 10%
II	Adequate	30 to 50th	Crash rate lower than the worst 50%, but higher than the safest 30% of intersections.
I	Good	0 to 30th	Crash rate in the best 30% band. Lower than expected of 70% of intersections of similar speed environment and signal type.

2.6.3 Ranking by KSI metric

The relative safety of each intersection was compared by ranking the high risk intersections in each intersection type:

1. All intersections falling in the black quadrant were ranked above those in the red quadrant.
2. All high risk intersections in the same quadrant were then ranked by CSP, with those with a CSP of V being ranked above those with a CSP of IV, and so on.
3. Finally, all intersections were further ranked from the highest KSI metric to the lowest.

Therefore, the overall highest ranked intersection (less safe and highest risk intersection) had the highest RTR (usually black quadrant) and CSP (usually CSP IV or V) with the highest KSI metric for each intersection type.

2.7 Measures of crash risk

2.7.1 IRIS crash data

The KSI metric is the baseline measure used to calculate crash density (collective risk) and crash rate (personal risk). It uses the total number of KSI crashes plus the factored-up medical crashes (Main Roads, 2016).

Equation 1: KSI metric

$$KSI\ Metric_{(of\ an\ intersection\ of\ type\ xy)} = \sum_z [No.\ of\ KSI\ Crashes_{(of\ crash\ type\ z\ at\ the\ intersection)} + Severity\ Index_{xyz} \times No.\ of\ Medical\ Crashes_{(of\ crash\ type\ z\ at\ the\ intersection)}]$$

where

x = speed environment

y = intersection control

z = crash type

and

$$Severity\ Index_{xyz} = \frac{Number\ of\ KSI\ Crashes_{xyz}}{Number\ of\ Casualty\ Crashes_{xyz}}$$

Two measures of crash risk were required for the analysis methodologies: crash density and crash rate².

1. Crash density (or collective risk): a measure of the number of KSI crashes (and factored-up medical crashes) for intersections (Table 1 - low, low-medium, medium, medium-high or high).

Equation 2: Crash density

$$\text{Crash Density (intersection)} = \text{KSI Metric}$$

2. Crash rate (or personal risk): KSI metric per level of exposure for intersections (Table 1 - low, low-medium, medium, medium-high or high).

Equation 3: Crash rate

$$\text{Crash Rate (intersection)} = \frac{\text{KSI Metric} \times 10^8}{\text{PoF} \times 5 \times 365 \times 1.7}$$

where

PoF = product of flow

2.7.2 Exposure to traffic

A measure of traffic flow and potential traffic conflicts is product of flow (PoF). The data for the major and minor road for each intersection (annual average daily traffic - AADT) was used to calculate the product of flow according to the following equation (Main Roads, 2016):

Equation 4: Product of flow

Product of Flow

$$= \{ \text{Average (AADT for major road before \& after intersection)} \times$$

$$\text{Average (AADT for minor road before \& after intersection)} \}^{0.4}$$

² The definitions for crash density and crash risk used in this report apply to intersections. They are defined differently for non-intersection (mid-block) locations.

Missing data for the major or minor road leading to a metropolitan intersection were estimated using the following business rules (Main Roads, 2016):

1. For state road/state road intersections in the metropolitan region the traffic volume on the minor road was estimated as 81% of the traffic volume for the major road.
2. For state road/local road intersections in the metropolitan region, the traffic volume on the minor road was estimated as 9% of the traffic volume for the major road.
3. For three-way intersections, the traffic volume used opposite the terminating road is assumed to be zero.

These rules were implemented using the statistical software package SAS. The data was then manually checked in Microsoft Excel and corrected if necessary.

2.8 Maps of intersection sites

Maps were created for each of the built-up intersection types (with and without traffic signals, and with roundabouts) displaying intersections by RTR and CSP categories in the appropriate colours. The maps were created using ArcGIS 10.4 (ESRI, 2015).

2.9 Changes to intersections from the start of the study period

The online software Nearmap (Nearmap Ltd., 2016) was used to check each casualty intersection for any painting, road safety treatments or structural changes to the intersection from the start of the study period (1 January 2011) to 1 December 2016. This involved using the geographic co-ordinates to locate each intersection, and then visually comparing the aerial views of the intersection immediately prior to the start date (1 January 2011) and close to the end date (1 December 2016). Any changes were characterised as follows:

1. Minor changes were applied to the intersection between 1 January 2011 and 1 December 2016, such as painting or repainting of lines and/or arrows.
2. Significant changes were applied to the intersection between 1 January 2011 and 1 December 2016; these changes could be road safety related treatments other than painting, and/or traffic related structure overhaul.

The final ranked high risk intersection tables were then annotated with one or two asterisks if there had been any changes during the study period. Intersections with no changes were not annotated.

2.10 Ethics approval

The project was approved by Curtin Human Research Ethics committee in April 2016 (approval number HRE 2016-0071).

3. RESULTS

The results for each intersection type are reported from Sections 3.1 to 3.8, as described below. Road Trauma Risk Analysis was undertaken to assess metropolitan intersections according to the Road Trauma Risk (RTR) tool (Figure 2). Intersections with less than three observed KSI crashes were downgraded to red or orange depending on their road type (main road or highway).

Figure 2: Key to Road Trauma Risk Analysis tool

<u>Legend</u>	
●	Black Intersections – High Crash Density & High Crash Rate
●	Red Intersections – High Crash Density & Low Crash Rate
●	Orange Intersections – Low Crash Density & High Crash Rate
●	Green Intersections – Low Crash Density & Low Crash Rate

The analyses were done for each of the nine intersection types, by intersection speed environment (low, built-up and open) and control type (traffic signal, roundabout and no traffic signal). Only eight categories are presented below. The ninth category (intersections with a roundabout at low-speed) is not included as there were no intersections in this category.

Once high risk intersections were selected for each intersection type, Comparative Safety Performance Analysis was undertaken for these intersections, yielding a Comparative Safety Performance (CSP) category from black (I, extremely poor CSP) to green (V, good CSP – Figure 3).

Figure 3: Key to Comparative Safety Performance tool

<u>Legend</u>	
◆	Black Intersections – Extremely Poor Comparative Safety Performance
◆	Red Intersections – Very Poor Comparative Safety Performance
◆	Orange Intersections – Poor Comparative Safety Performance
◆	Yellow Intersections – Adequate Comparative Safety Performance
◆	Green Intersections – Good Comparative Safety Performance

The high risk intersections in each intersection type (speed environment and traffic control type) were ranked by RTR first (all intersections in the black quadrant were ranked above red quadrant intersections), then by CSP (intersections in the RTR black quadrant in CSP V were ranked first, followed by intersections in the RTR black

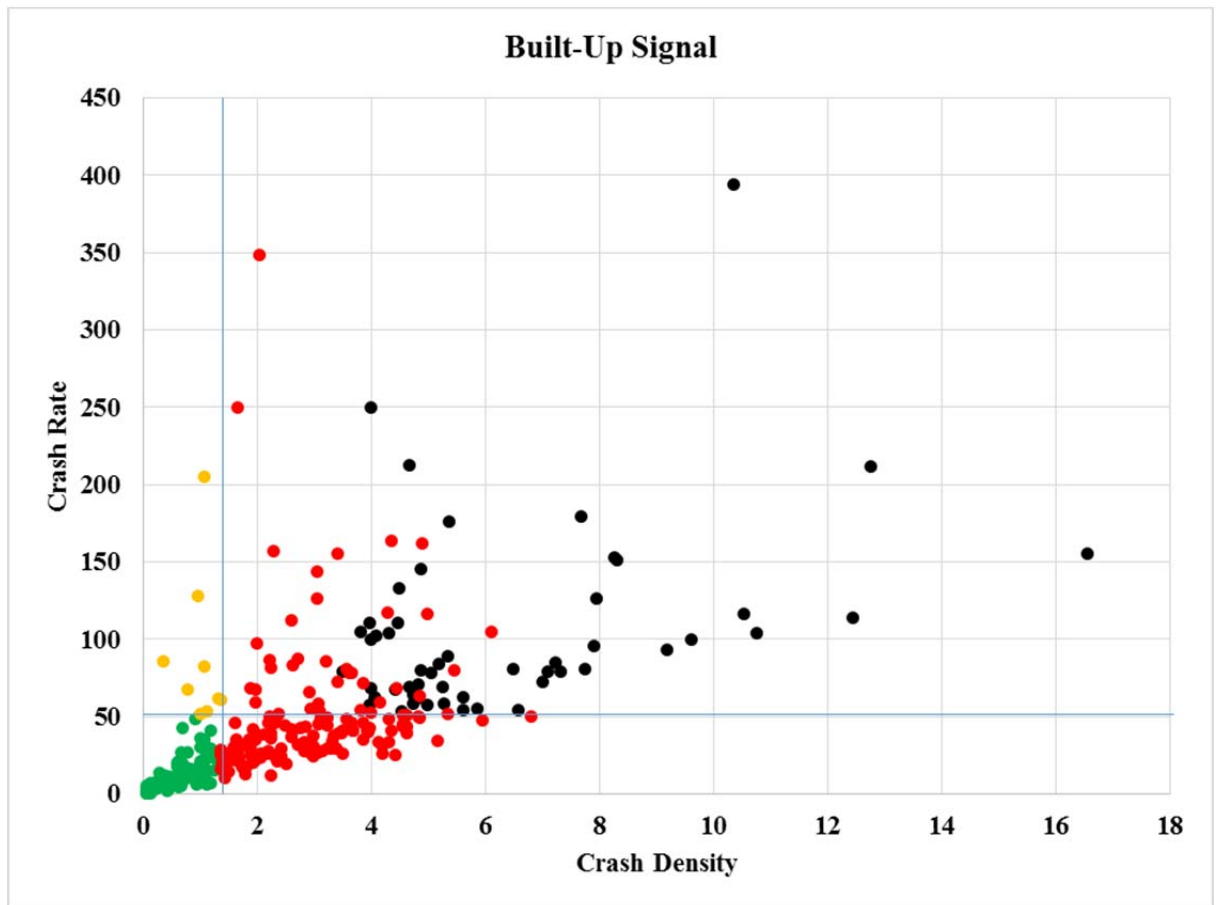
quadrant in CSP IV, and so on, followed by ranking of intersections in the red quadrant in a similar manner) and finally these RTR/CSP subgroups were ranked from the highest KSI metric downwards - the intersection in the RTR black quadrant in CSP V with the highest KSI metric was ranked first (i.e., as the highest risk intersection) for each intersection type.

Each intersection in the high risk tables was checked using the aerial photography available in Nearmap (as outlined in the methods) for changes over the study period. When more than 10 intersections were in the high risk table for an intersection type, only the intersections which fell in the RTR black quadrant and the top two CSP categories (IV and V) were assessed in Nearmap.

3.1 Intersections with traffic signals and a built-up speed environment

3.1.1 Road Trauma Risk Analysis

Figure 4: Road Trauma Risk: Intersections with traffic signals and a built-up speed environment

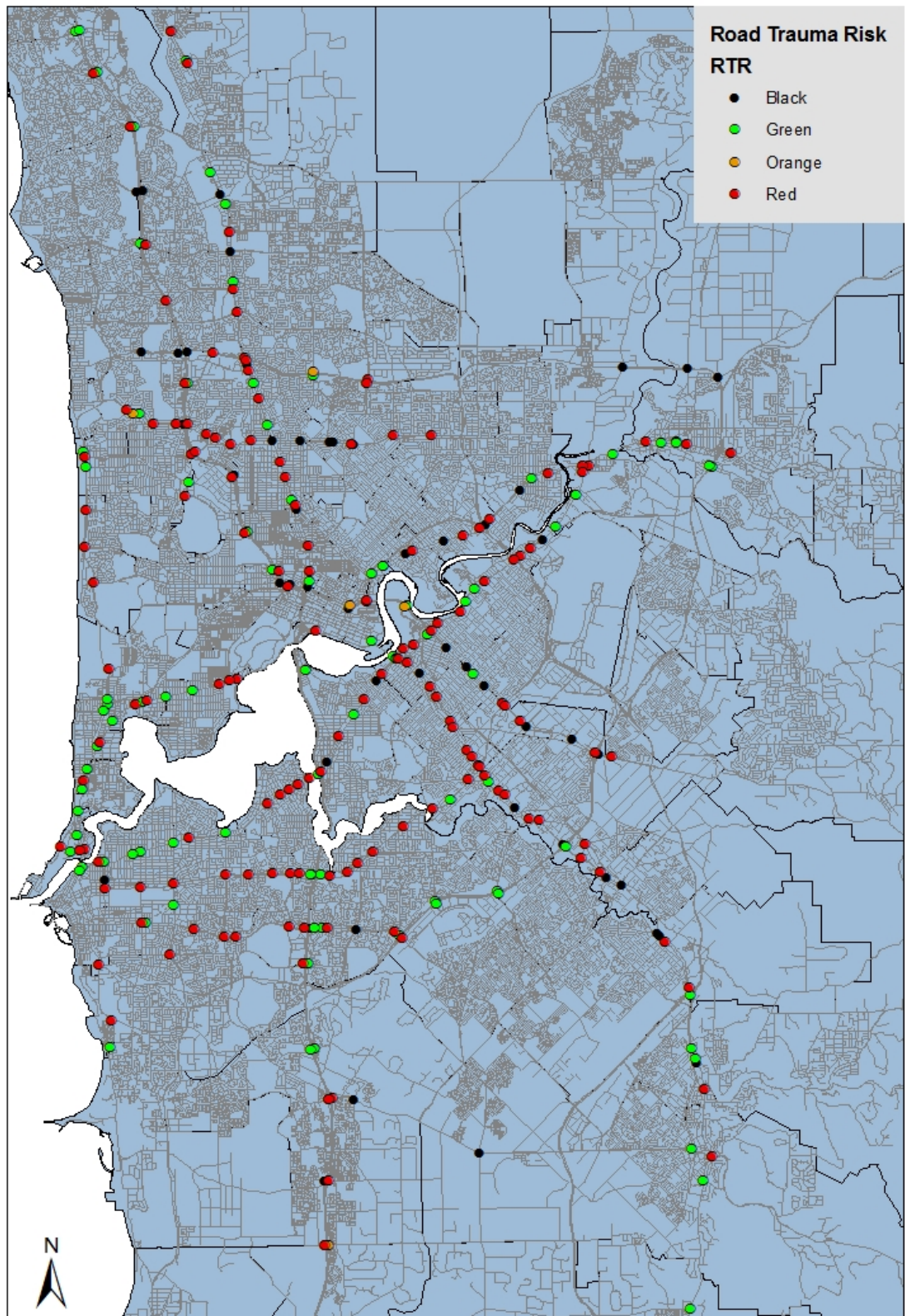


A high number of intersections with traffic signals in a built-up speed environment (n=310) had casualty crashes compared to other intersection types. This intersection type made up 31% of all 996 examined intersections. The RTR ratings for this group of intersections are shown in Figure 4, Map 1 and Table 3. A total of 52 (17%) of the intersections were in the black quadrant and 154 (50%) were in the red quadrant. The intersections falling in this (black) quadrant covered a large range of crash density (KSI metrics – Figure 4) ranging from 3.5 [Welshpool Rd East & H018 (Roe Hwy) Sth Bound Off & On] to 17 [Guildford Rd & H017 (Tonkin Hwy) Sth Bound On & Off Ramps], all falling in the “high” crash density category (Table 3). Intersections had crash rates that were classified as either medium-high or high (range: 53-394). There were two outliers: one had a high crash density (13) but a very high crash rate (212 – Intersection 4061, Armadale Road and Nicholson Road), while the other had a

moderate crash rate but a very high crash density (Intersection 14275, Guildford Road and H017 on/off ramp - Figure 4 and Table 3).

More intersections with highest RTR (black quadrant) were situated closer to the Perth CBD (Map 1). Those intersections with a slightly lower RTR (red quadrant) were spread throughout the city, while many intersections in the green quadrant were further from the CBD.

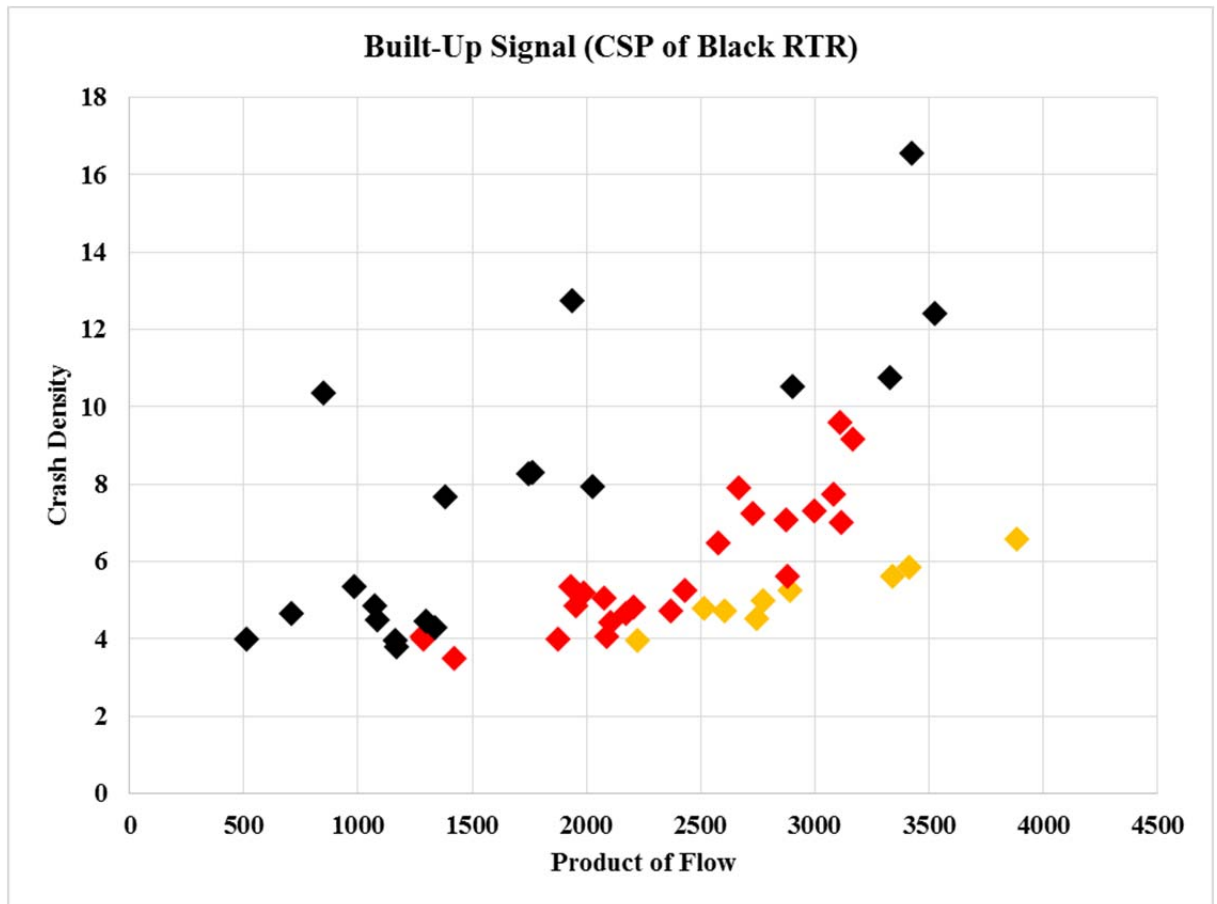
Map 1: Road Trauma Risk: Intersections with traffic signals and a built-up speed environment



Of the 52 crashes in the black quadrant indicated in Table 3 (page 21) below, 15 (29%) were three-way intersections, 23 (44%) were four-way intersections and the remainder were of unknown type.

3.1.2 Comparative Safety Performance Analysis

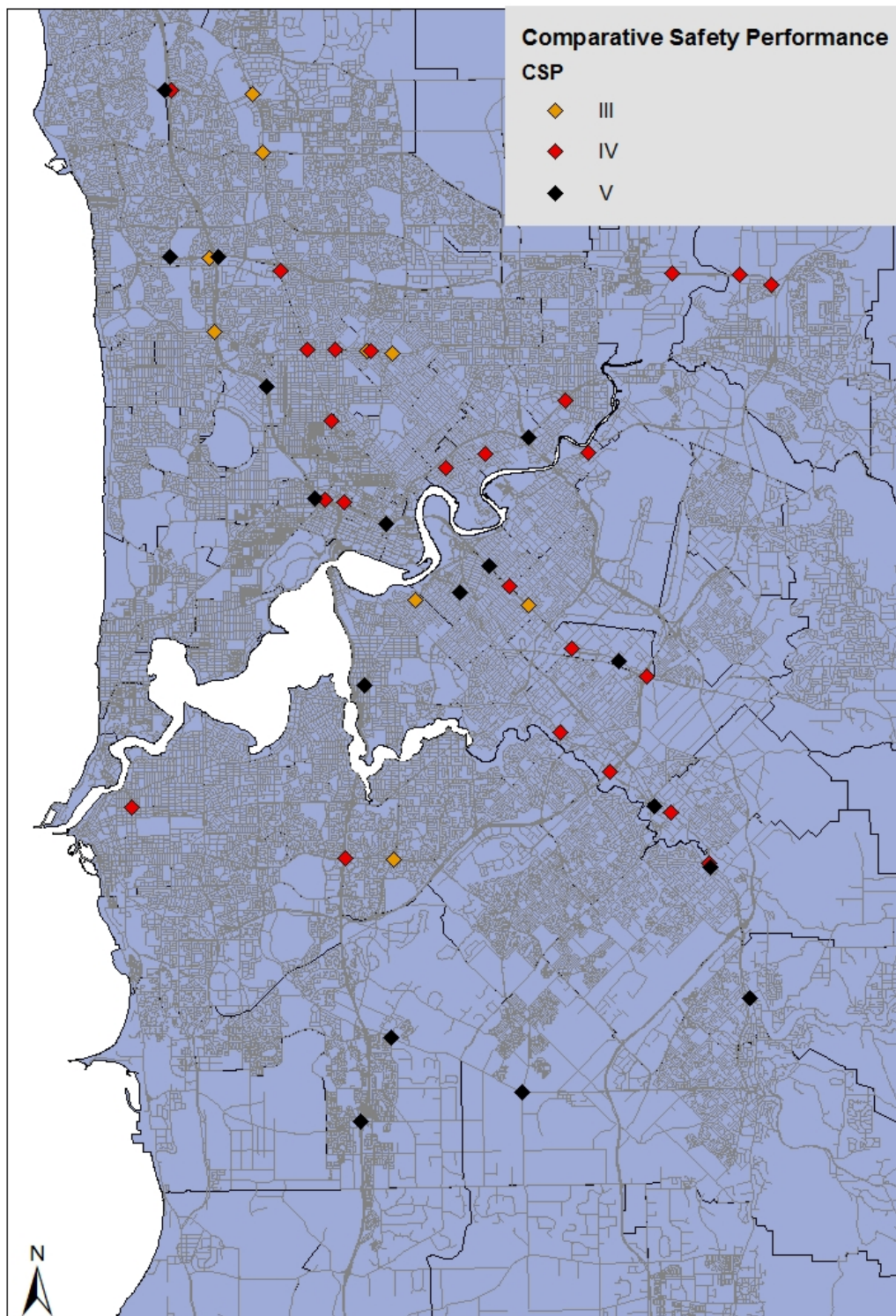
Figure 5: Comparative Safety Performance: Intersections with traffic signals and a built-up speed environment



The CSP categories for the 52 intersections identified as high risk are shown in Figure 5 and Map 2. All 52 intersections were in the black quadrant. A total of 19 (37%) of these intersections were in CSP category V, 24 (46%) were in CSP IV and 9 (17%) were in CSP III. Intersections in this category with the highest CSP category (V - least safe intersections) tended to have lower products of flow (range: 513-3525) with more than half of the intersections had a product of flow below 2000 (Figure 5 and Table 3).

Those in CSP IV were located in the North-East and South-West part of the metro area (Map 2) while those in CSP III and V were located roughly along a line running through the CBD from North-West to South-East.

Map 2: Comparative Safety Performance: Intersections with traffic signals and a built-up speed environment



3.1.3 Ranking of high risk intersections

Table 3: Ranking of high risk intersections with traffic signals and a built-up speed environment

Intersection number	Intersection Description	Product of Flow	Crash Rate	Crash Rate Category	Crash Density Category	RTR ¹ Quadrant	CSP ² Category	KSI Metric	Intersection rank
14275	GUILDFORD RD & H017 STH BOUND ON & OFF RAMPS	3425.13	155.74	High	High	Black	V	16.55	1**
4061	ARMADALE RD & NICHOLSON RD	1940.28	211.94	High	High	Black	V	12.76	2
50781	SOUTHPORT ST & CAMBRIDGE ST	3524.70	113.63	High	High	Black	V	12.43	3*
39039	FRANCISCO ST & ORRONG RD & FRANCISCO PL	3329.14	104.13	Med-High	High	Black	V	10.76	4
3642	REID HWY & REID HWY - MITCHELL FWY STH ON & H016 STH BOUND - REID HWY OFF & BALC	2904.69	116.73	High	High	Black	V	10.52	5**
14185	ALBANY HWY (END DUAL) & DUNCAN ST	847.88	393.72	High	High	Black	V	10.36	6
4347	HUTTON ST ON - H016 STH BOUND & HUTTON ST & H016 STH BOUND - HUTTON ST OFF	1764.45	151.58	High	High	Black	V	8.30	7
13882	H016 NTH BND - WHITFORDS AV OFF & WHITFORDS AV & WHITFORDS AV OFF - H016 NTH BND	1746.19	152.63	High	High	Black	V	8.27	8
14753	ALBANY HWY & BURSLEM DR	2030.19	126.27	High	High	Black	V	7.95	9
81636	MCDOWELL ST & ORRONG RD	1382.65	179.01	High	High	Black	V	7.68	10
168405	H016 NTH BND END & BURNS BEACH RD	984.04	175.76	High	High	Black	V	5.37	11*
14845	ALBANY HWY & DENNY AV	1075.08	145.65	High	High	Black	V	4.86	12
82815	ALBANY HWY (END DUAL) & MAIN ST	706.74	212.69	High	High	Black	V	4.66	13*
14786	ROE HWY & BERKSHIRE RD	1084.13	133.33	High	High	Black	V	4.48	14**
12315	ARMADALE RD & TAPPER RD & VERDE DR	1297.60	110.84	High	High	Black	V	4.46	15
119141	REID HWY & OKELY RD (NORTH)	1334.46	103.86	Med-High	High	Black	V	4.30	16**
119092	KWINANA FWY NTH - RUSSELL RD & RUSSELL RD & RUSSELL RD - KWINANA FWY NTH	513.20	250.24	High	High	Black	V	3.98	17
14121	CANNING HWY & HENLEY ST	1160.57	110.41	High	High	Black	V	3.98	18
50639	EAST PDE - LORD ST & LORD ST & NEWCASTLE ST	1168.34	105.11	Med-High	High	Black	V	3.81	19
77668	REID HWY & WEST SWAN RD	3109.87	99.56	Med-High	High	Black	IV	9.61	20

4147	GREAT NORTHERN HWY & ROE HWY & GREAT NORTHERN HWY & REID HWY	3165.27	93.42	Med-High	High	Black	IV	9.17	21
4336	WANNEROO RD & NEWCASTLE ST & CHARLES ST ON - H016 STH BOUND & H016 NTH BOUND	2666.58	95.56	Med-High	High	Black	IV	7.91	22
55048	KARRINYUP - MORLEY HWY & WANNEROO RD	3085.44	80.76	Med-High	High	Black	IV	7.73	23
55516	KARRINYUP - MORLEY HWY & FLINDERS ST	2996.15	78.79	Med-High	High	Black	IV	7.32	24
38822	ORRONG RD & ARCHER ST	2731.93	85.31	Med-High	High	Black	IV	7.23	25
50690	WANNEROO RD & GREEN ST & WALCOTT ST	2874.66	79.39	Med-High	High	Black	IV	7.08	26
4160	GUILDFORD RD & GARRATT RD	3119.15	72.45	Med-High	High	Black	IV	7.01	27
14106	SOUTH ST & H015 STH BOUND - SOUTH ST WEST	2577.70	81.10	Med-High	High	Black	IV	6.49	28
14898	ROE HWY & TOODYAY RD & TOODYAY RD	2878.37	62.87	Med-High	High	Black	IV	5.61	29
14172	GUILDFORD RD & EIGHTH AV	1933.93	89.15	Med-High	High	Black	IV	5.35	30
14713	GREAT EASTERN HWY & FAUNTLEROY AV	2432.35	69.48	Med-High	High	Black	IV	5.24	31
13900	WHITFORDS AV ON - H016 STH BOUND & WHITFORDS AV & H016 STH BOUND - WHITFORDS AV	1987.46	84.10	Med-High	High	Black	IV	5.19	32
67708	LOFTUS ST ON - H020 EAST BOUND & LOFTUS ST & LEEDERVILLE PDE	2076.51	78.24	Med-High	High	Black	IV	5.04	33
4161	GUILDFORD RD & COLLIER RD	1953.71	80.26	Med-High	High	Black	IV	4.86	34
55559	KARRINYUP - MORLEY HWY & GRAND PROM	2206.82	70.45	Med-High	High	Black	IV	4.82	35
39611	KEWDALE RD & ORRONG RD	2369.56	64.27	Med-High	High	Black	IV	4.72	36
4413	ALBANY HWY & KELVIN RD & OLGA RD	2175.85	69.05	Med-High	High	Black	IV	4.66	37
14306	ALBANY HWY & LIEGE ST	2107.26	67.51	Med-High	High	Black	IV	4.41	38
13822	STIRLING HWY & MARMION ST	1278.43	102.66	Med-High	High	Black	IV	4.07	39
128025	KENWICK LINK & H018 NTH BND OFF & ON	2088.19	62.68	Med-High	High	Black	IV	4.06	40
11975	WANNEROO RD & VICTORIA RD & HALLEY RD	1289.05	99.96	Med-High	High	Black	IV	4.00	41
4123	ALBANY HWY & FREMANTLE RD	1876.50	68.44	Med-High	High	Black	IV	3.98	42
75552	WELSHPOOL RD EAST & H018 STH BOUND OFF & ON	1422.90	79.26	Med-High	High	Black	IV	3.50	43
38828	ORRONG RD & OATS ST - LG BDRY	3884.83	54.54	Med-High	High	Black	III	6.57	44

3641	REID HWY & REID HWY ON - H016 NTH BOUND & MITCHELL FWY NTH - REID HWY	3411.28	55.41	Med-High	High	Black	III	5.86	45
4356	KARRINYUP - MORLEY HWY & KARRINYUP RD ON - H016 NTH BOU & CEDRIC ST - KARRINYUP	3343.21	54.11	Med-High	High	Black	III	5.61	46
4154	WANNEROO RD & HEPBURN AV	2891.19	58.69	Med-High	High	Black	III	5.26	47
55308	KARRINYUP - MORLEY HWY & ALEXANDER DR (STH BND)	2772.34	57.99	Med-High	High	Black	III	4.99	48
47049	SOUTH ST & KAREL AV	2517.12	61.34	Med-High	High	Black	III	4.79	49
4575	WANNEROO RD & WHITFORDS AV	2605.69	58.50	Med-High	High	Black	III	4.73	50
4462	CANNING HWY & WAY RD	2747.20	53.05	Med-High	High	Black	III	4.52	51
55596	KARRINYUP - MORLEY HWY & DIANELLA DR	2226.50	57.37	Med-High	High	Black	III	3.96	52

¹RTR: Road Trauma Risk ²CSP: Comparative Safety Performance

* Minor change(s) were applied to the intersection between 1 January 2011 and 1 December 2016, such as painting or repainting of lines and/or arrows.

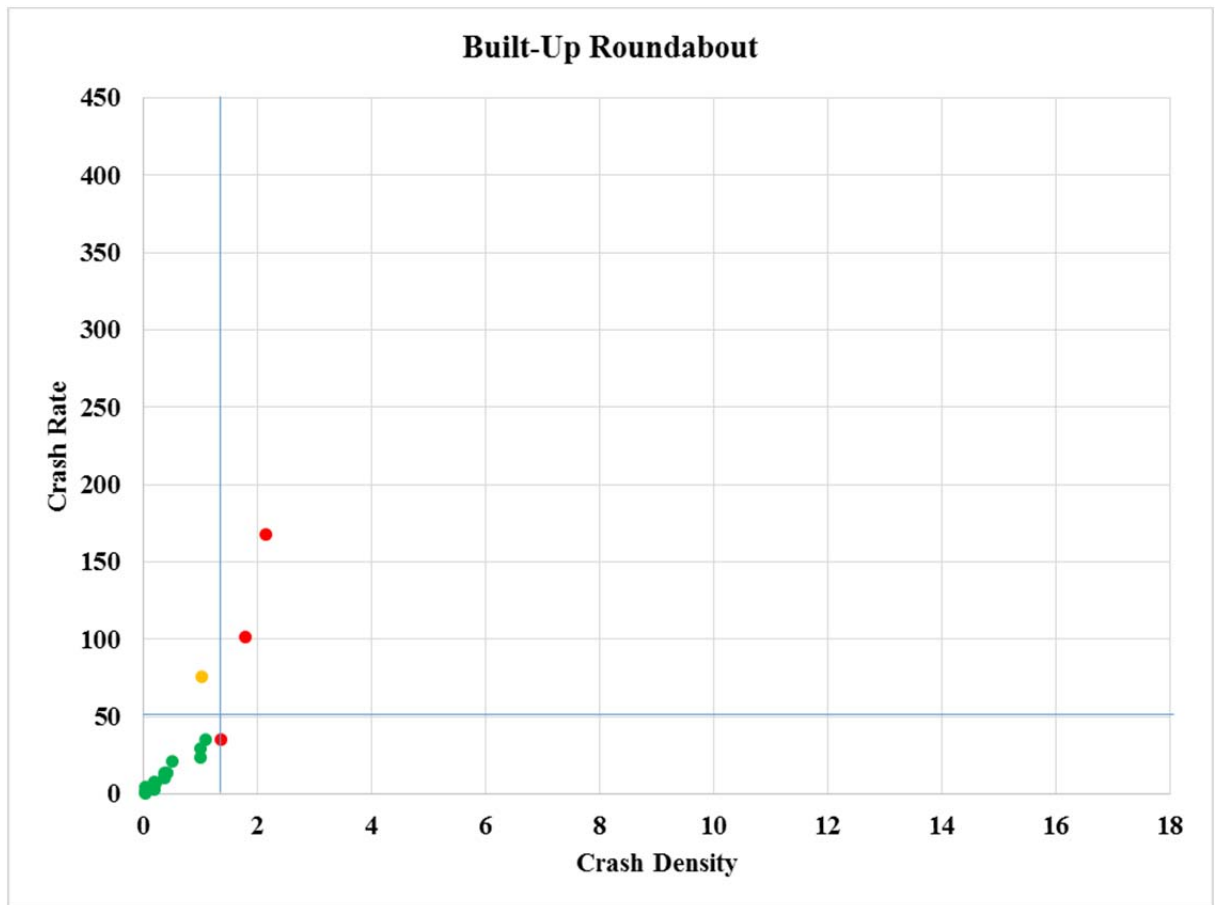
** Significant change(s) were applied to the intersection between 1 January 2011 and 1 December 2016, that could be road safety related treatment(s) other than painting, and/or traffic related structure overhaul.

Table 3 shows the rankings of the 52 intersections in the built-up speed environment by RTR, CSP and KSI metric. The top six intersections were in the black quadrant with a CSP of V and a KSI metric of above 10.

3.2 Intersections with a roundabout and a built-up speed environment

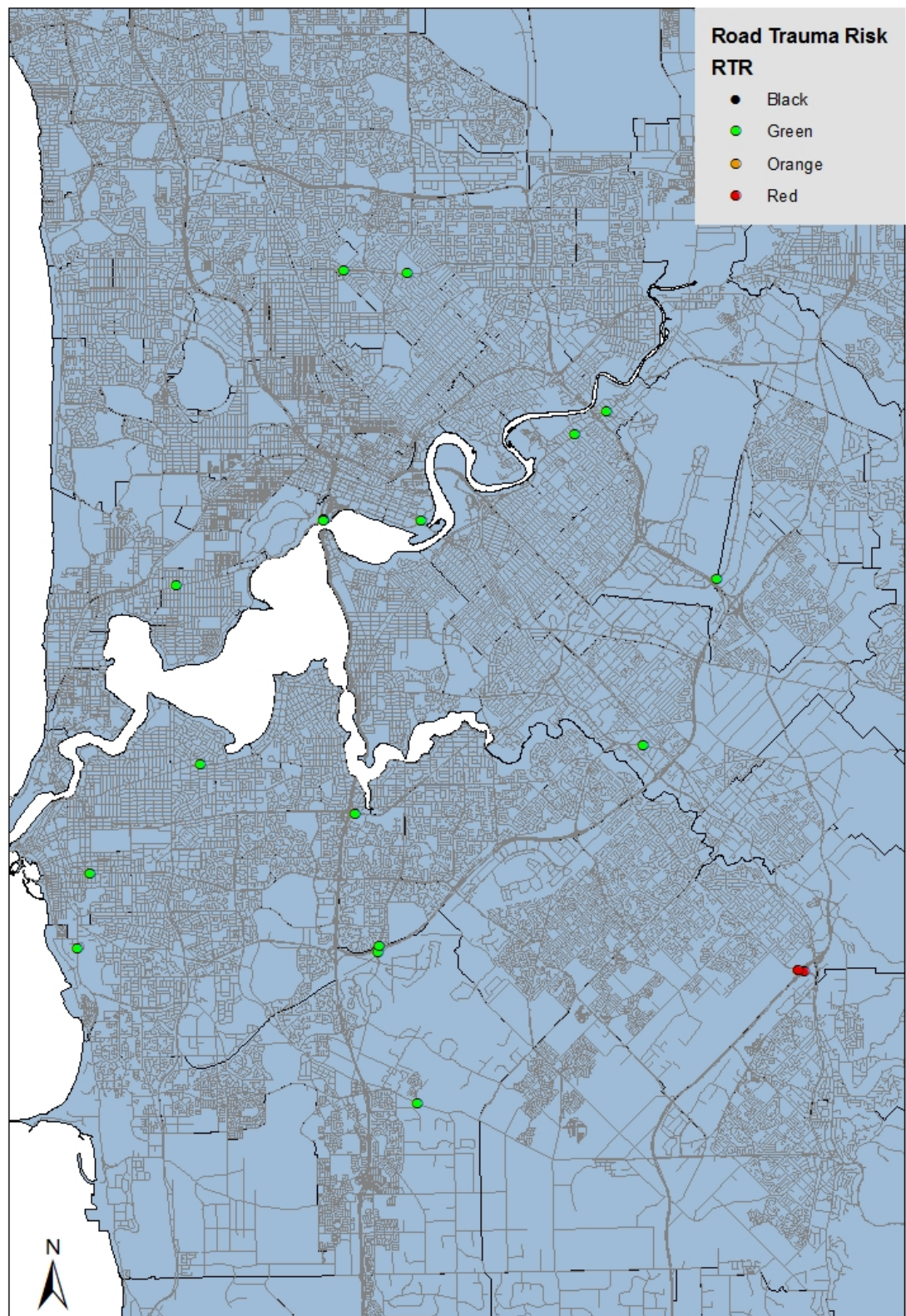
3.2.1 Road Trauma Risk Analysis

Figure 6: Road Trauma Risk: Intersections with a roundabout and a built-up speed environment



Very few intersections controlled with a roundabout in a built-up speed environment had casualty crashes ($n=23$, 2.3% of all examined intersections). The RTR ratings for this group of crashes are shown in Figure 6 and Map 3. No intersections were classified in the black quadrant, with three (13%) of the intersections being classified in the red quadrant and one (4.3%) in the orange quadrant. Most intersections in the red quadrant had relatively low crash rates (KSI metric/exposure to traffic, range: 35-168 – Table 4) and crash density (KSI metric, range: 1.4-2.2) compared to the intersections in the built-up speed environment with traffic signals. Map 3 demonstrated the location of the intersections with the red and orange quadrants: in outer suburbs such as Rockingham and Southern River/Gosnells (Map 3).

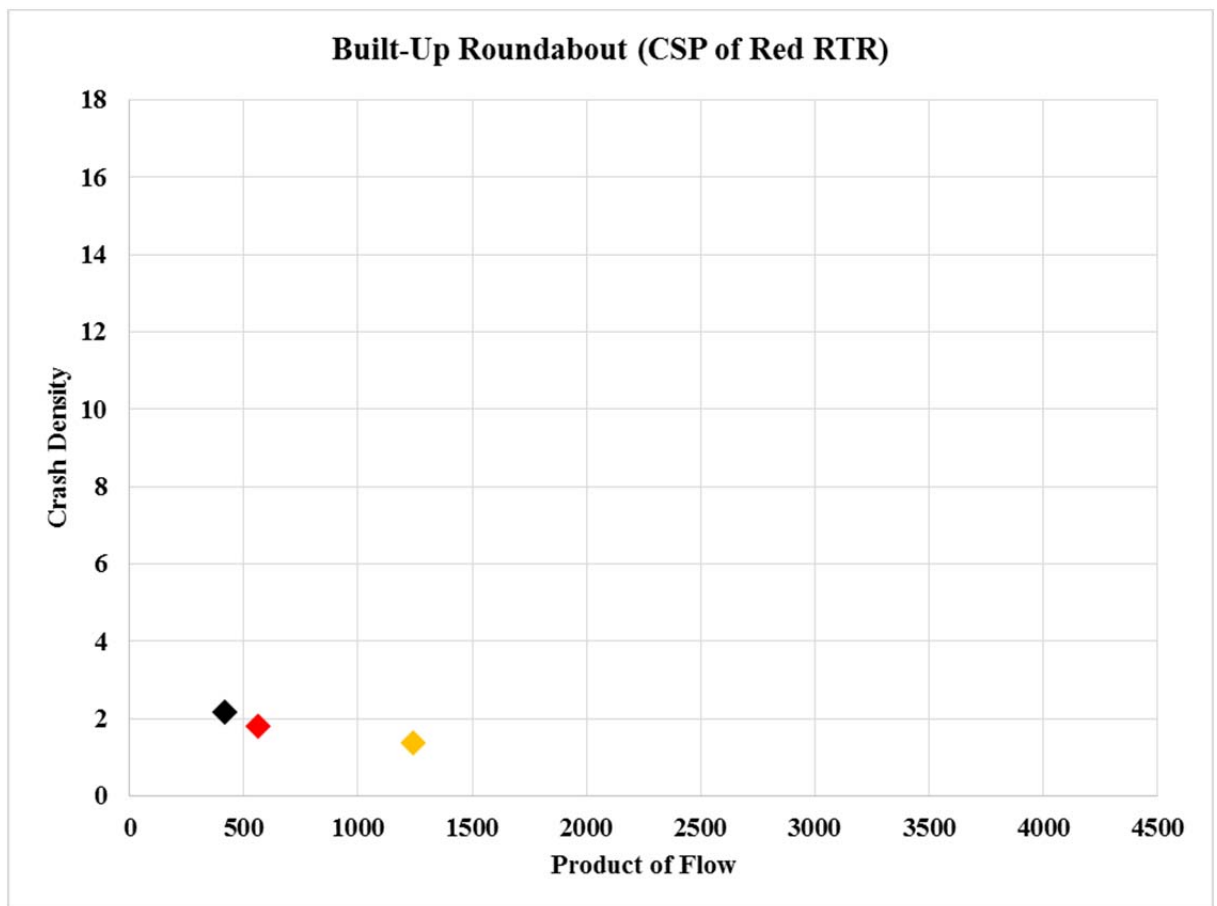
Map 3: Road Trauma Risk: Intersections with a roundabout and a built-up speed environment



Of the three intersections with roundabouts in built-up speed environments which were considered the least safe, all three fell in the red quadrant (Table 4). Two were initially categorised as black quadrant intersections but were manually altered to the red quadrant due to their lower KSI (below three) and highway/freeway road type. One was a four-way intersection and the other two were unknown intersection types.

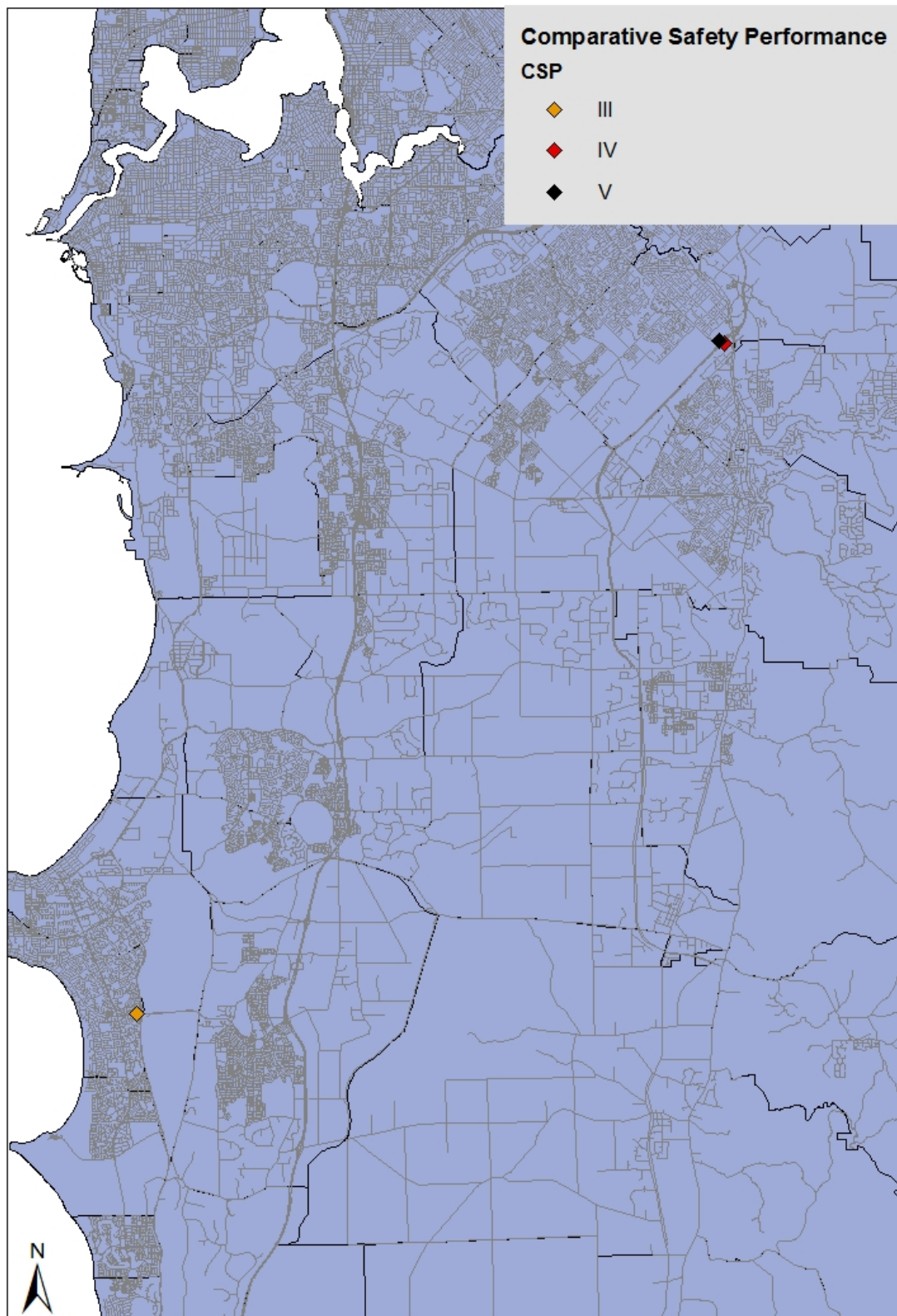
3.2.2 Comparative Safety Performance Analysis

Figure 7: Comparative Safety Performance: Intersections with a roundabout and a built-up speed environment



The CSP categories are shown in Figure 7 and Map 4. Of the three intersections selected as high risk intersections, one each were in CSP categories III, IV and V. The intersection with the highest CSP score (V, the least safe intersection) had the lowest products of flow (414), compared to the intersection in CSP III which had a product of flow of 1245 (Table 4). Crash density ranged from 35 to 168. All three intersections were located in outer suburbs (Map 4), with the intersection in CSP V located in the Southern River/Gosnells area.

Map 4: Comparative Safety Performance: Intersections with a roundabout and a built-up speed environment



3.2.3 Ranking of high risk intersections

Table 4: Ranking of high risk intersections with a roundabout and a built-up speed environment

Intersection number	Intersection Description	Product of Flow	Crash Rate	Crash Rate Category	Crash Density Category	RTR ¹ Quadrant	CSP ² Category	KSI Metric	Intersection rank
139158	TONKIN HWY (NTH BND) OFF & CORFIELD ST & TONKIN HWY (NTH BND) ON	413.75	167.91	High	Med-High	Red	V	2.16	1
139162	TONKIN HWY (STH BND) OFF & CORFIELD ST & TONKIN HWY (STH BND) ON	567.76	101.33	Med-High	Med-High	Red	IV	1.78	2*
119133	ENNIS AV NTH - SAFETY BAY RD & SAFETY BAY RD & SAFETY BAY RD - ENNIS AV NTH	1,245.43	35.47	Med	Med-High	Red	III	1.37	3

¹RTR: Road Trauma Risk ²CSP: Comparative Safety Performance

* Minor change(s) were applied to the intersection between 1 January 2011 and 1 December 2016, such as painting or repainting of lines and/or arrows.

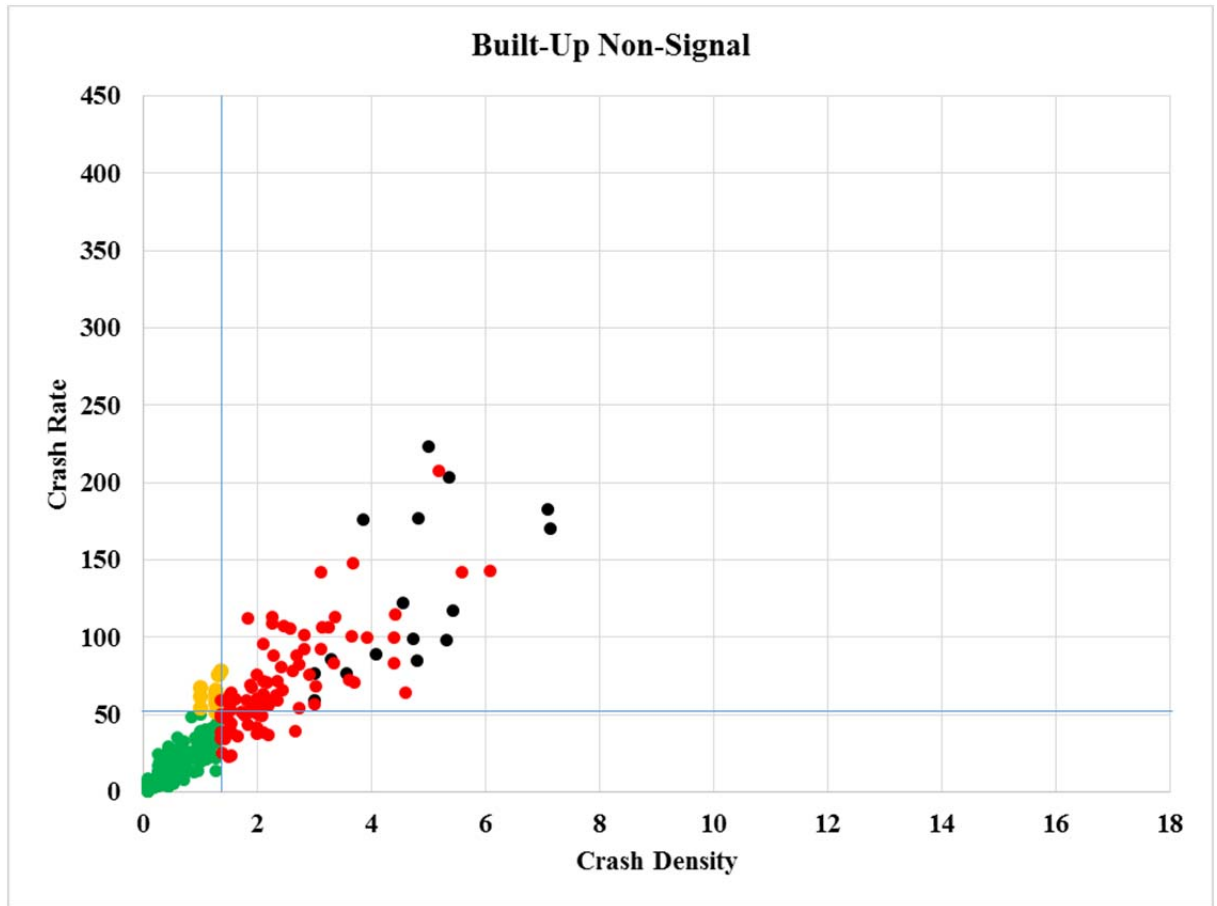
** Significant change(s) were applied to the intersection between 1 January 2011 and 1 December 2016, that could be road safety related treatment(s) other than painting, and/or traffic related structure overhaul.

The intersections with the highest RTR in this intersection type were all in the red quadrant (Table 4). As the only intersection classified as CSP category V, this intersection was ranked first, with the intersection in CSP IV ranked second and the intersection in CSP III ranked third.

3.3 Intersections with no traffic signals and built-up speed environment

3.3.1 Road Trauma Risk Analysis

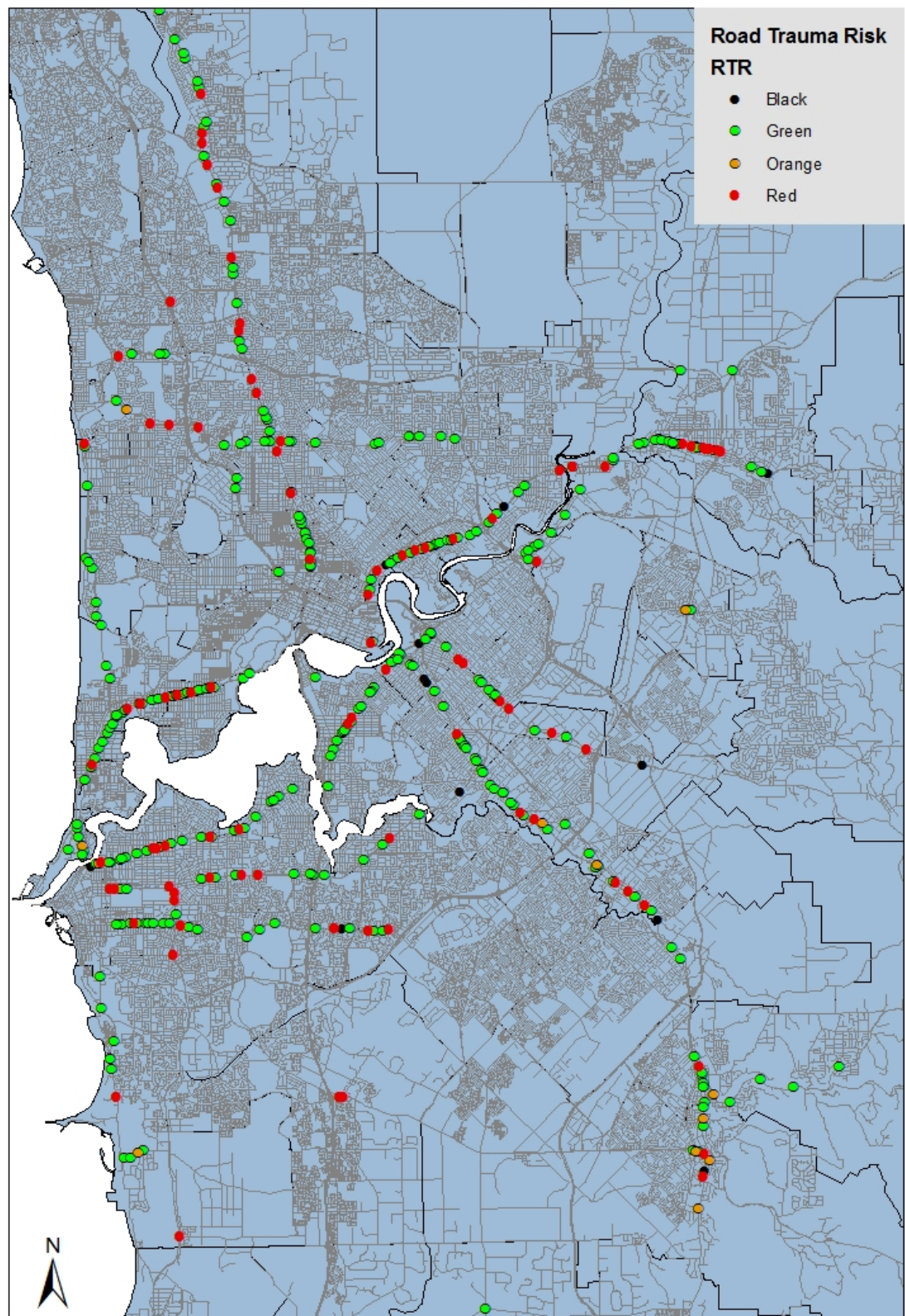
Figure 8: Road Trauma Risk: Intersections with no traffic signals and built-up speed environment



A high proportion of intersections ($n=425$, 43% of all intersections in the study) without traffic signals in a built-up speed environment had at least one casualty crash compared to other intersection categories. The RTR ratings for this group of crashes are shown in Figure 8 and Map 5. However, only 16 (3.8%) intersections in this intersection type were in the black quadrant, with 94 (22%) being in the red quadrant. Intersections in the black quadrant had lower crash density (range: 3-7, Figure 8 and Table 5) compared to intersections with traffic signals (up to 17 – Figure 4) with crash rates which ranged from 59 to 224.

Map 5 shows the location of the intersections of this type by RTR quadrant. The intersections with a higher RTR were spread throughout the Perth metro area, with most black quadrant intersections being located south of the river (Map 5).

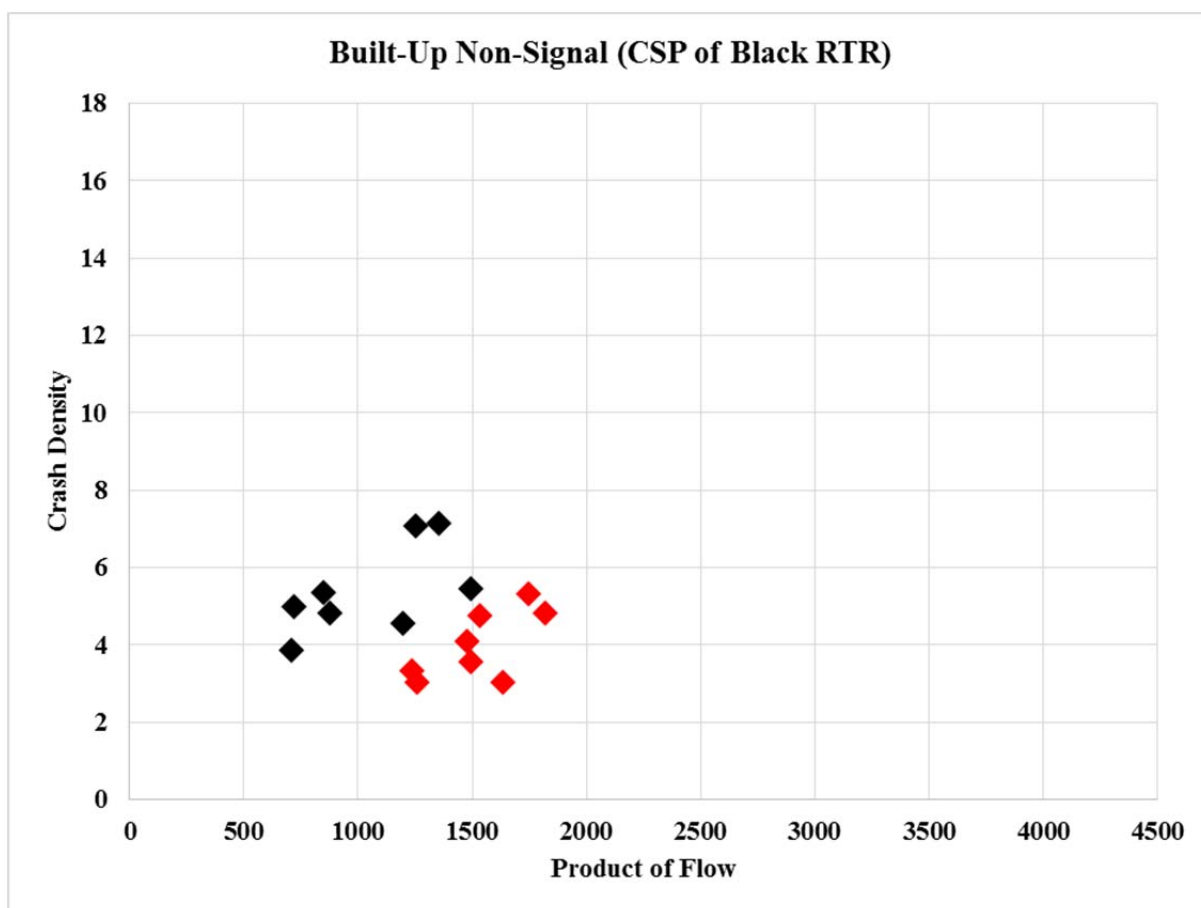
Map 5: Road Trauma Risk: Intersections with no traffic signals and built-up speed environment



3.3.2 Comparative Safety Performance Analysis

Table 5 lists the high risk intersections selected using RTR. All 16 intersections were in the black quadrant, with 8 (50%) being three-way intersections, 6 (38%) being four-way intersections and the remainder being of unknown type.

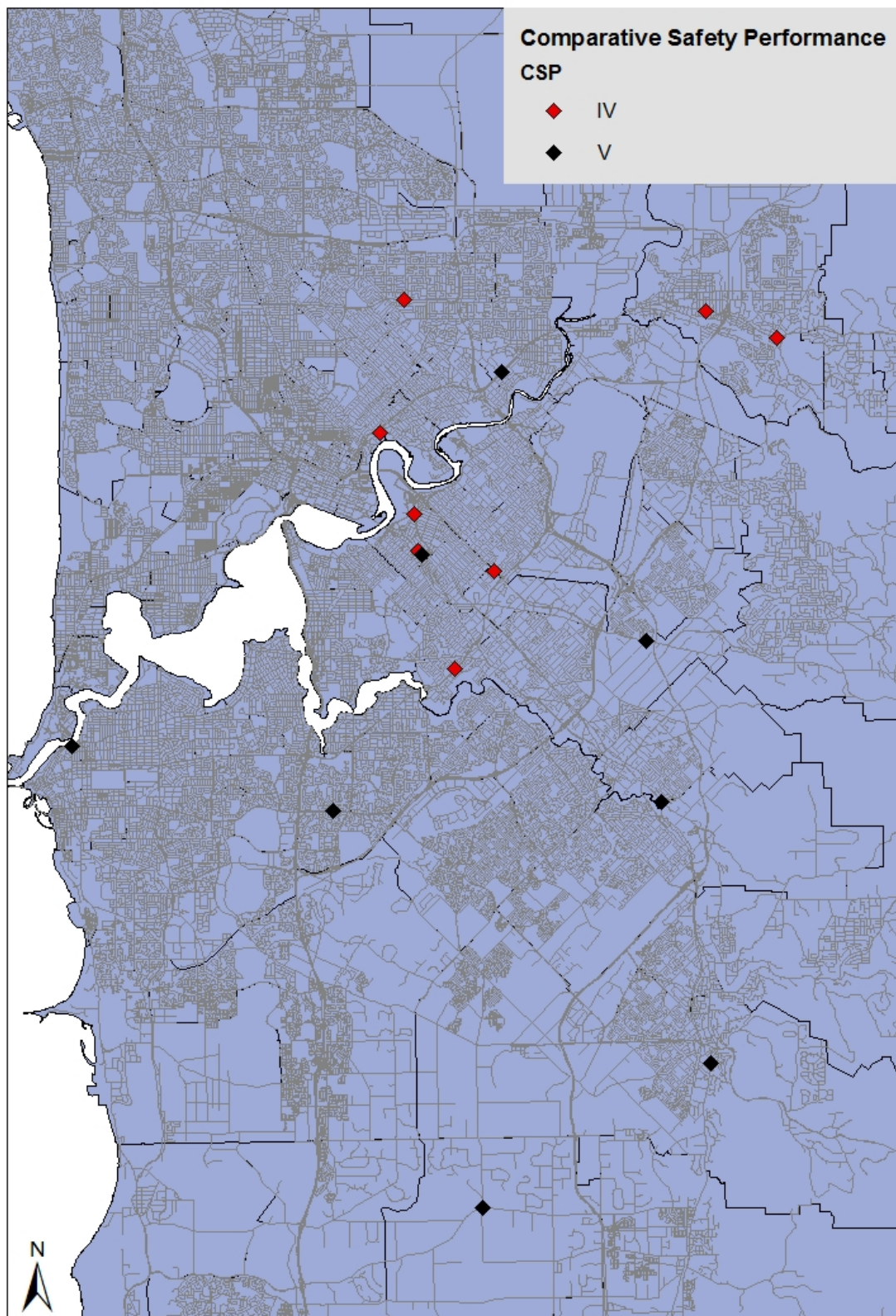
Figure 9: Comparative Safety Performance: Intersections with no traffic signals and built-up speed environment



The CSP categories of the 16 high risk crashes of this intersection type (all in the black quadrant) are shown in Figure 9. Eight (50%) had a CSP of V and eight (50%) had a CSP of IV. Intersections with in the highest CSP (V) tended to have lower products of flow (range: 706-1496) but higher crash density (range: 117-224) than similar intersections with lower CSP scores (Table 5). Crash density in the least safe intersections was generally across a smaller range (4 to 7) than built-up intersections with traffic signals (1 to 17).

Map 6 shows the location of the casualty intersections in the built-up environment with no traffic signals. Higher CSP-rated intersections in this class occurred more towards the eastern side of the metro area. Most of those in CSP V were south of the river.

Map 6: Comparative Safety Performance: Intersections with no traffic signals and built-up speed environment



3.3.3 Ranking of high risk intersections

Table 5: Ranking of high risk intersections with no traffic signals and built-up speed environment

Intersection number	Intersection Description	Product of Flow	Crash Rate	Crash Rate Category	Crash Density Category	RTR ¹ Quadrant	CSP ² Category	KSI Metric	Intersection rank
54230	NICHOLSON RD & THOMAS RD	1353.33	169.91	High	High	Black	V	7.13	1*
42886	CANNING HWY & EAST ST	1252.39	182.49	High	High	Black	V	7.09	2*
14192	ALBANY HWY & GRESHAM ST	1496.35	117.13	High	High	Black	V	5.44	3
45285	WELSHPOOL RD EAST & BRUCE RD & BROOK RD	850.04	203.48	High	High	Black	V	5.37	4
14879	SOUTH WESTERN HWY & THIRD RD	719.71	223.61	High	High	Black	V	4.99	5*
14295	GUILDFORD RD & COLSTOUN RD	878.20	176.73	High	High	Black	V	4.82	6
47051	SOUTH ST & WHEATLEY DR	1198.25	122.32	High	High	Black	V	4.55	7**
4414	ALBANY HWY & GOSNELLS RD WEST	706.25	176.09	High	High	Black	V	3.86	8**
4432	GREAT EASTERN HWY & SCOTT ST	1750.35	97.81	Med-High	High	Black	IV	5.31	9
14186	GREAT EASTERN HWY & VICTORIA PARK DR & BURSWOOD RD	1823.88	84.82	Med-High	High	Black	IV	4.80	10**
37927	KARRINYUP - MORLEY HWY & MCGILVRAY AV	1536.95	99.09	Med-High	High	Black	IV	4.73	11
14236	LEACH HWY & BRAIBRISE RD	1482.29	88.87	Med-High	High	Black	IV	4.09	12
14188	ALBANY HWY & AXON AV	1496.35	76.58	Med-High	High	Black	IV	3.56	13
14855	GREAT EASTERN HWY & FERGUSON ST	1238.44	85.97	Med-High	High	Black	IV	3.30	14
38835	ORRONG RD & PRESIDENT ST	1634.71	59.15	Med-High	High	Black	IV	3.00	15
75574	GUILDFORD RD & SECOND AV EAST	1259.07	76.80	Med-High	High	Black	IV	3.00	16*

¹RTR: Road Trauma Risk ²CSP: Comparative Safety Performance

* Minor change(s) were applied to the intersection between 1 January 2011 and 1 December 2016, such as painting or repainting of lines and/or arrows.

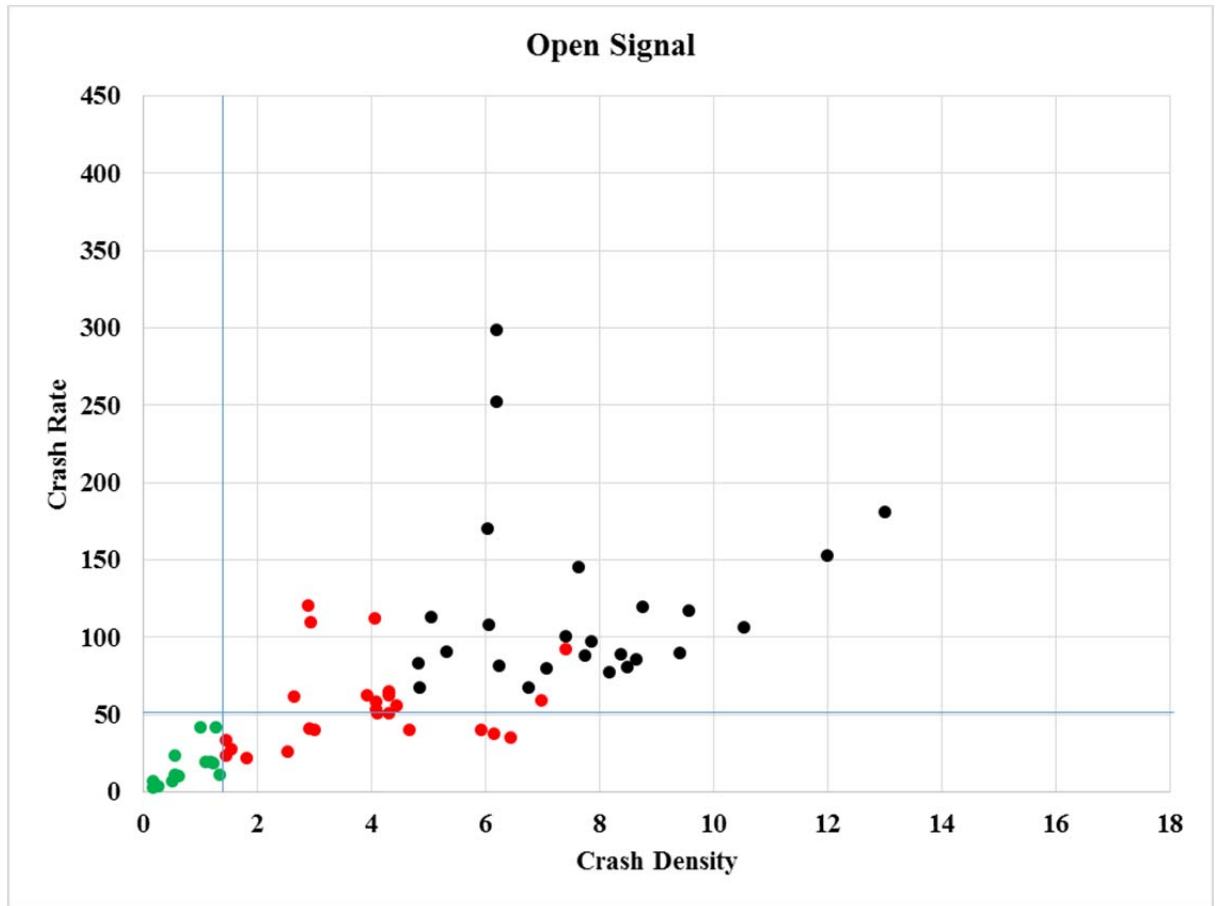
** Significant change(s) were applied to the intersection between 1 January 2011 and 1 December 2016, that could be road safety related treatment(s) other than painting, and/or traffic related structure overhaul.

Of the 16 intersections judged to be the least safe (Table 5), the two highest ranked intersections had KSI metrics of above 7.

3.4 Intersections with traffic signals and open speed environment

3.4.1 Road Trauma Risk Analysis

Figure 10: Road Trauma Risk: Intersections with traffic signals and open speed environment

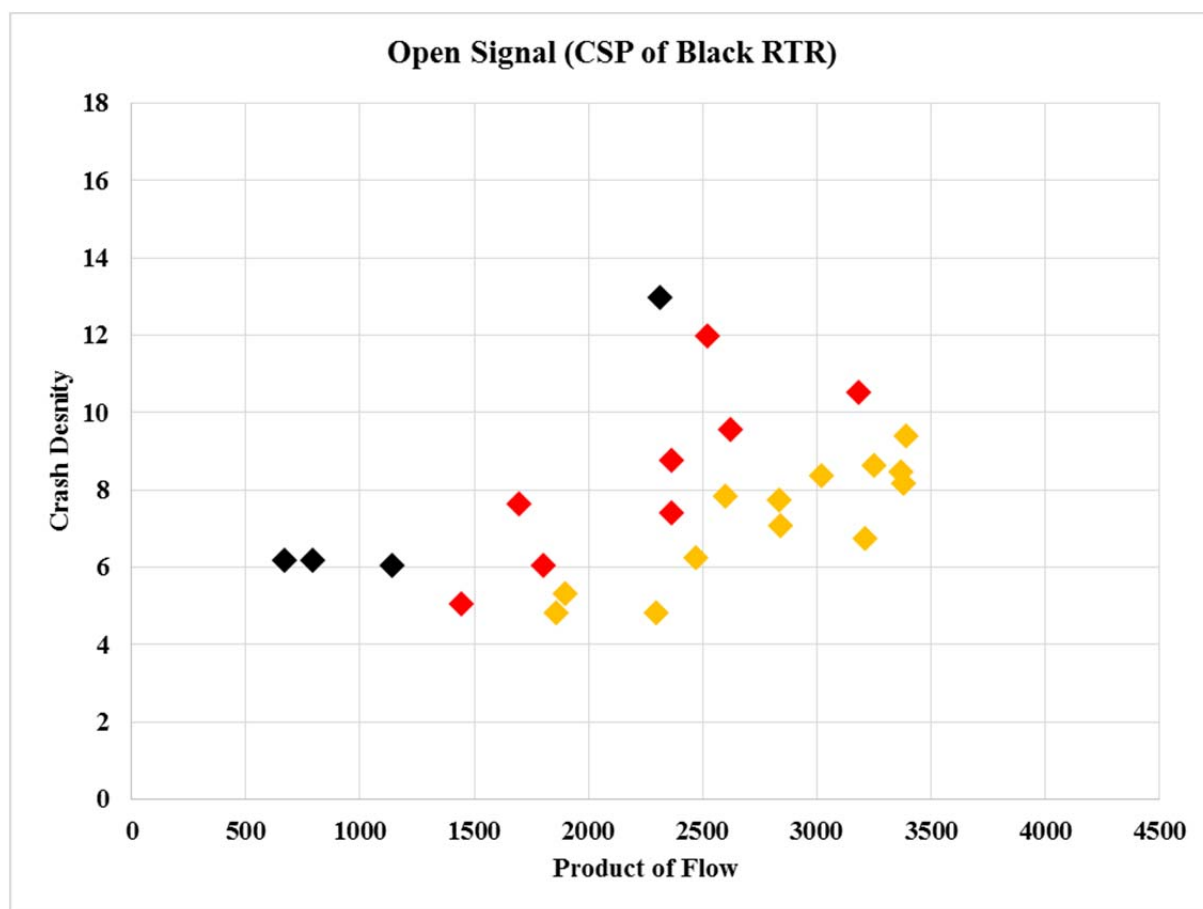


A relatively high number of intersections ($n=63$, 6.3%) with traffic signals in an open speed environment had at least one casualty crash compared to other intersections in the open speed environment categories. The RTR ratings for this group of crashes are shown in Figure 10. A total of 25 (40%) intersections fell in the black and 25 (40%) fell in the red quadrant. Several of the intersections in the black quadrant had high crash rates (in excess of 150) with moderately high crash density, while several had very high crash density but moderately high crash rates. Crash density for intersections in the black quadrant ranged from 5 to 13, while crash rates ranged from 68 to 298 (Table 6).

Table 6 details the 25 intersections which were classified as high risk crashes. Five of these were three-way intersections, 19 were four-way intersections and the remainder were of unknown type.

3.4.2 Comparative Safety Performance Analysis

Figure 11: Comparative Safety Performance: Intersections with traffic signals and open speed environment



Of the 25 intersections which were considered high risk, all were categorised in the black quadrant (Figure 11). Four (16%) intersections were in CSP category V, eight (32%) were in CSP IV and thirteen (52%) were in CSP III. Those intersections in the highest CSP category of V (least safe intersections) had lower products of flow (range: 669-2314) with crash density ranging from 6 to 13 (Table 6).

3.4.3 Ranking of high risk intersections

Table 6: Ranking of high risk intersections with traffic signals and open speed environment

Intersection number	Intersection Description	Product of Flow	Crash Rate	Crash Rate Category	Crash Density Category	RTR ¹ Quadrant	CSP ² Category	KSI Metric	Intersection rank
14261	REID HWY & BEECHBORO RD NORTH	2314.13	180.89	High	High	Black	V	12.99	1
14184	ARMADALE RD & WARTON RD	790.82	252.34	High	High	Black	V	6.19	2**
141661	TONKIN HWY & CHAMPION DR	668.56	298.38	High	High	Black	V	6.19	3**
14902	ROE HWY & MORRISON RD & MORRISON RD	1141.09	170.47	High	High	Black	V	6.03	4
14241	TONKIN HWY & BENARA RD	2522.55	153.09	High	High	Black	IV	11.98	5**
4543	TONKIN HWY & HORRIE MILLER DR & KEWDALE RD	3185.22	106.62	High	High	Black	IV	10.54	6**
4552	ROE HWY & KALAMUNDA RD	2622.48	117.37	High	High	Black	IV	9.55	7
4143	PATTERSON RD & ENNIS AV	2361.60	119.53	High	High	Black	IV	8.76	8
77885	REID HWY & ALTONE RD	1694.96	145.01	High	High	Black	IV	7.63	9
1544	ENNIS AV & ROCKINGHAM STATION ACCESS RD & RAE RD	2362.26	100.92	Med-High	High	Black	IV	7.40	10**
10142	ROCKINGHAM RD & ANKETELL RD	1804.63	108.22	High	High	Black	IV	6.06	11
4019	GREAT NORTHERN HWY & WEST SWAN RD	1442.12	113.02	High	High	Black	IV	5.06	12
4546	TONKIN HWY & HALE RD	3388.85	89.50	Med-High	High	Black	III	9.41	13
13875	WANNEROO RD & JOONDALUP DR	3252.25	85.73	Med-High	High	Black	III	8.65	14
4547	TONKIN HWY & WELSHPOOL RD EAST	3369.90	81.12	Med-High	High	Black	III	8.48	15
14176	REID HWY & MALAGA DR	3023.79	89.20	Med-High	High	Black	III	8.37	16
4035	WANNEROO RD & OCEAN REEF RD	3380.48	77.88	Med-High	High	Black	III	8.17	17
13837	ENNIS AV & ELANORA DR & GRANGE DR	2602.14	97.22	Med-High	High	Black	III	7.85	18
60436	MARMION AV & WHITFORDS AV	2834.50	88.13	Med-High	High	Black	III	7.75	19

60446	MARMION AV & OCEAN REEF RD	2842.95	80.09	Med-High	High	Black	III	7.06	20
4121	STOCK RD & SOUTH ST	3211.45	67.77	Med-High	High	Black	III	6.75	21
13807	ENNIS AV & CARVIE ST & COUNCIL AV	2471.88	81.31	Med-High	High	Black	III	6.24	22
138650	TONKIN HWY & THOMAS RD	1899.25	90.34	Med-High	High	Black	III	5.32	23
4116	STOCK RD & BEELIAR DR	2296.41	67.90	Med-High	High	Black	III	4.84	24
13935	ROCKINGHAM RD & RUSSELL RD (WEST)	1856.45	83.68	Med-High	High	Black	III	4.82	25

¹RTR: Road Trauma Risk ²CSP: Comparative Safety Performance

* Minor change(s) were applied to the intersection between 1 January 2011 and 1 December 2016, such as painting or repainting of lines and/or arrows.

** Significant change(s) were applied to the intersection between 1 January 2011 and 1 December 2016, that could be road safety related treatment(s) other than painting, and/or traffic related structure overhaul.

Of the 25 intersections which were considered as high risk, 4 (16%) were also classified as having a CSP category of V (Table 6). These intersections were ranked highest. The intersection ranked first (intersection 14261, Reid Highway and Beechboro Road) had a much higher KSI metric (12.99) than the other three intersections with a CSP of V (KSI metrics of approximately 6).

3.5.1 Road Trauma Risk Analysis

Open Roundabout

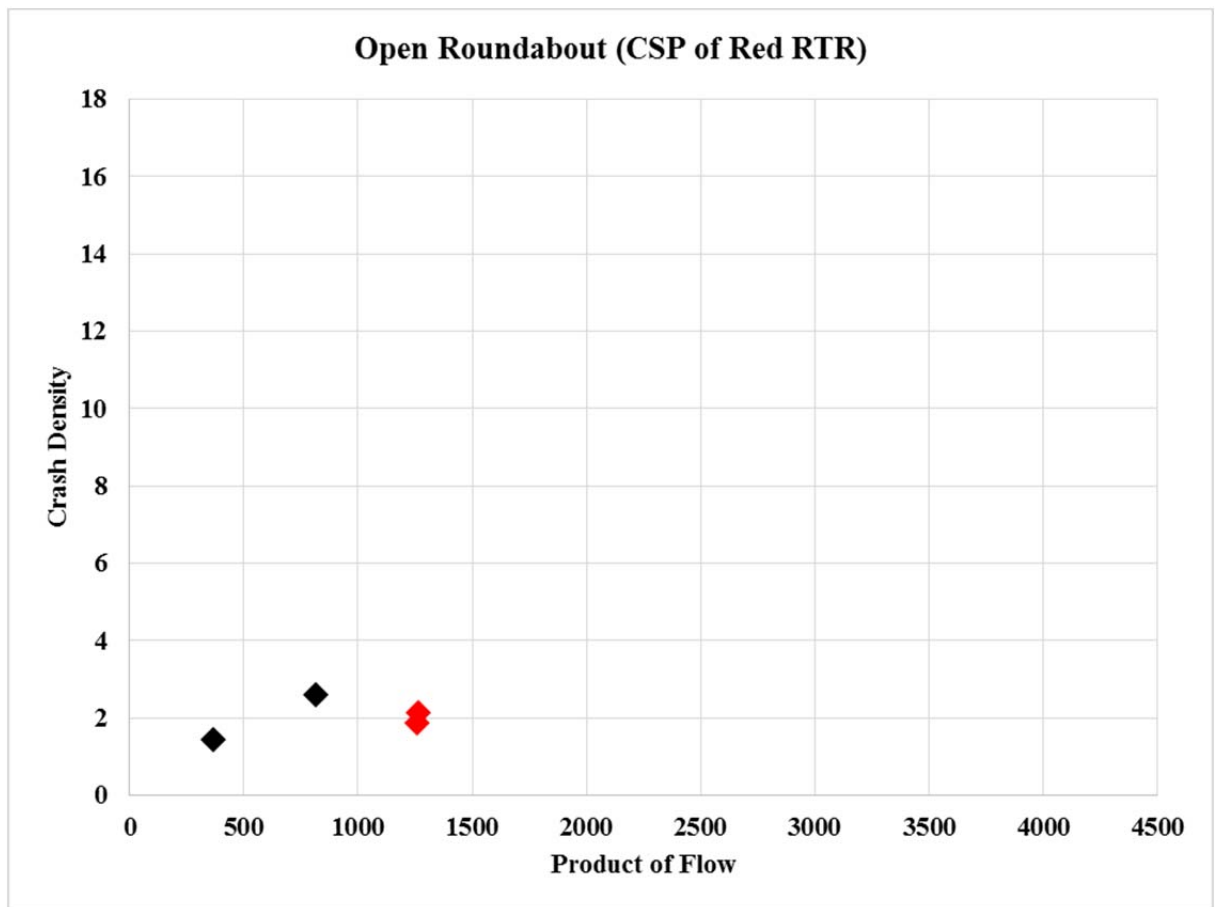
This scatter plot displays the relationship between Crash Density (X-axis) and Crash Rate (Y-axis) for an open roundabout. The X-axis ranges from 0 to 18, and the Y-axis ranges from 0 to 450. A vertical blue line is drawn at a Crash Density of 1.5, and a horizontal blue line is drawn at a Crash Rate of 50. The data points are categorized by color: green for low density and low rate, yellow for low density and medium rate, and red for medium density and medium rate.

Crash Density	Crash Rate	Category
0.1	0	Green
0.2	10	Green
0.3	20	Green
0.4	15	Green
0.5	25	Green
0.6	10	Green
0.7	15	Green
0.8	10	Green
0.9	15	Green
1.0	15	Green
1.1	15	Green
1.2	15	Green
1.3	15	Green
1.4	15	Green
1.5	15	Green
1.6	15	Green
1.7	15	Green
1.8	15	Green
1.9	15	Green
2.0	15	Green
2.1	15	Green
2.2	15	Green
2.3	15	Green
2.4	15	Green
2.5	15	Green
2.6	15	Green
2.7	15	Green
2.8	15	Green
2.9	15	Green
3.0	15	Green
3.1	15	Green
3.2	15	Green
3.3	15	Green
3.4	15	Green
3.5	15	Green
3.6	15	Green
3.7	15	Green
3.8	15	Green
3.9	15	Green
4.0	15	Green
4.1	15	Green
4.2	15	Green
4.3	15	Green
4.4	15	Green
4.5	15	Green
4.6	15	Green
4.7	15	Green
4.8	15	Green
4.9	15	Green
5.0	15	Green
5.1	15	Green
5.2	15	Green
5.3	15	Green
5.4	15	Green
5.5	15	Green
5.6	15	Green
5.7	15	Green
5.8	15	Green
5.9	15	Green
6.0	15	Green
6.1	15	Green
6.2	15	Green
6.3	15	Green
6.4	15	Green
6.5	15	Green
6.6	15	Green
6.7	15	Green
6.8	15	Green
6.9	15	Green
7.0	15	Green
7.1	15	Green
7.2	15	Green
7.3	15	Green
7.4	15	Green
7.5	15	Green
7.6	15	Green
7.7	15	Green
7.8	15	Green
7.9	15	Green
8.0	15	Green
8.1	15	Green
8.2	15	Green
8.3	15	Green
8.4	15	Green
8.5	15	Green
8.6	15	Green
8.7	15	Green
8.8	15	Green
8.9	15	Green
9.0	15	Green
9.1	15	Green
9.2	15	Green
9.3	15	Green
9.4	15	Green
9.5	15	Green
9.6	15	Green
9.7	15	Green
9.8	15	Green
9.9	15	Green
10.0	15	Green
10.1	15	Green
10.2	15	Green
10.3	15	Green
10.4	15	Green
10.5	15	Green
10.6	15	Green
10.7	15	Green
10.8	15	Green
10.9	15	Green
11.0	15	Green
11.1	15	Green
11.2	15	Green
11.3	15	Green
11.4	15	Green
11.5	15	Green
11.6	15	Green
11.7	15	Green
11.8	15	Green
11.9	15	Green
12.0	15	Green
12.1	15	Green
12.2	15	Green
12.3	15	Green
12.4	15	Green
12.5	15	Green
12.6	15	Green
12.7	15	Green
12.8	15	Green
12.9	15	Green
13.0	15	Green
13.1	15	Green
13.2	15	Green
13.3	15	Green
13.4	15	Green
13.5	15	Green
13.6	15	Green
13.7	15	Green
13.8	15	Green
13.9	15	Green
14.0	15	Green
14.1	15	Green
14.2	15	Green
14.3	15	Green
14.4	15	Green
14.5	15	Green
14.6	15	Green

Of the four intersections which were considered high risk intersections, all were in the red quadrant (Table 7). Three of these were three-way intersections and the other was a four-way intersection.

3.5.2 Comparative Safety Performance Analysis

Figure 13: Comparative Safety Performance: Intersections with a roundabout and open speed environment



Of the four intersections considered high risk intersections, two were identified as CSP category V and two were CSP category IV. The CSPs categories are shown in Figure 13. All intersections in this category had products of flow below 1300 with crash density of less than 3 (Table 7). The two intersections in CSP category IV had lower products of flow (103 and 126) than the intersections in CSP category III (48 and 54).

3.5.3 Ranking of high risk intersections

Table 7: Ranking of high risk intersections with a roundabout and open speed environment

Intersection number	Intersection Description	Product of Flow	Crash Rate	Crash Rate Category	Crash Density Category	RTR ¹ Quadrant	CSP ² Category	KSI Metric	Intersection rank
14796	GREAT EASTERN HWY BYPASS & STIRLING CR	813.68	103.42	Med-High	Med-High	Red	V	2.61	1
148903	H410 & WELD ST	367.51	125.66	High	Med-High	Red	V	1.43	2**
148910	H411 & ARMADALE RD (RT)	1267.85	53.65	Med-High	Med-High	Red	IV	2.11	3**
148909	H411 & ARMADALE RD (LT)	1260.27	47.72	Med	Med-High	Red	IV	1.87	4**

¹RTR: Road Trauma Risk ²CSP: Comparative Safety Performance

* Minor change(s) were applied to the intersection between 1 January 2011 and 1 December 2016, such as painting or repainting of lines and/or arrows.

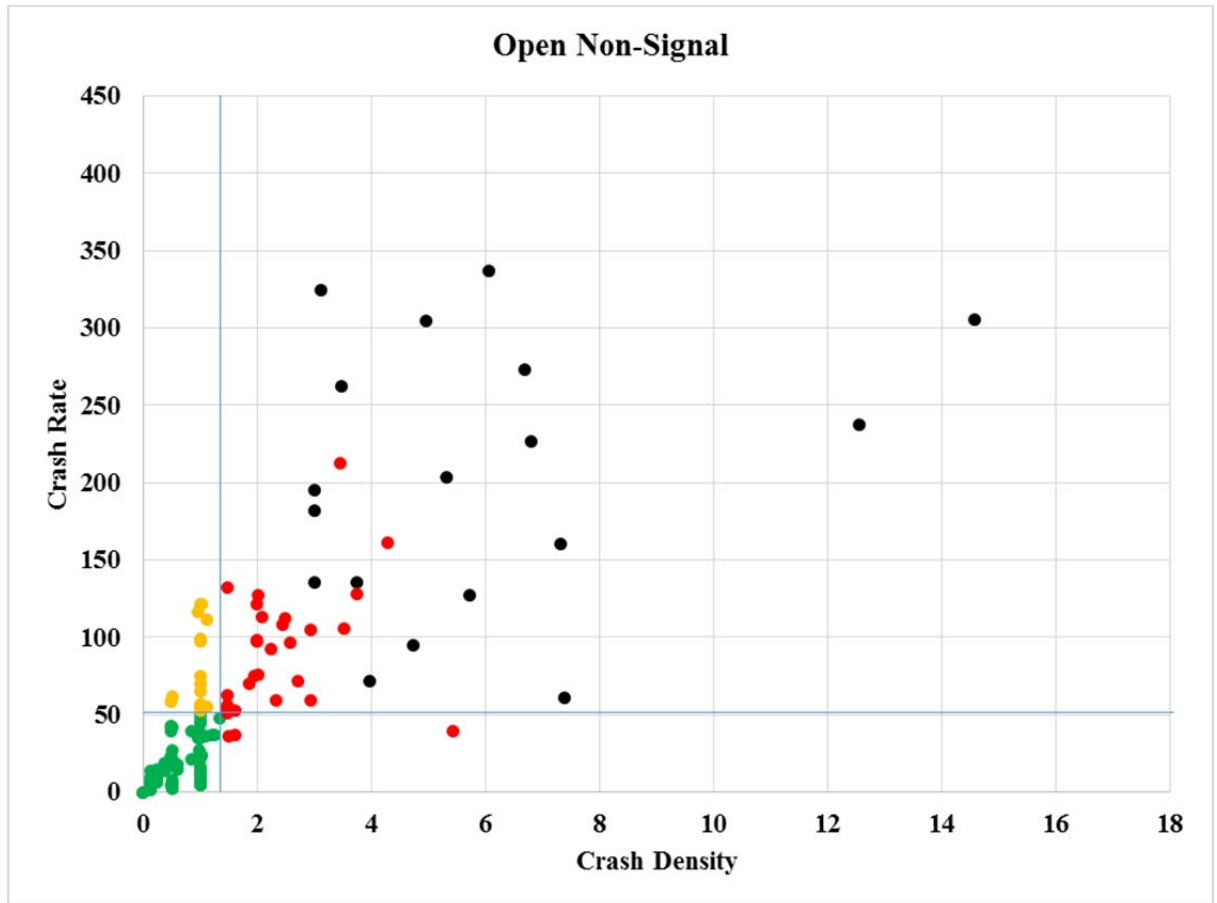
** Significant change(s) were applied to the intersection between 1 January 2011 and 1 December 2016, that could be road safety related treatment(s) other than painting, and/or traffic related structure overhaul.

All intersections selected as “least safe” in this category fell into the red quadrant (Table 7). The highest ranked intersection (intersection 14796, situated at Great Eastern Highway Bypass and Stirling Crescent) had a lower product of flow (814) than the third and fourth ranked intersections (1268 and 1260 respectively), but had the highest KSI metric of 2.6.

3.6 Intersections with no signals and open speed environment

3.6.1 Road Trauma Risk Analysis

Figure 14: Road Trauma Risk: Intersections with no signals and open speed environment

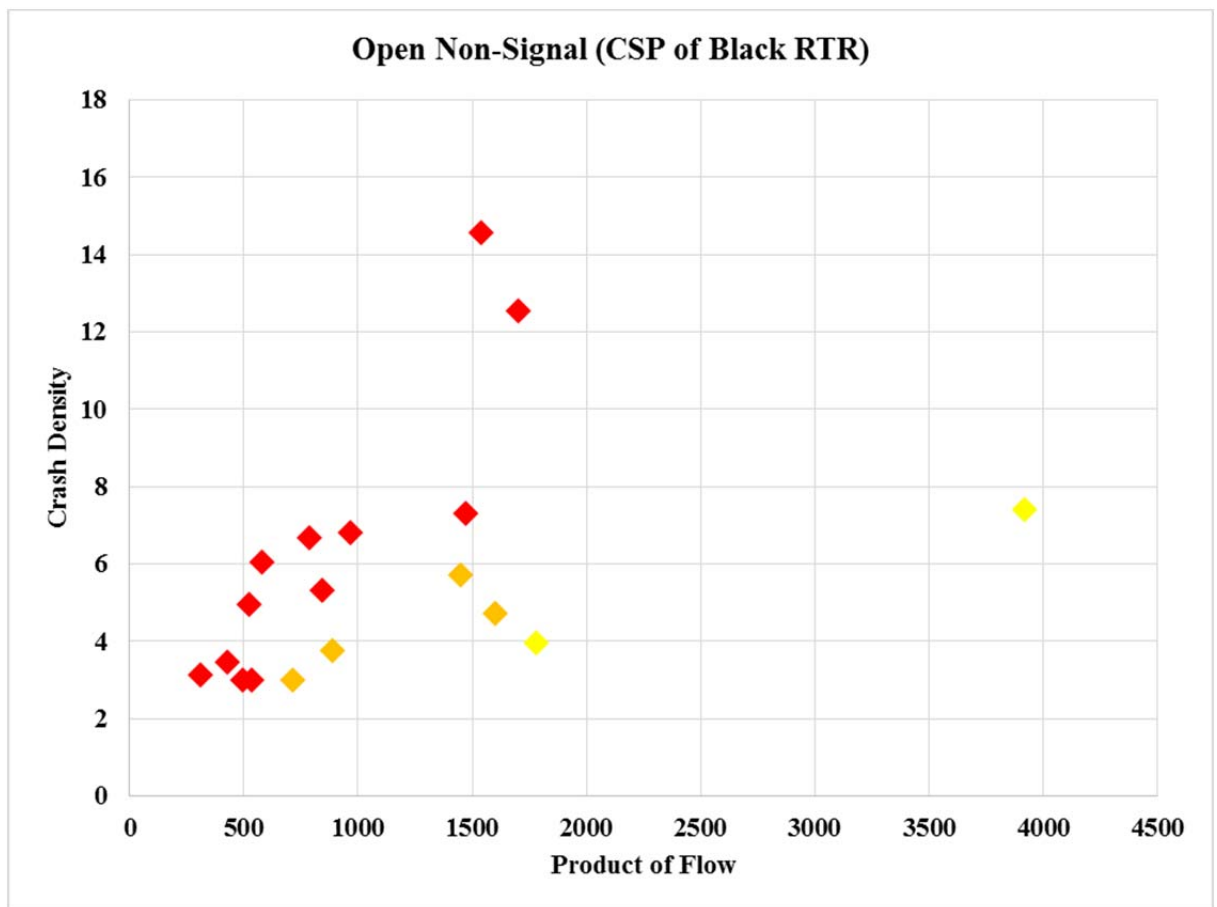


A total of 135 (14%) of all intersections were in an open speed environment and had no traffic control signals. Of these, 18 (13%) were in the black quadrant and 29 (21%) were in the red quadrant. The RTR ratings for intersections with no signals where a casualty crash occurred in an open speed environment are shown in Figure 14. Crash rates for intersections in the black quadrant were relatively high (range: 61-336) with lower crash density (range: 3-15) compared to other intersections in the open speed environment (Table 8).

A total of 18 intersections were considered high risk intersections (Table 8). All were categorised as having high crash density, with 3 categorised as having medium-high crash rate. The remainder were in the high crash rate category. Only one intersection was a four-way intersection, with 14 three-way intersections. The other intersections were of unknown type.

3.6.2 Comparative Safety Performance Analysis

Figure 15: Comparative Safety Performance: Intersections with no signals and open speed environment



A total of 18 intersections were considered high risk intersections, all falling in the black quadrant. Twelve (67%) of these were in CSP IV, four (22%) in CSP III and two (11%) in CSP II. The CSP categories are shown in Figure 15. Intersections in CSP IV (less safe intersections) tended to have higher crash rates (range: 161-336) than the intersections with lower CSP scores, and this higher risk group had crash density ranging from 3 to 15 (Table 8).

3.6.3 Ranking of high risk intersections

Table 8: Ranking of high risk intersections with no signals and open speed environment

Intersection number	Intersection Description	Product of Flow	Crash Rate	Crash Rate Category	Crash Density Category	RTR ¹ Quadrant	CSP ² Category	KSI Metric	Intersection rank
138328	ENNIS AV (NTH BND) & PORT KENNEDY DR	1538.38	305.05	High	High	Black	IV	14.56	1**
4549	TONKIN HWY & GOSNELLS RD WEST	1700.49	237.80	High	High	Black	IV	12.55	2**
36346	ARMADALE RD & EIGHTH RD	1470.23	160.56	High	High	Black	IV	7.32	3*
75571	ENNIS AV & WILLMOTT DR	967.98	226.54	High	High	Black	IV	6.80	4**
4018	GREAT NORTHERN HWY & RUTLAND RD	789.65	272.74	High	High	Black	IV	6.68	5*
54070	KARGOTICH RD & THOMAS RD	579.39	336.45	High	High	Black	IV	6.05	6**
80578	ENNIS AV & ROYAL PALM DR	842.57	203.26	High	High	Black	IV	5.31	7
36770	ARMADALE RD & GRIBBLE AV	523.76	304.54	High	High	Black	IV	4.95	8
14934	TOODYAY RD & CAMPERSIC RD	428.26	261.88	High	High	Black	IV	3.48	9
15015	GREAT EASTERN HWY & OLD NORTHAM RD	310.12	324.44	High	High	Black	IV	3.12	10
15001	GREAT EASTERN HWY & RAILWAY TCE WEST	532.63	181.54	High	High	Black	IV	3.00	11
46412	THOMAS RD & MEDINA AV	495.38	195.20	High	High	Black	IV	3.00	12
60434	MARMION AV & COOK AV	1447.77	127.17	High	High	Black	III	5.71	13
60442	MARMION AV & MULLALOO DR	1602.14	95.01	Med-High	High	Black	III	4.72	14
60438	MARMION AV & CORAL ST	890.45	135.85	High	High	Black	III	3.75	15
14920	GREAT NORTHERN HWY & Warbrook Rd	712.84	135.65	High	High	Black	III	3.00	16
4545	ROE HWY & H017 STH BOUND - ROE HWY OFF & ROE HWY ON - H017 STH BOUND	3919.27	60.70	Med-High	High	Black	II	7.38	17
60424	MARMION AV & SEACREST DR	1781.85	71.62	Med-High	High	Black	II	3.96	18

¹RTR: Road Trauma Risk ²CSP: Comparative Safety Performance

* Minor change(s) were applied to the intersection between 1 January 2011 and 1 December 2016, such as painting or repainting of lines and/or arrows.

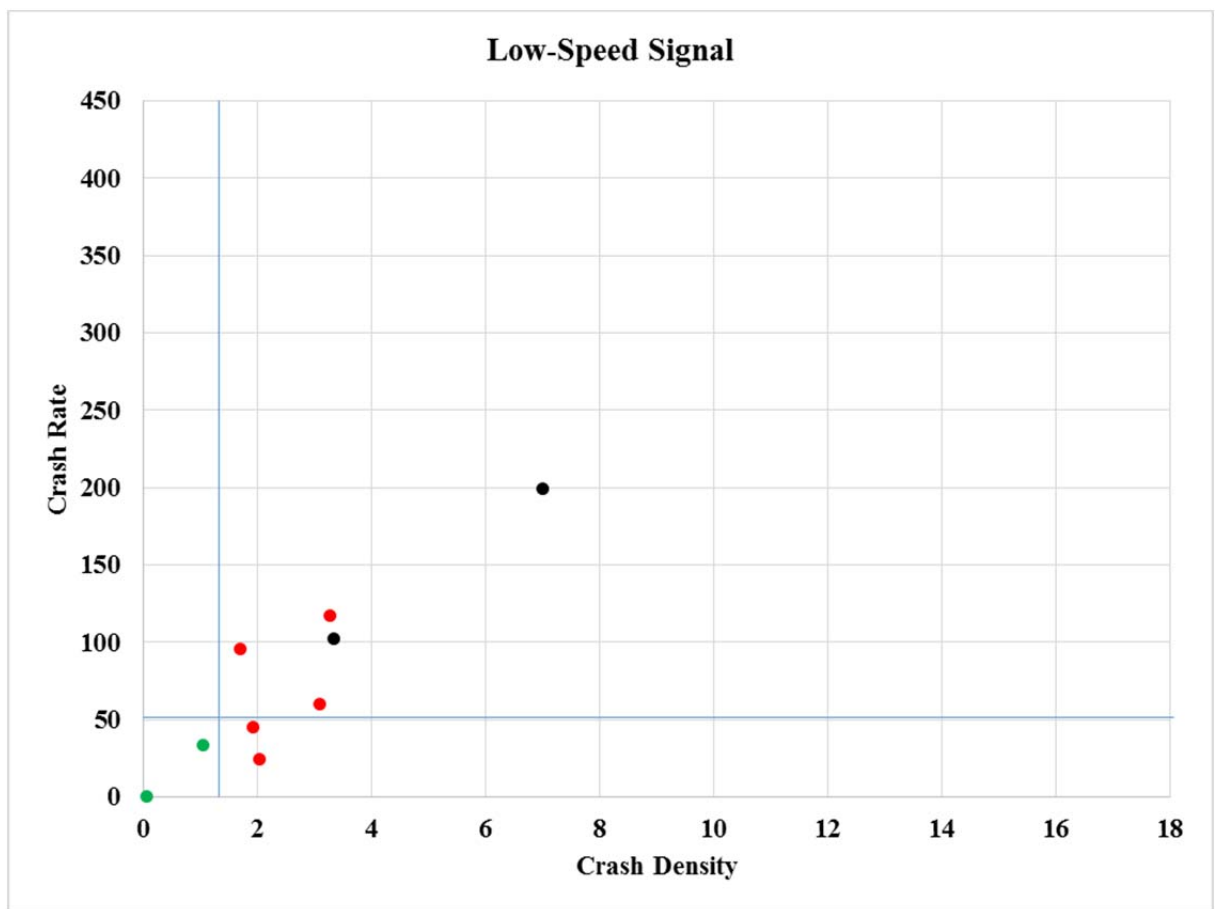
** Significant change(s) were applied to the intersection between 1 January 2011 and 1 December 2016, that could be road safety related treatment(s) other than painting, and/or traffic related structure overhaul.

All 18 intersections selected as “least safe” in this category were in the black quadrant, with the top 12 ranked intersections being in CSP category IV (Table 8). The top two ranked intersections had much higher KSI metrics than the other intersections (14.56 and 12.55, compared to KSI metrics of below 8 for all other intersections.)

3.7 Intersections with traffic signals and low-speed environment

3.7.1 Road Trauma Risk Analysis

Figure 16: Road Trauma Risk: Intersections with traffic signals and low-speed environment



Only nine (0.90%) of casualty crash intersections had traffic signals and occurred in a low-speed environment. The RTR for intersections in this category are shown in Figure 16. Two fell in the black quadrant, five in the red quadrant and two in the green quadrant. There was a large range of crash rates (range: 25-199) and crash density (range: 2-7) in the intersections in the black and red quadrants (Table 9), with one outlier with a crash density of 7 and a crash rate of 199 (intersection 50569, Wellington Street and George Street).

Seven intersections were categorised as high serious intersections – two in the black quadrant and five in the red quadrant (Table 9). Four of the intersections were three-way intersections and the remaining three were of unknown type.

3.7.2 Comparative Safety Performance Analysis

Figure 17: Comparative Safety Performance: Intersections with traffic signals and low-speed environment in the black quadrant

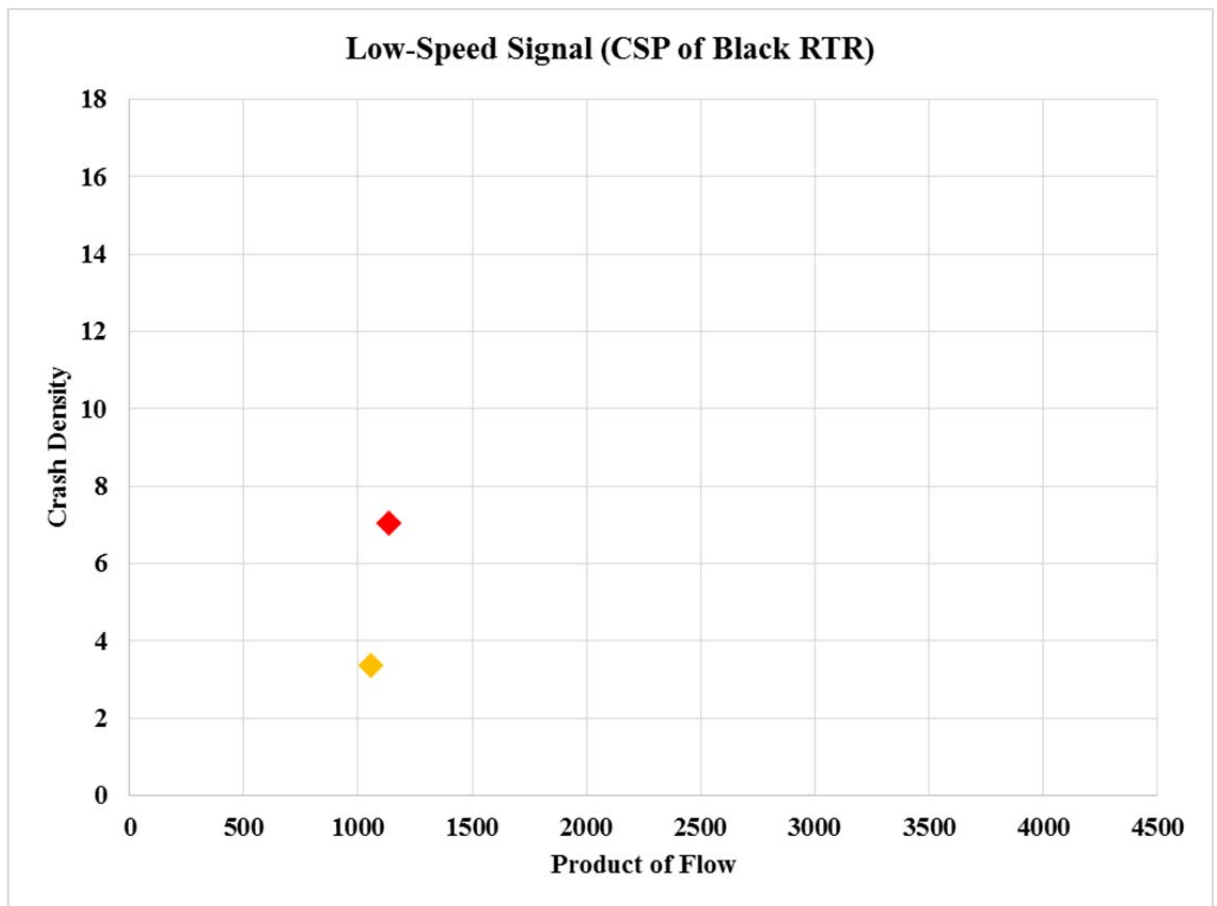
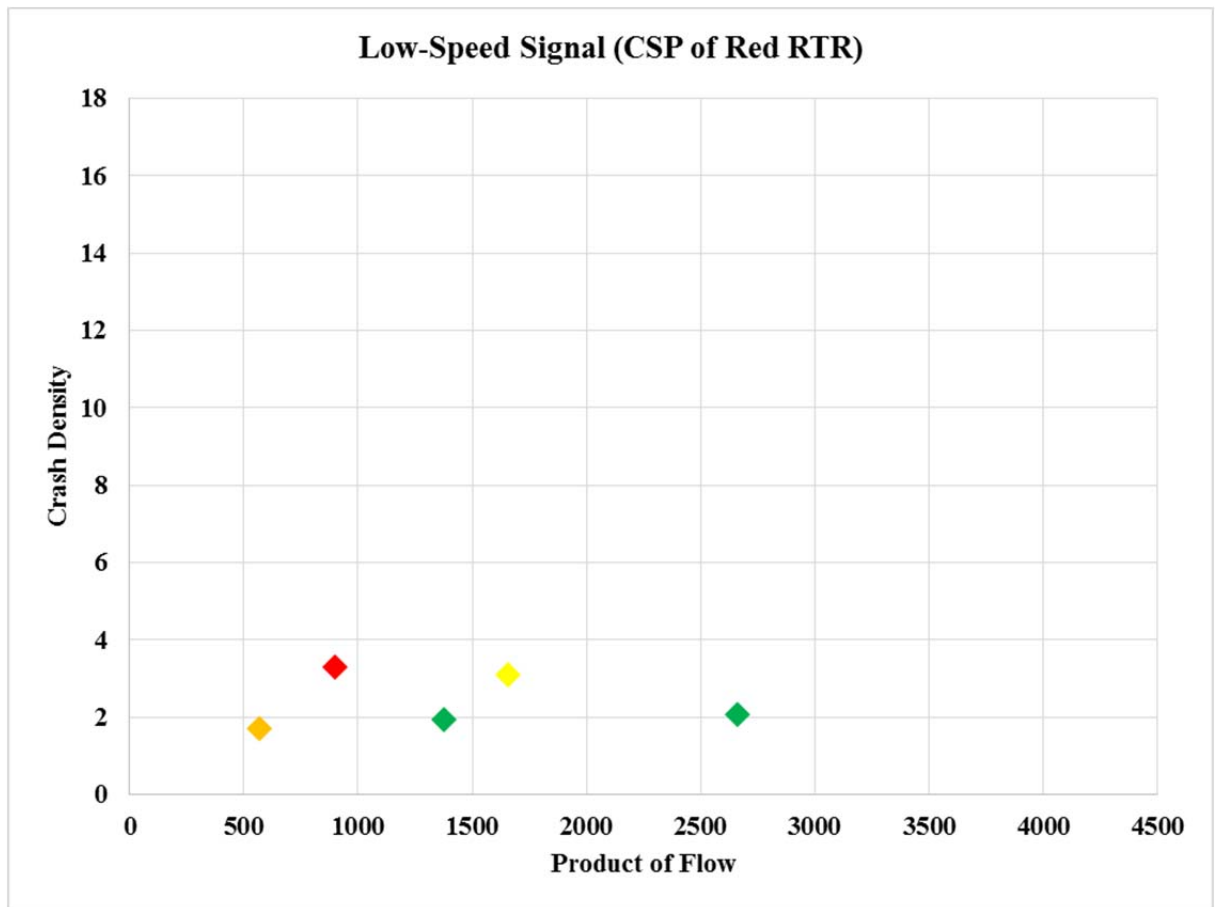


Figure 18: Comparative Safety Performance: Intersections with traffic signals and low-speed environment in the red quadrant



Of the seven intersections that were considered high risk intersections, two were CSP IV, two were CSP III, one was CSP II and two were CSP I. The CSP categories of these intersections are shown in Figure 17 (black quadrant) and 18 (red quadrant). The two intersections in the highest CSP category IV (least safe intersections) had crash density of 3 and 7, and products of flow of 899 and 1137 (Table 9).

3.7.3 Ranking of high risk intersections

Table 9: Ranking of high risk intersections with traffic signals and low-speed environment

Intersection number	Intersection Description	Product of Flow	Crash Rate	Crash Rate Category	Crash Density Category	RTR ¹ Quadrant	CSP ² Category	KSI Metric	Intersection rank
50569	WELLINGTON ST 124 0116 - H016 & WELLINGTON ST & GEORGE ST	1,137.22	198.78	High	High	Black	IV	7.01	1
50544	MURRAY ST ON - H016 STH BOUND & GEORGE ST & MURRAY ST	1,058.71	102.20	Med-High	High	Black	III	3.36	2
50545	ELDER ST LINK TO H521 & MURRAY ST & ELDER ST	899.43	117.43	High	High	Red	IV	3.28	3**
4987	H015 STH BOUND - CRANFORD AV & CRANFORD AV	571.55	95.56	Med-High	Med-High	Red	III	1.69	4
50567	H528 - WELLINGTON ST 124 0116 & WELLINGTON ST & ELDER ST	1,660.75	59.89	Med-High	High	Red	II	3.09	5
14291	GREAT EASTERN HWY & EPSOM AV	2,663.02	24.69	Low-Med	Med-High	Red	I	2.04	6**
4515	H016 NTH BOUND - HAY ST OFF & HAY ST & GEORGE ST	1,379.15	44.87	Med	Med-High	Red	I	1.92	7

¹RTR: Road Trauma Risk ²CSP: Comparative Safety Performance

* Minor change(s) were applied to the intersection between 1 January 2011 and 1 December 2016, such as painting or repainting of lines and/or arrows.

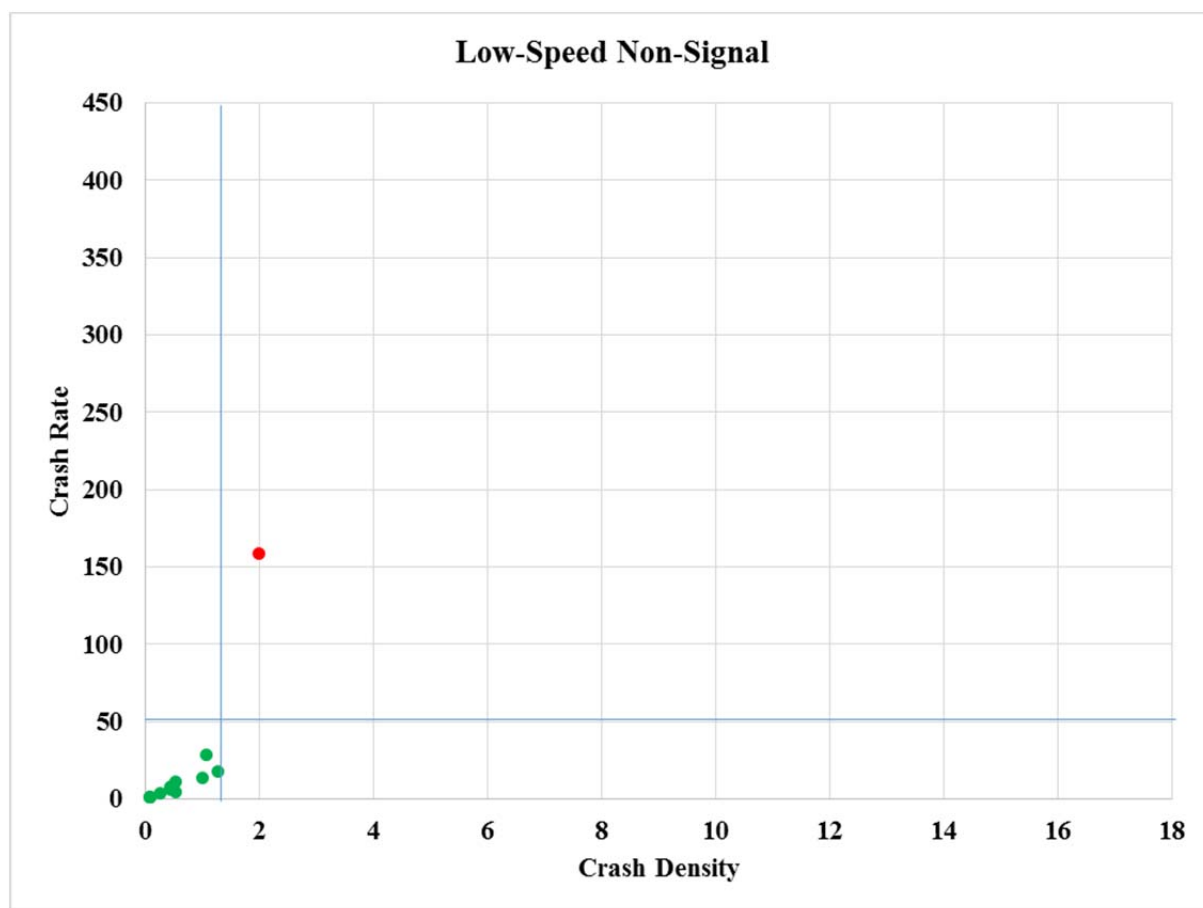
** Significant change(s) were applied to the intersection between 1 January 2011 and 1 December 2016, that could be road safety related treatment(s) other than painting, and/or traffic related structure overhaul.

The two highest ranked intersections were in the black quadrant with the first ranked intersection falling into CSP IV (Table 9). This intersection had a KSI metric of 7, with other ranked intersections having KSI metrics of below 3.5. The products of flow of these intersections were relatively high compared to other intersection types, indicating busier intersections. Most of the high intersections were situated in the CBD, with the top three ranked intersections involving Murray Street.

3.8 Intersections with no traffic signals and low-speed environment

3.8.1 Road Trauma Risk Analysis

Figure 19: Road Trauma Risk: Intersections with no traffic signals and low-speed environment

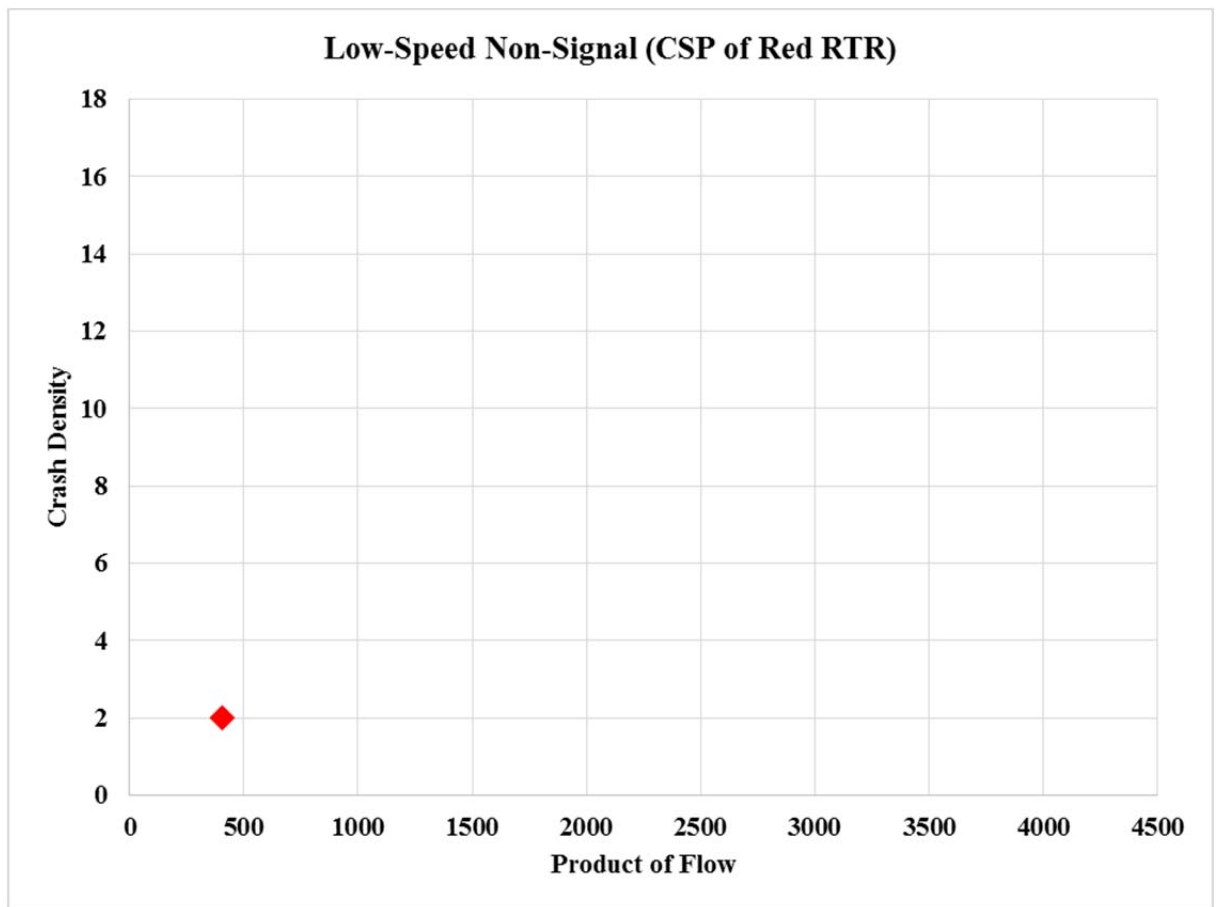


Twelve casualty intersections with no traffic signals in a low-speed environment were examined (1.2% of all intersections analysed). All fell in the green quadrant (Figure 19) with the exception of one intersection which was classified as being in the red quadrant. This intersection had a crash rate of 158 and a crash density of 2 (Table 10).

Only one intersection was considered a high risk intersection (Table 10). The intersection was in the high crash rate category but the medium-high crash density category, placing it in the red quadrant. It was a three-way intersection.

3.8.2 Comparative Safety Performance Analysis

Figure 20: Comparative Safety Performance: Intersections with no traffic signals and low-speed environment



The CSP category of the single high risk intersection is shown in Figure 20. The only intersection considered in the analysis had a CSP category of IV with a crash density of 2 and low product of flow of 407.

3.8.3 Ranking of high risk intersections

Table 10: Ranking of high risk intersections with no traffic signals and low-speed environment

Intersection number	Intersection Description	Product of Flow	Crash Rate	Crash Rate Category	Crash Density Category	RTR ¹ Quadrant	CSP ² Category	KSI Metric	Intersection rank
4332	H016 NTH BOUND - MARKET ST OFF & MARKET ST	407.41	158.23	High	Med-High	Red	IV	2.00	1**

¹RTR: Road Trauma Risk ²CSP: Comparative Safety Performance

* Minor change(s) were applied to the intersection between 1 January 2011 and 1 December 2016, such as painting or repainting of lines and/or arrows.

** Significant change(s) were applied to the intersection between 1 January 2011 and 1 December 2016, that could be road safety related treatment(s) other than painting, and/or traffic related structure overhaul.

Since only one intersection was considered as a high risk intersection, it was ranked first (Table 10). It had a relatively low product of flow compared to other top ranked intersections of other types.

3.9 Comparison of results in different intersection types

A Road Trauma Risk Analysis was undertaken on 996 Perth metropolitan casualty crash intersections, by intersection type (speed environment and traffic control type). The number of intersections analysed for each intersection type varied from 425 (43%, built-up non-signal intersections) to 9 (1.0%, low-speed intersections with traffic signals). There were no low-speed casualty intersections with roundabouts. Approximately 11% and 32% of all types of intersections where a casualty crash occurred fell in the black and red quadrants respectively. However, open and low-speed intersections with traffic signals had a much higher proportions of intersections which fell in the black quadrant (40% and 22% respectively).

The high crash risk intersections were selected using the results from the RTR Analysis. Certain intersection types, with a high proportion of intersections falling in the black quadrant, contained larger numbers of high risk intersections: specifically built-up intersections with and without traffic signals, and open speed intersections with and without traffic signals. All other intersection types only contained intersections in the red quadrant, with the exception of low-speed intersections with traffic signals which contained a mix of black and red quadrant intersections. None of the intersections with roundabouts fell in the black quadrant.

A Comparative Safety Performance Analysis was used to analysis the high crash risk intersections by intersection type. Only three intersection types contained intersections which fell in both the RTR black quadrant and the top (least safe) CSP category V: built-up intersections with and without traffic signals and open speed intersections with traffic signals. The other non-roundabout intersection types had intersections in CSP category IV.

The third stage of the ranking process simply used the KSI metric (collective risk or crash density) to create a final ranked list of the high crash risk intersections. The final rankings demonstrated that the top-ranked intersection with the highest KSI metric was in the built-up speed environment with traffic signals, followed by the top ranked intersection in the open-speed environment with no traffic signals, and then the top intersection in the built-up speed environment with no traffic signals. There were no

casualty intersections in the low-speed environment with a roundabout. The next lowest KSI metric was the top-ranked low-speed intersection with no traffic signals.

4. DISCUSSION

This report examined and ranked the crash risk of intersections in metropolitan Perth by intersection type. Intersections were grouped by speed environment (built-up, open or low-speed) and control type (traffic signal, roundabout or no traffic signal). A three-stage approach was used to rank the highest crash risk intersections relative to other intersections of a similar type; Road Trauma Risk Analysis was used to create a shortlist of high crash risk intersections, then Comparative Safety Performance Analysis was used to further assess intersections within the same RTR quadrants, and finally these intersections were ranked from the highest KSI metric to the lowest.

The RTR analysis found that intersections with and without traffic signals, and open speed intersections with and without traffic signals contained more high crash risk intersections than other intersection types. Only three of these intersection types contained intersections in both the RTR black quadrant and CSP category V: built-up intersections with and without traffic signals, and open speed intersections with traffic signals.

Both the Road Trauma Risk Analysis and the Comparative Safety Performance Analysis used crash density (KSI metric or collective risk) and compared intersections based on speed environment and control type. However, the RTR Analysis examined the change in crash rate (vertical axis) relative to the change in crash density (horizontal axis); that is, the change in personal risk relative to the change in collective risk. The CSP analysis examined the change in crash density (vertical axis) relative to the change in product of flow (horizontal axis); that is, the change in collective risk relative to exposure to traffic and potential conflicts at the intersection. Thus in the CSP Analysis, exposure to traffic is directly examined, unlike the RTR Analysis where it is included merely as a denominator of crash rate. Furthermore, the CSP Analysis directly compared the relative safety performance of similar intersections, by using percentiles of safety performance. Using the two analytical methods to assess risk of intersections allows the comparison of collective risk with both personal risk and traffic exposure to obtain a more accurate assessment of intersection risk, which is a strength of the study.

The top-ranked intersections with the highest KSI metric were in the built-up speed environment with traffic signals, in the open-speed environment with no traffic signals,

and then in the built-up speed environment with no traffic signals. Using the KSI metric effectively uses the absolute number of injury crashes, without reference to traffic exposure, to rank high crash risk intersections. Personal risk (crash rate), which is used in the RTR Analysis, may be reduced by modifying personal responses to traffic conditions, which is challenging to implement at a population-level. Collective risk (the KSI metric) may be lowered by improvements to infrastructure (KiwiRAP), and is therefore a useful measure of changes in population-level road safety. At a state level, therefore, the use of KSI metric as the tool to create the final ranking of high crash risk intersections is appropriate because resources need to be allocated optimally to minimise the number of road crashes at intersections.

A further tool which can be used to compare intersection safety across the metropolitan area is mapping the location of intersections by RTR and CSP. The locations for higher RTR intersections tended to differ from locations of higher CSP intersections across the examined built-up area intersections which were mapped.

Some limitations of this project need to be noted. The annual average daily traffic (AADT) was used in the RTR and CSP analyses as a measure of traffic volume. While this is the best available measure of traffic volume at a given location, it does not represent the variability and distribution of traffic volume over different hours and days of the week. For example, two locations could have the same AADT but one intersection might experience a steady, but low traffic flow throughout the day, while the other might experience little traffic for most of the day but heavy traffic flow at certain times of the day, leading to a higher opportunity for conflict during these time periods. To account for this, future analyses could classify intersections by their “weekly traffic flow pattern” with categories such as “weekdays constant and weekend low”, “weekdays peak hours heavy and weekend low” and so on. However, as AADT data is difficult to obtain, this may not be feasible at present, but is worth further investigation in the future. Furthermore, AADT data was missing for some intersections for 2015 and so previous years’ data were used to estimate the missing AADT data. This may have led to some inaccuracies in crash rate estimation. AADT data was used for 2015 to calculate the crash rates, although crash data was used from 2011 to 2015. At certain intersections, traffic flow may have changed considerably between 2011 and 2015, leading to potentially misleading estimates of crash rates for these intersections.

Intersections were also categorised and then analysed by speed environment. However, in some cases, these may have changed over the study period, leading to misclassification of a small number of intersections. However these limitations would affect relatively few intersections so are unlikely to alter the results substantially.

5. RECOMMENDATIONS

5.1 Recommendations for future work

Because percentile cut-off values were not available by crash type (right angle, right turn through, rear end and other crash types), the Road Trauma Risk Analysis, the Comparative Safety Analysis and the ranking by KSI metric were only undertaken by intersection control type and speed environment. An analysis by crash type would be helpful both in assessing the crash risk of intersections, and for planning more focused and appropriate interventions (including engineering treatments) to intersections.

This report trialed the use of simple maps to explore the relative positions of built-up intersections by RTR and CSP category, as suggested in the New Zealand Transport Agency's *High Risk Intersections Guide* (2013). This could be extended to mapping all intersections with high crash rates and crash density, and measuring hot spots and clustering of high risk intersections across the metropolitan area (and potentially in regional and remote parts of Western Australia.)

5.2 Recommendations for intersection safety improvements

The three-stage process does not provide information on the optimal allocation of resources, by location and treatment type, to achieve the greatest improvement to road safety. However, by using the highest risk intersections identified in this report and their relative KSI metrics, decisions could be made on the selection intersections for resource allocation to maximise road safety gains.

Prior to choosing intersection treatments, site inspections of high risk intersections with similar CSP categories and KSI metrics should be conducted to: i) compare intersections, and ii) assess the intersections for potential treatments.

Candappa and colleagues (2013) developed a taxonomy based on their literature review of driver errors leading to KSI crashes, and road design features which could minimise these errors. For each intersection control type and crash type (right angle, right through, side swipe, hit object, rear end, and hit pedestrian), the authors examined a range of driver errors (including attention, distraction, excessive speed and poor gap selection as well as other errors) and the following potential intersection treatments:

1. Convert to a roundabout

2. Speed cushions
3. Increase signal timing
4. Ban right hand turn movements
5. Vary speed limits according to time of day

For each driver error category and crash type, each intersection treatment was rated as either a possible solution, not a possible solution or not applicable. Each intersection with a high RTR (black, and, in some cases, red quadrants) and a high CSP score (categories IV and V) can be linked with candidate possible solutions using this taxonomy (p. 51-60 Devlin et al., 2011).

5.3 Conclusion

The three-stage approach of the RTR and the CSP analysis as well as the ranking by KSI metric provides a method of prioritising high risk intersections by intersection type. Three intersection types were highlighted as having the highest KSI metrics overall: intersections in the built-up speed environment with traffic signals, in the open-speed environment with no traffic signals, and in the built-up speed environment with no traffic signals. These results can be used to target the highest crash risk intersections for safety treatments.

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7. APPENDIX

Table 11: Thresholds for categories of crash density and crash rate by intersection type³

Comparative Performance		Percentile Band	Speed Environment	Traffic Signals	Roundabout	No Traffic Signals
V	Extremely poor	90 to 100th	Built-Up Speed Environment	Greater than 103.11	Greater than 137.28	Greater than 116.4
IV	Very poor	70 to 90th		62.00 to 103.11	49.96 to 137.28	46.94 to 116.4
III	Poor	50 to 70th		41.63 to 62.00	33.34 to 49.96	24.99 to 46.94
II	Adequate	30 to 50th		26.98 to 41.63	12.70 to 33.34	10.28 to 24.99
I	Good	0 to 30th		Less than 26.98	Less than 12.70	Less than 10.28

Comparative Performance		Percentile Band	Speed Environment	Traffic Signals	Roundabout	No Traffic Signals
V	Extremely poor	90 to 100th	Open Speed Environment	Greater than 155.45	Greater than 97.34	Greater than 361.38
IV	Very poor	70 to 90th		99.92 to 155.45	31.59 to 97.34	146.41 to 361.38
III	Poor	50 to 70th		61.48 to 99.92	28.25 to 31.59	74.31 to 146.41
II	Adequate	30 to 50th		36.00 to 61.48	21.75 to 28.25	37.68 to 74.31
I	Good	0 to 30th		Less than 36.00	Less than 21.75	Less than 37.68

Comparative Performance		Percentile Band	Speed Environment	Traffic Signals	Roundabout	No Traffic Signals
V	Extremely poor	90 to 100th	Low-Speed Environment	Greater than 252.46	No cut-offs provided by Main Roads Western Australia due to low number of such intersections	Greater than 289.36
IV	Very poor	70 to 90th		104.00 to 252.46		63.11 to 289.36
III	Poor	50 to 70th		68.87 to 104.00		23.45 to 63.11
II	Adequate	30 to 50th		45.70 to 68.87		5.95 to 23.45
I	Good	0 to 30th		Less than 45.70		Less than 5.95

³ Thresholds are percentile cut-offs provided by Main Roads Western Australia

Table 12: All casualty intersections in the Perth metropolitan area used in the analysis

Intersection type	Intersection number	Intersection Description	Intersection type	Product of Flow	Crash Rate	Crash Rate Category	Crash Density Category	RTR¹ Quadrant
Built-Up Signal	14275	GUILDFORD RD & H017 STH BOUND ON & OFF RAMPS	Unknown	3425.13	155.74	High	High	Black
Built-Up Signal	4061	ARMADALE RD & NICHOLSON RD	Unknown	1940.28	211.94	High	High	Black
Built-Up Signal	50781	SOUTHPORT ST & CAMBRIDGE ST	Unknown	3524.70	113.63	High	High	Black
Built-Up Signal	39039	FRANCISCO ST & ORRONG RD & FRANCISCO PL	Four-way	3329.14	104.13	Med-High	High	Black
Built-Up Signal	3642	REID HWY & REID HWY - MITCHELL FWY STH ON & H016 STH BOUND - REID HWY OFF & BALC	Three-way	2904.69	116.73	High	High	Black
Built-Up Signal	14185	ALBANY HWY (END DUAL) & DUNCAN ST	Three-way	847.88	393.72	High	High	Black
Built-Up Signal	4347	HUTTON ST ON - H016 STH BOUND & HUTTON ST & H016 STH BOUND - HUTTON ST OFF	Unknown	1764.45	151.58	High	High	Black
Built-Up Signal	13882	H016 NTH BND - WHITFORDS AV OFF & WHITFORDS AV & WHITFORDS AV OFF - H016 NTH BND	Unknown	1746.19	152.63	High	High	Black
Built-Up Signal	14753	ALBANY HWY & BURSLEM DR	Three-way	2030.19	126.27	High	High	Black
Built-Up Signal	81636	MCDOWELL ST & ORRONG RD	Four-way	1382.65	179.01	High	High	Black
Built-Up Signal	168405	H016 NTH BND END & BURNS BEACH RD	Three-way	984.04	175.76	High	High	Black
Built-Up Signal	14845	ALBANY HWY & DENNY AV	Three-way	1075.08	145.65	High	High	Black

Built-Up Signal	82815	ALBANY HWY (END DUAL) & MAIN ST	Three-way	706.74	212.69	High	High	Black
Built-Up Signal	14786	ROE HWY & BERKSHIRE RD	Three-way	1084.13	133.33	High	High	Black
Built-Up Signal	12315	ARMADALE RD & TAPPER RD & VERDE DR	Four-way	1297.60	110.84	High	High	Black
Built-Up Signal	119141	REID HWY & OKELY RD (NORTH)	Three-way	1334.46	103.86	Med-High	High	Black
Built-Up Signal	119092	KWINANA FWY NTH - RUSSELL RD & RUSSELL RD & RUSSELL RD - KWINANA FWY NTH	Unknown	513.20	250.24	High	High	Black
Built-Up Signal	14121	CANNING HWY & HENLEY ST	Three-way	1160.57	110.41	High	High	Black
Built-Up Signal	50639	EAST PDE - LORD ST & LORD ST & NEWCASTLE ST	Three-way	1168.34	105.11	Med-High	High	Black
Built-Up Signal	77668	REID HWY & WEST SWAN RD	Four-way	3109.87	99.56	Med-High	High	Black
Built-Up Signal	4147	GREAT NORTHERN HWY & ROE HWY & GREAT NORTHERN HWY & REID HWY	Four-way	3165.27	93.42	Med-High	High	Black
Built-Up Signal	4336	WANNEROO RD & NEWCASTLE ST & CHARLES ST ON - H016 STH BOUND & H016 NTH BOUND - C	Four-way	2666.58	95.56	Med-High	High	Black
Built-Up Signal	55048	KARRINYUP - MORLEY HWY & WANNEROO RD	Four-way	3085.44	80.76	Med-High	High	Black
Built-Up Signal	55516	KARRINYUP - MORLEY HWY & FLINDERS ST	Four-way	2996.15	78.79	Med-High	High	Black
Built-Up Signal	38822	ORRONG RD & ARCHER ST	Three-way	2731.93	85.31	Med-High	High	Black
Built-Up Signal	50690	WANNEROO RD & GREEN ST & WALCOTT ST	Three-way	2874.66	79.39	Med-High	High	Black
Built-Up Signal	4160	GUILDFORD RD & GARRATT RD	Four-way	3119.15	72.45	Med-High	High	Black
Built-Up Signal	14106	SOUTH ST & H015 STH BOUND - SOUTH ST WEST	Three-way	2577.70	81.10	Med-High	High	Black

Built-Up Signal	14898	ROE HWY & TOODYAY RD & TOODYAY RD	Four-way	2878.37	62.87	Med-High	High	Black
Built-Up Signal	14172	GUILDFORD RD & EIGHTH AV	Four-way	1933.93	89.15	Med-High	High	Black
Built-Up Signal	14713	GREAT EASTERN HWY & FAUNTLEROY AV	Four-way	2432.35	69.48	Med-High	High	Black
Built-Up Signal	13900	WHITFORDS AV ON - H016 STH BOUND & WHITFORDS AV & H016 STH BOUND - WHITFORDS AV	Unknown	1987.46	84.10	Med-High	High	Black
Built-Up Signal	67708	LOFTUS ST ON - H020 EAST BOUND & LOFTUS ST & LEEDERVILLE PDE	Four-way	2076.51	78.24	Med-High	High	Black
Built-Up Signal	4161	GUILDFORD RD & COLLIER RD	Three-way	1953.71	80.26	Med-High	High	Black
Built-Up Signal	55559	KARRINYUP - MORLEY HWY & GRAND PROM	Unknown	2206.82	70.45	Med-High	High	Black
Built-Up Signal	39611	KEWDALE RD & ORRONG RD	Four-way	2369.56	64.27	Med-High	High	Black
Built-Up Signal	4413	ALBANY HWY & KELVIN RD & OLGA RD	Unknown	2175.85	69.05	Med-High	High	Black
Built-Up Signal	14306	ALBANY HWY & LIEGE ST	Unknown	2107.26	67.51	Med-High	High	Black
Built-Up Signal	13822	STIRLING HWY & MARMION ST	Four-way	1278.43	102.66	Med-High	High	Black
Built-Up Signal	128025	KENWICK LINK & H018 NTH BND OFF & ON	Four-way	2088.19	62.68	Med-High	High	Black
Built-Up Signal	11975	WANNEROO RD & VICTORIA RD & HALLEY RD	Four-way	1289.05	99.96	Med-High	High	Black
Built-Up Signal	4123	ALBANY HWY & FREMANTLE RD	Unknown	1876.50	68.44	Med-High	High	Black
Built-Up Signal	75552	WELSHPOOL RD EAST & H018 STH BOUND OFF & ON	Four-way	1422.90	79.26	Med-High	High	Black
Built-Up Signal	38828	ORRONG RD & OATS ST - LG BDRY	Four-way	3884.83	54.54	Med-High	High	Black

Built-Up Signal	3641	REID HWY & REID HWY ON - H016 NTH BOUND & MITCHELL FWY NTH - REID HWY	Unknown	3411.28	55.41	Med-High	High	Black
Built-Up Signal	4356	KARRINYUP - MORLEY HWY & KARRINYUP RD ON - H016 NTH BOU & CEDRIC ST - KARRINYUP	Four-way	3343.21	54.11	Med-High	High	Black
Built-Up Signal	4154	WANNEROO RD & HEPBURN AV	Four-way	2891.19	58.69	Med-High	High	Black
Built-Up Signal	55308	KARRINYUP - MORLEY HWY & ALEXANDER DR (STH BND)	Four-way	2772.34	57.99	Med-High	High	Black
Built-Up Signal	47049	SOUTH ST & KAREL AV	Four-way	2517.12	61.34	Med-High	High	Black
Built-Up Signal	4575	WANNEROO RD & WHITFORDS AV	Unknown	2605.69	58.50	Med-High	High	Black
Built-Up Signal	4462	CANNING HWY & WAY RD	Three-way	2747.20	53.05	Med-High	High	Black
Built-Up Signal	55596	KARRINYUP - MORLEY HWY & DIANELLA DR	Unknown	2226.50	57.37	Med-High	High	Black
Built-Up Signal	4346	H016 NTH BOUND - HUTTON ST OFF & HUTTON ST & HUTTON ST ON - H016 NTH BOUND	Unknown	1884.53	104.54	Med-High	High	Red
Built-Up Signal	14170	GREAT EASTERN HWY & CRAIG ST	Three-way	1382.25	116.18	High	High	Red
Built-Up Signal	50783	H020 WEST BOUND - LOFTUS ST OFF & LOFTUS ST & CAMBRIDGE ST	Unknown	973.78	162.15	High	High	Red
Built-Up Signal	14148	REID HWY EAST BND RAMPS & ALEXANDER DR	Unknown	856.92	163.25	High	High	Red
Built-Up Signal	76936	KWINANA FWY STH - RUSSELL RD & GIBB RD & RUSSELL RD - KWINANA FWY STH & RUSSEL	Four-way	1181.71	117.10	High	High	Red

Built-Up Signal	180343	REID HWY WEST BND RAMPS & ALEXANDER DR	Unknown	704.41	155.45	High	High	Red
Built-Up Signal	13933	WARWICK RD ON - H106 NTH BOUND & WARWICK RD & H016 NTH BOUND - WARWICK RD OF	Unknown	780.47	126.03	High	High	Red
Built-Up Signal	176182	COCKBURN RD & SPEARWOOD AV	Three-way	683.26	143.74	High	High	Red
Built-Up Signal	155434	NARROWS RAMPS & BUSPORT ACCESS & WILLIAM ST & RIVERSIDE DR	Four-way	744.22	112.17	High	Med-High	Red
Built-Up Signal	119118	KWINANA FWY STH - MUNDIJONG RD & MUNDIJONG RD & MUNDIJONG RD - KWINANA FWY STH	Unknown	470.42	156.66	High	Med-High	Red
Built-Up Signal	119104	KWINANA FWY NTH - ANKETELL RD & ANKETELL RD & ANKETELL RD - KWINANA FWY NTH	Unknown	189.37	348.41	High	Med-High	Red
Built-Up Signal	119098	KWINANA FWY NTH - ROWLEY RD & ROWLEY RD & ROWLEY RD - KWINANA FWY NTH	Unknown	213.08	249.59	High	Med-High	Red
Built-Up Signal	56004	KARRINYUP - MORLEY HWY & CEDRIC ST	Four-way	2208.81	79.62	Med-High	High	Red
Built-Up Signal	4406	ALBANY HWY & MINT ST	Unknown	2461.75	63.42	Med-High	High	Red
Built-Up Signal	55042	WANNEROO RD & CAPE ST	Four-way	2079.68	68.72	Med-High	High	Red
Built-Up Signal	52589	WEST COAST HWY & HALE RD	Three-way	1744.40	71.31	Med-High	High	Red
Built-Up Signal	4350	CEDRIC ST ON - H016 STH BOUND & CEDRIC ST & KARRINYUP RD - CEDRIC ST	Four-way	1512.95	78.02	Med-High	High	Red

Built-Up Signal	52623	WEST COAST HWY & OCEANIC DR	Four-way	1482.76	78.44	Med-High	High	Red
Built-Up Signal	4349	H016 NTH BOUND - CEDRIC ST OFF & CEDRIC ST & CEDRIC ST - KARRINYUP RD	Four-way	1419.74	81.14	Med-High	High	Red
Built-Up Signal	10894	LEACH HWY & WINTHROP DR	Three-way	1518.26	72.48	Med-High	High	Red
Built-Up Signal	14250	ALBANY HWY & EWING ST STH & BEDFORD ST	Unknown	1206.40	85.80	Med-High	High	Red
Built-Up Signal	14136	LEACH HWY & WEBB ST	Three-way	1418.93	66.12	Med-High	High	Red
Built-Up Signal	56006	KARRINYUP - MORLEY HWY & GRINDLEFORD DR & SAN REMO BVD	Four-way	1001.89	87.59	Med-High	Med-High	Red
Built-Up Signal	14738	GREAT EASTERN HWY & HELENA ST	Four-way	1012.16	83.50	Med-High	Med-High	Red
Built-Up Signal	43188	SOUTH ST & MCCOMBE AV	Three-way	878.62	82.04	Med-High	Med-High	Red
Built-Up Signal	14096	FARRINGTON RD ON - H015 NTH BO & FARRINGTON RD	Three-way	818.92	86.91	Med-High	Med-High	Red
Built-Up Signal	46788	THOMAS RD & JOHNSON RD	Three-way	663.51	97.16	Med-High	Med-High	Red
Built-Up Signal	14245	ALBANY HWY & JOHN ST STH & ASHBURTON ST	Three-way	946.36	67.36	Med-High	Med-High	Red
Built-Up Signal	55992	KARRINYUP - MORLEY HWY & SHOPPING CENTRE ACCESS & JEANES RD	Four-way	887.78	68.07	Med-High	Med-High	Red
Built-Up Signal	4255	ALBANY HWY & NICHOLSON RD	Unknown	4348.06	50.33	Med	High	Red
Built-Up Signal	3548	CANNING HWY & KWINANA FWY SOUTHBOUND OFF + ON RAMPS & BUS LANE TO CANNING HWY WB	Four-way	4026.41	47.64	Med	High	Red

Built-Up Signal	55823	KARRINYUP - MORLEY HWY & HUNTRISS RD	Four-way	3308.35	52.10	Med-High	High	Red
Built-Up Signal	82598	GUILDFORD RD & LORD ST - EAST PDE & EAST PDE ON - H020 EAST BOUND	Four-way	3145.30	49.72	Med	High	Red
Built-Up Signal	4041	LEACH HWY & MOOLYEEN RD	Three-way	3101.55	50.03	Med	High	Red
Built-Up Signal	76283	GUILDFORD RD & EAST PDE - LORD ST & H020 WEST BOUND - EAST PDE OFF	Four-way	2904.67	51.29	Med	High	Red
Built-Up Signal	75553	WANNEROO RD & WANNEROO RD ON - H021 WEST BOU & H021 WEST BOUND - WANNEROO RD	Unknown	3391.04	43.83	Med	High	Red
Built-Up Signal	14750	ALBANY HWY & AUSTIN AV & KENWICK LINK	Unknown	3393.06	43.74	Med	High	Red
Built-Up Signal	14265	GUILDFORD RD & H017 NTH BND OFF & ON RAMPS	Unknown	3344.48	44.35	Med	High	Red
Built-Up Signal	67701	STIRLING HWY & WINTHROP AV	Unknown	3364.76	43.72	Med	High	Red
Built-Up Signal	4177	LEACH HWY & NORTH LAKE RD	Four-way	3270.23	44.88	Med	High	Red
Built-Up Signal	182711	WANNEROO RD & PINJAR RD	Unknown	2880.26	50.89	Med	High	Red
Built-Up Signal	4439	LEACH HWY & BARBICAN ST WEST & VAHLAND AV	Four-way	2874.36	48.23	Med	High	Red
Built-Up Signal	50673	WANNEROO RD & SCARBOROUGH BEACH RD & ANGOVE ST	Four-way	2263.48	59.10	Med-High	High	Red
Built-Up Signal	37931	KARRINYUP - MORLEY HWY & CRIMEA ST	Four-way	2443.93	52.70	Med-High	High	Red
Built-Up Signal	55392	WEST COAST HWY & SCARBOROUGH BEACH RD	Four-way	3008.71	42.61	Med	High	Red
Built-Up Signal	55045	WANNEROO RD & ROYAL ST	Four-way	2705.18	45.86	Med	High	Red

Built-Up Signal	4122	ALBANY HWY (END DUAL) & WELSHPOOL RD & ALBANY HWY (LG)	Three-way	2257.32	54.34	Med-High	High	Red
Built-Up Signal	14040	WANNEROO RD & KINGSWAY	Unknown	2579.36	45.79	Med	High	Red
Built-Up Signal	14296	ALBANY HWY & CECIL AV	Three-way	2569.27	45.34	Med	High	Red
Built-Up Signal	47055	SOUTH ST & MURDOCH DR	Four-way	2390.33	48.15	Med	High	Red
Built-Up Signal	3630	WANNEROO RD & BALCATTA RD	Unknown	2370.65	44.03	Med	High	Red
Built-Up Signal	14210	GREAT EASTERN HWY & BRIGHTON RD & KOORYONG RD	Four-way	2121.61	49.05	Med	High	Red
Built-Up Signal	4344	H016 NTH BOUND - POWIS ST OFF & POWIS ST	Three-way	2108.68	47.70	Med	High	Red
Built-Up Signal	4033	WANNEROO RD & BEACH RD	Four-way	2031.48	49.43	Med	High	Red
Built-Up Signal	13905	HEPBURN AV ON - H016 STH BND & HEPBURN AV & H016 STH BND - HEPBURN AV OFF	Unknown	1865.82	53.57	Med-High	High	Red
Built-Up Signal	11948	WANNEROO RD & HESTER AV	Three-way	1692.95	58.48	Med-High	High	Red
Built-Up Signal	47053	SOUTH ST & BENNINGFIELD RD	Three-way	2190.71	45.12	Med	High	Red
Built-Up Signal	13870	H016 NTH BOUND - OCEAN REEF RD & OCEAN REEF RD & OCEAN REEF RD ON - H016 NTH BO	Unknown	1725.55	54.83	Med-High	High	Red
Built-Up Signal	4062	ALBANY HWY & SOUTH WESTERN HWY & ARMADALE RD	Four-way	2114.98	43.44	Med	High	Red
Built-Up Signal	14271	ALBANY HWY & HAMILTON ST	Unknown	2074.62	42.86	Med	Med-High	Red
Built-Up Signal	55775	KARRINYUP - MORLEY HWY & NORTH BEACH RD	Three-way	1983.56	42.08	Med	Med-High	Red
Built-Up Signal	67711	H016 STH BOUND - VINCENT ST OFF & VINCENT ST & LEEDERVILLE PDE & LINK TO H536	Unknown	1817.29	44.28	Med	Med-High	Red

Built-Up Signal	14082	CANNING HWY & ARDROSS ST	Four-way	1485.20	51.56	Med	Med-High	Red
Built-Up Signal	13812	STIRLING HWY & LEAKE ST & NAPOLEON ST	Four-way	1537.48	48.94	Med	Med-High	Red
Built-Up Signal	14128	CANNING HWY & BARKER AV & THELMA ST	Four-way	1612.62	46.24	Med	Med-High	Red
Built-Up Signal	45282	WELSHPOOL RD EAST & HALE RD	Three-way	1557.45	46.58	Med	Med-High	Red
Built-Up Signal	4471	CANNING HWY & CANNING BEACH RD	Three-way	1418.14	50.32	Med	Med-High	Red
Built-Up Signal	13985	WANNEROO RD & HASTINGS ST & CONLAN AV	Four-way	1536.96	45.98	Med	Med-High	Red
Built-Up Signal	14177	GUILDFORD RD & FALKIRK AV	Three-way	1071.76	58.97	Med-High	Med-High	Red
Built-Up Signal	77115	KARRINYUP - MORLEY HWY & JONES ST	Three-way	1483.74	41.75	Med	Med-High	Red
Built-Up Signal	4181	H016 NTH BOUND - ERINDALE RD O & ERINDALE RD	Three-way	1130.70	46.24	Med	Med-High	Red
Built-Up Signal	3730	GREAT EASTERN HWY & GEH ON - H017 NTH BOUND & H017 NTH BOUND - GEH OFF	Unknown	4790.90	34.64	Med	High	Red
Built-Up Signal	4427	GREAT EASTERN HWY & RESOLUTION DR & HARDEY RD	Four-way	3798.66	39.13	Med	High	Red
Built-Up Signal	4120	STOCK RD & LEACH HWY	Four-way	3425.34	40.92	Med	High	Red
Built-Up Signal	4149	ALBANY HWY & WILLIAM ST & KENWICK LINK	Four-way	4156.54	33.44	Med	High	Red
Built-Up Signal	119086	ARMADALE RD & KWINANA FWY NTH BND OFF & ON RAMPS	Unknown	4300.30	31.39	Med	High	Red
Built-Up Signal	14092	SOUTH ST & SOUTH ST ON - H015 NTH BOUND & H015 NTH BOUND - SOUTH ST OFF	Four-way	3933.20	33.88	Med	High	Red

Built-Up Signal	4453	LEACH HWY & HIGH RD	Unknown	3147.56	40.34	Med	High	Red
Built-Up Signal	4410	ALBANY HWY & WHARF ST & CARDEN DR	Unknown	3080.79	40.99	Med	High	Red
Built-Up Signal	50664	WANNEROO RD & VINCENT ST	Four-way	3564.45	34.87	Med	High	Red
Built-Up Signal	47047	SOUTH ST & NORTH LAKE RD	Four-way	2907.48	40.74	Med	High	Red
Built-Up Signal	4353	KARRINYUP - MORLEY HWY & H016 STH BOUND - KARRINYUP RD & KARRINYUP RD - CEDRIC S	Four-way	2874.41	41.19	Med	High	Red
Built-Up Signal	4407	ALBANY HWY & OATS ST	Unknown	2735.38	41.09	Med	High	Red
Built-Up Signal	43023	SOUTH ST & CARRINGTON ST	Four-way	2865.10	39.21	Med	High	Red
Built-Up Signal	4463	CANNING HWY & DOUGLAS AV	Four-way	2790.39	39.72	Med	High	Red
Built-Up Signal	4461	CANNING HWY & BERWICK ST	Unknown	3672.38	29.75	Med	High	Red
Built-Up Signal	3717	REID HWY & ERINDALE RD	Four-way	2831.73	38.03	Med	High	Red
Built-Up Signal	4405	H001 & BUS LANE : BUS STN - H530 & H005 W BND OFF RAMP & BUS LANE : CAUSEWAY N	Unknown	3105.79	34.36	Med	High	Red
Built-Up Signal	4457	ORRONG RD & RAMPS OFF FROM/ON TO LEACH HWY	Four-way	3558.04	29.77	Med	High	Red
Built-Up Signal	4487	STIRLING HWY & QUEENSLEA DR & STIRLING RD	Four-way	3562.07	29.30	Low-Med	High	Red
Built-Up Signal	14262	ALBANY HWY & ALBANY HWY ON - H012 EAST BOUN & H012 EAST BOUND - ALBANY HWY O	Unknown	3645.42	27.73	Low-Med	High	Red
Built-Up Signal	14264	ALBANY HWY & H012 WEST BOUND - ALBANY HWY O & ALBANY HWY ON - H012 WEST BOUN	Unknown	3645.42	27.10	Low-Med	High	Red
Built-Up Signal	55368	KARRINYUP - MORLEY HWY & MAIN ST	Four-way	3130.43	30.79	Med	High	Red

Built-Up Signal	4597	WEST COAST HWY & TO CAMPBELL BARRACKS & ALFRED RD	Four-way	2558.01	37.60	Med	High	Red
Built-Up Signal	75554	WANNEROO RD & H021 EAST BOUND - WANNEROO RD & WANNEROO RD ON - H021 EAST BOU	Unknown	3433.64	27.25	Low-Med	High	Red
Built-Up Signal	14173	ALBANY HWY & TEDDINGTON RD	Unknown	2734.65	33.40	Med	High	Red
Built-Up Signal	4136	ALBANY HWY (START DUAL) & BROOKTON HWY	Unknown	3276.24	27.78	Low-Med	High	Red
Built-Up Signal	4451	LEACH HWY & BULL CREEK DR	Unknown	2719.00	32.16	Med	Med-High	Red
Built-Up Signal	13901	STIRLING HWY & LEURA AV	Three-way	2049.59	41.20	Med	Med-High	Red
Built-Up Signal	75484	STOCK RD (NTH BND) & WINTERFOLD RD	Four-way	2306.58	36.47	Med	Med-High	Red
Built-Up Signal	4040	GREAT EASTERN HWY & LLOYD ST	Four-way	2673.80	29.18	Low-Med	Med-High	Red
Built-Up Signal	4431	GREAT EASTERN HWY & MORRISON RD	Four-way	2026.19	35.80	Med	Med-High	Red
Built-Up Signal	14740	ALBANY HWY & WANAPING RD & ROYAL ST	Unknown	1834.81	39.28	Med	Med-High	Red
Built-Up Signal	55055	WANNEROO RD & AMELIA ST	Four-way	2550.58	27.65	Low-Med	Med-High	Red
Built-Up Signal	4475	CANNING HWY & PRESTON POINT RD	Three-way	1777.92	38.51	Med	Med-High	Red
Built-Up Signal	43046	PORT BEACH RD & TYDEMAN RD	Three-way	1674.13	38.51	Med	Med-High	Red
Built-Up Signal	4156	COCKBURN RD & HAMPTON RD & ROCKINGHAM RD	Three-way	1777.58	35.60	Med	Med-High	Red
Built-Up Signal	4415	ALBANY HWY & DOROTHY ST	Unknown	2067.68	29.36	Low-Med	Med-High	Red

Built-Up Signal	13797	STIRLING HWY & VICTORIA ST CRSG	Three-way	1692.77	35.27	Med	Med-High	Red
Built-Up Signal	3601	CANNING HWY & SLEAT RD	Four-way	1872.52	31.23	Med	Med-High	Red
Built-Up Signal	4050	GREAT EASTERN HWY & STONEVILLE RD & MUNDARING WEIR RD	Four-way	1731.71	31.60	Med	Med-High	Red
Built-Up Signal	39688	PILBARA ST & ORRONG RD	Four-way	1479.31	35.44	Med	Med-High	Red
Built-Up Signal	76958	STEPHENSON HWY & JON SANDERS DR & PEARSON ST	Unknown	1707.41	30.20	Med	Med-High	Red
Built-Up Signal	16590	GREAT EASTERN HWY & BOLTON AV	Unknown	1823.88	27.34	Low-Med	Med-High	Red
Built-Up Signal	82411	H016 NTH BOUND - HODGES DR OFF & HODGES DR	Unknown	1572.30	28.20	Low-Med	Med-High	Red
Built-Up Signal	4424	GREAT EASTERN HWY & H020 EAST BOUND - GEH OFF & GEH ON - H020 STH BOUND	Unknown	5559.05	25.56	Low-Med	High	Red
Built-Up Signal	4146	GREAT EASTERN HWY & H017 STH BOUND - GEH OFF & BREARLEY AV	Four-way	5204.65	26.01	Low-Med	High	Red
Built-Up Signal	39628	WELSHPOOL RD EAST & H018 NTH BOUND OFF & ON	Four-way	4287.12	26.32	Low-Med	High	Red
Built-Up Signal	14240	GREAT EASTERN HWY & BELMONT AV & TANUNDA DR	Four-way	3887.04	24.79	Low-Med	High	Red
Built-Up Signal	4438	LEACH HWY & RISELEY ST	Unknown	3750.50	25.57	Low-Med	High	Red
Built-Up Signal	14897	GREAT EASTERN HWY & ROE HWY	Four-way	4197.40	19.19	Low-Med	Med-High	Red
Built-Up Signal	4313	LEACH HWY & CARRINGTON ST & CARRINGTON ST	Four-way	3178.93	24.60	Low-Med	Med-High	Red

Built-Up Signal	4104	STIRLING HWY & BROADWAY & HAMPDEN RD	Four-way	2876.06	26.51	Low-Med	Med-High	Red
Built-Up Signal	10901	LEACH HWY & MURDOCH DR	Unknown	3348.02	22.78	Low-Med	Med-High	Red
Built-Up Signal	119083	ARMADALE RD & KWINANA FWY STH BND OFF & ON RAMPS	Unknown	3634.79	20.87	Low-Med	Med-High	Red
Built-Up Signal	80699	KENWICK LINK & ROYAL ST	Four-way	3031.13	24.60	Low-Med	Med-High	Red
Built-Up Signal	4436	LEACH HWY & HIGH ST & STIRLING HWY	Unknown	6017.20	11.99	Low-Med	Med-High	Red
Built-Up Signal	14197	ALBANY HWY & MILLER ST	Unknown	2768.00	25.87	Low-Med	Med-High	Red
Built-Up Signal	4579	GUILDFORD RD & KING WILLIAM ST	Four-way	2593.96	26.41	Low-Med	Med-High	Red
Built-Up Signal	39799	SOUTH ST & VAHLAND AV	Unknown	2799.82	23.72	Low-Med	Med-High	Red
Built-Up Signal	68098	KARRINYUP - MORLEY HWY & ALEXANDER DR (NTH BND)	Four-way	2571.75	25.77	Low-Med	Med-High	Red
Built-Up Signal	4016	STIRLING HWY & JOHN ST & TYDEMAN RD	Four-way	2948.50	21.59	Low-Med	Med-High	Red
Built-Up Signal	155047	ORRONG RD & OFF FROM/ON TO LEACH HWY	Four-way	3005.80	20.67	Low-Med	Med-High	Red
Built-Up Signal	4125	WANNEROO RD & WARWICK RD	Unknown	2401.94	25.19	Low-Med	Med-High	Red
Built-Up Signal	4455	LEACH HWY & MANNING RD	Four-way	3223.64	18.12	Low-Med	Med-High	Red
Built-Up Signal	43008	QUEEN VICTORIA ST & TYDEMAN RD & QUEEN VICTORIA ST	Unknown	4438.11	12.97	Low-Med	Med-High	Red
Built-Up Signal	3512	LEACH HWY & KAREL AV	Unknown	3260.87	17.31	Low-Med	Med-High	Red
Built-Up Signal	4044	GREAT EASTERN HWY & FARRALL RD & HORACE ST	Four-way	3036.81	18.31	Low-Med	Med-High	Red
Built-Up Signal	4479	CANNING HWY & STIRLING HWY	Three-way	2325.52	23.24	Low-Med	Med-High	Red
Built-Up Signal	47060	SOUTH ST & GILBERTSON RD	Four-way	1995.40	26.85	Low-Med	Med-High	Red
Built-Up Signal	4481	STIRLING HWY & HACKETT DR	Unknown	2297.69	22.64	Low-Med	Med-High	Red

Built-Up Signal	4118	GREAT EASTERN HWY & MEADOW ST	Four-way	2315.44	22.27	Low-Med	Med-High	Red
Built-Up Signal	14705	GREAT EASTERN HWY & COOLGARDIE AV	Four-way	1854.79	26.44	Low-Med	Med-High	Red
Built-Up Signal	136988	ALBANY HWY & TONKIN HWY NTH BND ON / OFF RAMPS	Unknown	1895.41	25.41	Low-Med	Med-High	Red
Built-Up Signal	4162	GREAT EASTERN HWY & GUILDFORD RD	Three-way	3288.03	14.60	Low-Med	Med-High	Red
Built-Up Signal	51156	WEST COAST HWY & THE BOULEVARD	Unknown	2108.35	22.68	Low-Med	Med-High	Red
Built-Up Signal	4047	CANNING HWY & REYNOLDS RD	Four-way	2183.26	21.09	Low-Med	Med-High	Red
Built-Up Signal	37889	KARRINYUP - MORLEY HWY & CAMBOON RD & WELLINGTON RD	Four-way	3061.37	15.02	Low-Med	Med-High	Red
Built-Up Signal	129571	SOUTH ST & H754 OFF FROM H018 WEST BND & H755 ON TO H018 WEST BND & 1140924	Unknown	4446.59	10.34	Low	Med-High	Red
Built-Up Signal	55032	WANNEROO RD & WILUNA ST	Three-way	2553.10	18.01	Low-Med	Med-High	Red
Built-Up Signal	4472	CANNING HWY & RISELEY ST	Four-way	2210.87	20.06	Low-Med	Med-High	Red
Built-Up Signal	4580	GUILDFORD RD & WEST RD	Four-way	2693.36	16.47	Low-Med	Med-High	Red
Built-Up Signal	81522	GUILDFORD RD & GUILDFORD/RAILWAY PDE XING	Three-way	1765.13	25.12	Low-Med	Med-High	Red
Built-Up Signal	14204	LEACH HWY (WEST BND) & CENTENARY AV ONRAMP	Three-way	1689.66	26.20	Low-Med	Med-High	Red
Built-Up Signal	119115	KWINANA FWY NTH - MORTIMER RD & MORTIMER RD & MORTIMER RD - KWINANA FWY NTH	Unknown	166.79	205.35	High	Med	Orange

Built-Up Signal	119121	KWINANA FWY NTH - KULIJA RD & KULIJA RD & KULIJA RD - KWINANA FWY NTH	Unknown	242.43	127.77	High	Low-Med	Orange
Built-Up Signal	119095	KWINANA FWY STH - ROWLEY RD & ROWLEY RD & ROWLEY RD - KWINANA FWY STH	Unknown	414.54	82.62	Med-High	Med	Orange
Built-Up Signal	171500	SAFETY BAY RD ON - H015 NTH BND & SAFETY BAY RD	Unknown	379.27	67.13	Med-High	Low-Med	Orange
Built-Up Signal	116268	H020 WB OFF & VICTORIA PARK DR & H020 WB ON	Unknown	137.16	85.46	Med-High	Low	Orange
Built-Up Signal	119101	KWINANA FWY STH - ANKETELL RD & ANKETELL RD & ANKETELL RD - KWINANA FWY STH	Unknown	717.49	61.26	Med-High	Med	Orange
Built-Up Signal	14110	REID HWY EAST BND OFF AND ON RAMPS & MIRRABOOKA AV	Unknown	686.87	61.42	Med-High	Med	Orange
Built-Up Signal	50640	LORD ST - EAST PDE & PARRY ST & LORD ST	Unknown	678.67	53.44	Med-High	Med	Orange
Built-Up Signal	55993	KARRINYUP - MORLEY HWY & MILES ST	Three-way	620.41	51.95	Med-High	Med	Orange
Built-Up Signal	119112	KWINANA FWY STH - MORTIMER RD & MORTIMER RD & MORTIMER RD - KWINANA FWY STH	Unknown	604.53	48.43	Med	Low-Med	Green
Built-Up Signal	119080	KWINANA FWY NTH - BERRIGAN DR & BERRIGAN DR & BERRIGAN DR - KWINANA FWY NTH	Unknown	521.17	42.34	Med	Low-Med	Green
Built-Up Signal	14104	H015 STH BOUND - FARRINGTON RD & FARRINGTON RD	Unknown	1292.47	29.62	Med	Med	Green

Built-Up Signal	55929	WEST COAST HWY & MANNING ST	Three-way	939.18	40.77	Med	Med	Green
Built-Up Signal	134963	H018 WEST BND OFF/ON - WILLERI DR & WILLERI DR	Unknown	982.63	34.86	Med	Med	Green
Built-Up Signal	11024	SOUTH WESTERN HWY & BEENYUP RD & ABERNETHY RD	Three-way	1075.41	29.97	Med	Med	Green
Built-Up Signal	67459	TYDEMAN RD & NAPIER RD (FPA)	Three-way	893.43	36.08	Med	Med	Green
Built-Up Signal	60091	GREAT EASTERN HWY & HELENA ST	Four-way	2163.59	20.31	Low-Med	Med	Green
Built-Up Signal	55050	WANNEROO RD & NOLLAMARA AV	Three-way	1847.16	23.07	Low-Med	Med	Green
Built-Up Signal	4490	STIRLING HWY & JARRAD ST	Three-way	1734.43	24.40	Low-Med	Med	Green
Built-Up Signal	4106	WANNEROO RD & MARANGAROO DR	Unknown	2306.97	18.32	Low-Med	Med	Green
Built-Up Signal	4464	CANNING HWY & SOUTH TCE	Four-way	2719.76	14.93	Low-Med	Med	Green
Built-Up Signal	4485	STIRLING HWY & LOCH ST	Three-way	1695.33	23.78	Low-Med	Med	Green
Built-Up Signal	14075	VINCENT ST ON - H016 NTH BOUND & VINCENT ST & SOUTHPORT ST & LAKE MONGER DR	Four-way	1631.30	24.27	Low-Med	Med	Green
Built-Up Signal	4449	LEACH HWY & H015 STH BOUND - LEACH HWY OFF	Unknown	5428.51	7.05	Low	Med	Green
Built-Up Signal	4425	GREAT EASTERN HWY & ABERNETHY RD	Three-way	2549.48	14.23	Low-Med	Med	Green
Built-Up Signal	128045	NICHOLSON RD & H018 WEST BND OFF & ON	Unknown	1571.94	23.07	Low-Med	Med	Green
Built-Up Signal	47054	SOUTH ST & SHOPPING CTR ACCESS & CALLEY DR	Four-way	1520.60	23.81	Low-Med	Med	Green

Built-Up Signal	3549	CANNING HWY & RAMP FROM MANNING RD + KWINANA FWY NB & BUS LANE TO CANNING HWY WB	Unknown	5945.78	6.05	Low	Med	Green
Built-Up Signal	4409	ALBANY HWY & MALLARD WY & MANNING RD	Unknown	4337.61	8.27	Low	Med	Green
Built-Up Signal	41181	WEST COAST HWY & CLAREMONT CR	Three-way	2304.11	15.52	Low-Med	Med	Green
Built-Up Signal	4491	STIRLING HWY & WELLINGTON ST	Three-way	1483.17	23.09	Low-Med	Med	Green
Built-Up Signal	128044	NICHOLSON RD & H018 EAST BND OFF & ON	Unknown	1649.19	20.73	Low-Med	Med	Green
Built-Up Signal	13981	WANNEROO RD & DUNDEBAR RD	Three-way	2422.92	13.93	Low-Med	Med	Green
Built-Up Signal	14843	ALBANY HWY & GILWELL AV	Three-way	1514.05	21.48	Low-Med	Med	Green
Built-Up Signal	13992	STIRLING HWY & DALKEITH RD	Four-way	1739.28	18.53	Low-Med	Med	Green
Built-Up Signal	42713	WEST COAST HWY & CURTIN AV & GRANT ST	Three-way	2503.51	12.87	Low-Med	Med	Green
Built-Up Signal	76957	STEPHENSON HWY & SCARBOROUGH BEACH RD	Unknown	1922.33	16.36	Low-Med	Low-Med	Green
Built-Up Signal	4476	CANNING HWY & STOCK RD	Four-way	2324.99	13.35	Low-Med	Low-Med	Green
Built-Up Signal	55912	WEST COAST HWY & BRIGHTON RD	Four-way	2028.67	15.07	Low-Med	Low-Med	Green
Built-Up Signal	4426	GREAT EASTERN HWY & STONEHAM ST & BELGRAVIA ST (A)	Four-way	4777.55	6.34	Low	Low-Med	Green
Built-Up Signal	4107	GUILDFORD RD & GUILDFORD RD & WHATLEY CR	Three-way	2820.17	10.02	Low	Low-Med	Green

Built-Up Signal	4915	MILL POINT RD ON - H015 NTH BO & H015 STH BOUND - MILL POINT RD & MILL PT RD & L	Three-way	1723.98	15.85	Low-Med	Low-Med	Green
Built-Up Signal	4477	CANNING HWY & CARRINGTON ST	Three-way	1596.58	16.35	Low-Med	Low-Med	Green
Built-Up Signal	4295	H018 NTH BOUND - CLAYTON ST OFF & CLAYTON ST & ROBINSON RD	Unknown	943.14	26.84	Low-Med	Low-Med	Green
Built-Up Signal	50658	WANNEROO RD & CARR ST	Four-way	2153.54	11.38	Low	Low-Med	Green
Built-Up Signal	4473	CANNING HWY & NORTH LAKE RD	Three-way	2495.69	9.36	Low	Low-Med	Green
Built-Up Signal	4430	GREAT EASTERN HWY & TERRACE RD	Unknown	1661.38	14.02	Low-Med	Low-Med	Green
Built-Up Signal	11019	SOUTH WESTERN HWY & BEDFORDALE HILL RD & WILLIAM ST	Four-way	1231.34	18.65	Low-Med	Low-Med	Green
Built-Up Signal	13793	STIRLING HWY & MCCABE ST	Three-way	1330.03	16.92	Low-Med	Low-Med	Green
Built-Up Signal	38823	ORRONG RD & WRIGHT ST	Three-way	2497.30	8.87	Low	Low-Med	Green
Built-Up Signal	82300	REID HWY WEST BND OFF AND ON RAMPS & MIRRABOOKA AV	Unknown	874.85	25.31	Low-Med	Low-Med	Green
Built-Up Signal	55994	KARRINYUP - MORLEY HWY & FRANCIS AV	Three-way	815.66	26.75	Low-Med	Low-Med	Green
Built-Up Signal	119160	ALBANY HWY & BUS LANE : CAUSEWAY NTH BND & H005 W BND OFF RAMP	Unknown	2177.44	10.02	Low	Low-Med	Green
Built-Up Signal	154233	SOUTH ST & SOUTH ST ON - H015 STH BOUND	Four-way	3990.82	5.47	Low	Low-Med	Green
Built-Up Signal	14226	LEACH HWY & BUNGAREE RD	Four-way	2465.28	8.66	Low	Low-Med	Green

Built-Up Signal	4182	ERINDALE RD ON - H016 STH BOUN & ERINDALE RD	Three-way	1629.20	12.57	Low-Med	Low-Med	Green
Built-Up Signal	11969	WANNEROO RD & PRINDIVILLE DR	Three-way	2080.69	9.70	Low	Low-Med	Green
Built-Up Signal	129570	SOUTH ST & H766 OFF FROM H018 EAST BND & H753 ON TO H018 EAST BND	Unknown	4646.11	4.35	Low	Low-Med	Green
Built-Up Signal	43174	SOUTH ST & PAGET ST	Three-way	944.34	21.23	Low-Med	Low-Med	Green
Built-Up Signal	4577	GUILDFORD RD & FIRST AV EAST	Three-way	1427.63	13.87	Low-Med	Low-Med	Green
Built-Up Signal	13880	OCEAN REEF RD ON - H016 STH BO & OCEAN REEF RD & H016 STH BOUND - OCEAN REEF RD	Unknown	2146.04	9.01	Low	Low-Med	Green
Built-Up Signal	119077	KWINANA FWY STH - BERRIGAN DR & BERRIGAN DR & BERRIGAN DR - KWINANA FWY STH	Unknown	946.15	20.43	Low-Med	Low-Med	Green
Built-Up Signal	168389	H016 NTH BND - SHENTON AVE OFF & SHENTON AVE ON & SHENTON AVE	Unknown	1103.64	17.51	Low-Med	Low-Med	Green
Built-Up Signal	188271	ARMADALE RD & RAILWAY AV & ABBEY RD	Three-way	1572.85	12.24	Low-Med	Low-Med	Green
Built-Up Signal	13892	H016 NTH BND - HEPBURN AV OFF & HEPBURN AV & HEPBURN AV ON - H016 NTH BND	Unknown	2087.21	8.67	Low	Low-Med	Green
Built-Up Signal	128026	KENWICK LINK & H018 STH BND OFF & ON	Four-way	2266.80	7.09	Low	Low-Med	Green
Built-Up Signal	4401	ALBANY HWY & H013 EAST BOUND - CAUSEWAY NTH	Three-way	2993.17	5.26	Low	Low-Med	Green
Built-Up Signal	4478	CANNING HWY & PRESTON POINT RD	Three-way	1356.21	11.27	Low	Low-Med	Green

Built-Up Signal	4446	LEACH HWY & H015 NTH BOUND - LEACH HWY OFF	Unknown	5527.33	2.56	Low	Low-Med	Green
Built-Up Signal	136989	ALBANY HWY & TONKIN HWY STH BND ON / OFF RAMPs	Unknown	2382.02	5.90	Low	Low-Med	Green
Built-Up Signal	4139	ALBANY HWY & ADELAIDE TCE	Unknown	2973.75	4.62	Low	Low-Med	Green
Built-Up Signal	4316	STIRLING HWY & BAY VIEW TCE	Four-way	1851.97	7.16	Low	Low-Med	Green
Built-Up Signal	14721	GREAT EASTERN HWY & GREAT EASTERN HWY BYPASS	Three-way	5967.78	2.22	Low	Low-Med	Green
Built-Up Signal	81673	WEST COAST HWY & NORTH ST	Four-way	2850.56	4.65	Low	Low-Med	Green
Built-Up Signal	13787	STIRLING HWY & ALFRED RD	Three-way	1330.03	9.11	Low	Low-Med	Green
Built-Up Signal	13873	CANNING HWY & PETRA ST (LG BDRY)	Four-way	1147.03	10.56	Low	Low-Med	Green
Built-Up Signal	4428	GREAT EASTERN HWY & KALAMUNDA RD	Three-way	1755.51	6.86	Low	Low-Med	Green
Built-Up Signal	4993	GREAT EASTERN HWY & MIDLAND GATE ACCESS RD & PADBURY TCE	Four-way	986.08	12.21	Low-Med	Low-Med	Green
Built-Up Signal	4345	POWIS ST ON - H016 STH BOUND & POWIS ST	Three-way	1083.96	10.38	Low	Low	Green
Built-Up Signal	82410	HODGES DR ON - H016 STH BOUND & HODGES DR	Unknown	1750.30	6.43	Low	Low	Green
Built-Up Signal	68988	ALBANY HWY & PAGE RD	Three-way	689.95	13.38	Low-Med	Low	Green
Built-Up Signal	134962	H018 EAST BND OFF/ON - WILLERI DR & WILLERI DR	Unknown	1006.29	9.17	Low	Low	Green
Built-Up Signal	4034	WANNEROO RD & GNANGARA RD	Three-way	2290.44	3.53	Low	Low	Green
Built-Up Signal	13949	STOCK RD & GARLING ST & STOCKDALE RD	Four-way	978.43	8.25	Low	Low	Green

Built-Up Signal	4587	CANNING HWY & QUEEN VICTORIA ST & QUEEN VICTORIA ST	Three-way	1897.45	3.19	Low	Low	Green
Built-Up Signal	72536	THOMAS RD & KWINANA FWY STH - THOMAS RD & THOMAS RD & THOMAS RD - KWINANA FWY	Unknown	1699.78	3.56	Low	Low	Green
Built-Up Signal	149893	GREAT EASTERN HWY & PADBURY TCE	Four-way	881.91	6.87	Low	Low	Green
Built-Up Signal	4020	SOUTH WESTERN HWY & THOMAS RD	Three-way	1213.03	3.33	Low	Low	Green
Built-Up Signal	4138	WANNEROO RD & MAIN ST	Three-way	2206.12	1.83	Low	Low	Green
Built-Up Signal	13800	STIRLING HWY & GLYDE ST	Three-way	1306.78	3.09	Low	Low	Green
Built-Up Signal	13842	STIRLING HWY & OSBORNE PDE & ERIC ST	Four-way	1674.15	2.41	Low	Low	Green
Built-Up Signal	14161	GUILDFORD RD & THIRLMERE RD	Three-way	1259.07	3.21	Low	Low	Green
Built-Up Signal	14194	GREAT EASTERN HWY & GRIFFITHS ST & H020 WEST BOUND - GEH OFF	Unknown	4972.44	0.81	Low	Low	Green
Built-Up Signal	55033	WANNEROO RD & LONDON ST	Three-way	1577.50	2.56	Low	Low	Green
Built-Up Signal	91532	GUILDFORD RD & OLD PERTH RD	Three-way	1001.39	4.03	Low	Low	Green
Built-Up Signal	116267	H020 EB OFF & H020 EB ON & VICTORIA PARK DR	Four-way	1019.23	3.96	Low	Low	Green
Built-Up Signal	168403	H016 STH BND - SHENTON AVE ON & SHENTON AVE OFF & SHENTON AVE	Unknown	562.22	7.18	Low	Low	Green
Built-Up Signal	168406	H016 STH BND START - BURNS BEACH RD	Three-way	991.71	4.07	Low	Low	Green

Built-Up Signal	194349	LEACH HWY & KWINANA FWY (NORTHBOUND) OFF TO LEACH HWY (WESTBOUND)	Three-way	2199.70	1.84	Low	Low	Green
Built-Up Signal	3500	CLAYTON ST ON - H018 STH BOUND & CLAYTON ST	Three-way	807.35	2.50	Low	Low	Green
Built-Up Signal	82731	ALBANY HWY & ALBANY HWY ON - H013 WEST BOUND	Three-way	2993.17	0.67	Low	Low	Green
Built-Up Signal	143415	QUEEN VICTORIA ST (H031) & QUEEN VICTORIA ST & BEACH ST (H056)	Three-way	2623.10	0.77	Low	Low	Green
Built-Up Signal	164784	COCKBURN RD & ORSINO BVD	Three-way	393.61	5.13	Low	Low	Green
Built-Up Signal	171499	H015 STH BND OFF - SAFETY BAY RD & SAFETY BAY RD	Three-way	1322.97	1.53	Low	Low	Green
Built-Up Non-Signal	54230	NICHOLSON RD & THOMAS RD	Three-way	1353.33	169.91	High	High	Black
Built-Up Non-Signal	42886	CANNING HWY & EAST ST	Four-way	1252.39	182.49	High	High	Black
Built-Up Non-Signal	14192	ALBANY HWY & GRESHAM ST	Unknown	1496.35	117.13	High	High	Black
Built-Up Non-Signal	45285	WELSHPOOL RD EAST & BRUCE RD & BROOK RD	Four-way	850.04	203.48	High	High	Black
Built-Up Non-Signal	14879	SOUTH WESTERN HWY & THIRD RD	Three-way	719.71	223.61	High	High	Black
Built-Up Non-Signal	14295	GUILDFORD RD & COLSTOUN RD	Three-way	878.20	176.73	High	High	Black
Built-Up Non-Signal	47051	SOUTH ST & WHEATLEY DR	Three-way	1198.25	122.32	High	High	Black
Built-Up Non-Signal	4414	ALBANY HWY & GOSNELLS RD WEST	Three-way	706.25	176.09	High	High	Black
Built-Up Non-Signal	4432	GREAT EASTERN HWY & SCOTT ST	Three-way	1750.35	97.81	Med-High	High	Black
Built-Up Non-Signal	14186	GREAT EASTERN HWY & VICTORIA PARK DR & BURSWOOD RD	Four-way	1823.88	84.82	Med-High	High	Black

Built-Up Non-Signal	37927	KARRINYUP - MORLEY HWY & MCGILVRAY AV	Three-way	1536.95	99.09	Med-High	High	Black
Built-Up Non-Signal	14236	LEACH HWY & BRAIBRISE RD	Four-way	1482.29	88.87	Med-High	High	Black
Built-Up Non-Signal	14188	ALBANY HWY & AXON AV	Unknown	1496.35	76.58	Med-High	High	Black
Built-Up Non-Signal	14855	GREAT EASTERN HWY & FERGUSON ST	Four-way	1238.44	85.97	Med-High	High	Black
Built-Up Non-Signal	38835	ORRONG RD & PRESIDENT ST	Four-way	1634.71	59.15	Med-High	High	Black
Built-Up Non-Signal	75574	GUILDFORD RD & SECOND AV EAST	Three-way	1259.07	76.80	Med-High	High	Black
Built-Up Non-Signal	39040	ROBERTS RD & ORRONG RD	Three-way	1371.48	143.10	High	High	Red
Built-Up Non-Signal	13931	CANNING HWY & MURRAY RD	Four-way	1272.23	141.75	High	High	Red
Built-Up Non-Signal	14711	BREARLEY AV & SECOND ST (B) H016 STH BOUND - WARWICK RD OFF & WARWICK RD & WARWICK RD ON - H016 STH BOUND	Three-way	805.47	207.23	High	High	Red
Built-Up Non-Signal	13941	ALBANY HWY & HELM ST	Unknown	799.17	148.19	High	High	Red
Built-Up Non-Signal	14775	ORRONG RD & ALEXANDER RD	Three-way	706.25	142.32	High	High	Red
Built-Up Non-Signal	38821	GREAT EASTERN HWY & LOTON AV	Three-way	2306.94	64.32	Med-High	High	Red
Built-Up Non-Signal	14831	LEACH HWY & NORMA RD	Four-way	1238.44	115.17	High	High	Red
Built-Up Non-Signal	14055	WANNEROO RD & ARKANA RD	Three-way	1425.82	99.58	Med-High	High	Red
Built-Up Non-Signal	55056	CANNING HWY & FOSS ST	Three-way	1705.42	83.05	Med-High	High	Red
Built-Up Non-Signal	13920	SOUTH ST & FINDLAY RD	Four-way	1272.23	99.45	Med-High	High	Red
Built-Up Non-Signal	47052	LEACH HWY & MONTREAL ST	Three-way	1673.23	71.14	Med-High	High	Red
Built-Up Non-Signal	13830	LEACH HWY & MARCUS AV	Three-way	1170.99	100.88	Med-High	High	Red
Built-Up Non-Signal	16606	KARRINYUP - MORLEY HWY & CONSTANCE ST	Three-way	1609.30	72.30	Med-High	High	Red
Built-Up Non-Signal	55611	WANNEROO RD & NUGENT ST & AMBERLEY WY	Four-way	960.42	112.73	High	High	Red
Built-Up Non-Signal	14063		Four-way	1289.05	83.38	Med-High	High	Red

Built-Up Non-Signal	14132	ARMADALE RD & SOLOMON RD	Three-way	983.40	106.45	High	High	Red
Built-Up Non-Signal	56001	KARRINYUP - MORLEY HWY & JACKSON AV	Three-way	952.49	106.59	High	High	Red
Built-Up Non-Signal	14021	LEACH HWY & ROME RD	Three-way	1091.96	92.05	Med-High	High	Red
Built-Up Non-Signal	14169	GUILDFORD RD & SEVENTH AV	Four-way	1414.20	68.76	Med-High	High	Red
Built-Up Non-Signal	14311	ALBANY HWY & STATION ST STH	Three-way	1710.74	56.67	Med-High	High	Red
Built-Up Non-Signal	14890	GREAT EASTERN HWY & BUSHBY ST	Four-way	1238.44	75.73	Med-High	High	Red
Built-Up Non-Signal	13964	ROCKINGHAM RD (STH BND) & WATTLEUP RD	Four-way	896.32	101.24	Med-High	High	Red
Built-Up Non-Signal	14041	WANNEROO RD & CANHAM WY	Three-way	985.31	92.10	Med-High	High	Red
Built-Up Non-Signal	14156	GUILDFORD RD & STANLEY ST	Three-way	1068.27	82.45	Med-High	Med-High	Red
Built-Up Non-Signal	38837	ORRONG RD & KEW ST	Four-way	1634.71	53.88	Med-High	Med-High	Red
Built-Up Non-Signal	80669	ARMADALE RD & FRESHWATER DR	Three-way	983.40	87.87	Med-High	Med-High	Red
Built-Up Non-Signal	14181	GUILDFORD RD & CALEDONIAN AV	Three-way	1071.46	78.58	Med-High	Med-High	Red
Built-Up Non-Signal	13909	WANNEROO RD & ASHLEY RD	Three-way	785.63	105.64	Med-High	Med-High	Red
Built-Up Non-Signal	10158	STOCK RD & SAINSBURY RD	Three-way	741.51	106.97	High	Med-High	Red
Built-Up Non-Signal	13843	LEACH HWY & ONSLOW ST	Three-way	1198.89	65.54	Med-High	Med-High	Red
Built-Up Non-Signal	14708	ALBANY HWY & HIGHBURY CR	Three-way	965.39	80.85	Med-High	Med-High	Red
Built-Up Non-Signal	14051	CANNING HWY & NORMA RD & DUNKLEY AV	Four-way	1283.13	59.26	Med-High	Med-High	Red
Built-Up Non-Signal	56003	KARRINYUP - MORLEY HWY & MUIR ST	Three-way	1054.64	72.09	Med-High	Med-High	Red
Built-Up Non-Signal	14232	ALBANY HWY & BOUNDARY RD	Three-way	1198.47	62.83	Med-High	Med-High	Red
Built-Up Non-Signal	43168	SOUTH ST & SHEPHERD ST	Three-way	831.78	88.49	Med-High	Med-High	Red
Built-Up Non-Signal	14002	KARRINYUP - MORLEY HWY & DENNIS ST	Three-way	670.84	109.15	High	Med-High	Red

Built-Up Non-Signal	14870	GREAT EASTERN HWY & WELLATON ST	Three-way	645.10	113.51	High	Med-High	Red
Built-Up Non-Signal	13913	CANNING HWY & MCKIMMIE RD & POINT WALTER RD	Four-way	1272.23	55.55	Med-High	Med-High	Red
Built-Up Non-Signal	14053	WANNEROO RD & CULLOTON CR	Three-way	992.81	70.83	Med-High	Med-High	Red
Built-Up Non-Signal	11972	WANNEROO RD & EAST RD	Three-way	1164.79	59.81	Med-High	Med-High	Red
Built-Up Non-Signal	14007	WANNEROO RD & ELLIOT RD	Three-way	1164.79	58.62	Med-High	Med-High	Red
Built-Up Non-Signal	12301	GUILDFORD RD & MARKET ST	Three-way	1224.04	55.15	Med-High	Med-High	Red
Built-Up Non-Signal	13890	STIRLING HWY & FRESHWATER PDE	Three-way	1162.25	58.09	Med-High	Med-High	Red
Built-Up Non-Signal	14761	ALBANY HWY & BLACKBURN ST	Three-way	1063.59	63.47	Med-High	Med-High	Red
Built-Up Non-Signal	14766	ALBANY HWY & DALZIELL ST	Three-way	706.25	95.59	Med-High	Med-High	Red
Built-Up Non-Signal	81683	GREAT EASTERN HWY & MOORE AV	Three-way	938.56	71.93	Med-High	Med-High	Red
Built-Up Non-Signal	14851	ALBANY HWY & FANCOTE ST & DAVIS RD	Unknown	1357.43	49.63	Med	Med-High	Red
Built-Up Non-Signal	119139	REID HWY & NORTH BEACH RD	Three-way	1220.24	53.56	Med-High	Med-High	Red
Built-Up Non-Signal	14810	GREAT EASTERN HWY & BROCKMAN RD	Four-way	1286.54	50.42	Med	Med-High	Red
Built-Up Non-Signal	13956	STIRLING HWY & TAYLOR RD	Three-way	1272.68	50.65	Med	Med-High	Red
Built-Up Non-Signal	14191	GUILDFORD RD & BELGRAVE ST	Three-way	1071.76	60.15	Med-High	Med-High	Red
Built-Up Non-Signal	68322	CANNING HWY & ANDREW RD	Three-way	1072.41	60.11	Med-High	Med-High	Red
Built-Up Non-Signal	55037	WANNEROO RD & ROBERTS ST	Three-way	850.66	75.52	Med-High	Med-High	Red
Built-Up Non-Signal	13802	STIRLING HWY & SALVADO ST	Three-way	1194.02	51.56	Med	Med-High	Red
Built-Up Non-Signal	43186	SOUTH ST & YARRICK ST	Three-way	911.14	67.56	Med-High	Med-High	Red
Built-Up Non-Signal	50669	WANNEROO RD & VIEW ST	Three-way	1158.52	53.12	Med-High	Med-High	Red
Built-Up Non-Signal	14020	CANNING HWY & ROME RD	Three-way	876.50	69.13	Med-High	Med-High	Red
Built-Up Non-Signal	81638	ORRONG RD & KURNALL RD	Four-way	1156.01	52.36	Med-High	Med-High	Red
Built-Up Non-Signal	13848	COCKBURN RD & MAYOR RD	Three-way	524.84	112.20	High	Med-High	Red

Built-Up Non-Signal	14054	WANNEROO RD & TREEN ST	Three-way	992.81	58.94	Med-High	Med-High	Red
Built-Up Non-Signal	11971	WANNEROO RD & VILLANOVA ST	Three-way	1164.79	49.41	Med	Med-High	Red
Built-Up Non-Signal	51110	GUILDFORD RD & SUMMERS ST	Three-way	1124.99	50.54	Med	Med-High	Red
Built-Up Non-Signal	55046	WANNEROO RD & SWAN ST	Four-way	1072.72	52.06	Med-High	Med-High	Red
Built-Up Non-Signal	13938	LEACH HWY & JUSTINIAN ST	Three-way	862.45	60.03	Med-High	Med-High	Red
Built-Up Non-Signal	14032	WANNEROO RD & LANCASTER RD	Three-way	860.88	60.13	Med-High	Med-High	Red
Built-Up Non-Signal	14752	GREAT EASTERN HWY & ATTFIELD ST	Three-way	770.38	64.58	Med-High	Med-High	Red
Built-Up Non-Signal	13896	WANNEROO RD & CLARKSON AV	Three-way	785.63	62.86	Med-High	Med-High	Red
Built-Up Non-Signal	14885	GREAT EASTERN HWY & EWART ST	Three-way	938.56	52.62	Med-High	Med-High	Red
Built-Up Non-Signal	76904	WANNEROO RD & GOLF LINKS DR	Three-way	901.46	54.79	Med-High	Med-High	Red
Built-Up Non-Signal	14871	SOUTH WESTERN HWY & MARSH RD & FOURTH RD	Four-way	949.66	49.58	Med	Med-High	Red
Built-Up Non-Signal	12300	GUILDFORD RD & NORTH ST	Unknown	909.48	48.42	Med	Med-High	Red
Built-Up Non-Signal	13948	STOCK RD & BOON ST	Three-way	741.51	59.39	Med-High	Med-High	Red
Built-Up Non-Signal	14286	GUILDFORD RD & MOOJEBING ST	Three-way	878.20	50.15	Med	Med-High	Red
Built-Up Non-Signal	75485	STOCK RD (STH BND) & WINTERFOLD RD	Four-way	2169.33	39.72	Med	Med-High	Red
Built-Up Non-Signal	119153	ALBANY HWY & RIVERSIDE DR (END LEFT CWY)	Three-way	1896.72	37.20	Med	Med-High	Red
Built-Up Non-Signal	13986	STIRLING HWY & MOUNTJOY RD & BAIRD AV	Four-way	1739.28	38.82	Med	Med-High	Red
Built-Up Non-Signal	14011	WANNEROO RD & BUCKINGHAM DR	Three-way	1699.52	38.00	Med	Med-High	Red
Built-Up Non-Signal	13864	STIRLING HWY & ALBERT ST	Three-way	1535.74	41.98	Med	Med-High	Red

Built-Up Non-Signal	41027	SOUTH ST & BEASLEY RD	Three-way	1362.47	43.69	Med	Med-High	Red
Built-Up Non-Signal	39306	BALLANTYNE RD & ORRONG RD & DIVISION ST STH	Four-way	1479.31	36.28	Med	Med-High	Red
Built-Up Non-Signal	13930	STIRLING HWY & BAY RD	Three-way	1297.45	38.35	Med	Med-High	Red
Built-Up Non-Signal	47048	SOUTH ST & GRACECHURCH CR	Three-way	1119.22	44.45	Med	Med-High	Red
Built-Up Non-Signal	55931	WEST COAST HWY & PEARL PDE	Three-way	1299.36	38.29	Med	Med-High	Red
Built-Up Non-Signal	36342	ARMADALE RD & CHURCH AV	Three-way	1191.65	41.25	Med	Med-High	Red
Built-Up Non-Signal	14139	CANNING HWY & BIRDWOOD AV	Three-way	1277.99	37.63	Med	Med-High	Red
Built-Up Non-Signal	14164	LEACH HWY & CORINTHIAN RD EAST	Three-way	1043.70	46.08	Med	Med-High	Red
Built-Up Non-Signal	129008	FELSPAR ST & ORRONG RD	Three-way	1212.81	39.47	Med	Med-High	Red
Built-Up Non-Signal	14023	STIRLING HWY & ARCHDEACON ST	Three-way	1344.83	34.46	Med	Med-High	Red
Built-Up Non-Signal	14163	CANNING HWY & TAYLOR ST	Three-way	1169.42	38.52	Med	Med-High	Red
Built-Up Non-Signal	184390	GEH & ROE HWY STH BND OFF TO GEH & GEH EAST BND ON TO ROE HWY	Unknown	1761.57	25.21	Low-Med	Med-High	Red
Built-Up Non-Signal	14135	CANNING HWY & COMER ST	Three-way	1277.99	34.46	Med	Med-High	Red
Built-Up Non-Signal	14229	GUILDFORD RD & ROBERTS ST	Three-way	1140.69	38.61	Med	Med-High	Red
Built-Up Non-Signal	119109	THOMAS RD & THOMAS RD - KWINANA FWY NTH & KWINANA FWY NTH - THOMAS RD	Unknown	2140.34	23.42	Low-Med	Med-High	Red
Built-Up Non-Signal	187334	GEH & GEH ON TO ROE HWY NTH BND & ROE HWY NTH BND OFF TO GEH WEST BND	Unknown	2092.23	22.99	Low-Med	Med-High	Red
Built-Up Non-Signal	4550	H018 NTH BOUND - MAIDA VALE RD & MAIDA VALE RD	Three-way	560.99	78.08	Med-High	Med	Orange
Built-Up Non-Signal	36310	ARMADALE RD & STREICH AV	Three-way	559.44	75.67	Med-High	Med	Orange

Built-Up Non-Signal	55990	KARRINYUP - MORLEY HWY & BURROUGHS RD	Three-way	672.81	62.63	Med-High	Med	Orange
Built-Up Non-Signal	10002	ALBANY HWY & MCINTYRE WY	Three-way	644.26	63.63	Med-High	Med	Orange
Built-Up Non-Signal	13795	STIRLING HWY & HARVEST RD	Three-way	703.20	58.29	Med-High	Med	Orange
Built-Up Non-Signal	14864	ALBANY HWY & CARAWATHA AV	Three-way	663.06	61.82	Med-High	Med	Orange
Built-Up Non-Signal	14888	SOUTH WESTERN HWY & SAW RD	Three-way	719.71	56.96	Med-High	Med	Orange
Built-Up Non-Signal	42195	SPARKS RD & RUSSELL RD (WEST)	Three-way	787.05	52.08	Med-High	Med	Orange
Built-Up Non-Signal	75569	SOUTH WESTERN HWY & DICKENS PL	Three-way	622.92	65.81	Med-High	Med	Orange
Built-Up Non-Signal	14894	BROOKTON HWY & LEFROY RD	Three-way	477.26	67.54	Med-High	Med	Orange
Built-Up Non-Signal	42883	CANNING HWY & SEWELL RD	Three-way	519.48	62.05	Med-High	Med	Orange
Built-Up Non-Signal	130005	KENWICK LINK & WIMBLEDON ST SVC RD	Three-way	589.64	54.66	Med-High	Med	Orange
Built-Up Non-Signal	67463	WANNEROO RD & WOODVALE DR	Three-way	833.75	50.38	Med	Med	Green
Built-Up Non-Signal	4551	MAIDA VALE RD ON - H018 STH BO & MAIDA VALE RD	Three-way	626.59	51.44	Med	Med	Green
Built-Up Non-Signal	14742	ALBANY HWY & COOPER AV	Three-way	644.26	50.03	Med	Med	Green
Built-Up Non-Signal	36541	ARMADALE RD & ORCHARD AV	Three-way	559.44	48.78	Med	Low-Med	Green
Built-Up Non-Signal	14914	TOODYAY RD & LEWIS JONES CR	Three-way	1199.34	35.14	Med	Med	Green
Built-Up Non-Signal	14842	GREAT EASTERN HWY & LEFROY AV	Three-way	938.56	44.75	Med	Med	Green
Built-Up Non-Signal	119142	REID HWY & DUFFY RD (NORTH)	Three-way	1306.21	31.67	Med	Med	Green
Built-Up Non-Signal	14759	GREAT EASTERN HWY & TURTON ST	Three-way	1153.99	35.52	Med	Med	Green
Built-Up Non-Signal	14793	GREAT EASTERN HWY & CALE ST	Four-way	986.08	41.57	Med	Med	Green

Built-Up Non-Signal	14846	GREAT EASTERN HWY & MATHOURA ST	Three-way	938.56	43.68	Med	Med	Green
Built-Up Non-Signal	119015	COCKBURN RD & RUSSELL RD (WEST)	Three-way	1283.29	30.86	Med	Med	Green
Built-Up Non-Signal	13863	LEACH HWY & WILKINSON ST	Three-way	1198.89	31.97	Med	Med	Green
Built-Up Non-Signal	14122	CANNING HWY & CALE ST (A)	Three-way	1222.14	31.36	Med	Med	Green
Built-Up Non-Signal	38826	ORRONG RD & MERCURY ST	Three-way	1238.88	30.93	Med	Med	Green
Built-Up Non-Signal	50688	WANNEROO RD & ELLESMERE ST	Three-way	932.10	41.12	Med	Med	Green
Built-Up Non-Signal	50969	GODDARD ST & ORRONG RD	Three-way	1494.26	25.50	Low-Med	Med	Green
Built-Up Non-Signal	47057	SOUTH ST & PRESCOTT DR	Three-way	986.24	37.57	Med	Med	Green
Built-Up Non-Signal	55053	WANNEROO RD & RAVENSWOOD DR	Three-way	1220.65	30.06	Med	Med	Green
Built-Up Non-Signal	14061	STIRLING HWY & KINGS PARK AV	Three-way	1148.36	31.17	Med	Med	Green
Built-Up Non-Signal	4408	ALBANY HWY & BURTON ST	Three-way	1054.25	33.46	Med	Med	Green
Built-Up Non-Signal	13827	CANNING HWY & MAY ST	Three-way	869.29	40.58	Med	Med	Green
Built-Up Non-Signal	14022	STIRLING HWY & WILLIAMS RD	Three-way	1344.83	26.23	Low-Med	Med	Green
Built-Up Non-Signal	14042	WANNEROO RD & PARIN RD	Three-way	985.31	35.80	Med	Med	Green
Built-Up Non-Signal	14289	GUILDFORD RD & PEARSON ST	Three-way	878.20	40.17	Med	Med	Green
Built-Up Non-Signal	14770	GREAT EASTERN HWY & FIRST AV	Three-way	1012.98	34.83	Med	Med	Green
Built-Up Non-Signal	14858	ALBANY HWY & CHURCH ST	Three-way	1028.74	34.29	Med	Med	Green
Built-Up Non-Signal	16607	LEACH HWY & FIFTH AV	Three-way	1348.91	26.15	Low-Med	Med	Green
Built-Up Non-Signal	38829	ORRONG RD & COHN ST (BELMONT)	Three-way	1118.53	31.54	Med	Med	Green
Built-Up Non-Signal	127282	WANNEROO RD & AUTOMATIVE DR	Three-way	874.57	40.34	Med	Med	Green
Built-Up Non-Signal	133201	GUILDFORD RD & DARBY ST	Three-way	1071.76	32.92	Med	Med	Green

Built-Up Non-Signal	139007	STIRLING HWY & GOLDSWORTHY RD	Three-way	1235.49	28.55	Low-Med	Med	Green
Built-Up Non-Signal	14704	BREARLEY AV & FIRST ST	Four-way	1062.82	32.97	Med	Med	Green
Built-Up Non-Signal	43183	SOUTH ST & COLLUCK ST	Three-way	978.63	35.81	Med	Med	Green
Built-Up Non-Signal	13801	STIRLING HWY & STUART ST	Three-way	1306.78	26.54	Low-Med	Med	Green
Built-Up Non-Signal	14243	ALBANY HWY & PALMERSTON ST	Three-way	1198.47	28.63	Low-Med	Med	Green
Built-Up Non-Signal	68661	SOUTH ST & PLANE TREE GR	Three-way	878.62	37.99	Med	Med	Green
Built-Up Non-Signal	14244	ALBANY HWY & COOLGARDIE ST	Three-way	1198.47	27.23	Low-Med	Med	Green
Built-Up Non-Signal	13806	STIRLING HWY & IRVINE ST	Three-way	932.12	34.58	Med	Med	Green
Built-Up Non-Signal	13815	STIRLING HWY & STATION ST	Three-way	1165.19	27.66	Low-Med	Med	Green
Built-Up Non-Signal	13879	CANNING HWY & WESTBURY CR	Three-way	869.29	37.08	Med	Med	Green
Built-Up Non-Signal	13903	CANNING HWY & ADRIAN ST	Three-way	964.17	33.43	Med	Med	Green
Built-Up Non-Signal	13973	WANNEROO RD & HART CT	Three-way	1050.29	30.69	Med	Med	Green
Built-Up Non-Signal	14028	STIRLING HWY & BRUCE ST	Three-way	989.46	32.58	Med	Med	Green
Built-Up Non-Signal	14058	CANNING HWY & DONEY ST	Three-way	972.43	33.15	Med	Med	Green
Built-Up Non-Signal	14149	CANNING HWY & SALISBURY AV	Three-way	1249.77	25.79	Low-Med	Med	Green
Built-Up Non-Signal	14178	ALBANY HWY & HARVEY ST NORTH	Three-way	847.83	38.02	Med	Med	Green
Built-Up Non-Signal	14760	ALBANY HWY & SAMPSON ST	Three-way	1063.59	30.30	Med	Med	Green
Built-Up Non-Signal	14768	ALBANY HWY & BURWASH PL & RIVER AV	Unknown	931.91	34.59	Med	Med	Green
Built-Up Non-Signal	14904	GREAT NORTHERN HWY & CHITTERING RD	Three-way	981.58	32.84	Med	Med	Green
Built-Up Non-Signal	14929	GREAT EASTERN HWY & BULLARRA RD	Three-way	969.00	33.26	Med	Med	Green
Built-Up Non-Signal	14930	GREAT EASTERN HWY & WOLOWRA RD	Three-way	969.00	33.26	Med	Med	Green

Built-Up Non-Signal	38825	ORRONG RD & FULHAM ST (B)	Three-way	1238.88	26.02	Low-Med	Med	Green
Built-Up Non-Signal	38834	ORRONG RD & ORRONG PL	Three-way	1238.88	26.02	Low-Med	Med	Green
Built-Up Non-Signal	43009	QUEEN VICTORIA ST & SWAN ST	Three-way	1079.03	29.87	Med	Med	Green
Built-Up Non-Signal	43158	SOUTH ST & WILUNA AV	Three-way	831.78	38.75	Med	Med	Green
Built-Up Non-Signal	43169	SOUTH ST & MINILYA ST	Three-way	831.78	38.75	Med	Med	Green
Built-Up Non-Signal	50666	WANNEROO RD & CLAVERTON ST	Three-way	1094.21	29.46	Med	Med	Green
Built-Up Non-Signal	54428	MILL POINT RD & PARKER ST	Three-way	1047.42	30.77	Med	Med	Green
Built-Up Non-Signal	55052	WANNEROO RD & WOLLONG PL	Three-way	819.59	39.33	Med	Med	Green
Built-Up Non-Signal	55609	KARRINYUP - MORLEY HWY & HILLSBOROUGH DR	Three-way	1130.26	28.52	Low-Med	Med	Green
Built-Up Non-Signal	133253	WEST COAST HWY & RESERVE ST	Three-way	939.18	34.32	Med	Med	Green
Built-Up Non-Signal	50674	WANNEROO RD & WAUGH ST	Three-way	932.10	32.54	Med	Low-Med	Green
Built-Up Non-Signal	125840	WANNEROO RD & KIRKSTALL DR	Three-way	1164.79	26.04	Low-Med	Low-Med	Green
Built-Up Non-Signal	55601	KARRINYUP - MORLEY HWY & WINDSOR AV	Three-way	826.44	35.48	Med	Low-Med	Green
Built-Up Non-Signal	14160	LEACH HWY & BEATRICE AV	Three-way	1043.70	26.15	Low-Med	Low-Med	Green
Built-Up Non-Signal	43187	SOUTH ST & LADNER ST	Three-way	894.91	26.38	Low-Med	Low-Med	Green
Built-Up Non-Signal	14821	SOUTH WESTERN HWY & LARSEN RD	Three-way	692.78	33.01	Med	Low-Med	Green
Built-Up Non-Signal	55051	WANNEROO RD & SYLVIA ST (BALCATT)	Three-way	819.59	25.09	Low-Med	Low-Med	Green
Built-Up Non-Signal	14952	BROOKTON HWY & HOLDEN RD	Three-way	549.06	35.58	Med	Low-Med	Green
Built-Up Non-Signal	55613	KARRINYUP - MORLEY HWY & HUCKLE ST (NORTH)	Three-way	661.49	28.01	Low-Med	Low-Med	Green
Built-Up Non-Signal	11028	BROOKTON HWY & OLD COACH PL	Three-way	477.26	29.57	Med	Low-Med	Green
Built-Up Non-Signal	12304	COCKBURN RD & AMITY BVD	Three-way	524.84	26.89	Low-Med	Low-Med	Green

Built-Up Non-Signal	42884	CANNING HWY & HUBBLE ST	Three-way	519.48	27.16	Low-Med	Low-Med	Green
Built-Up Non-Signal	14703	GREAT EASTERN HWY & BULONG AV (A)	Four-way	1854.79	22.10	Low-Med	Med	Green
Built-Up Non-Signal	154237	SOUTH ST & H616 - SOUTH ST EAST BOUND	Three-way	3024.47	13.55	Low-Med	Med	Green
Built-Up Non-Signal	4578	GUILDFORD RD & PENINSULA RD	Three-way	1536.96	24.93	Low-Med	Med	Green
Built-Up Non-Signal	14248	GUILDFORD RD & SLADE ST	Four-way	1648.60	22.10	Low-Med	Med	Green
Built-Up Non-Signal	4474	CANNING HWY & HISLOP RD	Three-way	1692.26	20.85	Low-Med	Med	Green
Built-Up Non-Signal	14166	GUILDFORD RD & THIRD AV EAST	Four-way	1661.35	21.23	Low-Med	Med	Green
Built-Up Non-Signal	14217	ALBANY HWY & DANE ST NORTH & DANE ST SOUTH	Unknown	1496.35	23.58	Low-Med	Med	Green
Built-Up Non-Signal	4412	ALBANY HWY & ALBANY HWY	Three-way	1531.19	21.05	Low-Med	Med	Green
Built-Up Non-Signal	13798	STIRLING HWY & FAIRLIGHT ST	Three-way	1306.78	24.67	Low-Med	Med	Green
Built-Up Non-Signal	13847	STIRLING HWY & CONGDON ST	Three-way	1370.28	23.52	Low-Med	Med	Green
Built-Up Non-Signal	13999	STIRLING HWY & KINNINMONT AV	Three-way	1318.12	24.45	Low-Med	Med	Green
Built-Up Non-Signal	14074	CANNING HWY & SIMPSON ST	Four-way	1681.65	19.17	Low-Med	Med	Green
Built-Up Non-Signal	14300	ALBANY HWY & COCKRAM ST	Three-way	1530.44	21.06	Low-Med	Med	Green
Built-Up Non-Signal	4574	WANNEROO RD & CAMBERWELL RD	Three-way	1512.55	20.97	Low-Med	Low-Med	Green
Built-Up Non-Signal	14758	GREAT EASTERN HWY & SWAN ST EAST & WATER ST	Four-way	2198.27	13.97	Low-Med	Low-Med	Green
Built-Up Non-Signal	13922	CANNING HWY & HARRIS RD	Four-way	1272.23	23.84	Low-Med	Low-Med	Green
Built-Up Non-Signal	40701	SOUTH ST & DARIAN DR	Three-way	1362.47	21.51	Low-Med	Low-Med	Green
Built-Up Non-Signal	14787	GREAT EASTERN HWY & HELENA ST	Four-way	2287.80	12.66	Low-Med	Low-Med	Green
Built-Up Non-Signal	13970	CANNING HWY & PRINSEP RD	Four-way	1234.77	22.10	Low-Med	Low-Med	Green
Built-Up Non-Signal	76513	ARMADALE RD & RAILWAY AV	Unknown	1927.53	13.83	Low-Med	Low-Med	Green

Built-Up Non-Signal	43178	SOUTH ST & HINES RD	Four-way	1246.06	19.76	Low-Med	Low-Med	Green
Built-Up Non-Signal	14187	GUILDFORD RD & FERGUSON ST	Four-way	1414.20	16.89	Low-Med	Low-Med	Green
Built-Up Non-Signal	70206	LEACH HWY & MARSHALL RD	Three-way	1425.82	16.56	Low-Med	Low-Med	Green
Built-Up Non-Signal	4483	STIRLING HWY & SMYTH RD	Three-way	1812.98	12.11	Low-Med	Low-Med	Green
Built-Up Non-Signal	14048	WANNEROO RD & TEMPLETON CR	Three-way	870.06	24.80	Low-Med	Low-Med	Green
Built-Up Non-Signal	14190	GREAT EASTERN HWY & CORNWALL ST	Three-way	1382.25	15.61	Low-Med	Low-Med	Green
Built-Up Non-Signal	14150	CANNING HWY & DYSON ST	Four-way	1649.08	12.70	Low-Med	Low-Med	Green
Built-Up Non-Signal	119143	REID HWY & DUFFY RD (SOUTH)	Three-way	1348.69	15.53	Low-Med	Low-Med	Green
Built-Up Non-Signal	4429	GREAT EASTERN HWY & QUEENS RD	Three-way	964.30	21.33	Low-Med	Low-Med	Green
Built-Up Non-Signal	13952	STOCK RD & PEEL RD	Four-way	978.43	21.02	Low-Med	Low-Med	Green
Built-Up Non-Signal	14131	CANNING HWY & PRESTON ST	Three-way	1277.99	16.09	Low-Med	Low-Med	Green
Built-Up Non-Signal	14783	GREAT EASTERN HWY & WILLIAM ST	Four-way	986.08	20.86	Low-Med	Low-Med	Green
Built-Up Non-Signal	14133	CANNING HWY & TODD AV	Three-way	1277.99	15.81	Low-Med	Low-Med	Green
Built-Up Non-Signal	13954	STIRLING HWY & ORD ST	Three-way	1272.68	15.35	Low-Med	Low-Med	Green
Built-Up Non-Signal	3616	WANNEROO RD & NEVILLE DR	Three-way	1050.29	17.64	Low-Med	Low-Med	Green
Built-Up Non-Signal	14892	GREAT EASTERN HWY & VICTORIA PDE	Three-way	1233.37	15.02	Low-Med	Low-Med	Green
Built-Up Non-Signal	50670	WANNEROO RD & ALBERT ST	Four-way	1443.82	12.83	Low-Med	Low-Med	Green
Built-Up Non-Signal	132959	GREAT EASTERN HWY & KEANE ST	Three-way	747.31	23.95	Low-Med	Low-Med	Green
Built-Up Non-Signal	14035	WANNEROO RD & HOCKING RD	Three-way	973.28	18.00	Low-Med	Low-Med	Green
Built-Up Non-Signal	14774	GREAT EASTERN HWY & HARPER ST	Three-way	1012.98	17.30	Low-Med	Low-Med	Green
Built-Up Non-Signal	4348	HUTTON ST ON - H016 STH BOUND & CAPE ST	Three-way	1007.73	17.03	Low-Med	Low-Med	Green

Built-Up Non-Signal	14073	CANNING HWY & KEARNS CR	Three-way	1125.57	15.24	Low-Med	Low-Med	Green
Built-Up Non-Signal	14310	GUILDFORD RD & SHACKLETON ST	Three-way	878.20	19.54	Low-Med	Low-Med	Green
Built-Up Non-Signal	14838	GREAT EASTERN HWY & COPE ST	Three-way	938.56	18.28	Low-Med	Low-Med	Green
Built-Up Non-Signal	14127	CANNING HWY & ALSTON AV (B)	Three-way	1222.14	12.98	Low-Med	Low-Med	Green
Built-Up Non-Signal	47056	SOUTH ST & ROBSON WY	Three-way	869.06	18.25	Low-Med	Low-Med	Green
Built-Up Non-Signal	14700	GUILDFORD RD & PALMERSTON ST	Three-way	1001.39	14.83	Low-Med	Low-Med	Green
Built-Up Non-Signal	14866	ALBANY HWY & RUNDLE ST	Three-way	1028.74	14.44	Low-Med	Low-Med	Green
Built-Up Non-Signal	37936	KARRINYUP - MORLEY HWY & BATH RD	Three-way	668.14	22.23	Low-Med	Low-Med	Green
Built-Up Non-Signal	13855	CANNING HWY & DALGETY ST	Three-way	869.29	16.23	Low-Med	Low-Med	Green
Built-Up Non-Signal	13997	STIRLING HWY & FLORENCE RD	Three-way	1318.12	10.71	Low	Low-Med	Green
Built-Up Non-Signal	14013	STIRLING HWY & PORTLAND ST	Three-way	1344.83	10.49	Low	Low-Med	Green
Built-Up Non-Signal	14044	CANNING HWY & CLYDESDALE ST	Three-way	972.43	14.51	Low-Med	Low-Med	Green
Built-Up Non-Signal	14237	ALBANY HWY & VICTORIA ST	Three-way	1198.47	11.77	Low-Med	Low-Med	Green
Built-Up Non-Signal	14792	ALBANY HWY & GERALD ST	Three-way	688.31	20.50	Low-Med	Low-Med	Green
Built-Up Non-Signal	43175	SOUTH ST & ETHELWYN ST	Three-way	944.34	14.94	Low-Med	Low-Med	Green
Built-Up Non-Signal	44020	KENWICK LINK & CORDY PL	Three-way	589.64	23.93	Low-Med	Low-Med	Green
Built-Up Non-Signal	47058	SOUTH ST & WINDELYA RD	Three-way	670.89	21.03	Low-Med	Low-Med	Green
Built-Up Non-Signal	52392	WEST COAST HWY & HELSTON AV	Three-way	751.95	18.77	Low-Med	Low-Med	Green
Built-Up Non-Signal	55038	WANNEROO RD & DALEY ST	Three-way	972.79	14.51	Low-Med	Low-Med	Green
Built-Up Non-Signal	80700	KENWICK LINK & OSMOND ST	Three-way	796.15	17.72	Low-Med	Low-Med	Green
Built-Up Non-Signal	14174	GUILDFORD RD & NINTH AV	Three-way	1071.76	11.96	Low-Med	Low-Med	Green
Built-Up Non-Signal	50667	WANNEROO RD & ALMA RD	Three-way	1094.21	11.71	Low-Med	Low-Med	Green
Built-Up Non-Signal	13808	COCKBURN RD & ROLLINSON RD	Three-way	776.57	15.20	Low-Med	Low	Green

Built-Up Non-Signal	14030	LEACH HWY & WHEYLAND ST	Three-way	1091.96	10.81	Low	Low	Green
Built-Up Non-Signal	14781	ALBANY HWY & PITCHFORD AV	Three-way	706.25	16.72	Low-Med	Low	Green
Built-Up Non-Signal	14873	ALBANY HWY & FOSTER RD	Three-way	1028.74	11.48	Low-Med	Low	Green
		SOUTH ST (WEST BND) & WESTMORLAND DR & WESTMORLAND DR ACCESS	Three-way	1142.00	10.34	Low	Low	Green
Built-Up Non-Signal	47050	WANNEROO RD & MABEL ST	Three-way	932.10	12.67	Low-Med	Low	Green
Built-Up Non-Signal	50676	GUILDFORD RD & NEWTON ST	Three-way	943.24	10.36	Low	Low	Green
Built-Up Non-Signal	14259	TYDEMAN RD & BRACKS ST	Three-way	893.43	10.93	Low	Low	Green
Built-Up Non-Signal	43050	SOUTH ST & YORK ST	Three-way	831.78	11.74	Low-Med	Low	Green
Built-Up Non-Signal	43165	WANNEROO RD & CARRINGTON ST	Three-way	932.10	10.48	Low	Low	Green
Built-Up Non-Signal	50686	WANNEROO RD & HARRISON ST (STIRLING)	Three-way	833.61	11.72	Low-Med	Low	Green
Built-Up Non-Signal	55049	KARRINYUP - MORLEY HWY & MILVERTON AV	Three-way	672.81	14.52	Low-Med	Low	Green
Built-Up Non-Signal	55988	GREAT EASTERN HWY & CALE ST	Four-way	881.91	11.08	Low	Low	Green
Built-Up Non-Signal	60108	BROOKTON HWY & HILL ST	Three-way	477.26	19.15	Low-Med	Low	Green
Built-Up Non-Signal	14913	COCKBURN RD & BEACH RD	Three-way	524.84	16.69	Low-Med	Low	Green
Built-Up Non-Signal	13835	GUILDFORD RD & KATANNING ST	Three-way	838.64	10.45	Low	Low	Green
Built-Up Non-Signal	14278	ALBANY HWY & CAROLINE ST	Three-way	663.06	13.21	Low-Med	Low	Green
Built-Up Non-Signal	14862	ALBANY HWY & LILIAN AV	Three-way	663.06	13.21	Low-Med	Low	Green
Built-Up Non-Signal	14872	KARRINYUP - MORLEY HWY & BALLARAT ST	Three-way	668.14	13.11	Low-Med	Low	Green
Built-Up Non-Signal	37926	SOUTH ST & STOCKDALE RD	Three-way	748.17	11.71	Low-Med	Low	Green
Built-Up Non-Signal	43180	WEST COAST HWY & MARAPANA RD	Three-way	742.14	11.80	Low-Med	Low	Green

Built-Up Non-Signal	52475	WEST COAST HWY & KINGSLAND AV	Three-way	742.14	11.80	Low-Med	Low	Green
Built-Up Non-Signal	55071	KARRINYUP - MORLEY HWY & LIGHT ST (SOUTH)	Three-way	804.48	10.89	Low	Low	Green
Built-Up Non-Signal	55612	KARRINYUP - MORLEY HWY & MANOFF RD	Three-way	661.49	13.24	Low-Med	Low	Green
Built-Up Non-Signal	56005	KARRINYUP - MORLEY HWY & TELFORD CR	Three-way	759.29	11.54	Low-Med	Low	Green
Built-Up Non-Signal	116226	TYDEMAN RD & PENSIONER GUARD RD	Three-way	362.80	24.15	Low-Med	Low	Green
Built-Up Non-Signal	156848	WANNEROO RD & TADORNA ENT	Three-way	785.63	11.15	Low	Low	Green
Built-Up Non-Signal	129410	GUILDFORD RD & EAST PERTH TERMINAL - EAST CAR PARK ACCESS	Three-way	2947.48	7.76	Low	Low-Med	Green
Built-Up Non-Signal	4421	GREAT EASTERN HWY & H005 EAST BOUND - H532	Three-way	2262.54	8.93	Low	Low-Med	Green
Built-Up Non-Signal	67916	ALBANY HWY & MASON ST	Unknown	2088.91	8.87	Low	Low-Med	Green
Built-Up Non-Signal	13836	STIRLING HWY & AIRLIE ST	Three-way	3047.57	5.63	Low	Low-Med	Green
Built-Up Non-Signal	4460	CANNING HWY & H013 EAST BOUND - CAUSEWAY NTH	Three-way	2645.86	5.33	Low	Low-Med	Green
Built-Up Non-Signal	14154	CANNING HWY & BANKSIA TCE	Unknown	1649.08	8.56	Low	Low-Med	Green
Built-Up Non-Signal	82732	GREAT EASTERN HWY & GEH WEST BOUND ON - H020 WEST	Three-way	4169.75	3.38	Low	Low-Med	Green
Built-Up Non-Signal	136546	WANNEROO RD & WORKS DEPOT ACCESS 1	Three-way	1975.13	7.14	Low	Low-Med	Green
Built-Up Non-Signal	139537	ALBANY HWY & CAROUSEL SHOPPING CTR ACCESS	Three-way	4009.78	3.52	Low	Low-Med	Green
Built-Up Non-Signal	154158	LEACH HWY & LEACH HWY EAST BOUND ON - H015	Three-way	4051.84	3.48	Low	Low-Med	Green

Built-Up Non-Signal	14012	STIRLING HWY & THOMAS ST	Three-way	1344.83	9.53	Low	Low-Med	Green
Built-Up Non-Signal	38833	ORRONG RD & BRIGGS ST	Four-way	1634.71	7.84	Low	Low-Med	Green
Built-Up Non-Signal	14119	LEACH HWY & PULO RD	Three-way	1657.08	7.35	Low	Low-Med	Green
Built-Up Non-Signal	14242	ALBANY HWY & TATE ST	Three-way	1198.47	10.17	Low	Low-Med	Green
Built-Up Non-Signal	11973	WANNEROO RD & CELESTINE ST	Three-way	1164.79	10.14	Low	Low	Green
Built-Up Non-Signal	13826	STIRLING HWY & MCNEIL ST	Three-way	1165.19	10.13	Low	Low	Green
Built-Up Non-Signal	14287	ALBANY HWY & GEORGE WY & GEORGE ST STH	Unknown	2071.94	5.70	Low	Low	Green
Built-Up Non-Signal	4719	CANNING HWY - MANNING RD & LOCKHART ST (D) & MANNING RD ON - H015 NTH B	Three-way	1562.08	6.25	Low	Low	Green
Built-Up Non-Signal	13789	STIRLING HWY & CONGDON ST	Three-way	1330.03	7.34	Low	Low	Green
Built-Up Non-Signal	13814	WEST COAST HWY & ROCHDALE RD	Three-way	1342.44	7.28	Low	Low	Green
Built-Up Non-Signal	14043	WANNEROO RD & GORMAN ST	Three-way	985.31	9.91	Low	Low	Green
Built-Up Non-Signal	14138	CANNING HWY & HOBBS AV	Three-way	1277.99	7.64	Low	Low	Green
Built-Up Non-Signal	55072	KARRINYUP - MORLEY HWY & LIGHT ST (NORTH)	Three-way	1160.74	8.42	Low	Low	Green
Built-Up Non-Signal	68989	ALBANY HWY & STREICH AV	Three-way	1120.93	8.71	Low	Low	Green
Built-Up Non-Signal	82916	GUILDFORD RD & PARK AND RIDE ACCESS RD	Three-way	2322.03	4.21	Low	Low	Green
Built-Up Non-Signal	50668	WANNEROO RD & BOURKE ST	Three-way	1094.21	8.35	Low	Low	Green
Built-Up Non-Signal	4484	STIRLING HWY & VINCENT ST	Three-way	1184.20	7.40	Low	Low	Green
Built-Up Non-Signal	13785	STIRLING HWY & CRAIG ST	Three-way	1330.03	6.59	Low	Low	Green
Built-Up Non-Signal	13804	STIRLING HWY & JOHNSTON ST	Three-way	1306.78	6.70	Low	Low	Green
Built-Up Non-Signal	13840	STIRLING HWY & BOREHAM ST	Three-way	1165.19	7.52	Low	Low	Green
Built-Up Non-Signal	13856	STIRLING HWY & PARRY ST	Three-way	1453.60	6.03	Low	Low	Green
Built-Up Non-Signal	13861	CANNING HWY & WALTER ST	Three-way	869.29	10.08	Low	Low	Green
Built-Up Non-Signal	13942	STIRLING HWY & WAROONGA	Three-way	1272.68	6.88	Low	Low	Green

		RD						
Built-Up Non-Signal	13943	CANNING HWY & WADDELL RD	Four-way	1345.52	6.51	Low	Low	Green
Built-Up Non-Signal	13977	WANNEROO RD & CHURCH ST	Three-way	1050.29	8.34	Low	Low	Green
Built-Up Non-Signal	13983	STIRLING HWY & LOUISE ST	Three-way	1318.12	6.65	Low	Low	Green
Built-Up Non-Signal	13996	WANNEROO RD & ARITI AV	Three-way	1164.79	7.52	Low	Low	Green
		CANNING HWY & SVC RD						
Built-Up Non-Signal	14004	ACCESS	Three-way	2291.68	3.82	Low	Low	Green
Built-Up Non-Signal	14052	WANNEROO RD & BLISSETT WY	Three-way	992.81	8.82	Low	Low	Green
Built-Up Non-Signal	14056	STIRLING HWY & CRAWLEY AV	Three-way	1119.91	7.82	Low	Low	Green
Built-Up Non-Signal	14142	CANNING HWY & RENWICK ST	Three-way	1152.52	7.60	Low	Low	Green
Built-Up Non-Signal	14201	GUILDFORD RD & TRAYLEN RD	Three-way	1071.76	8.17	Low	Low	Green
		GREAT EASTERN HWY & LODER						
Built-Up Non-Signal	14726	WY & KOOJAN AV	Four-way	922.10	9.50	Low	Low	Green
		GREAT EASTERN HWY (END						
Built-Up Non-Signal	14803	DUAL) & SAYER ST	Unknown	986.08	8.88	Low	Low	Green
		SOUTH WESTERN HWY &						
Built-Up Non-Signal	14808	NETTLETON RD	Unknown	1120.53	7.82	Low	Low	Green
		GREAT EASTERN HWY &						
Built-Up Non-Signal	16586	SAWYERS RD & LEATHER GRN	Four-way	1037.23	8.45	Low	Low	Green
Built-Up Non-Signal	43173	SOUTH ST & VICTOR ST	Three-way	944.34	9.28	Low	Low	Green
Built-Up Non-Signal	50665	WANNEROO RD & EMMERSON ST	Three-way	1094.21	8.01	Low	Low	Green
Built-Up Non-Signal	50671	WANNEROO RD & KADINA ST	Three-way	1094.21	8.01	Low	Low	Green
		WEST COAST HWY & VENTNOR						
Built-Up Non-Signal	55927	ST	Three-way	863.70	10.14	Low	Low	Green
Built-Up Non-Signal	75572	WANNEROO RD & SCENIC DR	Three-way	1164.79	7.52	Low	Low	Green
		ALBANY HWY & HAY ST & HAY						
Built-Up Non-Signal	4400	ST CAUSEWAY ACCESS	Unknown	1290.45	4.72	Low	Low	Green
Built-Up Non-Signal	13831	CANNING HWY & STATON RD	Three-way	869.29	7.01	Low	Low	Green
Built-Up Non-Signal	13845	STIRLING HWY & CLIVE RD	Three-way	1370.28	4.45	Low	Low	Green

Built-Up Non-Signal	13853	CANNING HWY & WINDSOR RD	Three-way	869.29	7.01	Low	Low	Green
Built-Up Non-Signal	14006	LEACH HWY & WINNACOTT ST	Three-way	1091.96	5.58	Low	Low	Green
Built-Up Non-Signal	14086	CANNING HWY & ULLAPOOL RD	Three-way	1324.32	4.60	Low	Low	Green
Built-Up Non-Signal	14130	CANNING HWY & RYRIE AV	Three-way	1277.99	4.77	Low	Low	Green
Built-Up Non-Signal	14211	GUILDFORD RD & ADELIA ST	Three-way	1071.76	5.68	Low	Low	Green
Built-Up Non-Signal	14239	ALBANY HWY & WALPOLE ST	Three-way	1198.47	5.08	Low	Low	Green
Built-Up Non-Signal	14701	GREAT EASTERN HWY & CENTRAL AV (A)	Four-way	1854.79	3.28	Low	Low	Green
Built-Up Non-Signal	14709	GREAT EASTERN HWY & BEN ST	Three-way	1405.67	4.33	Low	Low	Green
Built-Up Non-Signal	14860	ALBANY HWY & OTTAWAY ST	Three-way	1028.74	5.92	Low	Low	Green
Built-Up Non-Signal	43160	SOUTH ST & NANNINE AV	Three-way	831.78	7.32	Low	Low	Green
Built-Up Non-Signal	50679	WANNEROO RD & REDFERN ST	Three-way	932.10	6.54	Low	Low	Green
Built-Up Non-Signal	50680	WANNEROO RD & HOBART ST	Three-way	932.10	6.54	Low	Low	Green
Built-Up Non-Signal	51113	GUILDFORD RD & GARDINER ST	Three-way	1340.01	4.55	Low	Low	Green
Built-Up Non-Signal	128465	WANNEROO RD & DALECROSS AV	Three-way	1013.39	6.01	Low	Low	Green
Built-Up Non-Signal	4141	GREAT EASTERN HWY & OLD GREAT NORTHERN HWY	Three-way	747.31	4.08	Low	Low	Green
Built-Up Non-Signal	4403	H005 WEST BOUND - SHEPPARTON R & H005 EAST BOUND - H532	Three-way	1032.84	2.95	Low	Low	Green
Built-Up Non-Signal	4447	LEACH HWY & LEACH HWY WEST BOUND ON - H015	Three-way	3847.09	0.79	Low	Low	Green
Built-Up Non-Signal	10897	LEACH HWY & MARJORIE AV	Three-way	1434.32	2.12	Low	Low	Green
Built-Up Non-Signal	11025	BROOKTON HWY & MOUNT ST	Unknown	629.74	4.84	Low	Low	Green
Built-Up Non-Signal	13784	STIRLING HWY & LESLIE RD	Three-way	1330.03	2.29	Low	Low	Green
Built-Up Non-Signal	13834	CANNING HWY & BEDFORD ST	Three-way	869.29	3.50	Low	Low	Green
Built-Up Non-Signal	13852	LEACH HWY & CHUDLEIGH ST	Three-way	1198.89	2.54	Low	Low	Green
Built-Up Non-Signal	13860	STIRLING HWY & GRANGE ST	Three-way	1535.74	1.98	Low	Low	Green

Built-Up Non-Signal	13912	STIRLING HWY & JOHN ST	Three-way	1235.49	2.47	Low	Low	Green
Built-Up Non-Signal	13940	STIRLING HWY & LOFTUS ST	Three-way	1272.68	2.39	Low	Low	Green
Built-Up Non-Signal	13947	STIRLING HWY & BULIMBA RD	Three-way	1272.68	2.39	Low	Low	Green
Built-Up Non-Signal	13962	STIRLING HWY & MARITA RD	Three-way	1272.68	2.39	Low	Low	Green
Built-Up Non-Signal	13975	STIRLING HWY & BROOME ST	Three-way	1272.68	2.39	Low	Low	Green
Built-Up Non-Signal	14016	STIRLING HWY & TYRELL ST	Three-way	1344.83	2.26	Low	Low	Green
Built-Up Non-Signal	14046	H016 NTH BOUND - HUTTON ST OFF & MCDONALD ST WEST	Three-way	481.87	6.32	Low	Low	Green
Built-Up Non-Signal	14064	CANNING HWY & CUNNINGHAM ST	Unknown	1283.13	2.37	Low	Low	Green
Built-Up Non-Signal	14087	LEACH HWY & MEDIAN OPENING (WAS DEAN RD)	Unknown	5485.30	0.56	Low	Low	Green
Built-Up Non-Signal	14124	CANNING HWY & SAUNDERS ST	Four-way	1612.62	1.89	Low	Low	Green
Built-Up Non-Signal	14134	CANNING HWY & BESSELL AV	Three-way	1277.99	2.38	Low	Low	Green
Built-Up Non-Signal	14143	CANNING HWY & HENSMAN ST (B)	Three-way	1152.52	2.64	Low	Low	Green
Built-Up Non-Signal	14167	GUILDFORD RD & FOURTH AV EAST	Three-way	1259.07	2.42	Low	Low	Green
Built-Up Non-Signal	14175	ALBANY HWY & RUSHTON ST NORTH	Three-way	847.83	3.59	Low	Low	Green
Built-Up Non-Signal	14202	ALBANY HWY & BOULDER ST	Three-way	1134.02	2.69	Low	Low	Green
Built-Up Non-Signal	14205	GUILDFORD RD & GRAFTON RD	Three-way	1071.76	2.84	Low	Low	Green
Built-Up Non-Signal	14221	GUILDFORD RD & CROWTHER ST	Three-way	1140.69	2.67	Low	Low	Green
Built-Up Non-Signal	14225	GUILDFORD RD & MILNE ST	Unknown	1505.15	2.02	Low	Low	Green
Built-Up Non-Signal	14233	GUILDFORD RD & LEAKE ST	Three-way	1140.69	2.67	Low	Low	Green
Built-Up Non-Signal	14235	ALBANY HWY & TENNANT ST	Three-way	1198.47	2.54	Low	Low	Green
Built-Up Non-Signal	14253	ALBANY HWY & ACTON AV	Three-way	914.28	3.33	Low	Low	Green
Built-Up Non-Signal	14255	ALBANY HWY & ALEXANDRA PL	Unknown	1248.72	2.44	Low	Low	Green
Built-Up Non-Signal	14267	ALBANY HWY & MILLS ST STH	Three-way	1054.25	2.89	Low	Low	Green

Built-Up Non-Signal	14280	ALBANY HWY & KENT ST	Three-way	1583.10	1.92	Low	Low	Green
Built-Up Non-Signal	14293	ALBANY HWY & FLETCHER ST	Three-way	1570.24	1.94	Low	Low	Green
Built-Up Non-Signal	14314	ALBANY HWY & SHORT ST	Three-way	1723.45	1.77	Low	Low	Green
Built-Up Non-Signal	14718	GREAT EASTERN HWY & IVY ST	Four-way	1854.79	1.64	Low	Low	Green
Built-Up Non-Signal	14748	ALBANY HWY & OZICH CT	Three-way	644.26	4.73	Low	Low	Green
Built-Up Non-Signal	14804	ALBANY HWY & VERNA ST	Three-way	688.31	4.43	Low	Low	Green
Built-Up Non-Signal	14869	ALBANY HWY & ARMITAGE RD	Three-way	1028.74	2.96	Low	Low	Green
Built-Up Non-Signal	14875	ALBANY HWY & ECKO RD	Three-way	663.06	4.59	Low	Low	Green
Built-Up Non-Signal	37929	KARRINYUP - MORLEY HWY & BAGSHOT PL	Three-way	668.14	4.56	Low	Low	Green
Built-Up Non-Signal	37932	KARRINYUP - MORLEY HWY & LUDLANDS ST	Three-way	668.14	4.56	Low	Low	Green
Built-Up Non-Signal	40630	SOUTH ST & PINETREE GULLY RD	Three-way	1242.34	2.45	Low	Low	Green
Built-Up Non-Signal	43159	SOUTH ST & CEASAR ST	Three-way	831.78	3.66	Low	Low	Green
Built-Up Non-Signal	50684	WANNEROO RD & GILL ST	Three-way	932.10	3.27	Low	Low	Green
Built-Up Non-Signal	50687	WANNEROO RD & ELMA ST	Three-way	932.10	3.27	Low	Low	Green
Built-Up Non-Signal	50798	WEST COAST HWY & CHALLENGER PDE	Three-way	742.14	4.10	Low	Low	Green
Built-Up Non-Signal	54231	NICHOLSON RD & THOMAS RD	Three-way	657.22	4.63	Low	Low	Green
Built-Up Non-Signal	55608	KARRINYUP - MORLEY HWY & KNIGHT AV	Three-way	727.86	4.18	Low	Low	Green
Built-Up Non-Signal	56007	KARRINYUP - MORLEY HWY & ALBERT ST	Three-way	759.29	4.01	Low	Low	Green
Built-Up Non-Signal	68289	GUILDFORD RD & KENILWORTH ST	Three-way	1071.76	2.84	Low	Low	Green
Built-Up Non-Signal	68549	WEST COAST HWY & CHALLENGER PDE	Three-way	751.95	4.05	Low	Low	Green

Built-Up Non-Signal	68621	GREAT EASTERN HWY & LILIAN GR	Three-way	1405.67	2.17	Low	Low	Green
Built-Up Non-Signal	75573	STIRLING HWY & CHURCH L	Three-way	1162.25	2.62	Low	Low	Green
Built-Up Non-Signal	78701	STIRLING HWY & AVION WY	Three-way	1162.25	2.62	Low	Low	Green
Built-Up Non-Signal	78818	VINCENT ST ON - H016 STH BOUND & VINCENT ST	Three-way	334.64	9.10	Low	Low	Green
Built-Up Non-Signal	80531	KARRINYUP - MORLEY HWY & NORTH BEACH DR (ACCESS)	Three-way	759.29	4.01	Low	Low	Green
Built-Up Non-Signal	80722	WEST COAST HWY & SEAWARD AV	Three-way	853.81	3.57	Low	Low	Green
Built-Up Non-Signal	81637	ORRONG RD & TREASURE RD NORTH	Three-way	876.09	3.48	Low	Low	Green
Built-Up Non-Signal	81641	BANKSIA RD & ORRONG RD	Three-way	876.09	3.48	Low	Low	Green
Built-Up Non-Signal	82730	CANNING HWY & ALBANY HWY ON - H013 WEST BOUN	Three-way	2907.90	1.05	Low	Low	Green
Built-Up Non-Signal	82740	GREAT EASTERN HWY & GEH EAST BOUND ON - H020 WEST	Three-way	4212.97	0.72	Low	Low	Green
Built-Up Non-Signal	116924	WEST COAST HWY & ALFRED RD WEST - ARMY	Three-way	1042.66	2.92	Low	Low	Green
Built-Up Non-Signal	119016	COCKBURN RD & RUSSELL RD (WEST) & QUILL WY	Three-way	524.84	5.80	Low	Low	Green
Built-Up Non-Signal	119066	CANNING HWY & ALNESS ST	Three-way	1183.30	2.57	Low	Low	Green
Built-Up Non-Signal	119140	REID HWY & EVERINGHAM ST (NORTH)	Three-way	1016.66	3.00	Low	Low	Green
Built-Up Non-Signal	119152	ALBANY HWY & HAY ST	Three-way	984.14	3.09	Low	Low	Green
Built-Up Non-Signal	125844	ALBANY HWY & SEVENOAKS ST	Three-way	563.55	5.40	Low	Low	Green
Built-Up Non-Signal	139578	RUSSELL RD (WEST) & WASTEWATER TREATMENT PLANT ACCESS	Three-way	542.93	5.61	Low	Low	Green

Built-Up Non-Signal	164783	COCKBURN RD & OCEAN RD	Three-way	393.61	7.74	Low	Low	Green
Built-Up Non-Signal	174149	REID HWY & YULE AV	Three-way	924.73	3.29	Low	Low	Green
Built-Up Non-Signal	177022	COCKBURN RD & BULL RD	Three-way	683.26	4.46	Low	Low	Green
Built-Up Roundabout	139158	TONKIN HWY (NTH BND) OFF & CORFIELD ST & TONKIN HWY (NTH BND) ON	Unknown	413.75	167.91	High	Med-High	Red
Built-Up Roundabout	139162	TONKIN HWY (STH BND) OFF & CORFIELD ST & TONKIN HWY (STH BND) ON	Unknown	567.76	101.33	Med-High	Med-High	Red
Built-Up Roundabout	119133	ENNIS AV NTH - SAFETY BAY RD & SAFETY BAY RD & SAFETY BAY RD - ENNIS AV NTH	Four-way	1245.43	35.47	Med	Med-High	Red
Built-Up Roundabout	119125	ENNIS AV STH - SAFETY BAY RD W & SAFETY BAY RD & SAFETY BAY RD - ENNIS AV STH	Unknown	447.39	75.21	Med-High	Med	Orange
Built-Up Roundabout	119128	SAFETY BAY RD WEST - H719 & SAFETY BAY RD	Three-way	991.55	35.36	Med	Med	Green
Built-Up Roundabout	14312	GREAT EASTERN HWY & BOULDER AV (A)	Unknown	1368.10	23.56	Low-Med	Med	Green
Built-Up Roundabout	43156	SOUTH ST & FIELD ST	Unknown	1097.54	29.37	Low-Med	Med	Green
Built-Up Roundabout	149992	KAREL AV & ROE HWY EAST BND OFF & ON RAMPS	Unknown	779.94	20.75	Low-Med	Low-Med	Green
Built-Up Roundabout	180982	KARRINYUP MORLEY HWY & OVAL #3 ACCESS RD	Unknown	1004.16	13.30	Low-Med	Low-Med	Green
Built-Up Roundabout	119127	H716 - SAFETY BAY RD EAST & SAFETY BAY RD	Three-way	882.76	13.53	Low-Med	Low	Green
Built-Up Roundabout	13998	CANNING HWY & REDCOURT ST	Unknown	1181.61	10.11	Low	Low	Green
Built-Up Roundabout	116259	COCKBURN RD & EMPLACEMENT CR	Unknown	1024.69	11.65	Low-Med	Low	Green

Built-Up Roundabout	150013	KAREL AV & ROE HWY WEST BND OFF & ON RAMPS	Unknown	992.36	7.13	Low	Low	Green
Built-Up Roundabout	4497	H646 & H400	Three-way	2113.66	3.16	Low	Low	Green
Built-Up Roundabout	13960	STIRLING HWY & ROBINSON ST SOUTH	Unknown	1679.32	3.98	Low	Low	Green
Built-Up Roundabout	14719	ALBANY HWY & BECKENHAM ST	Unknown	866.65	7.71	Low	Low	Green
Built-Up Roundabout	55602	KARRINYUP - MORLEY HWY & WALNEY AV	Unknown	1169.40	5.72	Low	Low	Green
Built-Up Roundabout	155488	H400 & RIVERSIDE DR	Three-way	1899.20	3.52	Low	Low	Green
Built-Up Roundabout	211903	ALBANY HWY & HAY ST CAUSEWAY ACCESS	Three-way	1137.13	3.73	Low	Low	Green
Built-Up Roundabout	14152	ARMADALE RD & FRASER RD	Unknown	1112.46	1.27	Low	Low	Green
Built-Up Roundabout	115514	ABERNETHY RD & H017 ON RAMP	Three-way	1347.34	1.05	Low	Low	Green
Built-Up Roundabout	154171	H557 & BULLCREEK STATION BUS EAST ENTRY	Unknown	297.47	4.76	Low	Low	Green
Built-Up Roundabout	203691	GREAT EASTERN HWY & LEAKE ST	Unknown	3075.83	0.46	Low	Low	Green
Open Signal	14261	REID HWY & BEECHBORO RD NORTH	Four-way	2314.13	180.89	High	High	Black
Open Signal	14184	ARMADALE RD & WARTON RD	Three-way	790.82	252.34	High	High	Black
Open Signal	141661	TONKIN HWY & CHAMPION DR	Three-way	668.56	298.38	High	High	Black
Open Signal	14902	ROE HWY & MORRISON RD & MORRISON RD	Four-way	1141.09	170.47	High	High	Black
Open Signal	14241	TONKIN HWY & BENARA RD	Four-way	2522.55	153.09	High	High	Black
Open Signal	4543	TONKIN HWY & HORRIE MILLER DR & KEWDALE RD	Four-way	3185.22	106.62	High	High	Black
Open Signal	4552	ROE HWY & KALAMUNDA RD	Four-way	2622.48	117.37	High	High	Black
Open Signal	4143	PATTERSON RD & ENNIS AV	Unknown	2361.60	119.53	High	High	Black

Open Signal	77885	REID HWY & ALTONE RD	Four-way	1694.96	145.01	High	High	Black
Open Signal	1544	ENNIS AV & ROCKINGHAM STATION ACCESS RD & RAE RD	Four-way	2362.26	100.92	Med-High	High	Black
Open Signal	10142	ROCKINGHAM RD & ANKETELL RD	Three-way	1804.63	108.22	High	High	Black
Open Signal	4019	GREAT NORTHERN HWY & WEST SWAN RD	Three-way	1442.12	113.02	High	High	Black
Open Signal	4546	TONKIN HWY & HALE RD	Four-way	3388.85	89.50	Med-High	High	Black
Open Signal	13875	WANNEROO RD & JOONDALUP DR	Four-way	3252.25	85.73	Med-High	High	Black
Open Signal	4547	TONKIN HWY & WELSHPOOL RD EAST	Four-way	3369.90	81.12	Med-High	High	Black
Open Signal	14176	REID HWY & MALAGA DR	Four-way	3023.79	89.20	Med-High	High	Black
Open Signal	4035	WANNEROO RD & OCEAN REEF RD	Four-way	3380.48	77.88	Med-High	High	Black
Open Signal	13837	ENNIS AV & ELANORA DR & GRANGE DR	Four-way	2602.14	97.22	Med-High	High	Black
Open Signal	60436	MARMION AV & WHITFORDS AV	Four-way	2834.50	88.13	Med-High	High	Black
Open Signal	60446	MARMION AV & OCEAN REEF RD	Four-way	2842.95	80.09	Med-High	High	Black
Open Signal	4121	STOCK RD & SOUTH ST	Four-way	3211.45	67.77	Med-High	High	Black
Open Signal	13807	ENNIS AV & CARVIE ST & COUNCIL AV	Four-way	2471.88	81.31	Med-High	High	Black
Open Signal	138650	TONKIN HWY & THOMAS RD	Four-way	1899.25	90.34	Med-High	High	Black
Open Signal	4116	STOCK RD & BEELIAR DR	Four-way	2296.41	67.90	Med-High	High	Black
Open Signal	13935	ROCKINGHAM RD & RUSSELL RD (WEST)	Three-way	1856.45	83.68	Med-High	High	Black
Open Signal	36814	ARMADALE RD & SEVILLE DR	Three-way	1170.26	112.00	High	High	Red
Open Signal	60435	MARMION AV & BANKS AV	Three-way	857.28	110.10	High	High	Red

Open Signal	124368	GREAT EASTERN HWY BYPASS & ABERNETHY RD	Unknown	776.06	120.30	High	High	Red
Open Signal	60428	MARMION AV & HEPBURN AV	Four-way	2591.50	92.13	Med-High	High	Red
Open Signal	4418	STOCK RD & PHOENIX RD	Four-way	2144.32	64.85	Med-High	High	Red
Open Signal	14785	ROE HWY & BERKSHIRE RD	Three-way	2211.26	62.63	Med-High	High	Red
Open Signal	137952	TONKIN HWY & MILLS RD EAST & MILLS RD WEST	Four-way	2024.55	62.54	Med-High	High	Red
Open Signal	13881	PATTERSON RD & KWINANA BEACH RD	Three-way	1368.09	62.14	Med-High	Med-High	Red
Open Signal	4541	TONKIN HWY & COLLIER RD	Four-way	3802.14	59.21	Med-High	High	Red
Open Signal	14238	TONKIN HWY & REID HWY	Four-way	5276.32	37.61	Med	High	Red
Open Signal	14827	ROE HWY & GREAT EASTERN HWY BYPASS	Unknown	4780.97	39.86	Med	High	Red
Open Signal	4456	LEACH HWY & WELSHPOOL RD	Four-way	3740.29	40.25	Med	High	Red
Open Signal	77884	REID HWY & LORD ST	Three-way	2558.60	55.86	Med-High	High	Red
Open Signal	55987	KARRINYUP - MORLEY HWY & WEST COAST HWY & KARRINYUP RD & MARMION AV	Four-way	2711.77	51.16	Med	High	Red
Open Signal	137011	TONKIN HWY & RANFORD RD	Four-way	2603.39	50.74	Med	High	Red
Open Signal	4548	TONKIN HWY & KELVIN RD	Four-way	2241.51	58.78	Med-High	High	Red
Open Signal	4754	REID HWY & MARMION AV & NORTH BEACH RD	Four-way	2451.78	53.64	Med-High	High	Red
Open Signal	14745	GREAT EASTERN HWY BYPASS & KALAMUNDA RD	Four-way	2409.52	40.29	Med	High	Red
Open Signal	137008	TONKIN HWY & ARMADALE RD	Four-way	2281.70	41.26	Med	High	Red
Open Signal	4540	TONKIN HWY & MORLEY DR & KARRINYUP - MORLEY HWY	Four-way	5822.73	35.62	Med	High	Red
Open Signal	4317	ENNIS AV & DIXON RD	Four-way	3145.95	25.83	Low-Med	Med-High	Red
Open Signal	13979	STOCK RD & SPEARWOOD AV	Four-way	2663.33	22.02	Low-Med	Med-High	Red

Open Signal	4057	ROCKINGHAM RD & COCKBURN RD	Three-way	1813.54	27.48	Low-Med	Med-High	Red
Open Signal	4115	STOCK RD & FORREST RD	Four-way	1970.73	23.80	Low-Med	Med-High	Red
Open Signal	56019	MARMION AV & BEACH RD	Three-way	1412.65	33.21	Med	Med-High	Red
Open Signal	10143	ROCKINGHAM RD & MASON RD	Three-way	979.99	41.88	Med	Med	Green
Open Signal	138649	TONKIN HWY & ROWLEY RD	Four-way	762.99	42.24	Med	Med	Green
Open Signal	4056	ROCKINGHAM RD & THOMAS RD	Unknown	3939.22	10.98	Low	Med	Green
Open Signal	60422	MARMION AV & WARWICK RD	Unknown	2113.26	18.71	Low-Med	Med	Green
Open Signal	14795	GREAT EASTERN HWY BYPASS & STIRLING CR	Four-way	1925.38	19.79	Low-Med	Med	Green
Open Signal	10144	MANDURAH RD & PAGANONI RD	Three-way	1794.64	19.60	Low-Med	Med	Green
Open Signal	13961	STOCK RD & BARRINGTON ST	Four-way	1913.60	10.33	Low	Low-Med	Green
Open Signal	3528	MANDURAH RD & SINGLETON BEACH RD & REDWOOD AV	Three-way	771.78	23.23	Low-Med	Low-Med	Green
Open Signal	46459	THOMAS RD & GILMORE AV	Unknown	1603.22	11.18	Low	Low-Med	Green
Open Signal	13902	ENNIS AV & MANDURAH RD & STAKEHILL RD WEST	Four-way	2527.17	6.66	Low	Low-Med	Green
Open Signal	13919	ROCKINGHAM RD & BEARD ST & LEE RD	Four-way	2195.41	4.01	Low	Low	Green
Open Signal	4032	ROCKINGHAM RD (STH BND) & MANDURAH RD & PATTERSON RD (STH BND)	Four-way	2273.84	2.58	Low	Low	Green
Open Signal	150512	PATTERSON RD (NTH BND) & ROCKINGHAM RD (NTH BND) & MANDURAH RD	Three-way	816.93	7.19	Low	Low	Green
Open Non-Signal	138328	ENNIS AV (NTH BND) & PORT KENNEDY DR	Four-way	1538.38	305.05	High	High	Black
Open Non-Signal	4549	TONKIN HWY & GOSNELLS RD WEST	Three-way	1700.49	237.80	High	High	Black

Open Non-Signal	36346	ARMADALE RD & EIGHTH RD	Three-way	1470.23	160.56	High	High	Black
Open Non-Signal	75571	ENNIS AV & WILLMOTT DR	Unknown	967.98	226.54	High	High	Black
Open Non-Signal	4018	GREAT NORTHERN HWY & RUTLAND RD	Three-way	789.65	272.74	High	High	Black
Open Non-Signal	54070	KARGOTICH RD & THOMAS RD	Unknown	579.39	336.45	High	High	Black
Open Non-Signal	80578	ENNIS AV & ROYAL PALM DR	Three-way	842.57	203.26	High	High	Black
Open Non-Signal	36770	ARMADALE RD & GRIBBLE AV	Three-way	523.76	304.54	High	High	Black
Open Non-Signal	14934	TOODYAY RD & CAMPERSIC RD	Three-way	428.26	261.88	High	High	Black
Open Non-Signal	15015	GREAT EASTERN HWY & OLD NORTHAM RD	Three-way	310.12	324.44	High	High	Black
Open Non-Signal	15001	GREAT EASTERN HWY & RAILWAY TCE WEST	Three-way	532.63	181.54	High	High	Black
Open Non-Signal	46412	THOMAS RD & MEDINA AV	Three-way	495.38	195.20	High	High	Black
Open Non-Signal	60434	MARMION AV & COOK AV	Three-way	1447.77	127.17	High	High	Black
Open Non-Signal	60442	MARMION AV & MULLALOO DR	Three-way	1602.14	95.01	Med-High	High	Black
Open Non-Signal	60438	MARMION AV & CORAL ST	Three-way	890.45	135.85	High	High	Black
Open Non-Signal	14920	GREAT NORTHERN HWY & WARBROOK RD	Three-way	712.84	135.65	High	High	Black
Open Non-Signal	4545	ROE HWY & H017 STH BOUND - ROE HWY OFF & ROE HWY ON - H017 STH BOUND	Unknown	3919.27	60.70	Med-High	High	Black
Open Non-Signal	60424	MARMION AV & SEACREST DR	Three-way	1781.85	71.62	Med-High	High	Black
Open Non-Signal	60431	MARMION AV & FLINDERS AV	Three-way	857.28	161.33	High	High	Red
Open Non-Signal	36784	ARMADALE RD & TAIT ST	Three-way	523.76	212.76	High	High	Red
Open Non-Signal	56021	MARMION AV & BEACH RD WEST	Three-way	938.54	128.39	High	High	Red
Open Non-Signal	14970	GREAT EASTERN HWY & PARK RD & HARDEY RD	Four-way	1077.54	105.28	Med-High	High	Red
Open Non-Signal	13828	WANNEROO RD & FLYNN DR	Three-way	901.46	105.01	Med-High	High	Red

Open Non-Signal	60429	MARMION AV & Warburton Av	Three-way	857.28	96.56	Med-High	Med-High	Red
Open Non-Signal	10412	GREAT EASTERN HWY & Coppin Rd	Four-way	714.40	111.87	High	Med-High	Red
Open Non-Signal	4021	SOUTH WESTERN HWY & JARRAHDAL RD & SHANLEY RD	Four-way	729.48	107.76	High	Med-High	Red
Open Non-Signal	13874	MANDURAH RD & SURF DR	Three-way	781.65	92.50	Med-High	Med-High	Red
Open Non-Signal	13967	STOCK RD & COUNSEL RD	Three-way	594.72	112.77	High	Med-High	Red
Open Non-Signal	14335	WANNEROO RD & ROMEO RD & KAROBORUP RD	Four-way	513.42	126.80	High	Med-High	Red
Open Non-Signal	60432	MARMION AV & GILES AV	Three-way	857.28	75.94	Med-High	Med-High	Red
Open Non-Signal	46745	THOMAS RD & MCLAUGHLAN RD	Three-way	663.51	97.16	Med-High	Med-High	Red
Open Non-Signal	54317	CUMMING RD & THOMAS RD	Three-way	657.22	98.09	Med-High	Med-High	Red
Open Non-Signal	80525	GREAT EASTERN HWY & WANDEARA CR	Three-way	532.63	121.03	High	Med-High	Red
Open Non-Signal	12316	ARMADALE RD & LIDDELOW RD	Three-way	843.09	74.90	Med-High	Med-High	Red
Open Non-Signal	14329	WANNEROO RD & PIPIDINNY RD	Three-way	360.61	132.25	High	Med-High	Red
Open Non-Signal	75559	ROE HWY & TONKIN HWY RAMPS	Unknown	4460.89	39.17	Med	High	Red
Open Non-Signal	60421	MARMION AV & FREEMAN WY	Three-way	1605.25	58.97	Med-High	High	Red
Open Non-Signal	147793	TONKIN HWY & FORREST RD (EAST)	Three-way	1224.93	71.65	Med-High	Med-High	Red
Open Non-Signal	13887	MANDURAH RD & ANSTEY RD	Three-way	1280.94	58.84	Med-High	Med-High	Red
Open Non-Signal	60433	MARMION AV & FORREST RD	Three-way	857.28	69.78	Med-High	Med-High	Red
Open Non-Signal	4434	GREAT EASTERN HWY & DARLINGTON RD	Three-way	982.06	52.55	Med-High	Med-High	Red
Open Non-Signal	4054	GREAT EASTERN HWY & CHIDLOW - YORK	Three-way	765.40	62.31	Med-High	Med-High	Red
Open Non-Signal	56024	MARMION AV & ALMADINE DR	Three-way	938.54	50.81	Med	Med-High	Red

Open Non-Signal	60430	MARMION AV & MCWHAE RD	Three-way	857.28	55.63	Med-High	Med-High	Red
Open Non-Signal	60439	MARMION AV & ALBION ST	Three-way	890.45	53.56	Med-High	Med-High	Red
Open Non-Signal	60423	MARMION AV & MARRI RD	Three-way	1408.65	36.64	Med	Med-High	Red
Open Non-Signal	13813	ENNIS AV (STH BND) & UNNARO ST	Four-way	1351.49	36.01	Med	Med-High	Red
Open Non-Signal	15019	GREAT EASTERN HWY & OLD NORTHAM RD	Three-way	324.24	111.49	High	Med	Orange
Open Non-Signal	3618	SOUTH WESTERN HWY & KINGSBURY DR	Three-way	271.44	121.09	High	Med	Orange
Open Non-Signal	10244	GREAT EASTERN HWY & WOOROOLOO PRISON FARM ACCESS RD	Three-way	324.24	99.41	Med-High	Med	Orange
Open Non-Signal	14836	SOUTH WESTERN HWY & KEIRNAN ST	Three-way	265.83	121.25	High	Med	Orange
Open Non-Signal	14931	TOODYAY RD & WILSON RD	Three-way	428.26	75.26	Med-High	Med	Orange
Open Non-Signal	15021	GREAT EASTERN HWY & LINLEY VALLEY RD	Three-way	332.35	96.98	Med-High	Med	Orange
Open Non-Signal	155582	SOUTH WESTERN HWY & CLONDYKE DR	Three-way	265.83	116.30	High	Low-Med	Orange
Open Non-Signal	116780	THOMAS RD & BOMBAY BVD	Three-way	657.22	55.01	Med-High	Med	Orange
Open Non-Signal	10141	STOCK RD & SHALLCROSS ST	Three-way	582.68	55.32	Med-High	Med	Orange
Open Non-Signal	10162	STOCK RD & RALSTON ST	Three-way	594.72	54.20	Med-High	Med	Orange
Open Non-Signal	14777	SOUTH WESTERN HWY & FALLS RD & KARNUP RD	Four-way	566.31	56.92	Med-High	Med	Orange
Open Non-Signal	14906	GREAT NORTHERN HWY & ORCHARD ST (EAST)	Three-way	610.87	52.76	Med-High	Med	Orange
Open Non-Signal	14936	ALBANY HWY & WATERWHEEL RD	Three-way	460.59	69.98	Med-High	Med	Orange
Open Non-Signal	46733	THOMAS RD & ABERCROMBIE	Three-way	495.38	65.07	Med-High	Med	Orange

		RD						
Open Non-Signal	14834	SOUTH WESTERN HWY & NORMAN RD	Three-way	265.83	61.82	Med-High	Low-Med	Orange
Open Non-Signal	14806	SOUTH WESTERN HWY & KILN RD	Three-way	265.83	58.15	Med-High	Low-Med	Orange
Open Non-Signal	60420	MARMION AV & BURRAGAH WY	Three-way	906.27	47.74	Med	Med	Green
Open Non-Signal	14825	GREAT NORTHERN HWY & DALE RD	Three-way	694.76	46.39	Med	Med	Green
Open Non-Signal	46791	THOMAS RD & MARRI PARK DR	Three-way	657.22	49.04	Med	Med	Green
Open Non-Signal	54322	ANKETELL RD & THOMAS RD	Three-way	727.18	44.33	Med	Med	Green
Open Non-Signal	14884	GREAT NORTHERN HWY & NOLAN AV	Three-way	694.76	39.72	Med	Low-Med	Green
Open Non-Signal	11949	WANNEROO RD & REINHOLD PL	Three-way	389.10	42.24	Med	Low-Med	Green
Open Non-Signal	14330	WANNEROO RD & BERNARD RD	Three-way	360.61	42.87	Med	Low-Med	Green
Open Non-Signal	80840	WANNEROO RD & NOWERGUP RD	Three-way	389.10	39.73	Med	Low-Med	Green
Open Non-Signal	36309	ARMADALE RD & SEVENTH RD	Three-way	1097.84	36.50	Med	Med	Green
Open Non-Signal	14840	TONKIN HWY & GOSNELLS RD EAST	Three-way	1055.74	36.71	Med	Med	Green
Open Non-Signal	14215	ARMADALE RD & TAYLOR RD & WRIGHT RD (SOUTH)	Four-way	973.35	36.01	Med	Med	Green
Open Non-Signal	4117	STOCK RD & ROCKINGHAM RD	Three-way	1395.17	23.56	Low-Med	Med	Green
Open Non-Signal	4358	ROE HWY & MAIDA VALE RD ON - H018 STH BO	Three-way	2912.11	11.07	Low	Med	Green
Open Non-Signal	4513	MITCHELL FWY & H016 STH BOUND - RIVERSIDE DR	Three-way	7030.61	4.58	Low	Med	Green
Open Non-Signal	4536	MITCHELL FWY & H016 NTH BOUND - CEDRIC ST OFF	Three-way	6855.64	4.70	Low	Med	Green
Open Non-Signal	13872	PATTERSON RD & OCEAN ST	Three-way	863.33	37.33	Med	Med	Green

Open Non-Signal	14959	GREAT EASTERN HWY & BILGOMAN RD	Three-way	916.09	35.18	Med	Med	Green
Open Non-Signal	60445	MARMION AV & ENSIGN WY	Three-way	857.51	37.59	Med	Med	Green
Open Non-Signal	77326	TOODYAY RD & TALBOT RD	Three-way	865.80	37.23	Med	Med	Green
Open Non-Signal	82400	GRAHAM FARMER FWY & H666 - H020 WEST BOUND	Three-way	4647.90	6.93	Low	Med	Green
Open Non-Signal	119082	KWINANA FWY & H015 STH BND - ARMADALE RD	Three-way	5236.63	6.16	Low	Med	Green
Open Non-Signal	158852	MARMION AV & HAMERSLEY GOLF COURSE ACCESS	Three-way	2046.22	15.75	Low-Med	Med	Green
Open Non-Signal	171993	KWINANA FWY & H015 NTH BND OFF TO SAFETY BAY RD	Three-way	2734.35	11.79	Low-Med	Med	Green
Open Non-Signal	179544	ENNIS AV & SPORTS FACILITIES / TIP ACCESS RD	Three-way	1480.94	21.76	Low-Med	Med	Green
Open Non-Signal	181510	PATTERSON RD & WMC NICKEL SMELTER ACCESS	Three-way	2204.67	14.62	Low-Med	Med	Green
Open Non-Signal	187331	ROE HWY & ROE HWY NTH BND OFF TO GEH WEST BND	Three-way	2992.12	10.77	Low	Med	Green
Open Non-Signal	14941	GREAT EASTERN HWY & OLD YORK RD	Three-way	1374.10	23.21	Low-Med	Low-Med	Green
Open Non-Signal	60419	MARMION AV & PARNELL AV	Three-way	906.27	34.77	Med	Low-Med	Green
Open Non-Signal	60441	MARMION AV & CRAIGIE DR	Three-way	1175.34	26.81	Low-Med	Low-Med	Green
Open Non-Signal	60426	MARMION AV & HARMAN RD	Three-way	868.96	35.58	Med	Low-Med	Green
Open Non-Signal	36391	ARMADALE RD & LAKE RD	Three-way	1288.35	21.29	Low-Med	Low-Med	Green
Open Non-Signal	14988	GREAT EASTERN HWY & SEABORNE ST	Three-way	1064.79	18.20	Low-Med	Low-Med	Green
Open Non-Signal	81440	ROE HWY & CHISHOLM CR	Three-way	1340.94	14.45	Low-Med	Low-Med	Green

Open Non-Signal	4335	CHARLES ST ON - H016 STH BOUND & H020 WEST BOUND - H525	Three-way	2117.90	7.76	Low	Low-Med	Green
Open Non-Signal	4532	MITCHELL FWY & H016 NTH BOUND - HUTTON ST OFF	Three-way	6596.66	2.49	Low	Low-Med	Green
Open Non-Signal	10176	PATTERSON RD & WARD RD	Three-way	863.33	19.04	Low-Med	Low-Med	Green
Open Non-Signal	10409	GREAT EASTERN HWY & HOMESTEAD RD	Three-way	770.19	21.34	Low-Med	Low-Med	Green
Open Non-Signal	13888	MITCHELL FWY & H016 NTH BND - WHITFORDS AV OFF	Three-way	4950.75	3.32	Low	Low-Med	Green
Open Non-Signal	14882	ROE HWY & CLAYTON ST ON - H018 STH BOUND	Three-way	3423.61	4.80	Low	Low-Med	Green
Open Non-Signal	14896	GREAT NORTHERN HWY & COPLEY RD	Three-way	610.87	26.90	Low-Med	Low-Med	Green
Open Non-Signal	69575	PATTERSON RD & ALUMINA RD	Three-way	863.33	19.04	Low-Med	Low-Med	Green
Open Non-Signal	119151	WANNEROO RD & OCEAN TAVERN ACC	Three-way	988.64	16.62	Low-Med	Low-Med	Green
Open Non-Signal	184394	ROE HWY & GEH ON TO ROE HWY STH BND	Three-way	3032.95	5.42	Low	Low-Med	Green
Open Non-Signal	14841	GREAT NORTHERN HWY & HYEM RD	Three-way	694.76	23.11	Low-Med	Low-Med	Green
Open Non-Signal	13871	MANDURAH RD & CRYSTALUNA DR	Three-way	781.65	19.78	Low-Med	Low-Med	Green
Open Non-Signal	14307	TONKIN HWY & GEH EAST BOUND ON - H017 STH B	Three-way	3383.10	4.57	Low	Low-Med	Green
Open Non-Signal	14861	GREAT NORTHERN HWY & HADDRILL RD	Three-way	694.76	22.25	Low-Med	Low-Med	Green
Open Non-Signal	14907	ALBANY HWY & BEDFORDALE HILL RD	Three-way	679.11	22.76	Low-Med	Low-Med	Green

Open Non-Signal	55932	WEST COAST HWY & ELLIOTT RD	Three-way	896.31	17.25	Low-Med	Low-Med	Green
Open Non-Signal	60427	MARMION AV & GILBERT RD	Three-way	868.96	17.79	Low-Med	Low-Med	Green
Open Non-Signal	4042	WANNEROO RD & YANCHEP BEACH RD & INDIAN OCEAN DR	Three-way	868.42	13.97	Low-Med	Low-Med	Green
Open Non-Signal	128964	THOMAS RD & COLCHESTER AV	Three-way	663.51	18.29	Low-Med	Low-Med	Green
Open Non-Signal	4978	PATTERSON RD & OFFICE RD	Three-way	1323.03	5.92	Low	Low	Green
Open Non-Signal	54324	TUART RD & THOMAS RD	Three-way	657.22	11.93	Low-Med	Low	Green
Open Non-Signal	60443	MARMION AV & GUNTER GR	Three-way	857.51	9.14	Low	Low	Green
Open Non-Signal	137667	ENNIS AV & CARLSTON RD	Three-way	547.59	14.31	Low-Med	Low	Green
Open Non-Signal	4011	BROOKTON HWY & CANNING RD	Three-way	423.33	9.26	Low	Low	Green
Open Non-Signal	4079	SOUTH WESTERN HWY & ELEVENTH RD	Three-way	718.58	5.45	Low	Low	Green
Open Non-Signal	11626	TOODYAY & LILYDALE RD	Three-way	284.11	13.79	Low-Med	Low	Green
Open Non-Signal	13917	ROCKINGHAM RD & LIONEL ST	Three-way	914.87	4.28	Low	Low	Green
Open Non-Signal	14832	GREAT NORTHERN HWY & LENNARD ST	Four-way	916.74	4.27	Low	Low	Green
Open Non-Signal	14954	GREAT EASTERN HWY & LIONEL RD	Three-way	969.00	4.04	Low	Low	Green
Open Non-Signal	14993	GREAT EASTERN HWY & GRANCEY AV	Three-way	541.41	7.24	Low	Low	Green
Open Non-Signal	60437	MARMION AV & CYGNET ST	Three-way	890.45	4.40	Low	Low	Green
Open Non-Signal	60444	MARMION AV & LINEAR AV	Three-way	857.51	4.57	Low	Low	Green
Open Non-Signal	148883	TONKIN HWY NTH BND & HV WEIGH SITE	Three-way	1626.92	2.41	Low	Low	Green
Open Non-Signal	149535	OFF RAMP FROM ENNIS AV (NTH BND) & PORT KENNEDY DR	Three-way	1547.72	2.53	Low	Low	Green
Open Non-Signal	166949	THOMAS RD & ORELIA AV	Three-way	663.51	5.91	Low	Low	Green
Open Non-Signal	184389	ROE HWY & ROE HWY STH BND OFF TO GEH	Three-way	1989.36	1.97	Low	Low	Green

Open Non-Signal	184569	REID HWY & REID HWY EAST BND OFF TO MIRRABOOKA AV	Three-way	3128.84	1.25	Low	Low	Green
Open Non-Signal	14333	WANNEROO RD & KAROBORUP RD	Three-way	672.28	0.00	Low	Low	Green
Open Non-Signal	36679	ARMADALE RD & ABBEY RD	Three-way	528.56	0.00	Low	Low	Green
Open Roundabout	14796	GREAT EASTERN HWY BYPASS & STIRLING CR	Four-way	813.68	103.42	Med-High	Med-High	Red
Open Roundabout	148903	H410 & WELD ST	Three-way	367.51	125.66	High	Med-High	Red
Open Roundabout	148910	H411 & ARMADALE RD (RT)	Three-way	1267.85	53.65	Med-High	Med-High	Red
Open Roundabout	148909	H411 & ARMADALE RD (LT)	Three-way	1260.27	47.72	Med	Med-High	Red
Open Roundabout	4071	ROCKINGHAM RD & RUSSELL RD	Three-way	679.29	63.19	Med-High	Med	Orange
Open Roundabout	11621	TOODYAY RD & REEN RD	Unknown	376.38	85.64	Med-High	Med	Orange
Open Roundabout	15003	TOODYAY RD & RESERVE RD	Unknown	376.38	23.98	Low-Med	Low	Green
Open Roundabout	218426	LEACH HWY ON & OFF RAMPS & ABERNETHY RD	Three-way	2467.33	14.50	Low-Med	Med	Green
Open Roundabout	128212	MANNING RD - H547 ON & KWINANA FWY NTH BOUND	Unknown	1854.20	17.38	Low-Med	Med	Green
Open Roundabout	148911	H411 & ARMADALE RD (LT)	Three-way	2878.40	4.85	Low	Low-Med	Green
Open Roundabout	214243	REID HWY & LORD ST	Unknown	1219.93	8.74	Low	Low	Green
Open Roundabout	10165	ROCKINGHAM RD (NTH BND) & HURST RD	Unknown	945.59	9.54	Low	Low	Green
Open Roundabout	220584	ROE HWY (NORTHBOUND) & TONKIN HWY ON RAMP	Unknown	3614.80	2.50	Low	Low	Green
Open Roundabout	4000	TOODYAY & BAILUP RD	Unknown	208.47	17.04	Low-Med	Low	Green
Open Roundabout	4076	ALBANY HWY & CANNING DAM RD	Unknown	278.56	12.76	Low-Med	Low	Green
Open Roundabout	148907	H410 & ARMADALE RD	Three-way	1276.71	2.78	Low	Low	Green
Open Roundabout	218425	LEACH HWY OFF & ON RAMPS AND ABERNETHY RD	Three-way	2467.33	1.44	Low	Low	Green

Open Roundabout	193109	ARMADALE RD & ROSSITER AV	Unknown	973.35	0.00	Low	Low	Green
Open Roundabout	218447	TONKIN HWY (NB) & RAMP FROM AIRPORT DR (SB)	Unknown	5151.21	0.00	Low	Low	Green
Low-Speed Signal	50569	WELLINGTON ST 124 0116 - H016 & WELLINGTON ST & GEORGE ST	Unknown	1137.22	198.78	High	High	Black
Low-Speed Signal	50544	MURRAY ST ON - H016 STH BOUND & GEORGE ST & MURRAY ST	Three-way	1058.71	102.20	Med-High	High	Black
Low-Speed Signal	50545	ELDER ST LINK TO H521 & MURRAY ST & ELDER ST	Three-way	899.43	117.43	High	High	Red
Low-Speed Signal	4987	H015 STH BOUND - CRANFORD AV & CRANFORD AV	Three-way	571.55	95.56	Med-High	Med-High	Red
Low-Speed Signal	50567	H528 - WELLINGTON ST 124 0116 & WELLINGTON ST & ELDER ST	Unknown	1660.75	59.89	Med-High	High	Red
Low-Speed Signal	14291	GREAT EASTERN HWY & EPSOM AV	Three-way	2663.02	24.69	Low-Med	Med-High	Red
Low-Speed Signal	4515	H016 NTH BOUND - HAY ST OFF & HAY ST & GEORGE ST	Unknown	1379.15	44.87	Med	Med-High	Red
Low-Speed Signal	4334	SUTHERLAND ST ON - H016 NTH BO & SUTHERLAND ST	Four-way	1015.10	33.51	Med	Med	Green
Low-Speed Signal	14227	GREAT EASTERN HWY & ACTON AV (A)	Three-way	2579.67	0.69	Low	Low	Green
Low-Speed Non-Signal	4332	H016 NTH BOUND - MARKET ST OFF & MARKET ST	Three-way	407.41	158.23	High	Med-High	Red
Low-Speed Non-Signal	143588	BEACH ST (H056) & BEACH ST	Three-way	1204.39	28.89	Low-Med	Med	Green
Low-Speed Non-Signal	14279	GREAT EASTERN HWY & KIMBERLEY ST	Three-way	2331.04	17.51	Low-Med	Med	Green

Low-Speed Non-Signal	14281	GREAT EASTERN HWY & KALGOORLIE ST	Three-way	2331.04	13.83	Low-Med	Med	Green
Low-Speed Non-Signal	4339	H016 STH BOUND - JAMES ST OFF & H671 - H528 LINK & JAMES ST WEST	Three-way	1557.65	11.03	Low	Low-Med	Green
Low-Speed Non-Signal	14284	GREAT EASTERN HWY & KEYMER ST	Three-way	2331.04	6.27	Low	Low-Med	Green
Low-Speed Non-Signal	78816	H016 NTH BOUND - MOUNTS BAY OFF & MOUNTS BAY RD WB	Four-way	1834.06	7.97	Low	Low-Med	Green
Low-Speed Non-Signal	45570	CENTRAL RD & BURT ST	Unknown	3670.23	4.68	Low	Low-Med	Green
Low-Speed Non-Signal	14260	GREAT EASTERN HWY & HARGREAVES ST	Three-way	2309.04	3.72	Low	Low	Green
Low-Speed Non-Signal	14219	GREAT EASTERN HWY & ARMADALE RD	Three-way	2652.99	0.97	Low	Low	Green
Low-Speed Non-Signal	14224	GREAT EASTERN HWY & ST KILDA RD (A)	Three-way	2652.99	0.97	Low	Low	Green
Low-Speed Non-Signal	14290	GREAT EASTERN HWY & LEAKE ST	Three-way	2331.04	1.10	Low	Low	Green