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TRAFFIC & ROAD SAFETY PROJECTS

# Speed Limit Review

## Sir Joseph Banks Drive and Lamerough Parade, Pelican Waters

Prepared for Sunshine Coast Council

Prepared by:
Darren Shirley
10 September 2013
FINAL VERSION

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# Document control sheet

**Version history:**

| Version No. | Date | Changed by | Nature of amendment |
|---|---|---|---|
| Draft V1 | 05.08.2013 | Darren Shirley | Initial draft |
| Final | 10.09.2013 | Darren Shirley | Final Report |
| | | | |

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# Client sign-off

**Prepared for:**
Sunshine Coast Council

**Project Description:**
Speed Limit Review – Sir Joseph Banks Drive and Lamerough Parade, Pelican Waters

**Document sign off**
The following officer acknowledges receipt of this document on behalf of Sunshine Coast Council:

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Position _____

Signature _____ Date _____

## Contents

# 1 Introduction

This report presents the findings of a speed limit review conducted on Sir Joseph Banks Drive and Lamerough Parade, Pelican Waters. The speed limit review covers the entire 1.0km length of Sir Joseph Banks Drive and a 550m section of Lamerough Parade, between the intersections of Sir Joseph Banks Drive and Landsborough Parade.

The speed limit review has been undertaken at the request of Sunshine Coast Council (SCC) and has been conducted in accordance with the speed limit review processes outlined in the *Manual of Uniform Traffic Control Devices (MUTCD), Part 4: Speed Controls.*

Figure 1 and Figure 2 illustrates the locality and geographical limit of the review.

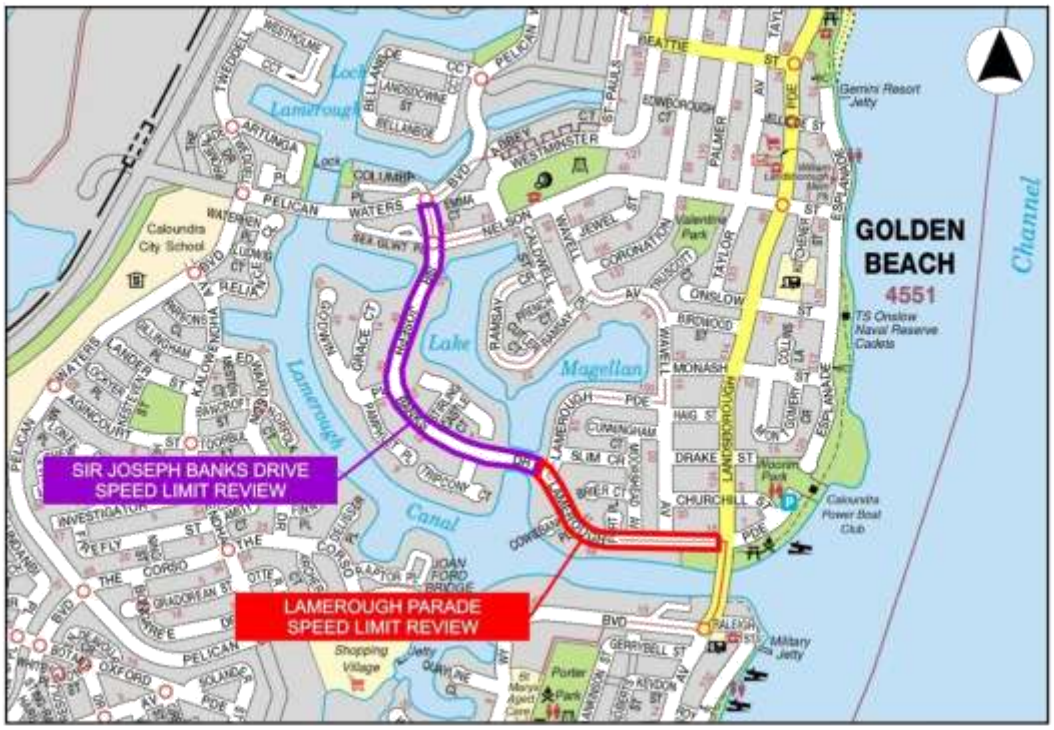



**Figure 1: Location of Speed Limit Review site (Source: Universal Publishers)**


**Figure 2: The geographical limits of the Speed Limit Review (Source: Google Earth)**

# 2 Site Details

Sir Joseph Banks Drive and Lamerough Parade are both local government roads that fall under the jurisdiction of Sunshine Coast Council. The subject road section is approximately 1.55km in combined length, commencing at the intersection with Pelican Waters Boulevard (northern end) and continuing through to the intersection with Landsborough Parade (southern end).

Both roads are single carriageway, undivided, asphalt sealed roads with no marked centre or edge lines. The road width is consistent along Sir Joseph Banks Drive, with a typical width of 7.2m (transitioning to 5.2m where kerb extensions were installed). However the width of Lamerough Parade varies at numerous locations, from 7.3m to 9.2m.

Both roads are bound with kerb and channel along the entire length, with semi-mountable kerb installed along Sir Joseph Banks Drive and barrier kerb installed along Lamerough Parade. Kerb extensions are installed on Sir Joseph Banks Drive in the vicinity of all side street intersections. The kerbs extend towards the centre of the road by 1m on both sides, resulting in a typical 'clear lane width' of 5.2m between kerb clearance points.

The horizontal alignment is generally curvilinear, apart from a 310m straight at the southern end of Lamerough Parade. The vertical alignment is typically flat throughout.

The abutting roadside land is almost fully developed (apart from 2 vacant blocks) and predominantly residential in nature, with block sizes ranging between 650m² to 1100m².

Property boundaries are typically setback between 4m to 10m from the road edge, with most dwellings clearing visible to passing traffic. There are no restrictions on direct access on either road section.

Intersection and mid-block flag lighting is provided throughout both road sections. The number and frequency of existing street lights appeared consistent and appropriate for the roadside environment.

A 2m wide concrete path is provided along the full length of both Sir Joseph Banks Drive and Lamerough Parade, with a formalised pedestrian refuge located near the intersection with Landsborough Parade and ramped kerb cut-through crossings located near the roundabout with Pelican Waters Boulevard and the intersection with Godwin Place. Pedestrian warning signage has been provided inconsistently on the approaches to the crossing points.

At the time of the site inspection (30 July 2013), Sir Joseph Banks Drive and Lamerough Parade both operated under a 50km/h speed limit.

# 3 Previous Speed Reviews

No details have been provided with regard to any formal speed limit reviews previously undertaken on Sir Joseph Banks Drive or Lamerough Parade. However, a number of speed studies have been undertaken by Council on both roads, between August 2008 and March 2013. The results from these studies have been tabulated and are shown in Appendix C. When referencing these results, it should be noted that 'speed humps' (vertical displacement bars), were temporarily installed on Sir Joseph Banks Drive when speed surveys were undertaken in June 2010.

# 4 Traffic Data

The average daily traffic (ADT) volume has been determined using traffic count data collected during February and March 2013. The traffic survey sites on Sir Joseph Banks Drive yielded average daily traffic volumes that ranged between 1,141 vehicles per day (200m south of Godwin Place) and 1,581 vehicles per day (200m north of Godwin Place). While the survey site on Lamerough Parade yielded an average daily traffic volume of 1,053 vehicles per day (30m north of Cowiebank Place).

Table 1 provides a summary of the ADT volumes at each count site. Reference should be made to Appendix C for summarised details of the calculated ADT at each count site between August 2008 and March 2013.

| Average Daily Traffic Volumes – Sir Joseph Banks Dr and Lamerough Pde 13 Feb 2013 – 6 Mar 2013 | | |
|---|---|---|
| **200m South of Godwin Pl** | **200m North of Godwin Pl** | **30m North of Cowiebank Pl** |
| 1,141 | 1,581 | 1,053 |

**Table 1: Summary of 2013 average daily traffic volumes on Sir Joseph Banks Drive and Lamerough Parade**

# 5 Homogeneity of Road Section

Part 4/4.3.2 of the MUTCD suggests the speed limit review process should be applied only to segments of road which are homogenous in terms of characteristics and speed environment. Following a subjective assessment of the continuity of the road section with regard to density of land use, visibility and setback of dwellings, general speed environment, existing speed limits and traffic volume, it has been determined that for the purpose of this review there were two homogenous road sections. These separate homogenous sections are referred to hereafter as 'Section 1' and 'Section 2'. The extents of each section are as follows:

- Section 1 – Sir Joseph Banks Drive (Pelican Waters Boulevard to Lamerough Parade – 1km)
- Section 2 – Lamerough Parade (Sir Joseph Banks Drive to Landsborough Parade – 550m)

Table 4.1, Part 4 of the MUTCD specifies the desirable minimum length of speed zones dependent upon the speed limit.

Table 4.1 MINIMUM LENGTHS OF SPEED ZONES

| Speed Limit km/h | Minimum length of zone km |
|---|---|
| 40 | 0.4 |
| 40: School zone only | 0.2 (see Part 10 of this Manual) |
| 40 high pedestrian activity zone | 0.2 |
| 50 | 0.5 |
| 60 | 0.6 |
| 70 | 0.7 |
| 80 | 0.8 |
| 90 | 0.9 |
| 100 | 2.0 |
| 110 | 20.0 (see Clause 3.3) |

The existing 50km/h speed zones posted on Sir Joseph Banks Drive and Lamerough Parade both exceed the minimum length specified in Table 4.1, Part 4 of the MUTCD.

# 6 Determination of Appropriate Speed Limit

Part 4/4.2.1 of the MUTCD suggests the following criteria should be considered for a particular length of road in the determination of speed zones:

a) road function;

b) prevailing speeds; and

c) Speed Environment.

The MUTCD also suggests other issues, such as crash history and potential risk factors, be considered prior to the recommendation of an appropriate speed limit. The following analysis applies the standard procedure for the determination of an appropriate speed limit as described in Part 4/4.3.3 of the MUTCD.

## 6.1 Road Function

Sir Joseph Banks Drive and Lamerough Parade are located in an urban area within the residential catchment of the master planned Pelican Waters development. Both roads form a continuous link which facilitates 'through' travel between Pelican Waters Boulevard (northern end) and Landsborough Parade (southern end). Pelican Waters Boulevard and Landsborough Parade are two of the three major traffic carrying routes that service the Pelican Waters Development.

Sir Joseph Banks Drive and Lamerough Parade are multi-functional roads in that they provide for direct access to properties as well as access to other local neighbourhood streets. They also provide a 'collector' function, as side street traffic from within the residential catchment area collects onto these roads before being distributed throughout the broader network.

The connectivity provided between Pelican Waters Boulevard and Landsborough Parade (major Sub-Arterial / Trunk Collector roads) results in regular traffic which primarily has trip origins and destinations outside of the local Pelican Waters area (e.g. travel between the residential catchment and other towns throughout the Sunshine Coast area). With regard to functional classification, roads which facilitate this broader 'district' movement are referred to as 'traffic carrying' roads.

The function of both Sir Joseph Banks Drive and Lamerough Parade was determined to be 'Urban Traffic Carrying' in accordance with Part 4/4.2.2 of the MUTCD. The existing 50km/h posted speed limit was not equal the 'General Minimum Speed Limit' on traffic carrying roads of 60km/h.

## 6.2 Prevailing Traffic Speed

Part 4/4.2.3 of the MUTCD states that prevailing traffic speeds are a major factor in the determination of a speed limit. Speed survey data has been provided by Sunshine Coast

Council for two sites on Sir Joseph Banks Drive and two sites on Lamerough Parade. Both of the sites on Sir Joseph Banks Drive were located in Section 1, while both sites on Lamerough Parade were located in Section 2.

Table 2 and Table 3 provide a summary of the available traffic speed data within each homogenous section. Reference should be made to Appendix C for complete details of the 'Speed Statistics Reports'.

| Speed Statistics – Sir Joseph Banks Drive (200m South of Godwin Place) 13 Feb 2013 – 6 Mar 2013 | | | | | |
|---|---|---|---|---|---|
| **Direction** | **No. of Vehicles** | **Mean Speed (km/h)** | **85th % Speed (km/h)** | **15 km/h Pace (km/h)** | **No. in Pace (%)** |
| Both | 22, 460 | 50.4 | 58.3 | 44 - 59 | 66.99 |
| **Speed Statistics – Sir Joseph Banks Drive (200m North of Godwin Place) 13 Feb 2013 – 6 Mar 2013** | | | | | |
| **Direction** | **No. of Vehicles** | **Mean Speed (km/h)** | **85th % Speed (km/h)** | **15 km/h Pace (km/h)** | **No. in Pace (%)** |
| Both | 30, 674 | 51.7 | 59.4 | 45 - 60 | 70.32 |

**Table 2: Summary of supplied traffic speed data – Section 1**

| Speed Statistics – Lamerough Parade 30m North of Cowiebank Place) 13 Feb 2013 – 6 Mar 2013 | | | | | |
|---|---|---|---|---|---|
| **Direction** | **No. of Vehicles** | **Mean Speed (km/h)** | **85th % Speed (km/h)** | **15 km/h Pace (km/h)** | **No. in Pace (%)** |
| Both | 20, 857 | 49.0 | 56.5 | 42 - 57 | 71.40 |
| **Speed Statistics – Lamerough Parade 35m West of Wavell Avenue) 6 Mar 2013 – 27 Mar 2013** | | | | | |
| **Direction** | **No. of Vehicles** | **Mean Speed (km/h)** | **85th % Speed (km/h)** | **15 km/h Pace (km/h)** | **No. in Pace (%)** |
| Both | 22,926 | 50.4 | 59.4 | 45 - 60 | 63.97 |

**Table 3: Summary of supplied traffic speed data – Section 2**

## 6.3 Speed Environment

In accordance with Part 4/4.2.4 of the MUTCD, the QLIMITS program has been used to assess the speed environment for the subject road sections. The findings are documented as follows. Reference should be made to Appendix B for complete details of the QLIMITS 'Detailed Assessment Report'.

### 6.3.1 Frequency of Roadside Accesses

Table 4 and Table 5 provide a summary of the frequency of roadside accesses by type for each homogenous road section.

| Type of access | Number |
|---|---|
| Residences, small commercial establishments, small public buildings and other units which generate light and/or occasional activity. (The weighting for this type of access is 1). | 43 |
| Unsignalised intersecting roads of substantially lesser importance than the road being assessed, or intersecting roads where side traffic and turning movements have little effect on the traffic flow pattern of the road being considered. (The weighting for this type of access is 1). | 4 |
| Roundabouts and signalised intersecting roads. (The weighting for this type of access is 3). | 2 |
| **Average number of accesses per 100 m** | **5.30** |

**Table 4: Frequency of roadside accesses – Section 1**

| Type of access | Number |
|---|---|
| Residences, small commercial establishments, small public buildings and other units which generate light and/or occasional activity. (The weighting for this type of access is 1). | 34 |
| Unsignalised intersecting roads of substantially lesser importance than the road being assessed, or intersecting roads where side traffic and turning movements have little effect on the traffic flow pattern of the road being considered. (The weighting for this type of access is 1). | 3 |
| Unsignalised intersecting roads of lesser importance than the road being assessed but where the side road traffic and turning movements are such that the intersection has appreciable effect on the traffic flow pattern of the road being considered. (The weighting for this type of access is 2). | 2 |
| **Average number of accesses per 100 m** | **7.45** |

**Table 5: Frequency of roadside accesses – Section 2**

### 6.3.2 Crash History

A search of the Department of Transport and Main Roads (TMR) 'Web*Crash 2'* database indicates there were four recorded crashes along the subject sections of Sir Joseph Banks Drive and Lamerough Parade between January 2005 and July 2013 (the start date coincides with the beginning of the most recent five year period of crash data that has been fully validated by TMR. Reporting on higher severity 'hospitalisation' and 'fatal' crashes is available

to 30 November 2012 and 31 March 2013 respectively, and has been considered in the extent of data reviewed for this speed limit review).

All of the reported crashes occurred at the intersection of Lamerough Parade and Landsborough Parade. The predominant nature of the crashes was 'Intersection, from adjacent approaches – DCA Code Group 1' which accounted for over 75% (3) of the total number of crashes. The crash details indicate the predominant contributing factor to be motorists failing to stop or give way to conflicting traffic while crossing or turning at the intersection.

Although all of the reported crashes occurred within Section 2, it should be noted that all four crashes were intersection types which result predominantly from a higher degree of potential vehicular conflict (compared with road segments) and are not considered in crash rate calculations involving speed limit reviews. One additional crash is included in the WebCrash 2 report shown in Appendix D, however this crash involved a single vehicle losing control on Landsborough Parade before impacting with a power pole near the intersection of Lamerough Parade. As this crash did not occur on Lamerough Parade it has not been included in the crash analysis for Section 2.

As there were no reported crashes in either road section that are considered in crash rate calculations involving speed limit reviews, the calculated 'average annual crash cost' for both homogeneous sections is 0 ($\$10^4$), and the calculated 'crash rate' is also 0 ($\$10^4$ per $10^8$ VKT). Reference should be made to Appendix D for complete details of the *WebCrash2 Report*.

### 6.3.3 Crash Rate Comparison

Clause E2, Part 4 of the MUTCD, states that for comparison purposes, the following convention should be used to describe the crash rate in relation to typical crash rates:

- Low Crash Rate: Less than or equal to the average crash rate
- Medium Crash Rate: Between average and critical crash rates
- High Crash Rate: Greater than or equal to the critical crash rate

As 'typical crash rates' were not available for the subject site, this value has been determined using *Austroads' Technical Report AP-T152/10*, entitled *Road Safety Risk Assessment, Part 7: Crash Rates Database*. This document presents the findings of a research project which was commissioned to develop an Australia-wide database of crash and road inventory information to provide a platform for greater understanding of crash risks as they relate to road infrastructure and traffic operations (Austroads', 2010). Table 6 outlines the crash rates on Queensland roads by road stereotype based on the accepted method of exposure to risk.

| Road Stereotype | | Crash Rate (Casualty crashes per 100M VKT) | 95% confidence interval | Relative Risk | Crash Cost Rate (cents per VKT) | Relative Cost | Crash Cost ($10^4$ per $10^8$ VKT) |
|---|---|---|---|---|---|---|---|
| Urban | | 12.80 | (12.24; 13.36) | 1.00 | 5.38 | 1.00 | 538 |
| Rural | | 13.43 | (13.02; 13.84) | 1.05 | 7.04 | 1.31 | 704 |
| Urban | Single | 13.38 | (12.59; 14.17) | 1.56 | 5.73 | 1.31 | 573 |
| Urban | Divided | 12.19 | (11.41; 12.97) | 1.42 | 5.02 | 1.15 | 502 |
| Rural | Single | 15.28 | (14.76; 15.80) | 1.78 | 8.06 | 1.84 | 806 |
| Rural | Divided | 8.59 | (7.96; 9.22) | 1.00 | 4.38 | 1.00 | 438 |

**Table 6: Crash Rates on Queensland Road Sections by Stereotype (Source: Adapted from Table 3.7, Austroads, 2010)**

The calculated 'crash rate' for both homogenous road sections is 0 ($10^4$ per $10^8$ VKT). With reference to Table 6, the typical crash rate for the road stereotype is 573 ($10^4$ per $10^8$ VKT). As such, Section 1 and Section 2 are considered to have a low crash rate (in accordance with Clause E2, Part 4 of the MUTCD).

### 6.3.4 Additional Issues Considered

The additional issues considered during the speed environment analysis are listed as follows:

- The Q-Limits program used to perform the Stage 3 speed environment assessment does not provide for the assessment of speed limits in speed zones less than 60km/h. As such, the existing 50km/h speed limit is not able to be directly entered into the program. To enable a Q-Limits speed environment assessment to be performed, the existing speed limit on both Sir Joseph Banks Drive and Lamerough Parade has been entered into the Q-Limits program as 60km/h. It should be noted that the value of the existing speed limit does not directly influence the outcome of the Q-Limits speed environment assessment. Rather it is predominantly used to determine if the distribution of measured vehicle speeds conforms to the distribution of speeds expected from a particular speed zone. It is also used to flag issues that should be considered by practitioners if the recommended speed limit is higher than the existing posted limit.
- The Q-Limits Stage 3 speed environment assessment suggests a 60km/h speed limit for both Sir Joseph Banks Drive and Lamerough Parade; however several issues were flagged for further consideration on Sir Joseph Banks Drive (Section 1) prior to determining the recommended speed limit from this stage. The flagged issues included:
    - Traffic lane widths narrow below 6.6m in the vicinity of side street intersections due to the presence of kerb extensions.

- Large vehicles parked parallel to the kerb may obstruct bi-directional through traffic movements as a result of the narrowed road width and due to there being no dedicated shoulder or parking lanes.
- The 1m wide paved shoulders create a contrasting road surface that is a typical feature used in the design of roads with a 'local' or 'access' function.
- The semi-mountable kerb installed on both sides of Sir Joseph Banks Drive, is also a typical feature used in the design of roads with a 'local' or 'access' function.

Based on consideration of these flagged issues, the recommended speed limit from the Q-Limits speed environment assessment (Stage 3) for Section 1 (Sir Joseph Banks Drive) has been artificially reduced to 50km/h.

The recommended speed limit from Stage 3, shown in the Q-Limits report (Appendix B), remains as 60km/h as the program is unable to accept a recommended speed limit less than 60mkm/h.

# 7 Speed Correlation & Recommendations

Table 7 and Table 8 show the overall correlation between the different stages of this speed review for each homogenous section.

| Stage | Description | Suggested Speed |
|---|---|---|
| 1 | Road Function | 60km/h |
| 2 | Prevailing Traffic Speed | 60km/h |
| 3 | Speed Environment (QLIMITS) | 50km/h |
| **4** | **Recommendation** | **60 km/h** |

**Table 7: QLIMITS Speed Correlation & Recommendations – Section 1**

| Stage | Description | Suggested Speed |
|---|---|---|
| 1 | Road Function | 60km/h |
| 2 | Prevailing Traffic Speed | 60km/h |
| 3 | Speed Environment (QLIMITS) | 60km/h |
| **4** | **Recommendation** | **60 km/h** |

**Table 8: QLIMITS Speed Correlation & Recommendations – Section 2**

Given there is a correlation between stages 1 and 2 for Section 1 and between stages 1, 2 and 3 for Section 2, the recommended speed limit for Sir Joseph Banks Drive and Lamerough Parade, between Pelican Waters Boulevard and Landsborough Parade, is 60km/h.

As the review process has suggested an increase in the existing speed limit, a Safety Review or a Road Safety Audit, is recommended to check that the road environment can safely support a higher limit (as per Note 13, Page 57, Part 4 of the MUTCD). In the event that a Safety Review or Road Safety Audit identifies any risk factors, the provision of preventative treatment should be considered before the increased speed limit is adopted and implemented (refer to Part 4, Figure F1 of the MUTCD).

This recommendation is based on outcomes using the speed limit review process outlined in Part 4 of the MUTCD. The responsibility for the selection and implementation of an appropriate speed limit for the subject site rests with Sunshine Coast Council.

# Appendix A – Site photographs

**Photograph 1:** View looking south along Sir Joseph Banks Drive from the centre island at the roundabout with Pelican Waters Boulevard.

**Photograph 2:** View looking north along Sir Joseph Banks Drive toward the roundabout with Nelson Street and Sea Glint Place.


**Photograph 3:** View south along Sir Joseph Banks Drive approximately 50m south of Nelson Street. Kerb extensions can be seen beyond the 'Local Traffic Only' sign.

**Photograph 4:** View looking south along Sir Joseph Banks Drive approximately 150m south of Nelson Street. Paved shoulders can be seen starting at this point on both sides of the road.

**Photograph 5:** View looking south along Sir Joseph Banks Drive approaching the intersection with Godwin Place. A ramped kerb crossing is also located near the intersection.

**Photograph 6:** View looking east along Sir Joseph Banks Drive approaching the intersection with Tripcony Court.

**Photograph 7:** View looking west along Sir Joseph Banks Drive approximately 120m north of Lamerough Parade. This point marks the start/end of the paved road shoulders.

**Photograph 8:** View looking east along Sir Joseph Banks approaching the intersection with Lamerough Parade.

**Photograph 9:** View looking north along Lamerough Parade approaching the intersection with Sir Joseph Banks Drive.

**Photograph 10:** View looking south along Lamerough Parade approaching the intersection with Cowiebank Place.

**Photograph 11:** View looking west along Lamerough Parade approaching the intersection with Fort Place.

**Photograph 12:** View looking east along Lamerough Parade approaching the intersection with Moorshead Avenue.

**Photograph 13:** View looking east along Lamerough Parade approaching the intersection with Landsborough Parade.

**Photograph 14:** View looking west along Lamerough Parade at the intersection with Landsborough Parade.

# Appendix B – QLIMITS Summary

# Speed Limit Review – Queensland (SLR-QLD)
# Detailed Assessment Report

## Background Information

Analysed By: Luke Kidd.
User Reference: Sir Joseph Banks Dr_2013, Rev. 1
Road Name: Sir Joseph Banks Drive.
Road Location: Pelican Waters Bvld to Lamerough Parade.
Suburb: Pelican Waters.
Local Government: 263, Sunshine Coast Regional Council
Main Roads District: 14, North Coast
The need to review the speed limit on this road has occurred due to community request.
The length of the road section being assessed is 1 km
AADT on this road section is 1581 vpd
The existing speed limit is 60 km/h.

**Adjacent Speed Zones**
**Approach 1:** 60 km/h - Southbound
**Approach 2:** 50 km/h - Northbound

## Recommended Speed Limit:

**60**

## Stage 1: Road function

This section of Sir Joseph Banks Drive being assessed is located in a urban area.
The Typical Speed Limit is: 60 km/h.
The Existing Speed Limit **does** equal the Typical Speed Limit

## Stage 2: Prevailing Traffic speed

Sample data on 30674 vehicles was analysed using ' Other methods'
The upper limit of 15 km/h pace is 60
The mean speed is 52 km/h
The 85th percentile speed is 59 km/h
Hence, the prevailing traffic speed data **does** correlate with the existing Speed Limit

## Stage 3: QLIMITS

The suggested speed limit based on the speed environment analysis was **60 km/h** after allowing for site specific issues.

**Comments**
Note - minimum speed limit which can be selected in QLimits is 60km/h. Due to flagged considerations, the recommended speed limit from this stage is actually 50km/h.

**Additional issues considered:**

- A lower speed limit may be appropriate due to the presence of special roadside activities in the area. These include:
  - Narrow traffic lane width
  - 1. Traffic Lanes widths narrow below 6.6m in vicinity of side street intersections due to presence of kerb extensions. 2. No dedicated shoulder or parking lanes. Large vehicles parking beside kerb may obstruct through traffic movements. 3. 1m pave

**Frequency of Roadside Accesses**

| | Type of access | Number |
|---|---|---|
| A | Residences, small commercial establishments, small public buildings and other units which | 43 |

| | | |
|---|---|---|
| | generate light and/or occasional activity. (The weighting for this type of access is 1). | |
| B | Average commercial establishment, local schools, caravan parks, light industries, public buildings and units generating activity which is either:<br><br>1. Continuous light.<br>2. Moderate at certain times, such as commuting hours.<br>3. Substantial at infrequent intervals.<br><br>(The weighting for this type of access is 2). | 0 |
| C | Heavy industry, schools, shopping centres and other units generating continuous moderate activity or substantial activity at certain regular times. (The weighting for this type of access is 3). | 0 |
| D | Large shopping centres and other units generating substantial and continuous activity. Some large industries which are tourist attractions or for some other reason generate substantial traffic volumes would be included in this activity. (The weighting for this type of access is 4). | 0 |
| E | Unsignalised intersecting roads of substantially lesser importance than the road being assessed, or intersecting roads where side traffic and turning movements have little effect on the traffic flow pattern of the road being considered. (The weighting for this type of access is 1). | 4 |
| F | Unsignalised intersecting roads of lesser importance than the road being assessed but where the side road traffic and turning movements are such that the intersection has appreciable effect on the traffic flow pattern of the road being considered. (The weighting for this type of access is 2). | 0 |
| G | Unsignalised intersecting roads of comparable or greater significance than the road being assessed. Intersections which have pronounced effect on the traffic flow pattern of the road being considered. (The weighting for this type of access is 3). | 0 |
| H | Roundabouts and signalised intersecting roads. (The weighting for this type of access is 3). | 2 |
| | | |
| | **Average number of accesses per 100 m** | 5.3 |

**Road Cross Section**
The road is **Undivided**

**Number of Lanes**
The total number of traffic lanes on this section of road is **2**

**Function of Road**
The road is primarily used for **Traffic movement (freeway/arterial/sub arterial/trunk collector)**

**Restrictions of Access**
There are **no restrictions.**

**Special Roadside Activities**
A lower speed limit may be appropriate due to the presence of special roadside activities in the area. These include:

- Narrow traffic lane width
- 1. Traffic Lanes widths narrow below 6.6m in vicinity of side street intersections due to presence of kerb extensions. 2. No dedicated shoulder or parking lanes. Large vehicles parking beside kerb may obstruct through traffic movements. 3. 1m pave

**Number of crashes in the past 5 years:**

| Description | No. of crashes |
|---|---|
| Head-on | 0 |
| Rear-end | 0 |
| Lane change | 0 |
| Parallel lanes, turning | 0 |
| U-turn | 0 |
| Entering roadway | 0 |
| | |

| | |
|---|---|
| Overtaking, same direction | 0 |
| Hit parked vehicle | 0 |
| Hit railway train | 0 |
| Pedestrian | 0 |
| Permanent obstruction on carriageway | 0 |
| Hit animal | 0 |
| Off carriageway, on straight | 0 |
| Off carriageway, on straight, hit object | 0 |
| Out of control, on straight | 0 |
| Off carriageway on curve | 0 |
| Off carriageway, on curve, hit object | 0 |
| Out of control, on curve | 0 |

The average annual crash cost is 0.00 ($10^4$)

## Stage 4: Speed correlation check & recommendations

The speed limit based on road function is **60 km/h.**
The speed limit suggested by current speed data is **60 km/h.**
The speed limit suggested by the speed environment (QLIMITS) is **60 km/h.**

## Recommendations and authorisation

**THE RECOMMENDED SPEED LIMIT IS 60 km/h**

# Speed Limit Review – Queensland (SLR-QLD)
# Detailed Assessment Report

## Background Information

Analysed By: Luke Kidd.
User Reference: Lamerough Pde_Aug 2013, Rev. 1
Road Name: Lamerough Parade.
Road Location: Sir Joseph Banks Drive to Landsborough Parade.
Suburb: Pelican Waters.
Local Government: 263, Sunshine Coast Regional Council
Main Roads District: 14, North Coast
The need to review the speed limit on this road has occurred due to community request.
The length of the road section being assessed is 0.55 km
AADT on this road section is 1053 vpd
The existing speed limit is 60 km/h.

**Adjacent Speed Zones**
**Approach 1:** 60 km/h - Southbound
**Approach 2:** 50 km/h - Northbound

## Recommended Speed Limit:

**60**

## Stage 1: Road function

This section of Lamerough Parade being assessed is located in a urban area.
The Typical Speed Limit is: 60 km/h.
The Existing Speed Limit **does** equal the Typical Speed Limit

## Stage 2: Prevailing Traffic speed

Sample data on 20857 vehicles was analysed using ' Other methods'
The upper limit of 15 km/h pace is 57
The mean speed is 49 km/h
The 85th percentile speed is 56 km/h
Hence, the prevailing traffic speed data **does** correlate with the existing Speed Limit

## Stage 3: QLIMITS

The suggested speed limit based on the speed environment analysis was **60 km/h** after allowing for site specific issues.

**Frequency of Roadside Accesses**

| | Type of access | Number |
|---|---|---|
| A | Residences, small commercial establishments, small public buildings and other units which generate light and/or occasional activity. (The weighting for this type of access is 1). | 34 |
| B | Average commercial establishment, local schools, caravan parks, light industries, public buildings and units generating activity which is either:<br><br>1. Continuous light.<br>2. Moderate at certain times, such as commuting hours.<br>3. Substantial at infrequent intervals.<br><br>(The weighting for this type of access is 2). | 0 |
| C | Heavy industry, schools, shopping centres and other units generating continuous moderate activity or substantial activity at certain regular times. (The weighting for this type of access is 3). | 0 |
| D | Large shopping centres and other units generating substantial and continuous activity. Some large industries which are tourist attractions or for some other reason generate substantial traffic volumes would be included in this activity. (The weighting for this type of access is 4). | 0 |

| | | |
|---|---|---|
| E | Unsignalised intersecting roads of substantially lesser importance than the road being assessed, or intersecting roads where side traffic and turning movements have little effect on the traffic flow pattern of the road being considered. (The weighting for this type of access is 1). | 3 |
| F | Unsignalised intersecting roads of lesser importance than the road being assessed but where the side road traffic and turning movements are such that the intersection has appreciable effect on the traffic flow pattern of the road being considered. (The weighting for this type of access is 2). | 2 |
| G | Unsignalised intersecting roads of comparable or greater significance than the road being assessed. Intersections which have pronounced effect on the traffic flow pattern of the road being considered. (The weighting for this type of access is 3). | 0 |
| H | Roundabouts and signalised intersecting roads. (The weighting for this type of access is 3). | 0 |
| | | |
| | **Average number of accesses per 100 m** | 7.45 |

**Road Cross Section**
The road is **Undivided**

**Number of Lanes**
The total number of traffic lanes on this section of road is **2**

**Function of Road**
The road is primarily used for **Traffic movement (freeway/arterial/sub arterial/trunk collector)**

**Restrictions of Access**
There are **no restrictions.**

**Number of crashes in the past 5 years:**

| Description | No. of crashes |
|---|---|
| Head-on | 0 |
| Rear-end | 0 |
| Lane change | 0 |
| Parallel lanes, turning | 0 |
| U-turn | 0 |
| Entering roadway | 0 |
| Overtaking, same direction | 0 |
| Hit parked vehicle | 0 |
| Hit railway train | 0 |
| Pedestrian | 0 |
| Permanent obstruction on carriageway | 0 |
| Hit animal | 0 |
| Off carriageway, on straight | 0 |
| Off carriageway, on straight, hit object | 0 |
| Out of control, on straight | 0 |
| Off carriageway on curve | 0 |
| Off carriageway, on curve, hit object | 0 |
| Out of control, on curve | 0 |

The average annual crash cost is 0.00 ($10^4$)

## Stage 4: Speed correlation check & recommendations

The speed limit based on road function is **60 km/h.**
The speed limit suggested by current speed data is **60 km/h.**
The speed limit suggested by the speed environment (QLIMITS) is **60 km/h.**

## Recommendations and authorisation

**THE RECOMMENDED SPEED LIMIT IS 60 km/h**

# Appendix C – Traffic Data

# MetroCount Traffic Executive
# Speed Statistics

**SpeedStat-13 -- English (ENA)**

**Datasets:**

| | |
|---|---|
| **Site:** | **[01109] Sir Joseph Banks Dr 200m South of Godwin Pl<50>** |
| **Direction:** | 1 - North bound, A hit first. **Lane:** 0 |
| **Survey Duration:** | 14:00 Wednesday, 13 February 2013 => 7:20 Wednesday, 6 March 2013 |
| **Zone:** | |
| **File:** | 01109 N 2013-03-06 0721.EC0 (PlusB) |
| **Identifier:** | CV01VA6K MC56-L5 [MC55] (c)Microcom 19Oct04 |
| **Algorithm:** | Factory default (v3.21 - 15315) |
| **Data type:** | Axle sensors - Paired (Class/Speed/Count) |

**Profile:**

| | |
|---|---|
| **Filter time:** | **14:00 Wednesday, 13 February 2013 => 7:20 Wednesday, 6 March 2013** |
| **Included classes:** | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 |
| **Speed range:** | 10 - 160 km/h. |
| **Direction:** | North, East, South, West (bound) |
| **Separation:** | Greater than 4.00 seconds. - (Headway) |
| **Name:** | Default Profile |
| **Scheme:** | Vehicle classification (AustRoads94) |
| **Units:** | Metric (meter, kilometer, m/s, km/h, kg, tonne) |
| **In profile:** | Vehicles = 22460 / 24000 (93.58%) |

**Vehicles** = 22460
**Posted speed limit** = 50 km/h, Exceeding = 12420 (55.30%), Mean Exceeding = 56.33 km/h
**Maximum** = 93.3 km/h, **Minimum** = 10.4 km/h, **Mean** = 50.4 km/h
**85% Speed** = 58.3 km/h, **95% Speed** = 63.0 km/h, **Median** = 50.8 km/h
**15 km/h Pace** = 44 - 59, **Number in Pace** = 15047 (66.99%)
**Variance** = 75.97, **Standard Deviation** = 8.72 km/h

**Speed Bins (Partial days)**

| Speed | Bin | | Below | | Above | | Energy | vMult | n * vMult |
|---|---|---|---|---|---|---|---|---|---|
| 0 - 10 | 0 | 0.0% | 0 | 0.0% | 22460 | 100.0% | 0.00 | 0.00 | 0.00 |
| 10 - 20 | 130 | 0.6% | 130 | 0.6% | 22330 | 99.4% | 0.00 | 0.00 | 0.00 |
| 20 - 30 | 401 | 1.8% | 531 | 2.4% | 21929 | 97.6% | 0.00 | 0.00 | 0.00 |
| 30 - 40 | 1842 | 8.2% | 2373 | 10.6% | 20087 | 89.4% | 0.00 | 0.00 | 0.00 |
| 40 - 50 | 7667 | 34.1% | 10040 | 44.7% | 12420 | 55.3% | 0.00 | 0.00 | 0.00 |
| 50 - 60 | 9944 | 44.3% | 19984 | 89.0% | 2476 | 11.0% | 0.00 | 0.00 | 0.00 |
| 60 - 70 | 2309 | 10.3% | 22293 | 99.3% | 167 | 0.7% | 0.00 | 0.00 | 0.00 |
| 70 - 80 | 155 | 0.7% | 22448 | 99.9% | 12 | 0.1% | 0.00 | 0.00 | 0.00 |
| 80 - 90 | 9 | 0.0% | 22457 | 100.0% | 3 | 0.0% | 0.00 | 0.00 | 0.00 |
| 90 - 100 | 3 | 0.0% | 22460 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 100 - 110 | 0 | 0.0% | 22460 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 110 - 120 | 0 | 0.0% | 22460 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 120 - 130 | 0 | 0.0% | 22460 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 130 - 140 | 0 | 0.0% | 22460 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 140 - 150 | 0 | 0.0% | 22460 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 150 - 160 | 0 | 0.0% | 22460 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 160 - 170 | 0 | 0.0% | 22460 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 170 - 180 | 0 | 0.0% | 22460 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 180 - 190 | 0 | 0.0% | 22460 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 190 - 200 | 0 | 0.0% | 22460 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |

# MetroCount Traffic Executive
# Speed Statistics

**SpeedStat-16 -- English (ENA)**

**Datasets:**

| | |
|---|---|
| **Site:** | **[01848] Sir Joseph Banks Dr 200m North of Godwin Pl<50>** |
| **Direction:** | 5 - South bound A>B, North bound B>A. **Lane:** 0 |
| **Survey Duration:** | 14:00 Wednesday, 13 February 2013 => 7:09 Wednesday, 6 March 2013 |
| **Zone:** | |
| **File:** | 01848 SN 2013-03-06 0710.EC0 (PlusB) |
| **Identifier:** | CT77GQMT MC56-L5 [MC55] (c)Microcom 19Oct04 |
| **Algorithm:** | Factory default (v3.21 - 15315) |
| **Data type:** | Axle sensors - Paired (Class/Speed/Count) |

**Profile:**

| | |
|---|---|
| **Filter time:** | **14:00 Wednesday, 13 February 2013 => 7:09 Wednesday, 6 March 2013** |
| **Included classes:** | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 |
| **Speed range:** | 10 - 160 km/h. |
| **Direction:** | North, East, South, West (bound) |
| **Separation:** | Greater than 4.00 seconds. - (Headway) |
| **Name:** | Default Profile |
| **Scheme:** | Vehicle classification (AustRoads94) |
| **Units:** | Metric (meter, kilometer, m/s, km/h, kg, tonne) |
| **In profile:** | Vehicles = 30674 / 33234 (92.30%) |

**Vehicles** = 30674
**Posted speed limit** = 50 km/h, Exceeding = 19052 (62.11%), Mean Exceeding = 56.67 km/h
**Maximum** = 112.6 km/h, **Minimum** = 10.2 km/h, **Mean** = 51.7 km/h
**85% Speed** = 59.4 km/h, **95% Speed** = 64.1 km/h, **Median** = 51.8 km/h
**15 km/h Pace** = 45 - 60, **Number in Pace** = 21571 (70.32%)
**Variance** = 75.11, **Standard Deviation** = 8.67 km/h

**Speed Bins (Partial days)**

| Speed | Bin | | Below | | Above | | Energy | vMult | n * vMult |
|---|---|---|---|---|---|---|---|---|---|
| 0 - 10 | 0 | 0.0% | 0 | 0.0% | 30674 | 100.0% | 0.00 | 0.00 | 0.00 |
| 10 - 20 | 253 | 0.8% | 253 | 0.8% | 30421 | 99.2% | 0.00 | 0.00 | 0.00 |
| 20 - 30 | 513 | 1.7% | 766 | 2.5% | 29908 | 97.5% | 0.00 | 0.00 | 0.00 |
| 30 - 40 | 1317 | 4.3% | 2083 | 6.8% | 28591 | 93.2% | 0.00 | 0.00 | 0.00 |
| 40 - 50 | 9539 | 31.1% | 11622 | 37.9% | 19052 | 62.1% | 0.00 | 0.00 | 0.00 |
| 50 - 60 | 14798 | 48.2% | 26420 | 86.1% | 4254 | 13.9% | 0.00 | 0.00 | 0.00 |
| 60 - 70 | 3918 | 12.8% | 30338 | 98.9% | 336 | 1.1% | 0.00 | 0.00 | 0.00 |
| 70 - 80 | 302 | 1.0% | 30640 | 99.9% | 34 | 0.1% | 0.00 | 0.00 | 0.00 |
| 80 - 90 | 28 | 0.1% | 30668 | 100.0% | 6 | 0.0% | 0.00 | 0.00 | 0.00 |
| 90 - 100 | 5 | 0.0% | 30673 | 100.0% | 1 | 0.0% | 0.00 | 0.00 | 0.00 |
| 100 - 110 | 0 | 0.0% | 30673 | 100.0% | 1 | 0.0% | 0.00 | 0.00 | 0.00 |
| 110 - 120 | 1 | 0.0% | 30674 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 120 - 130 | 0 | 0.0% | 30674 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 130 - 140 | 0 | 0.0% | 30674 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 140 - 150 | 0 | 0.0% | 30674 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 150 - 160 | 0 | 0.0% | 30674 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 160 - 170 | 0 | 0.0% | 30674 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 170 - 180 | 0 | 0.0% | 30674 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 180 - 190 | 0 | 0.0% | 30674 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 190 - 200 | 0 | 0.0% | 30674 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |

# MetroCount Traffic Executive
# Speed Statistics

## SpeedStat-14 -- English (ENA)

**Datasets:**

| | |
|---|---|
| **Site:** | **[01110] Lamerough Pde 30m North of Cowiebank Pl <50>** |
| **Direction:** | 7 - North bound A>B, South bound B>A. **Lane:** 0 |
| **Survey Duration:** | 14:00 Wednesday, 13 February 2013 => 7:34 Wednesday, 6 March 2013 |
| **Zone:** | |
| **File:** | 01110 NS 2013-03-06 0735.EC0 (PlusB) |
| **Identifier:** | CT47CCKC MC56-L5 [MC55] (c)Microcom 19Oct04 |
| **Algorithm:** | Factory default (v3.21 - 15315) |
| **Data type:** | Axle sensors - Paired (Class/Speed/Count) |

**Profile:**

| | |
|---|---|
| **Filter time:** | **14:00 Wednesday, 13 February 2013 => 7:34 Wednesday, 6 March 2013** |
| **Included classes:** | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 |
| **Speed range:** | 10 - 160 km/h. |
| **Direction:** | North, East, South, West (bound) |
| **Separation:** | Greater than 4.00 seconds. - (Headway) |
| **Name:** | Default Profile |
| **Scheme:** | Vehicle classification (AustRoads94) |
| **Units:** | Metric (meter, kilometer, m/s, km/h, kg, tonne) |
| **In profile:** | Vehicles = 20857 / 22136 (94.22%) |

**Vehicles** = 20857
**Posted speed limit** = 50 km/h, Exceeding = 9994 (47.92%), Mean Exceeding = 55.36 km/h
**Maximum** = 91.6 km/h, **Minimum** = 10.1 km/h, **Mean** = 49.0 km/h
**85% Speed** = 56.5 km/h, **95% Speed** = 60.8 km/h, **Median** = 49.3 km/h
**15 km/h Pace** = 42 - 57, **Number in Pace** = 14891 (71.40%)
**Variance** = 68.92, **Standard Deviation** = 8.30 km/h

**Speed Bins (Partial days)**

| Speed | Bin | | Below | | Above | | Energy | vMult | n * vMult |
|---|---|---|---|---|---|---|---|---|---|
| 0 - 10 | 0 | 0.0% | 0 | 0.0% | 20857 | 100.0% | 0.00 | 0.00 | 0.00 |
| 10 - 20 | 147 | 0.7% | 147 | 0.7% | 20710 | 99.3% | 0.00 | 0.00 | 0.00 |
| 20 - 30 | 503 | 2.4% | 650 | 3.1% | 20207 | 96.9% | 0.00 | 0.00 | 0.00 |
| 30 - 40 | 1670 | 8.0% | 2320 | 11.1% | 18537 | 88.9% | 0.00 | 0.00 | 0.00 |
| 40 - 50 | 8543 | 41.0% | 10863 | 52.1% | 9994 | 47.9% | 0.00 | 0.00 | 0.00 |
| 50 - 60 | 8702 | 41.7% | 19565 | 93.8% | 1292 | 6.2% | 0.00 | 0.00 | 0.00 |
| 60 - 70 | 1212 | 5.8% | 20777 | 99.6% | 80 | 0.4% | 0.00 | 0.00 | 0.00 |
| 70 - 80 | 75 | 0.4% | 20852 | 100.0% | 5 | 0.0% | 0.00 | 0.00 | 0.00 |
| 80 - 90 | 3 | 0.0% | 20855 | 100.0% | 2 | 0.0% | 0.00 | 0.00 | 0.00 |
| 90 - 100 | 2 | 0.0% | 20857 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 100 - 110 | 0 | 0.0% | 20857 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 110 - 120 | 0 | 0.0% | 20857 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 120 - 130 | 0 | 0.0% | 20857 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 130 - 140 | 0 | 0.0% | 20857 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 140 - 150 | 0 | 0.0% | 20857 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 150 - 160 | 0 | 0.0% | 20857 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 160 - 170 | 0 | 0.0% | 20857 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 170 - 180 | 0 | 0.0% | 20857 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 180 - 190 | 0 | 0.0% | 20857 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 190 - 200 | 0 | 0.0% | 20857 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |

# MetroCount Traffic Executive
# Speed Statistics

**SpeedStat-15 -- English (ENA)**

**Datasets:**

| | |
|---|---|
| **Site:** | **[01152] Lamerough Pde 35m West of Wavell Ave <50>** |
| **Direction:** | 8 - East bound A>B, West bound B>A. **Lane:** 0 |
| **Survey Duration:** | 14:00 Wednesday, 6 March 2013 => 10:35 Wednesday, 27 March 2013 |
| **Zone:** | |
| **File:** | 01152 EW 2013-03-27 1036.EC0 (PlusB) |
| **Identifier:** | S773CMSX MC56-L5 [MC55] (c)Microcom 19Oct04 |
| **Algorithm:** | Factory default (v3.21 - 15315) |
| **Data type:** | Axle sensors - Paired (Class/Speed/Count) |

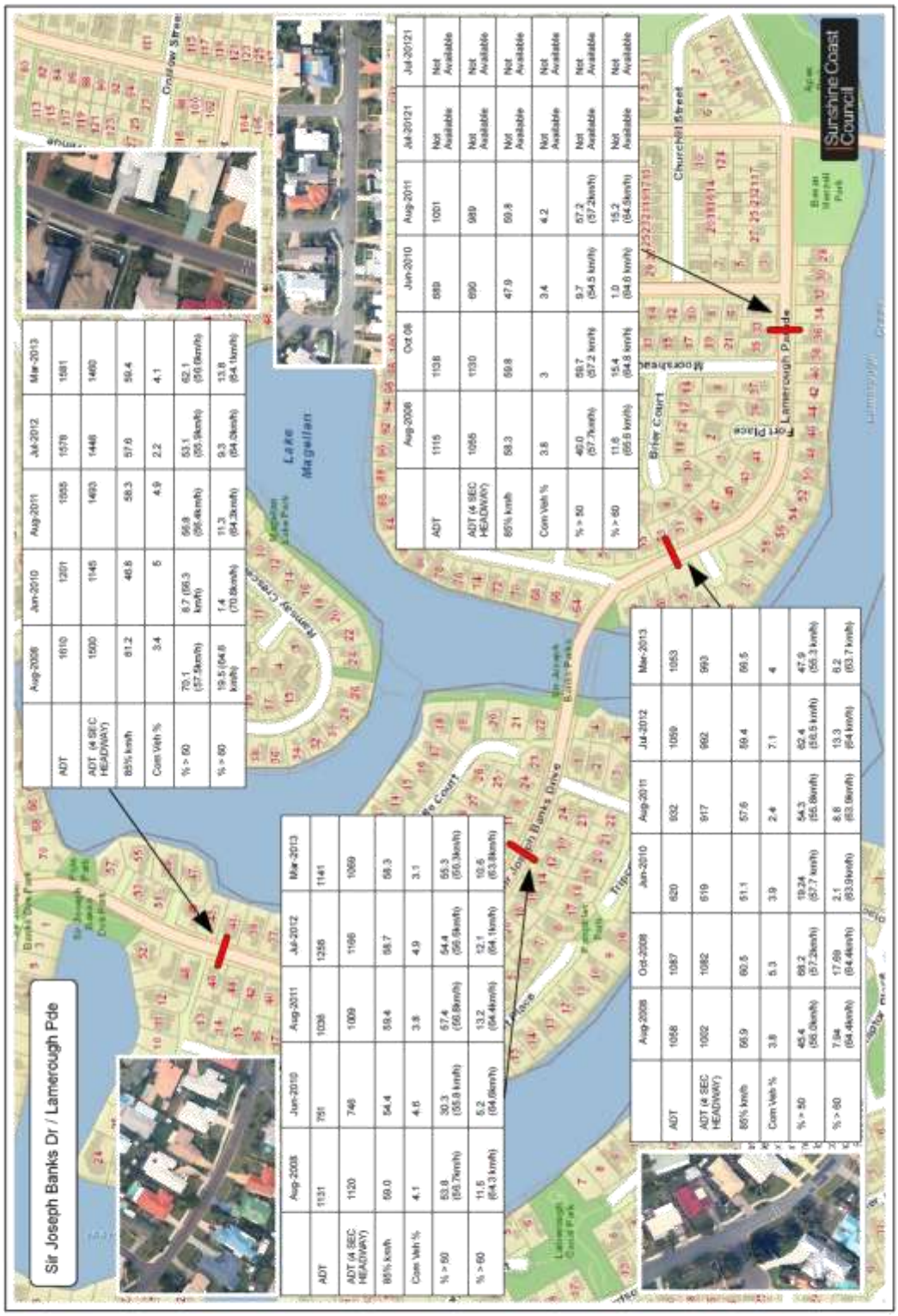
**Profile:**

| | |
|---|---|
| **Filter time:** | **14:00 Wednesday, 6 March 2013 => 10:35 Wednesday, 27 March 2013** |
| **Included classes:** | 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12 |
| **Speed range:** | 10 - 160 km/h. |
| **Direction:** | North, East, South, West (bound) |
| **Separation:** | Greater than 4.00 seconds. - (Headway) |
| **Name:** | Default Profile |
| **Scheme:** | Vehicle classification (AustRoads94) |
| **Units:** | Metric (meter, kilometer, m/s, km/h, kg, tonne) |
| **In profile:** | Vehicles = 22926 / 24486 (93.63%) |

**Vehicles** = 22926
**Posted speed limit** = 50 km/h, Exceeding = 13377 (58.35%), Mean Exceeding = 56.78 km/h
**Maximum** = 101.3 km/h, **Minimum** = 10.3 km/h, **Mean** = 50.4 km/h
**85% Speed** = 59.4 km/h, **95% Speed** = 63.7 km/h, **Median** = 51.5 km/h
**15 km/h Pace** = 45 - 60, **Number in Pace** = 14665 (63.97%)
**Variance** = 98.90, **Standard Deviation** = 9.94 km/h

**Speed Bins (Partial days)**

| Speed | Bin | | Below | | Above | | Energy | vMult | n * vMult |
|---|---|---|---|---|---|---|---|---|---|
| 0 - 10 | 0 | 0.0% | 0 | 0.0% | 22926 | 100.0% | 0.00 | 0.00 | 0.00 |
| 10 - 20 | 346 | 1.5% | 346 | 1.5% | 22580 | 98.5% | 0.00 | 0.00 | 0.00 |
| 20 - 30 | 612 | 2.7% | 958 | 4.2% | 21968 | 95.8% | 0.00 | 0.00 | 0.00 |
| 30 - 40 | 1992 | 8.7% | 2950 | 12.9% | 19976 | 87.1% | 0.00 | 0.00 | 0.00 |
| 40 - 50 | 6599 | 28.8% | 9549 | 41.7% | 13377 | 58.3% | 0.00 | 0.00 | 0.00 |
| 50 - 60 | 10261 | 44.8% | 19810 | 86.4% | 3116 | 13.6% | 0.00 | 0.00 | 0.00 |
| 60 - 70 | 2893 | 12.6% | 22703 | 99.0% | 223 | 1.0% | 0.00 | 0.00 | 0.00 |
| 70 - 80 | 202 | 0.9% | 22905 | 99.9% | 21 | 0.1% | 0.00 | 0.00 | 0.00 |
| 80 - 90 | 17 | 0.1% | 22922 | 100.0% | 4 | 0.0% | 0.00 | 0.00 | 0.00 |
| 90 - 100 | 3 | 0.0% | 22925 | 100.0% | 1 | 0.0% | 0.00 | 0.00 | 0.00 |
| 100 - 110 | 1 | 0.0% | 22926 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 110 - 120 | 0 | 0.0% | 22926 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 120 - 130 | 0 | 0.0% | 22926 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 130 - 140 | 0 | 0.0% | 22926 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 140 - 150 | 0 | 0.0% | 22926 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 150 - 160 | 0 | 0.0% | 22926 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 160 - 170 | 0 | 0.0% | 22926 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 170 - 180 | 0 | 0.0% | 22926 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 180 - 190 | 0 | 0.0% | 22926 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |
| 190 - 200 | 0 | 0.0% | 22926 | 100.0% | 0 | 0.0% | 0.00 | 0.00 | 0.00 |




| | Aug-2008 | Jun-2010 | Aug-2011 | Jul-2012 | Mar-2013 |
|---|---|---|---|---|---|
| ADT | 1131 | 751 | 1036 | 1256 | 1141 |
| ADT (4 SEC HEADWAY) | 1120 | 748 | 1009 | 1196 | 1069 |
| 85% km/h | 60.0 | 54.4 | 59.4 | 58.7 | 58.3 |
| Com Veh % | 4.1 | 4.6 | 3.8 | 4.9 | 3.1 |
| % > 50 | 53.8 (58.7km/h) | 30.3 (55.9 km/h) | 57.4 (58.8km/h) | 54.4 (58.6km/h) | 55.3 (56.1km/h) |
| % > 60 | 11.5 (64.3 km/h) | 5.2 (64.6km/h) | 13.2 (64.4km/h) | 12.1 (64.1km/h) | 10.6 (63.8km/h) |

| | Aug-2008 | Oct-2008 | Jun-2010 | Aug-2011 | Jul-2012 | Mar-2013 |
|---|---|---|---|---|---|---|
| ADT | 1058 | 1087 | 820 | 932 | 1059 | 1053 |
| ADT (4 SEC HEADWAY) | 1002 | 1082 | 819 | 917 | 992 | 993 |
| 85% km/h | 56.9 | 60.5 | 61.1 | 57.6 | 59.4 | 59.5 |
| Com Veh % | 3.8 | 5.3 | 3.9 | 2.4 | 7.1 | 4 |
| % > 50 | 45.4 (56.0km/h) | 58.2 (57.2km/h) | 19.24 (57.7 km/h) | 54.3 (55.8km/h) | 52.4 (56.5 km/h) | 47.9 (56.3 km/h) |
| % > 60 | 7.94 (64.4km/h) | 17.69 (64.4km/h) | 2.1 (63.0km/h) | 8.8 (63.6km/h) | 13.3 (64 km/h) | 8.2 (63.7 km/h) |

| | Aug-2008 | Oct 08 | Jun-2010 | Aug-2011 | Jul-20121 |
|---|---|---|---|---|---|
| ADT | 1115 | 1138 | 889 | 1001 | Not Available |
| ADT (4 SEC HEADWAY) | 1055 | 1130 | 890 | 989 | Not Available |
| 85% km/h | 58.3 | 59.8 | 47.9 | 59.8 | Not Available |
| Com Veh % | 3.8 | 3 | 3.4 | 4.2 | Not Available |
| % > 50 | 40.0 (57.7km/h) | 56.7 (57.2 km/h) | 9.7 (54.5 km/h) | 57.2 (57.2km/h) | Not Available |
| % > 60 | 11.8 (65.6 km/h) | 15.4 (64.8 km/h) | 1.0 (64.6 km/h) | 15.2 (64.5km/h) | Not Available |

| | Aug-2008 | Jun-2010 | Aug-2011 | Jul-2012 | Mar-2013 |
|---|---|---|---|---|---|
| ADT | 1610 | 1201 | 1555 | 1578 | 1581 |
| ADT (4 SEC HEADWAY) | 1500 | 1145 | 1493 | 1448 | 1460 |
| 85% km/h | 61.2 | 46.8 | 58.3 | 57.6 | 59.4 |
| Com Veh % | 3.4 | 6 | 4.9 | 2.2 | 4.1 |
| % > 50 | 70.1 (57.5km/h) | 8.7 (60.3 km/h) | 66.8 (56.4km/h) | 53.1 (55.9km/h) | 62.1 (56.6km/h) |
| % > 60 | 19.5 (64.8 km/h) | 1.4 (70.6km/h) | 11.3 (64.3km/h) | 9.3 (64.5km/h) | 13.8 (64.1km/h) |