# Cycle count data
## 2014/15

## Introduction
Perth's cycle network is monitored using 34 permanent bicycle counters located primarily on PSPs and RSPs in the Perth Metropolitan Area (Appendix A). These counters provide an accurate, continuous count of bicycle riders at each of the counter locations. The counters have been installed progressively since mid-2008 as the network has developed. While the counters provide an accurate picture of cycling at the counter sites there are numerous cycling routes which are not captured in the current counter network. For this reason, the analysis within this section should be considered as indicative rather than definitive indicators of cycling trends in the Perth Metropolitan Area.

### Overall Indicators

**Perth CBD**
Cycling travel into and out of the Perth Central Business District (CBD) is estimated using eight counters located on the CBD periphery (ten from 2014/15). These sites represent an incomplete cordon of cyclist movements into and out of the CBD, particularly on the road network towards North Perth. They will underestimate the amount of cycling activity into and out of the Perth CBD.

During 2014/15 there was an average of 10,500 riders crossing the Perth CBD cordon per day across the ten sites, increasing to 11,200 on weekdays (Figure 1.1). Overall, there has been a decrease in cycling across the cordon of 4% between 2013/14 and 2014/15. Most of the decrease is attributable to a 5% decline in weekday cycling demand; weekend demand has been stable over the period.

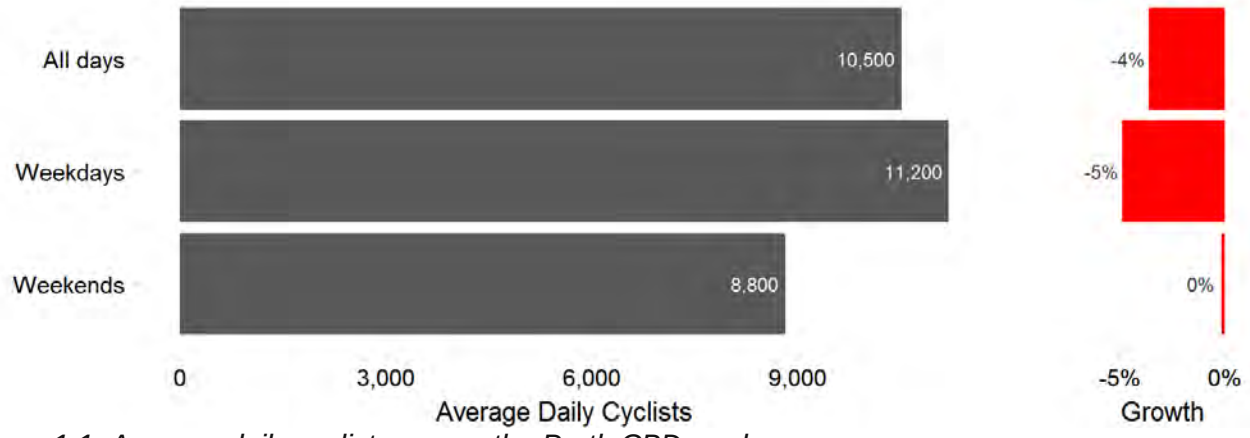


*Figure 1.1: Average daily cyclists across the Perth CBD cordon*

Almost all of the decrease in cycling across the Perth CBD cordon can be attributed to very substantial decreases in cycling at the Narrows Bridge east abutment and Riverside Drive at Causeway Bridge (Figure 1.3). Both of these sites were affected by construction work during the 2014/15 financial year:

- The Kwinana Freeway PSP (Narrows Bridge West) was closed from March to September 2014, which resulted in a significant increase in cycling across the Narrows Bridge East path during the 2013/14 financial year. Once the western path reopened cyclist demand across the eastern path declined markedly, but this decline was not mirrored by an equivalent increase on the western path. Overall cyclist demand across the bridge decreased by around 9% between 2013/14 and 2014/15. Given the absence of viable alternative cycling routes it is possible the decrease is a result of shifts towards motorised travel or suppression of discretionary cycling trips.

- The Riverside Drive RSP was affected by the closure of the path at Elizabeth Quay, which has markedly reduced demand on the Causeway Bridge. At least some of this reduction may have shifted to the Windan Bridge, which experienced an 11% increase in cycling.

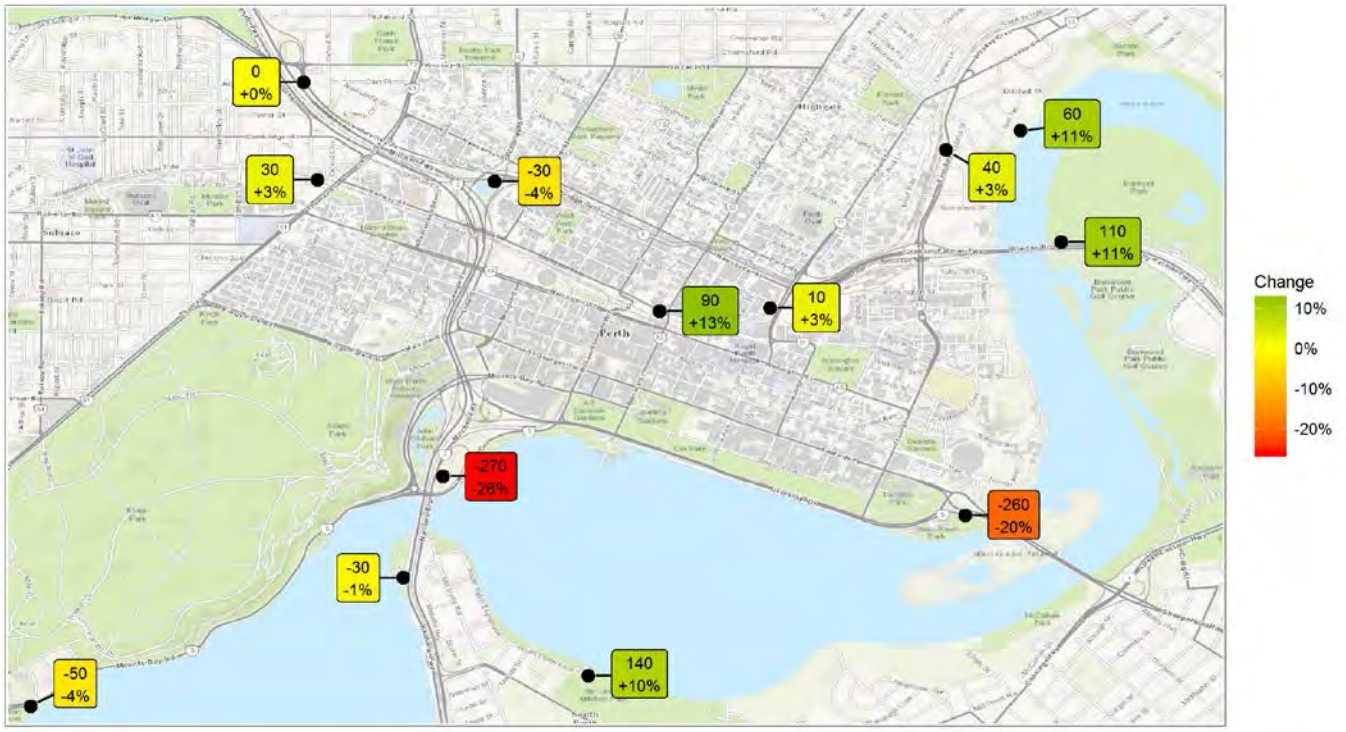


*Figure 1.2: Change in average daily traffic FY 2013/14 – 2014/15*

The declines in cycling over the 2014/15 financial year are in contrast to previous years, during which time there was sustained cycling growth of 5 to 15% per annum (Figure 1.4).

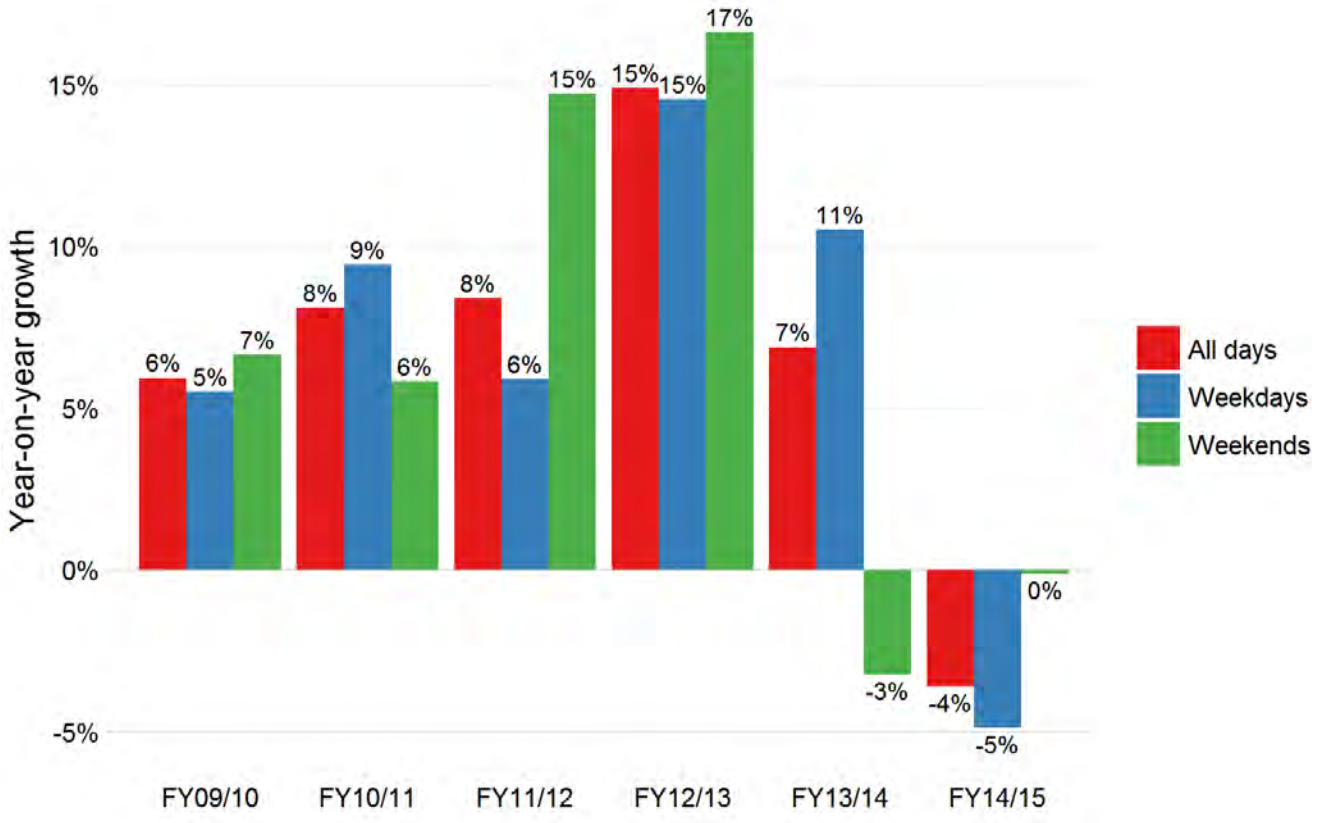


*Figure 1.3: Annual change in cycling traffic into and out of the Perth CBD*

**Suburban location**

The counter network was divided into sites that are predominantly in inner city locations, suburban areas and outer suburban areas[1]. The growth by inner city, suburban and outer suburban locations are shown in Figure 1.3[2]. The change in demand at the inner city sites is largely identical to the trends for the Perth CBD cordon, as 10 of the 12 sites making up this group are in both groups. Most suburban sites have only been installed in the past two to three years.

However, between 2013/14 and 2014/15 demand at the suburban sites appears to have been stable while there has been growth of around 7% at the outer suburban sites. However, it should be noted that the outer suburban sites consist of only two counters (Kwinana Freeway PSP (Paganoni Road) and Mitchell Freeway PSP (Hodges Drive)). Furthermore, these sites both have low rider demand (below 200 riders per day), such that small absolute changes will lead to large proportional changes in demand.

[1] The counters included within each group are provided in Appendix A.

[2] The average growth by site is weighted according to the average daily traffic at that site. Counters within each group that have a high likelihood of double counting cyclist movements from another nearby counter are excluded from the analysis.

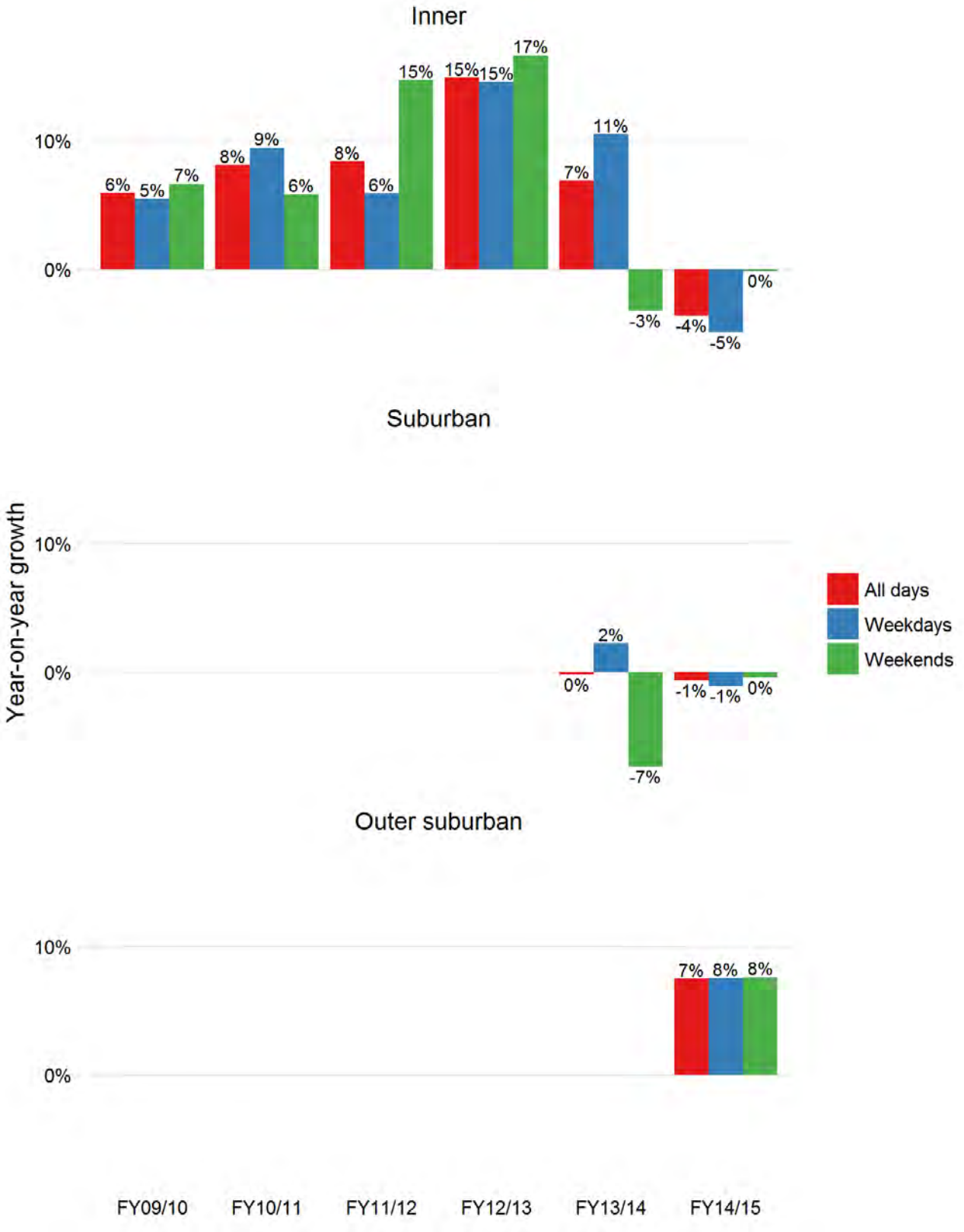


*Figure 1.4: Growth by counter location and day of week*

## Individual Sites

The busiest counter site in 2014/15 was the Kwinana Freeway PSP at the Narrows Bridge West abutment, with around 2,300 riders per day (Figure 1.5). This site has experienced a very marginal decrease in demand compared with 2013/14. The second and third busiest sites, the Canning Highway RSP at Canning Bridge and the South Perth Esplanade RSP, both experienced increases in demand of around 10%.

The greatest decreases in demand over the year occurred along the Riverside Drive RSP at the Causeway Bridge (attributable to the works at Elizabeth Quay) and the Kwinana Freeway PSP at Narrows Bridge east abutment, which is attributable to the reopening of the path on the western side of the bridge. Overall, 11 of 16 sites for which there is adequate data experienced stable demand or growth between 2013/14 and 2014/15.

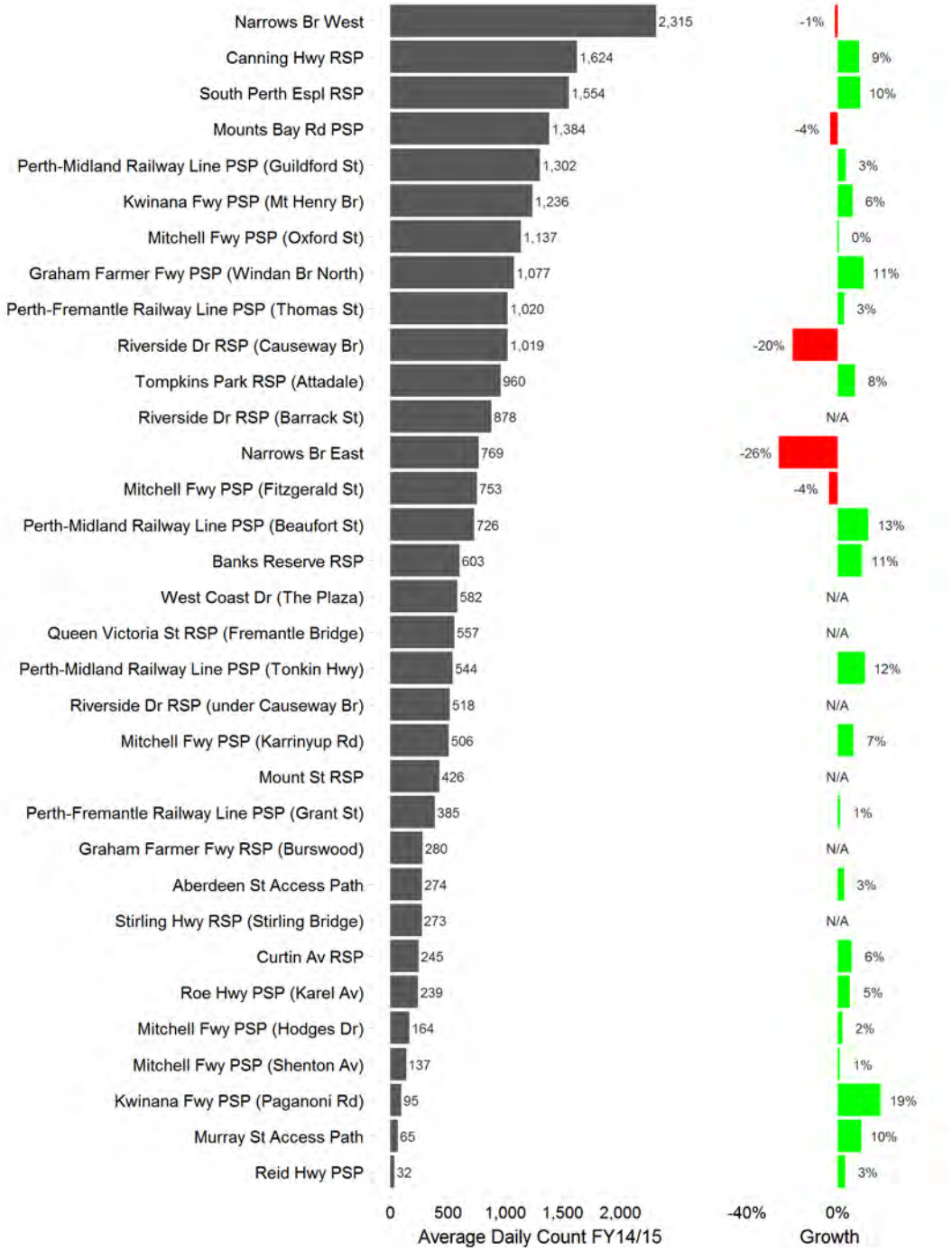


*Figure 1.5: Average annual daily traffic and growth FY 2013/14 – 2014/15*

Most of the sites where a counter has been installed since 2008/09 experienced strong growth until around 2012/13 (Figure 1.6). In the past two to three years this growth seems to have stagnated at many sites.

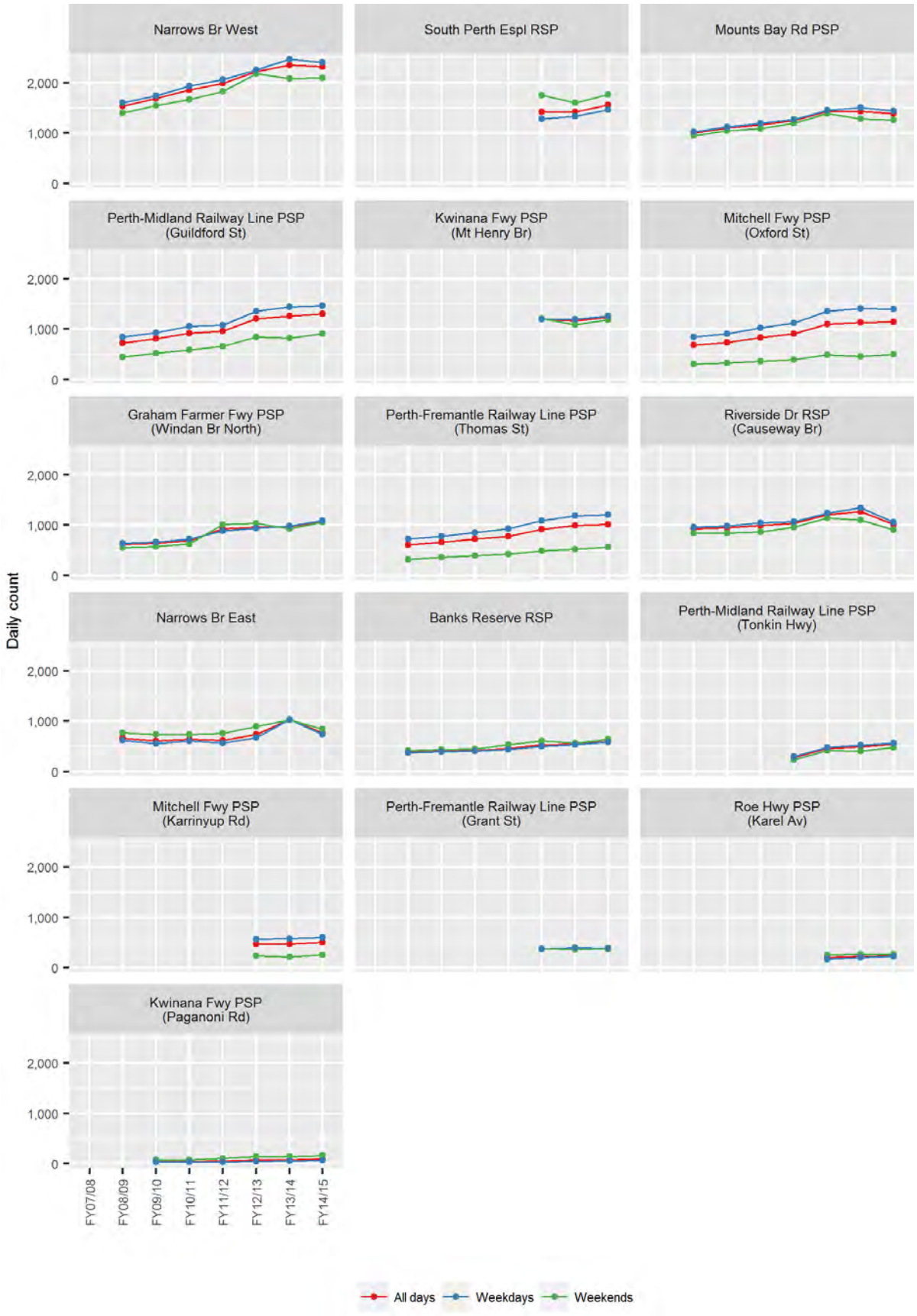


*Figure 1.6: Daily count by site, year and day-of-week*

There is a variety of factors that could have influenced the observed stagnation, and in some cases decline, in cycling demand between 2013/14 and 2014/15. These factors include:

- The economic downtown in Western Australia and a rise in unemployment (reaching 6.4% in July 2015 in seasonally adjusted terms in comparison with 4.0% in July 2014).
- A slower rate of population grown (e.g. 3.2% in 2012/13 declining to 1.3% in 2014/15).
- An increase in closures and detours for construction, maintenance and refurbishment works on the cycling network.
- Changes in community preferences and attitudes towards cycling.

These factors appear also to have affected public transport patronage over the past two to three years.

There is evidence from other Australian capital cities to suggest the rate of cycling growth has stabilised over the past few years in much the same way that it appears to have done in Perth. Why this would be the case is not clear.

The proportion of daily demand by time of day for each site, for weekdays and weekends, is shown in Figure 1.7. The sites with the strongest weekday peak periods are shown first. The Mitchell Freeway PSP has the strongest commuter usage; 39% of the typical weekday demand occurs in the two hours that are the AM and PM peak hours (Figure 1.8). Sites where this two hour period accounts for less than 20% of the daily demand are recreation-dominated sites such as the South Beach RSP (Fremantle) and West Coast Drive (Watermans Bay).

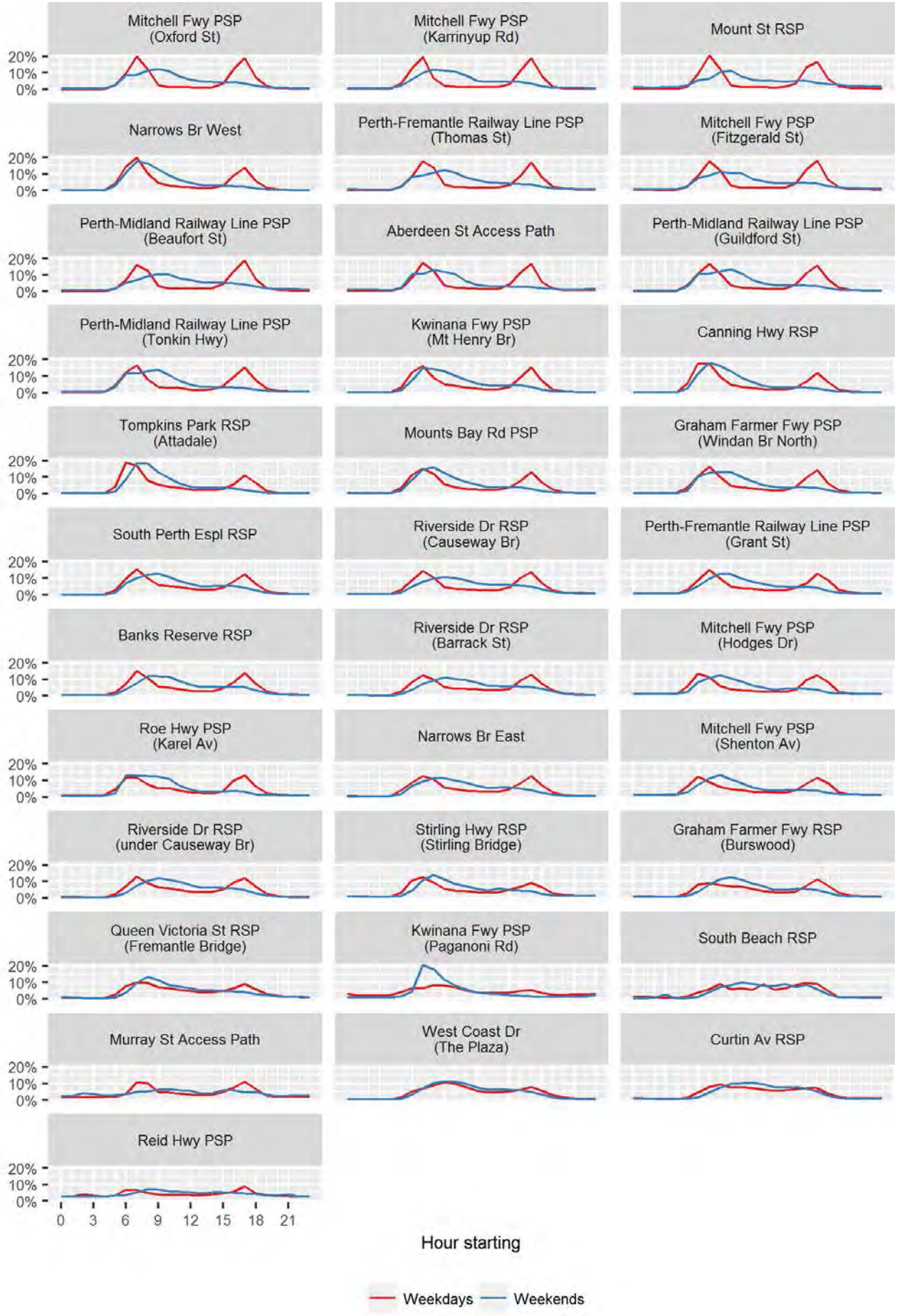


*Figure 1.7: Proportion of daily traffic by hour of day*

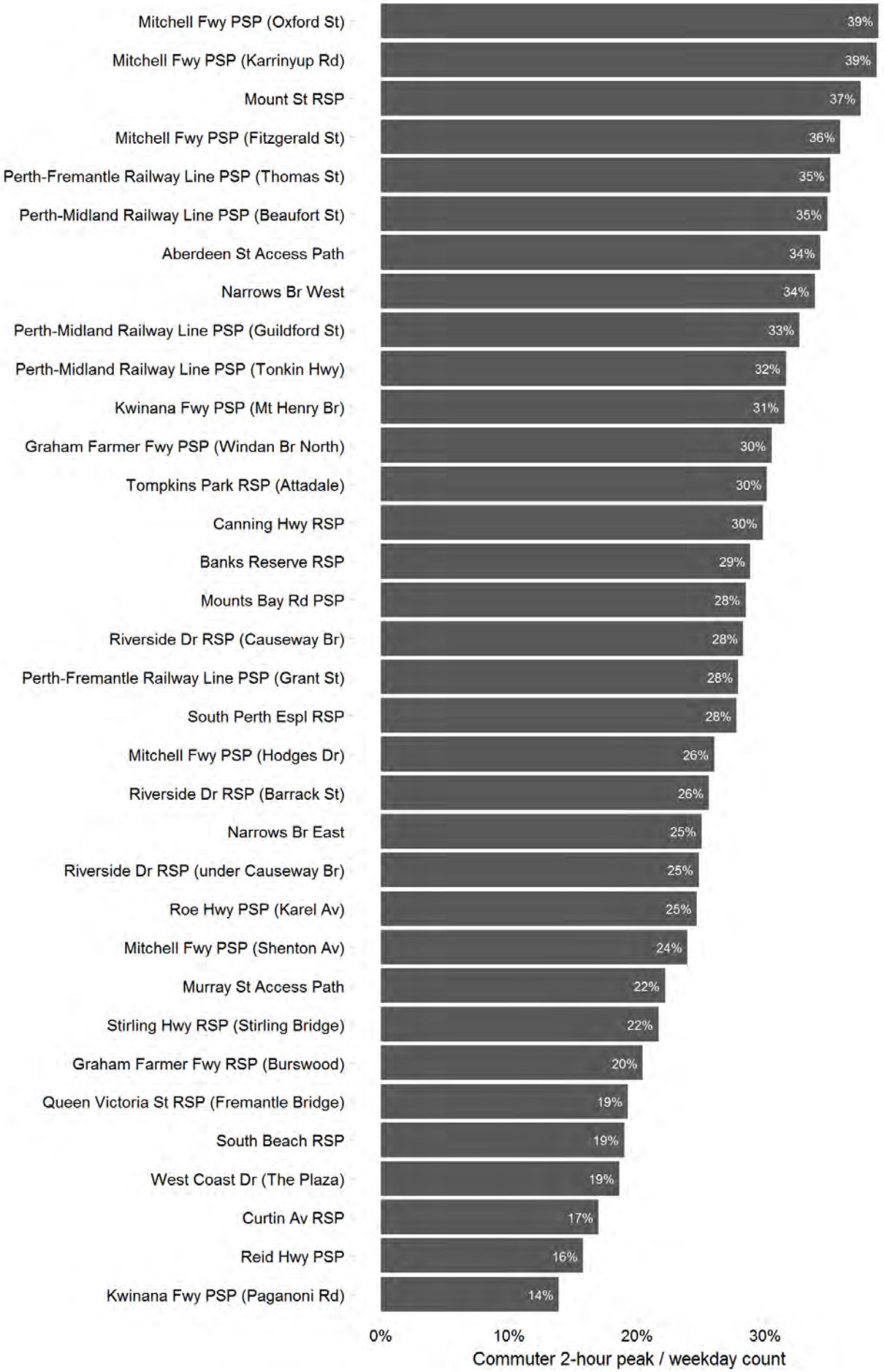


*Figure 1.8: Proportion of weekday traffic in the AM and PM peak hours*

# Appendix A: Counter locations

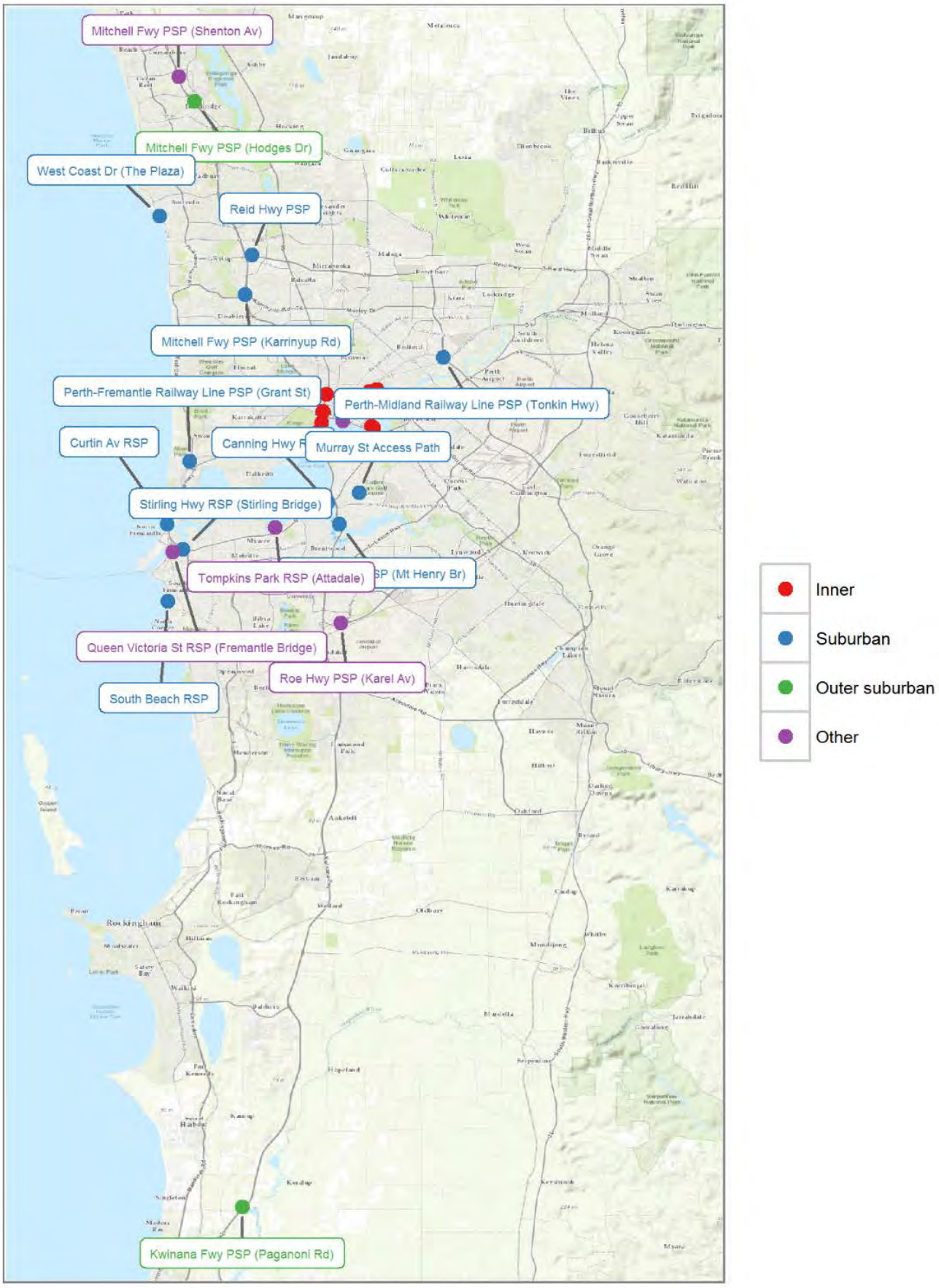


*Figure 1.9: Counter locations*

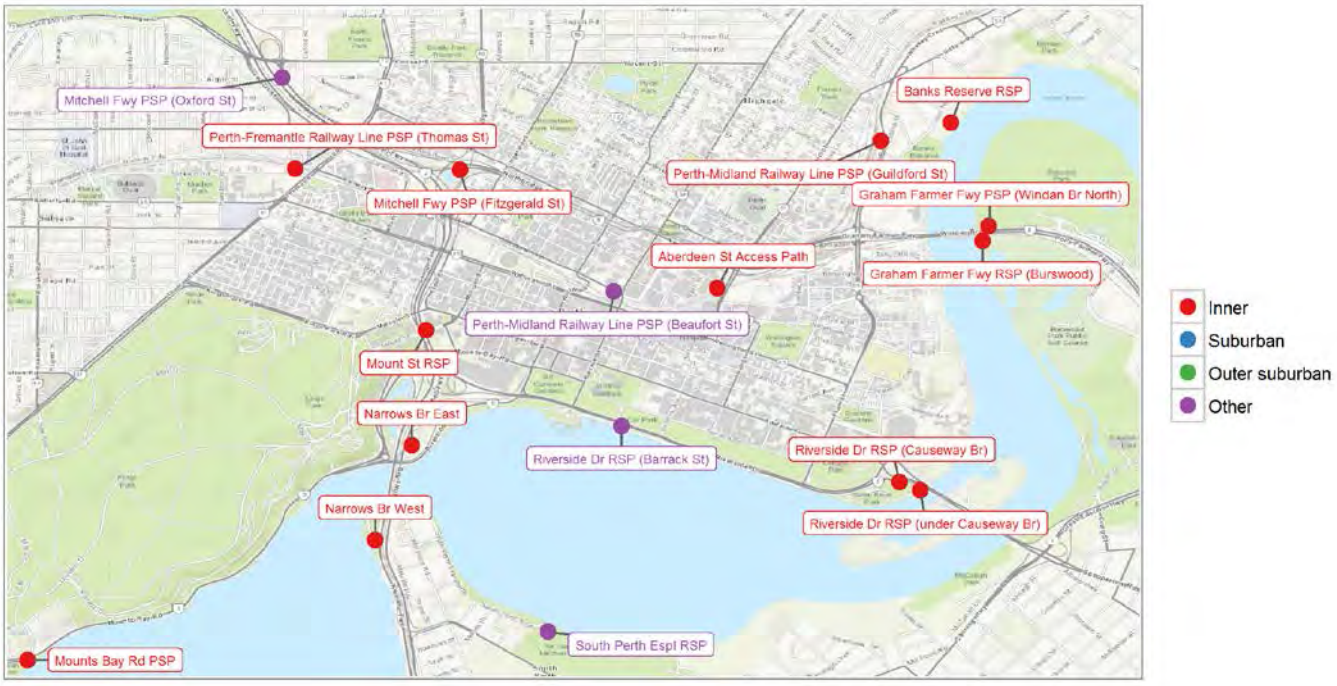


*Figure 1.10: Counter locations - Perth CBD*

## Appendix B: Data processing

**Data source**

The data used in this report is based on the network of automatic bicycle counters funded by the Department of Transport and maintained by Main Roads Western Australia (MRWA). The counters are Metrocount MC5720 units using piezoelectric sensors and have been demonstrated to have a count accuracy of above 98%. The counters are currently exclusively located on shared paths (PSPs and RSPs) to avoid the complications of having to differentiate bicycles from motor vehicle traffic. The counters do not count pedestrians but do provide individual records by direction and speed.

It should be noted that the assumptions with regard to handling missing values and holidays used in this analysis vary somewhat from those used by MRWA. As such, the statistics reported herein will vary marginally from those reported elsewhere by MRWA. These differences should be of no practical significance.

**Data analysis**

*Data cleaning*

Checks were performed on the data to ensure the data was plausible. These checks included removing records with speeds about 80 km/h and manually inspecting the daily totals and removing extreme outliers.

*Average-of-averages*

The analysis method is based on an average-of-averages methodology recommended by the American Association of State Highway and Transportation Officials (AASHTO). This approach minimises biases introduced as a result of gaps in the data, which usually occur due to hardware failures. The average-of-averages method calculates a monthly average day of week for every month and day-of-week in a year, which in turn is then averaged to produce an annual average. To avoid seasonal biases where there are periods of missing data yearly averages are only reported where there are a minimum of eight months of data in a year.

*Treatment of holidays*

All days are included in the “all days” definition. “Weekdays” exclude weekdays that are public holidays and “Weekends” include all weekends and weekdays that are public holidays. Public holidays falling on weekdays are treated as Sundays for the purpose of the aggregation; this marginally affects the weekday/weekend statistics. School holidays are treated as normal days, as are non-holiday weekdays over the Christmas period.

***Counter groups***

This report provides an analysis both of individual counters and groups of counters, such as across the Perth CBD and by metropolitan region. The method of grouping count sites is complicated by the different times in which counters were installed and the risk of double counting across count sites.

*Incorporating new counters*

The counter network has grown to 34 sites across the Perth Metropolitan Area. Not all of these counters are used in the present analysis, usually because they have only recently been installed and cannot yet provide a reliable picture of cycling at the count site. Where counters are grouped, such as for the Perth CBD cordon, year-on-year growth is calculated excluding a new counter for the first full year in which it is operational. For example, a counter was installed on the Mitchell Freeway PSP (Fitzgerald St) in June 2013. This counter is only incorporated into the growth calculations from 2014/15. In this way there is no discontinuity in

the time series arising from the addition of a counter. However, this does mean that the absolute counts across the cordons are discontinuous, and so are not reported herein.

*Double counting*

In grouping counter sites there is the likelihood that at least some riders will travel across multiple counter sites. This will, self-evidently, be especially true where counters are located close to one another. There is a risk that combining counters where a large proportion of riders are already crossing one or more other counters will overly inflate any observed increase in bicycle riders (i.e. one new rider crossing two counters will double the estimated rider growth).

To partly redress this problem counters which are likely to be largely duplicated by others are excluded from the groups. For example, there are two counters on the Mitchell Freeway PSP (at Shenton Ave and Hodges Dr within 1.4 km of one another). Similarly, most riders passing the counter on the Riverside Dr RSP at Barrack St are likely to have passed at least one of the counters forming the Perth CBD cordon.