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Study Results and Findings
Self Storage Facility Traffic and Parking
Study
Self Storage Association of Australia

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Contents

Section	Page
1. Introduction	1
2. Self Storage Facilities	2
2.1 Types of Self Storage Facilities	2
2.2 Operational Characteristics	4
2.2.1 Office Area	4
2.2.2 Storage Area	5
2.2.3 Security	6
2.2.4 Maintenance	7
2.3 Self Storage Customers	7
2.4 Observations	7
3. Current Analysis Practices	8
3.1 Current Practices	8
3.2 Use of Security Gate Data	8
4. Study Design	9
4.1 Study Area and Scope of Study	9
4.2 Stage 1	9
4.3 Stage 2	10
4.3.1 Office Parking Survey	10
4.3.2 Security Gate Data	10
4.3.3 Business Survey	10
4.3.4 Data Analysis	10
5. Results and Analysis	12
5.1 Vehicle Parking Demand	12
5.1.1 Staff parking requirement	12
5.1.2 Office Parking Accumulation	12
5.1.3 Storage Area	14
5.2 Traffic Generation	15
5.2.1 Office	15
5.2.2 Storage Area	16
6. Recommendations	17
6.1 Self Storage Sites	17
6.2 Parking	17
6.2.1 Location of parking spaces	17
6.3 Traffic Generation	18
Glossary	19
References	19

1. Introduction

Self Storage facilities are becoming more and more common around Australia and New Zealand as the trend for more compact homes grows.

At present there are no specific guidelines to assist business operators or local council authorities to determine the number of vehicle parking spaces required to adequately service these types of facilities, or assess the likely traffic impacts of new storage facilities on the surrounding road network. In the past new facilities have been assessed on a site by site basis using either typical warehouse characteristics or individual surveys of a similar site as determined by different Councils.

In order to address this lack of consolidated approach, Aurecon has been commissioned by the Self Storage Association of Australasia (SSAA) to undertake a study on behalf of the Associations members to identify typical vehicle parking demands and trip generation rates exhibited by Self Storage units around Australia. The aim of the study is to produce a series of parking and traffic characteristics for these facilities that can be applied anywhere across Australia and New Zealand.

The findings of this report are set down through the following chapters:

- Chapter 2 – Self Storage Facilities
- Chapter 3 – Current Analysis Practices
- Chapter 4 – Study Design
- Chapter 5 – Results and Analysis
- Chapter 6 – Recommendations

2. Self Storage Facilities

2.1 Types of Self Storage Facilities

Self Storage facilities are, as the name suggests, businesses that provide different types of storage solutions that can be leased by members of the public for either long or short term use. There are several different types of storage facility, however this report focuses on **general storage units**, (i.e. not specialised storage solutions such as climate controlled storage or document storage).

Discussions with SSAA have indicated that there are basically 3 types of general storage facility as follows:

- Ranch style – vehicles can park adjacent to their storage unit. All storage units are at ground level
- Multistorey – storage units are located in multistorey buildings, with vehicles parking in a central car park or loading area and accessing units via stairs and lifts
- Mixed – combination of both ranch and multistorey layout



Photograph 2-1: Ranch Style Self Storage Facility

Ranch style self storage facilities have parking aisles that are 6m or more in width to allow vehicle circulation around the buildings and vehicle parking. Vehicle parking within these aisles occurs in unmarked spaces adjacent to customers' storage units. Observations of these sites and discussion with business operators indicate that visiting customers rarely impede other customers' access to their storage units, because the number of customers at a site at any one time is low.



Photograph 2-2: Multistorey Self Storage Site

Multistorey self storage facilities have a centralised loading and parking area. These are adjacent to access doors and lift lobby areas. Vehicle parking spaces at these types of sites are generally marked.

The size of storage facility varies significantly depending on the area available and the set up of the storage facility. Typical parameters that could be used to describe these types of uses include:

- Gross site area – total site area including office and storage area
- Gross floor area (GFA) – Total area of storage units, circulation area, and office area
- Maximum leasable area (MLA) – maximum leasable floor area of the site
- Number of storage units

Given that the primary generator of traffic and indeed parking would be the amount of storage available, it is considered that when assessing future parking requirements or the traffic implications of storage facilities, the number of storage units or MLA will provide the best guide. In general, evidence from existing sites indicate that although these businesses contain a variety of storage facilities ranging from lockers to large units of up to 27 m², they typically exhibit an average of 105 units per 1,000 m² as indicated by Chart 2-1.

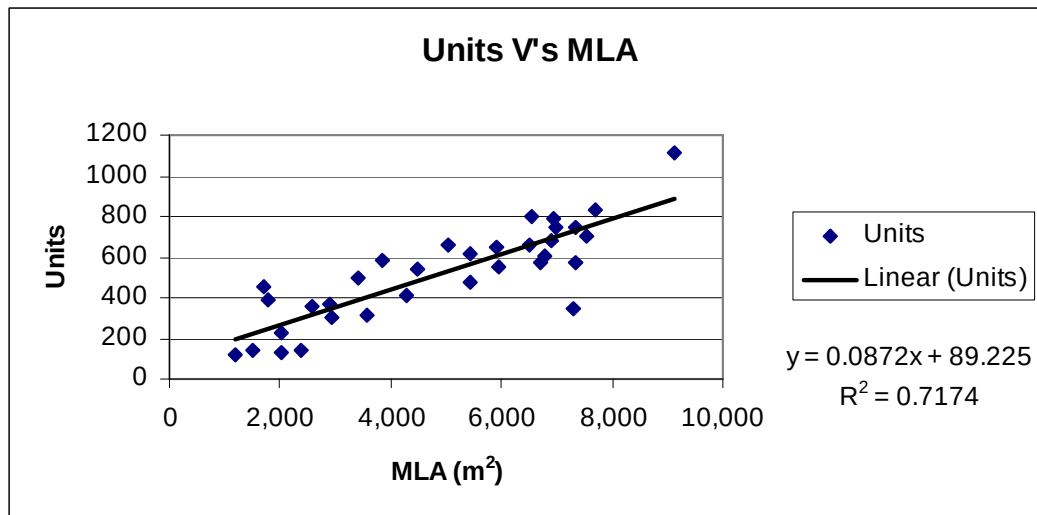


Chart 2-1: Self Storage Facility unit density

2.2 Operational Characteristics

Whilst each type of storage facility would have a different appearance, all operate in a similar manner.

In essence facilities typically comprise of two separate parts: the storage area generally secured by gates, which may or may not allow 24 hours access to existing storage customers, and the office area, which is open to the public during designated business periods.

Advice from the SSAA indicates that most self storage businesses are open seven days a week and operate between 0800 – 1800 Monday to Friday and 0800 – 1700 Saturdays and 1000 – 1600 on a Sunday, although as indicated above some sites allow after hours access to the storage component.

2.2.1 Office Area

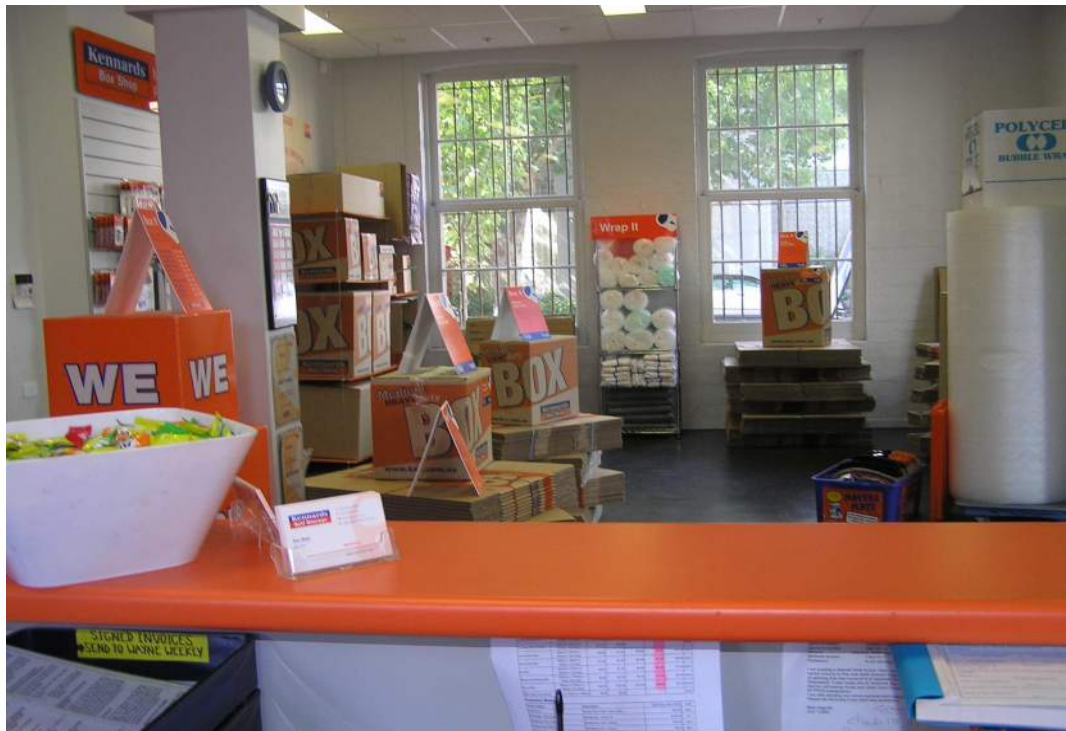
The office component of the self storage facility is generally located at the front of the site and has a floor area ranging from 30m² to 80m². The size of the office is not directly related to the size of the facility, more to design constraints, retail focus and requirement to maximise lettable area.

The office has two frontages to allow customer access from the street and from the storage areas, as shown in Photograph 2-3. The office has its own car park usually located at the front of the site adjacent to the office; this car park is accessible to all office visitors during office hours, and will be referred to as the office car park throughout this study.

The majority of offices are staffed by up to two staff for most periods. These staff members attend to the management of the storage facility and also the retail component of these businesses. The retail component entails the sale of packing and storage materials from the office area, as shown in Photograph 2-4.



Photograph 2-3: Self Storage Business Office



Photograph 2-4: Retail Component of Self Storage Business

2.2.2 Storage Area

The storage area comprises of storage units, parking aisles in the case of ranch style operations or loading bays and a centralised parking area for multistorey or mixed operations. The storage area of many businesses is secured by an electronic security gate system that can only be accessed by existing self storage customers and staff.

Most self storage businesses have a trailer and/or ute on site which can be borrowed by their storage customers. It is recommended that the provision of a parking space be made for these vehicles when designing the car park.



Photograph 2-5: Business trailer and ute kept on site.

Multistorey and mixed sites should have loading bay facilities located adjacent to service lifts, and should provide adequate turning space for at least one medium size truck (two axle, 5.5 m – 14.5 m length truck).



Photograph 2-6: Loading area located adjacent to service lift

2.2.3 Security

Access to self storage units is secured by either a:

- Locked gate, only open during office hours
- Security gate system, that only operates during business hours, or has extended hour access

The security gate systems operate in multistorey sites, mixed sites and in some large ranch operations. The security gate system includes boom gates or gates. Access to areas with the gates is controlled through a pin number system. Clients need to enter their pin to open gates, and deactivate alarms.

2.2.4 Maintenance

General maintenance of the sites and units such as cleaning and pest control is primarily managed by on site staff. However, our interviews with business operators indicated the following types and frequency of maintenance performed by other service providers:

- Lift service – quarterly
- Roller door service – quarterly
- Airconditioner – dependent on system
- Fire services – dependent on system
- Forklift service – as required
- Plumbing and electrical – as required

2.3 Self Storage Customers

A wide variety of people use self storage, ranging from large multi-national companies down to individuals storing personal belongings. Commercial customers generally account for around 25% of all self storage business, and tend to access their unit more often than residential customers. 88% of private individual customers access their unit every month or less, with 27% accessing it less than three times a year. Conversely 37% of business users would access their unit once or more per week. A significant number of people use self storage for storing their belongings while travelling or being posted to another location for employment. These customers typically require very little if any access to their unit while their goods are in storage (SSAA 2008).

Self storage customers of all types prefer to park their vehicles as close to their unit as possible. Business operators experience tells us that customers will not use marked vehicle parking bays if they are not located close to the storage units or access point.

2.4 Observations

Site visits made to 14 sites, three of which were observed for two hours each, showed very little activity to the office and the storage area during business hours.

Visits to the office were mostly short visits lasting no longer than 10 minutes.

Vehicle parking areas both at the front of the site and also within the storage area always had a large number of unoccupied spaces.

3. Current Analysis Practices

3.1 Current Practices

Currently vehicle parking spaces and traffic impacts on the surrounding road network are being determined on a site by site basis using different methods, as specified by the local council authority. Some methods or rates currently being adopted to determine the parking space requirement and potential traffic generation are:

- Warehouse rates
- Traffic counts at other similar sites

Warehouse vehicle parking rates are around one parking space per 300 m² GFA (RTA, 3-17, 2002). Use of parking rates of this size result in an excessive number of vehicle parking spaces being provided on self storage sites.

The collection of traffic and vehicle parking counts at self storage sites is a costly and often not an accurate method for estimating parking demand or traffic impacts of a proposed self storage site, because self storage businesses do not have a typical peak time or peak day. Instead they tend to have a low volume and sporadic trip generation pattern. This type of flow cannot be accurately measured in a few short hours of data collection. Furthermore, from initial trials in this study it was found that most sites do not have a suitable layout for automatic traffic counters to be used because:

- Vehicles travel at very slow speeds through the site
- The confined layout of most existing sites means that it is difficult to locate axle counters in locations where vehicles do not turn over them

3.2 Use of Security Gate Data

As described in Section 2.2.3, most multistorey and mixed sites use a security gate system to control vehicles entering and exiting the secured area of self storage sites. Entry and exit from these gates requires a customer to type in their unique pin code. The programs that manage these security gate systems record the number of entries and exits into sites and can be used to count the number of vehicles entering and exiting the secured storage area over large time frames, making them a useful source of vehicle trip data. However, it is important to recognise that the security gate data does not count the number of trips made to the self storage business by vehicles that park in the office car park, or on the street (i.e. areas not within the gated area).

From discussions with SSAA it is understood that some local council authorities are concerned about the use of this gate data for measuring the number of trips to and from a self storage site because of the underestimation of vehicle trips due to tailgating into and out of a site.

This study has found that the problem of tailgating can be overcome in most security gate data through the use of “door data”. “Door data” is a record of a customer’s entry or exit into their personal storage area and can be used to identify trips not recorded as going through the gates due to tailgating.

An analysis of 30,000 trips measured from gate data collected in this study, showed that a median of 6% were identified through door data, i.e. 6% of trips to or from a self storage site tailgated into or out of the site.

4. Study Design

4.1 Study Area and Scope of Study

For the purpose of this study a self storage facility is considered to be a business that provides **general storage units** (i.e. not specialised storage solutions such as climate controlled storage or document storage).

4.2 Stage 1

This study was undertaken in two stages. The first stage was a trial sample study; conducted on 10 sites within the Melbourne metropolitan area, used to determine the sample size and data collection methods that were to be adopted for the second stage of the study.

In Stage 1 of our study we estimated that to calculate a model with 85% level of accuracy, around 30 sites would need to be sampled. From this recommendation, we have held discussions and obtained data from 32 self storage businesses around Australia. A breakdown of site locations by state, city/region is shown in Table 4-1.

Table 4-1: National Site Breakdown

State	City/Region	Quantity
New South Wales	Sydney	4
	Newcastle	1
	Batemans Bay	1
Queensland	Brisbane	7
	Gold Coast	5
South Australia	Adelaide	1
Victoria	Melbourne	9
	Geelong	2
	Ballarat	1
Western Australia	Perth	1
Total		32

The distribution of sites was selected by:

- The number of self storage businesses in a particular region, i.e. areas with a larger number of self storage businesses have a higher number of sites selected for the study
- Site willingness to participate in study

A breakdown of the businesses participating in the survey are:

- Kennards – 8 sites
- Storage King – 8 sites
- National Self Storage – 6 sites
- Private businesses – 10 sites

A detailed list of participating sites is shown in Appendix A.

4.3 Stage 2

The data collection methods used in Stage 2 of the study are:

- Manual office parking survey
- Security gate data

4.3.1 Office Parking Survey

The office parking survey was designed to collect a record of movements into the office area of a self storage site. The surveys were conducted successfully at 27 sites over a seven day period between either the 1 May 2008 and 14 May 2008, or 9 February 2009 and 15 February 2009.

The staff at each of the survey sites was required to record visits to the office by the time and location of visitors parked vehicle. Self storage staff were sent a record sheet and instruction booklet (as shown in Appendix B) the week prior to the study and briefed individually via a phone call.

4.3.2 Security Gate Data

Gate data from 29 sites was provided for the period between 1 May 2008 and 16 May 2008 or 2 February 2009 and 22 February 2009.

The gate data collected shows the date, time, action and client code for each movement into and out of the secured area of a site. Over 50% of the sites also provided “door entry and exit” data used to overcome problems of tailgating.

4.3.3 Business Survey

Each of the self storage businesses participating in the 2009 surveys were required to complete a business survey. The business survey collected the following type of information:

- Site GFA
- Site MLA
- Total number of units
- Number of units occupied
- Type of storage provided
- Level of activity

A copy of this survey is shown in Appendix B. Sites participating in the surveys in 2008 provided much of this information via verbal discussions and emails with business operators.

4.3.4 Data Analysis

Office Parking Survey

Using the entry and exit data recorded for vehicles parked in the office car park or on-street for each half hour interval between 0630 and 2000, the number of trips generated and parking accumulation for visitors to the office was calculated. To avoid double counting all trips made by visitors parking in the “gated area” are not analysed in this data, and are instead captured in the gate data.

Staff shift hours recorded in the office survey indicate that most staff trips occur during the AM and PM peak hour. For the case of this analysis, staff vehicles were assumed to be parked in the office car park and their trips to and from the self storage site have been added to the office trip generation data.

The average number of staff working on each day over all surveyed sites was used to measure the staff vehicle parking demand. The staff vehicle parking demand has been treated as a separate component and is not included in the office parking accumulation calculations.

Gate Data Trip Generation

To calculate the vehicle trip generation within the gated areas the following assumptions were made when using the gate data.

- Customers entering or exiting the site should have a corresponding exit or entry trip on the same day
- Door data was used to align entries and exits into and out of the site when a corresponding gate movement was not found
- Any trips not aligned were then balanced to determine the most conservative scenario, in the daily trip generation calculations
- All staff movements into and out of the gates were counted as trips so as to measure staff giving access to customer and courier vehicles into the gated area

Gate Data Parking Accumulation

Many assumptions in the parking accumulation process are similar to those used for determining trip generation.

The alignment procedure used to measure the trips made into and out of the security gate is used to create a matrix showing the total number of vehicles parked for each minute during a 24 hour period.

For each minute of the day the difference between the cars in, cars out and cars already parked on the premises is calculated.

The algorithm calculates the maximum number of cars parked (for a minute interval) during the day and also records the time at which this occurs.

Data Sets

All data sets collected and used in this study are stored in the "2009 Traffic and Parking Study Data" disc. This is available upon request from the SSAA.

Statistical Analysis

Sites were segmented according to maximum leasable area (MLA), and grouped into one of the following 3 categories.

- Group 1: sites $\leq 3,000 \text{ m}^2$
 - 9 sites office survey data
 - 7 sites gate data
- Group 2: $3,000\text{m}^2 < \text{sites} \leq 6,000 \text{ m}^2$
 - 10 sites office survey data
 - 11 sites gate data
- Group 3: $6,000 \text{ m}^2 < \text{sites} \leq 9,500 \text{ m}^2$
 - 8 sites office survey data
 - 11 sites gate data

To account for the various levels of occupancy at the sites, the data was normalised by adjusting the MLA to 100% occupancy, i.e. their leased areas.

For each group a cumulative distribution function was used to calculate the 95% confidence value for both the gate and office parking survey data.

5. Results and Analysis

5.1 Vehicle Parking Demand

The vehicle parking demand has been measured by the parking accumulation calculated from each of the surveys.

5.1.1 Staff parking requirement

The average number of staff working on each day over all sites was two, with only two sites recording staff numbers above this. Based on a ratio of 1 space per staff member, two vehicle parking spaces are required to meet the average staff parking demand.

5.1.2 Office Parking Accumulation

The office parking accumulation is a measure of the vehicle parking accumulation generated by visitors to the office who park outside the gated area. As discussed in Section 4.3.4, the staff parking demand has been considered as a separate component (as shown above) and is not included in these results.

Table 5-1 and Table 5-2 below provide a summary of the 95% parking accumulation for each MLA group, for the weekday and weekend and the amount of time that this highly probable parking demand will be met. These tables also list the observed maximum parking accumulations and the total amount of time they would occur.

Table 5-1: Weekday Office Parking Accumulation

MLA	Weekday 95% Parking Accumulation	Time 95% will be met (out of 13.5 hrs)	Weekday Maximum	Duration of Maximum
0-3,000 m ²	1	12 hrs 28 min	4	< 2.5 mins
3,000 m ² -6,000 m ²	2	12 hrs 58 min	6	< 2 mins
6,000 m ² – 9,500 m ²	3	13 hrs 14 min	6	<1.5 mins

Table 5-2: Weekend Office Parking Accumulation

MLA	Weekend 95% Parking Accumulation	Time 95% will be met (out of 13.5 hrs)	Weekday Maximum	Duration of Maximum
0-3,000 m ²	1	12 hrs 54 mins	3	< 4 mins
3,000 m ² -6,000 m ²	2	13 hrs 17 mins	5	< 2.5 mins
6,000 m ² – 9,500 m ²	3	13 hrs 11 mins	6	< 2 mins

A breakdown of the parking accumulation generated by visitors to the office calculated for each of the MLA groups is shown below in Chart 5-1, Chart 5-2 and Chart 5-3.

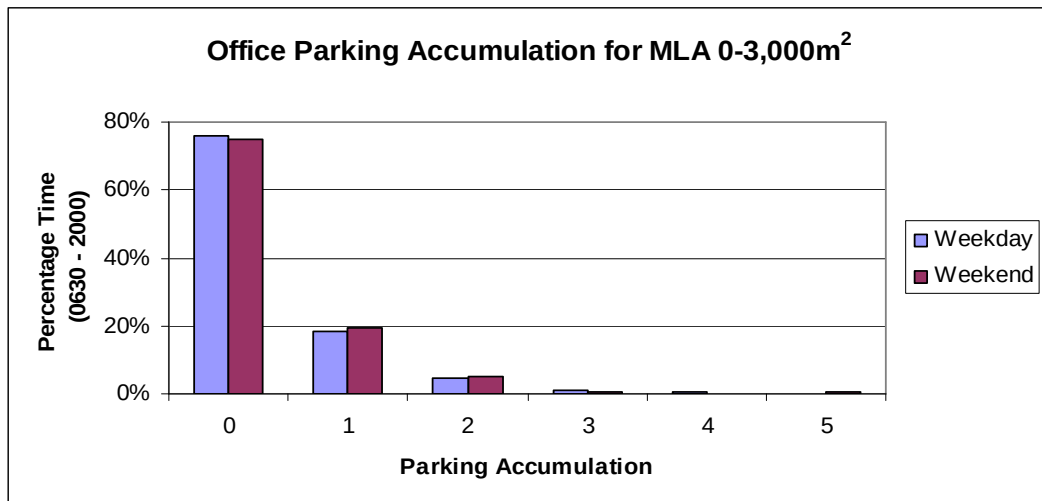


Chart 5-1: Office Parking Accumulation for MLA less than 3,000 m²

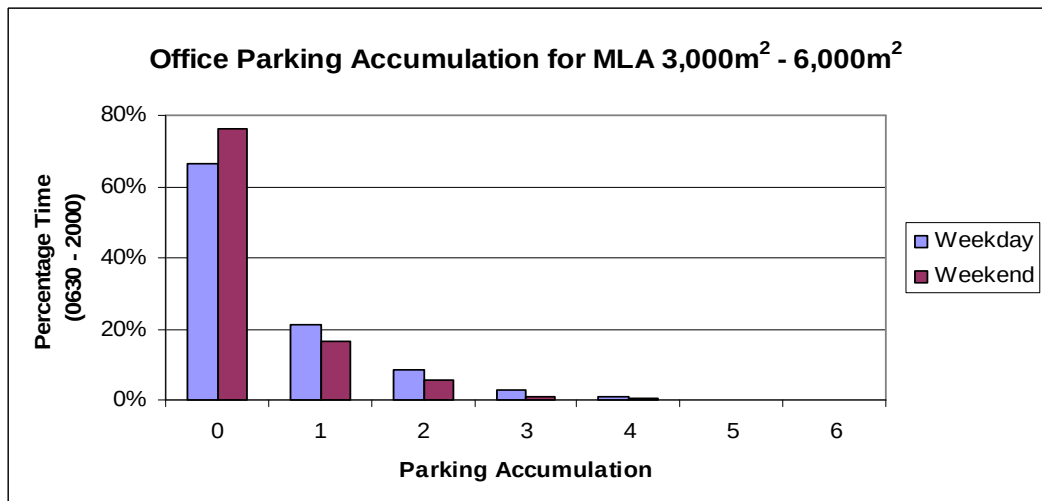


Chart 5-2: Office Parking Accumulation for MLA 3,000 m² – 6,000 m²

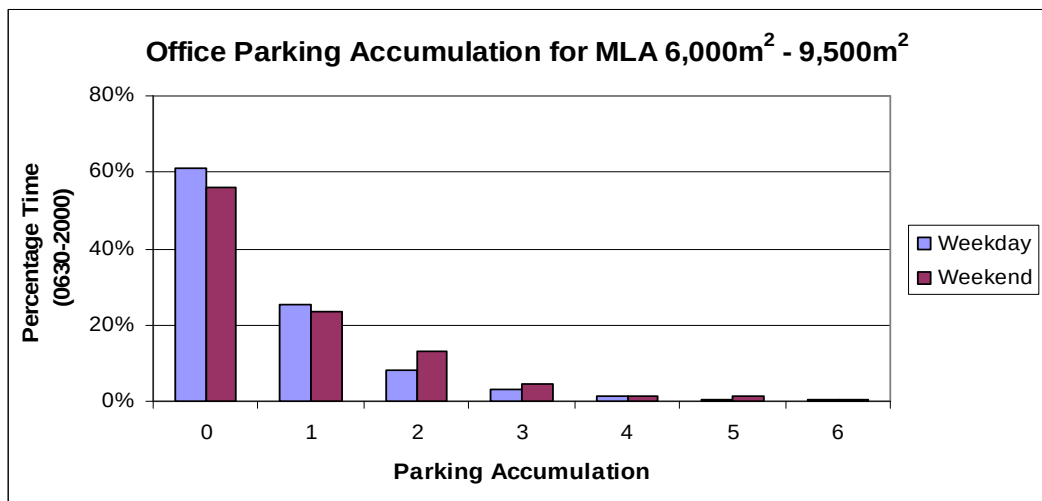


Chart 5-3: Office Parking Accumulation for MLA 6,000 m² – 9,500 m²

All three charts show that for a large majority of the time there are no visitors to the office requiring parking in the office car park. However, it can be observed that as the MLA increases there is a small increase in the observed parking accumulation.

5.1.3 Storage Area

The storage area parking accumulation calculated from the gate data is a measure of the parking accumulation generated by self storage customers, couriers and all other vehicles entering the gated area over a 24 hour period.

Table 5-3 and Table 5-4 show the 95% parking accumulation, and maximum parking accumulation calculated for the weekday and weekend.

Table 5-3: Weekday Storage Area Parking Accumulation

MLA	Weekday 95%	Time 95% will be met	Weekday Maximum	Duration of Maximum
0-3,000 m ²	2	23 hrs 28 mins	5 to 6	< 1 min
3,000 m ² -6,000 m ²	5	23 hrs 17 mins	11	< 1 min
6,000 m ² – 9,500 m ²	5	23 hrs 16 mins	13	< 1 min

Table 5-4: Weekend Storage Area Parking Accumulation

MLA	Weekend 95%	Time 95% will be met	Weekend Maximum	Duration of Maximum
0-3,000m ²	2	23 hrs 4 mins	7	< 1 min
3,000m ² -6,000m ²	3	23 hrs 1 min	9	< 1 min
6,000m ² – 9,500m ²	3	23 hrs 22 mins	9	< 1 min

A breakdown of the parking accumulation for the gated area is shown in Chart 5-4, Chart 5-5 and Chart 5-6 below.

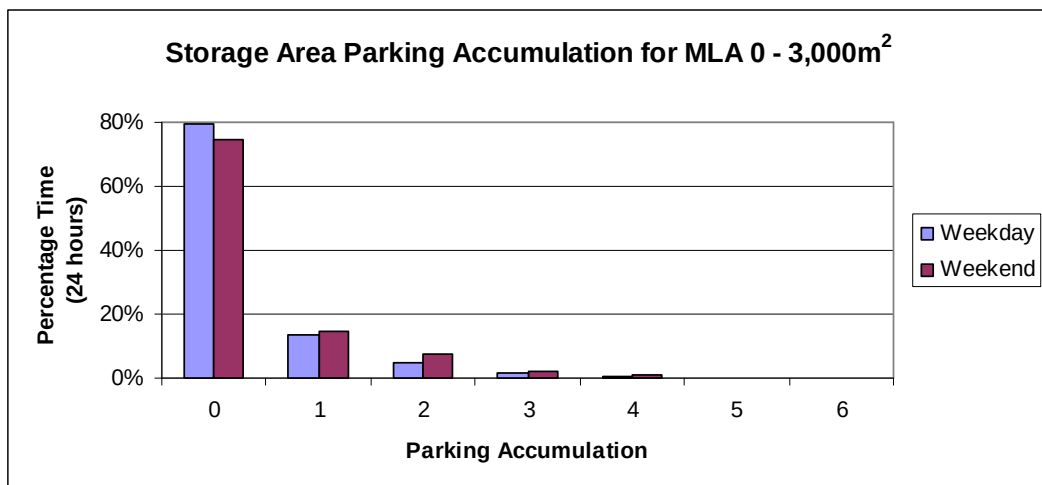


Chart 5-4: Storage Area Parking Accumulation for MLA less than 3,000 m²

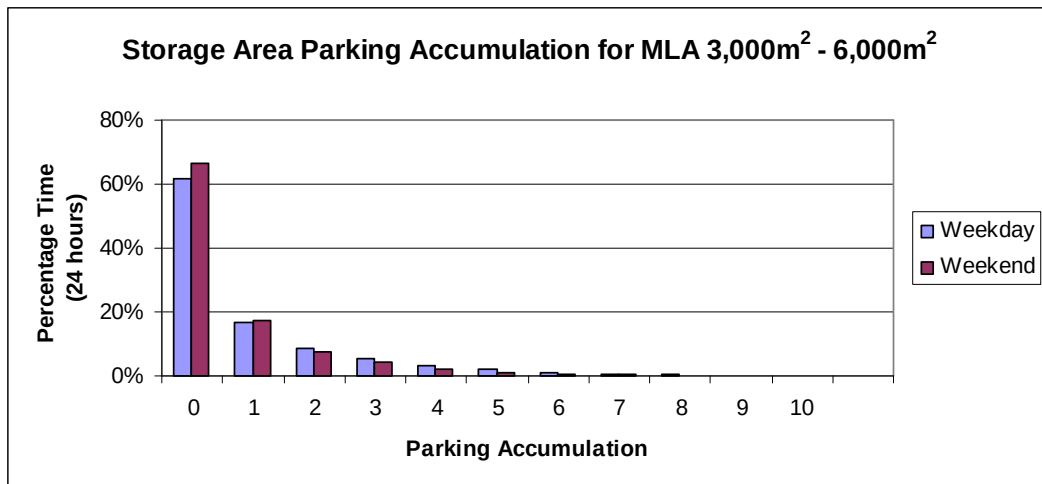


Chart 5-5: Office Parking Accumulation for MLA 3,000 m² – 6,000 m²

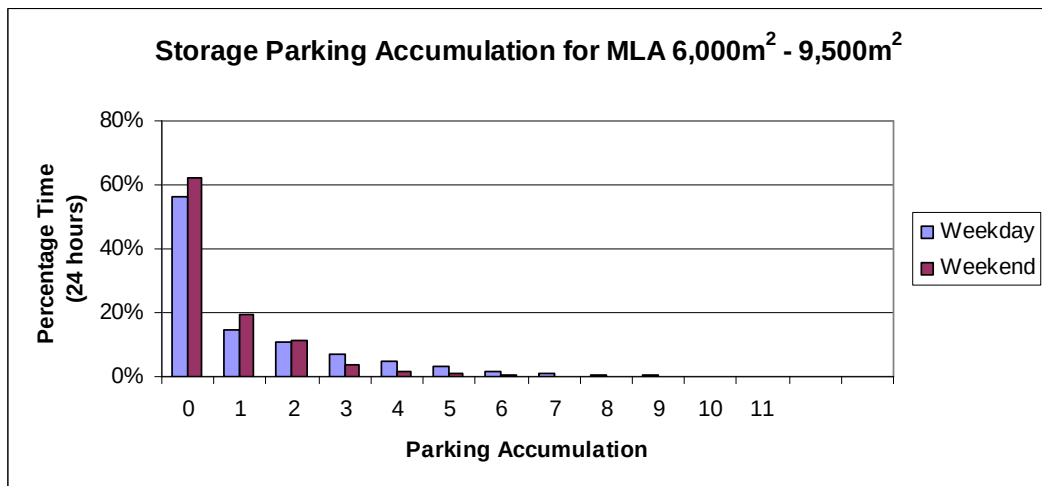


Chart 5-6: Office Parking Accumulation for MLA 6,000 m² – 9,500 m²

The results shown in the charts above indicate that there is no parking accumulation in the gated areas for a large proportion of the day. The small levels of parking accumulation observed indicate that there is minimal chance of vehicles impeding each other at ranch style sites; where vehicles park in the aisles adjacent to their unit.

5.2 Traffic Generation

Weekday and weekend traffic generation has been analysed for the following time periods:

- Daily – weekday or weekend
- AM peak hour – observed weekday peak hour between 0630 and 0900
- PM peak hour – observed weekday peak hour between 1600 and 2000
- Business peak hour – observed weekend peak hour between 0900 and 1600

5.2.1 Office

As observed and identified in discussions with self storage staff, vehicle trips to the sites are quite low and sporadic, with a significant level of variation at an individual site and between sites.

Table 5-5 summarises the total trips to a self storage site generated by the office, including staff trips. The significant differences between the average and median to the 95% trip value indicate a large scatter in the data. It is recommended that due to the sporadic behaviour of vehicles trips to these sites that a range be used to describe the potential number of trips to a site in a specified time period.

Table 5-5: Office Weekday and Weekend Trip Estimate

Office	Weekday Trips			Weekend Trips		
Daily	Average	Median	95%	Average	Median	95%
0-3,000 m ²	13	8	40	11	4	26
3,000 m ² -6,000 m ²	24	20	52	14	10	32
6,000 m ² -9,500 m ²	29	22	60	28	26	47
AM Peak Hour						
0-3,000 m ²	3	2	7			
3,000 m ² -6,000 m ²	3	3	7			
6,000 m ² -9,500 m ²	4	4	8			
PM Peak Hour						
0-3,000 m ²	3	2	8			
3,000 m ² -6,000 m ²	3	3	6			
6,000 m ² -9,500 m ²	4	4	7			
Business Peak Hour						
0-3,000 m ²				3	2	8
3,000 m ² -6,000 m ²				4	4	7
6,000 m ² -9,500 m ²				6	6	10

5.2.2 Storage Area

The traffic generation of the storage area as shown in Table 5-6, also shows a high level of scatter, with the 95% results being significantly different to the average and median results.

A comparison of the office trips to the storage area trips shows that the storage area has a higher traffic generation.

Table 5-6: Storage Area Weekday and Weekend Trip Estimate

Storage Area	Weekday Trips			Weekend Trips		
Daily	Average	Median	95%	Average	Median	95%
0-3,000 m ²	45	48	92	41	38	74
3,000 m ² -6,000 m ²	97	92	165	78	74	132
6,000 m ² -9,500 m ²	134	133	195	109	96	212
AM Peak Hour						
0-3,000 m ²	3	2	8			
3,000 m ² -6,000 m ²	8	7	14			
6,000 m ² -9,500 m ²	11	11	21			
PM Peak Hour						
0-3,000 m ²	4	4	11			
3000m ² -6000m ²	9	9	17			
6,000 m ² -9,500 m ²	13	13	22			
Business Peak Hour						
0-3,000 m ²				11	8	22
3,000 m ² -6,000 m ²				10	9	23
6,000 m ² -9,500 m ²				13	12	26

6. Recommendations

6.1 Self Storage Sites

Self storage businesses provide storage solutions for businesses and households. Self storage sites can be divided into two distinct areas; the office and the storage area.

- The office has an administrative and retail function and is open to both existing customers and off the street customers. The office also has its own parking area that can be accessed by all visitors to the site
- The storage area includes the storage units, parking aisles or a centralised car park, and loading bay. This area is only accessible to existing customers and staff

6.2 Parking

The parking demand for self storage sites has been calculated by separately considering the staff, office and the storage area parking demand. It is recommended that the 95% parking demand results from both the office parking surveys and gate data be used when making judgements on the number of parking spaces required for a self storage business.

Furthermore, information from our site visits and discussions with self storage businesses indicate that there should also be provision for an additional parking space for trailer/utes (refer to Section 2.2.2). Parking for the trailer/ute can be located in either car park; however for security reasons it is recommended that this be located in the secured storage area car park.

Staff vehicle parking can be located in either the office or storage area car park.

Table 5-7 summarises the recommended vehicle parking spaces by MLA for self storage sites.

Table 5-7: Recommended Number of Parking Spaces per MLA (m²)

MLA	Office Parking	Storage Area Parking*	Staff Parking	Trailer/Ute Parking	Total Parking Spaces
0-3,000 m ²	1	2	2	1	6
3,000 m ² -6,000 m ²	2	5	2	1	10
6,000 m ² – 9,500 m ²	3	5	2	1	11

*Note: Ranch style sites will not require designated storage area parking as vehicles in these sites will park in aisles adjacent to their storage units; similarly "mixed" sites may require less designated storage area parking if they have a significant number of drive up storage units in a ranch style arrangement.

To accommodate heavy vehicles that are used by customers to transport items to and from their self storage units, vehicle circulation areas and loading bays should be designed for a medium sized truck (i.e. a truck with two axles and up to 14.5 m length).

6.2.1 Location of parking spaces

As discussed in Section 2.3, customers visiting their storage units prefer to park their vehicle as close to their storage unit or a central access point as possible. To encourage the use of parking facilities, particularly centralised parking areas for multistorey and mixed sites, parking areas should be located in convenient locations to minimise the distance needed to travel between the customer's vehicle and their unit. Furthermore, paths between centralised car parks to access lifts, stairs and storage area circulation corridors should be clearly marked and allow for the use of trolleys.

6.3 Traffic Generation

From observations, discussion with self storage business staff and through our study it is shown that traffic generation to self storage sites varies significantly for each site and from site to site. Table 5-8 shows the probable traffic generation range for self storage sites.

Table 5-8: Estimated traffic generation range for whole site

Daily	Weekday Trips	Weekend Trips
0-3,000 m ²	60 to 130	40 to 100
3,000 m ² -6,000 m ²	110 to 220	80 to 160
6,000 m ² -9,500 m ²	160 to 260	120 to 260
AM Peak Hour		
0-3,000 m ²	5 to 15	
3,000 m ² -6,000 m ²	10 to 20	
6,000 m ² -9,500 m ²	15 to 30	
PM Peak Hour		
0-3,000 m ²	5 to 20	
3,000 m ² -6,000 m ²	10 to 20	
6,000 m ² -9,500 m ²	20 to 30	
Business Peak Hour		
0-3,000m ²		10 to 30
3,000 m ² -6,000 m ²		10 to 30
6,000 m ² -9,500 m ²		20 to 40

From Table 5-8 it is shown that the number of trips to a Self Storage business in the peak hour or over an entire day is low. However, it should be noted that a small number of trips generated by these sites will be medium size heavy vehicles. These vehicles may cause small delays along the adjacent road network when they are turning into the self storage site. To minimise this delay it is recommended that driveways to the security gate be designed for a medium size truck (up to 14.5 m).

Glossary

Acronyms	Definition
SSAA	Self Storage Association of Australasia
MLA	Maximum leasable floor area
GFA	Gross Floor Area
95%	95 percentile –95 percent of observations fall below this result.

References

NSW Roads and Traffic Authority, Guide to Traffic Generating Developments, 2002.

Self Storage Association of Australasia, Demand Study, 2008.

Appendix A

List of Participating Sites

Table A.2: List of Participating Self Storage Sites

Site No.	City/Region	State	Suburb	Survey Year	Survey Month	Office Survey	Business Survey	Gate Data
1	Melbourne	VIC	Abbotsford	2009	Feb	✓	✓	✓
2		VIC	Preston	2008	May	x	x	✓
3		VIC	Port Melbourne	2008	May	✓	x	✓
4		VIC	Vermont	2008	May	✓	x	✓
5		VIC	Greensborough	2008	May	✓	x	✓
6		VIC	Hoopers Crossing	2008	May	✓	x	✓
7		VIC	Mordialloc	2008	May	✓	x	✓
8		VIC	Cheltenham	2009	Feb	✓	✓	✓
9		VIC	Williamstown	2009	Feb	✓	✓	x
10	Sydney	NSW	Prospect	2009	Feb	✓	✓	✓
11		NSW	Homebush	2009	Feb	✓	✓	✓
12		NSW	Belfield	2009	Feb	✓	✓	✓
13		NSW	Woolloomooloo	2009	Feb	x	x	✓
14	Brisbane	QLD	Newstead	2009	Feb	✓	✓	✓
15		QLD	Virginia	2009	Feb	✓	✓	✓
16		QLD	Coorparoo	2009	Feb	✓	✓	✓
17		QLD	Macgregor	2009	Feb	x	x	✓
18		QLD	Bowen hills	2009	Feb	✓	✓	✓
19		QLD	Cleveland	2009	Feb	✓	✓	✓
20		QLD	Ormeau	2009	Feb	✓	✓	✓
21	Gold Coast	QLD	Tweed Heads	2009	Feb	✓	✓	✓
22		QLD	Miami	2009	Feb	x	✓	✓
23		QLD	Ashmore	2009	Feb	✓	✓	✓
24		QLD	Noosa	2009	Feb	✓	✓	✓

Site No.	City/Region	State	Suburb	Survey Year	Survey Month	Office Survey	Business Survey	Gate Data
25	Gold Coast cont.	QLD	Nerang	2009	Feb	✓	✓	✗
26	Perth	WA	East Perth	2009	Feb	✓	✓	✓
27	Adelaide	SA	Littlehampton	2009	Feb	✓	✓	✓
28	Geelong	VIC	Grovedale	2009	Feb	✗	✗	✓
29		VIC	Portland	2009	Feb	✓	✓	✓
30	Newcastle	NSW	Adamstown	2009	Feb	✓	✓	✓
31		NSW	Mayfield	2009	Feb	✓	✓	✓
32	Ballarat	VIC	Ballarat	2009	Feb	✗	✓	✗
33	Batemans Bay	NSW	Batemans Bay	2009	Feb	✓	✓	✗

Appendix B

Office Parking Survey Procedure, Record Sheet & Business Survey Form

Business Survey Form

Business Name: _____

Name of contact person: _____

1. Area

1a. Gross floor area: _____ m²

1b. Maximum leasable area: _____ m²

2. Units

2a. Total number of units on 7/2/09: _____

2b. Total number of units on 15/2/09: _____

2c. Total number of occupied units (by customers) on 7/2/09 – please note that data on total units and total customers is required as some customers may occupy more than one unit:

Total Customers	Total Units Occupied
_____	_____

2d. Total number of occupied units (by customers) on 15/2/09: – please note that data on total units and total customers is required as some customers may occupy more than one unit:

Total Customers	Total Units Occupied
_____	_____

3. Client Profile

3a. Percentage of commercial customers: _____

3b. Percentage of private customers: _____

4. Storage Types

4a. Circle the type of Storage facility that best describes your business:

Ranch Multistorey Mixed

4b. Circle and/or describe the types of storage you provide:

General Document Storage

Other (please describe): _____

5. Business Activity

Based on experience at this specific site please answer the following questions.

5a. When is your busiest* month:

5b. When is your slowest** month:

5c. In an average week what is your busiest* day:

5d. In an average week what is your slowest** day:

5e. How would you best describe the level of activity (in and out of the site) during the survey period (7 February to 15 February)?

Slow

Average

High

5f. If the activity was slower or higher than expected please explain what factors may have caused this:

*most activity in and out of the site

**least activity in and out of the site

Manual Parking Survey Procedures & Record Sheet

SSAA Vehicle Parking and Trip Rate Study: February 2009

1 Purpose of Survey

Connell Wagner was commissioned by the Self Storage Association of Australasia to conduct a study of the parking demand and traffic generation of self storage facilities.

This survey will collect data on parking behaviours of people using the Office at Self Storage sites.

This data is a necessary complement to the data being collected from the security gates. Accurate recording of the data is therefore necessary, and the following sections provide information on the survey process.

2 Survey Package

Your survey package should include:

- Manual parking survey procedures;
- 10 uncompleted survey “Record Sheets”;
- A Business Survey Form;
- An addressed and stamped envelope.

If any of these items have not been included in your package please contact Lora Colussi on 0447 288 917 or email colussil@conwag.com.

3 Survey Period and Process

The survey will operate over the seven (7) day period commencing **Monday 9 February** up to and including **Sunday 15 February**. One Record Sheet will be used for each survey day, with data recorded for the hours of operation of the Office on each day.

3.1 Recording Data

3.1.1 Survey Days

At the beginning of each day the person operating the Office should:

- record the business name;
- record the date of the survey;
- tick the day of the week;
- record the Start time and End time for the Hours of Operation for that day; and
- record the number of staff scheduled to work on the day and their expected start and finish times. For example if three staff are scheduled to work on a particular day and two staff members start at 8:30am and finish at 5:00pm and the third staff member begins their shift at 9:30am and finishes at 3:00pm the record sheet should be completed as shown below.

Number of Staff working this day:	1	2	3	4	5	6
Scheduled Start time:	8:30am	8:30am	9:30am			
Scheduled Finish time:	5:00pm	5:00pm	3:00pm			

3.1.2 Introduction and Identification of Drivers to the Office

From discussions with SSAA the purposes for visits to the Office will be:

- Staff – commencing their shift;
- New clients – people enquiring and/or booking storage;
- Customers – people with existing storage and/or purchasing packing items;
- Service and other – people arriving to conduct some service on the site (e.g. electrical or sales people).

When a person enters the Office and seeks assistance, he/she should be advised that a parking survey is being conducted at the site, to assist SSAA members in planning storage facilities.

If it is not apparent where the visitor has parked then please ask them if they drove to the site, and if so where did they park?

Note: *Parking has been divided into “Storage Area”, “Office car park or on-street” car park. “Storage area” parking is considered to be anywhere within the security gated area, or in a driveway adjacent to a storage unit. “Office car park or on-street” parking is the area on site that does not require pin access and is not storage unit parking or is located on the street near the site.*

3.1.3 Recording Data

To record a customer or visitor to the office put a tally mark in the “enter” column on the survey sheet, for the relevant time period, Office visit purpose, and parking location.

When a customer or visitor departs the office with the intention of leaving the site or moving their vehicle out of the office car park (or on-street parking) put a tally mark in the “exit” column on the survey sheet, for the relevant time period, Office visit purpose, and parking location.

Note: *It is important to remember that this survey is recording the parking demand generated by the office section of your site and how much demand is placed on the office car park or on the neighbouring street. So when a vehicle leaves these parking areas to either depart the site or move their vehicle into the gated area it should be recorded (refer to examples 1, 2 and 3).*

Example 1: A customer arrives at the site and parks their vehicle in the office car park and enters the office at 10:05 am to speak with staff, then leaves the office and walks into the gated area to view storage units while their vehicle remains in the office car park. The same customer then returns to the office at 11:50am again to speak with staff before leaving the office and departing the site in their vehicle.

This activity would be recorded in the following way:

Under “Customer and Clients” columns a tally mark would be placed in the “Enter”, “Office car park or on-street” columns in the row labelled “10:00-10:30am”. To record the departure of this visitor a tally mark would be placed under the “Customer and Clients”, “Exit”, “Office car park or on-street” columns in the row labelled “11:30-12:00am”. This is shown below.

Parking Area Time	Customers and Clients						Service People and other					
	Enter			Exit			Enter			Exit		
	Storage Area	Office car park or on-street	Did not drive	Storage Area	Office car park or on-street	Did not drive	Storage Area	Office car park or on-street	Did not drive	Storage Area	Office car park or on-street	Did not drive
10:00-10:30am		/										
10:30-11:00am												
11:00-11:30am												
11:30-12:00am					/							

Example 2: A trades person arrives at the site and parks their vehicle in the office car park and enters the office at 1:10pm to speak with staff, then leaves the office at 1:15pm to move his vehicle into the gated area to undertake the service job required, then returns to the office at 3:05pm having left his vehicle in the gated area to speak with staff before leaving the site.

This activity would be recorded in the following way:

Under “Service people and other” columns a tally mark would be placed in the “Enter”, “Office car park or on-street” columns in the row labelled “1.00-1:30pm”. To record the departure of this visitor a tally mark would be placed under the “Service people and other”, “Exit”, “Office car park or on-street” columns in the row labelled “1:00-1:30pm”. This is shown below.

Parking Area Time	Customers and Clients						Service People and other					
	Enter			Exit			Enter			Exit		
	Storage Area	Office car park or on-street	Did not drive	Storage Area	Office car park or on-street	Did not drive	Storage Area	Office car park or on-street	Did not drive	Storage Area	Office car park or on-street	Did not drive
1:00-1:30								/			/	

Note: In both examples the visitor’s second entry into the office is not recorded because it was made within one trip to the site.

Example 3: An existing customer arrives at the site and parks their vehicle in the gated area next to their unit. They enter the office at 2:40pm to settle their account, and then leave the office at 2:45pm to return to their storage unit where they remain for another hour.

This activity would be recorded in the following way:

Under “Customer and Clients” columns a tally mark would be placed in the “Enter”, “Storage Area” columns in the row labelled “2:30-3:00pm”. To record the departure of this customer a tally mark would be placed under the “Customer and Clients”, “Exit”, “Storage Area” columns in the row labelled “2:30-3:00pm”. This is shown below.

Parking Area Time	Customers and Clients						Service People and other					
	Enter			Exit			Enter			Exit		
	Storage Area	Office car park or on-street	Did not drive	Storage Area	Office car park or on-street	Did not drive	Storage Area	Office car park or on-street	Did not drive	Storage Area	Office car park or on-street	Did not drive
2:30-3:00pm	/			/								

Note for Non-drivers: *If a visitor to the office did not drive to the site their visit should be recorded in the appropriate non-driver column*

Note for customers and visitors attending the office with other people in their company, *only one tally should be recorded for their entry and exit.*

4 Telephone Briefing Session

A Connell Wagner staff member will telephone your office on Wednesday 4 February to discuss how to correctly complete the record sheets and to answer any of your questions.

4.1 Connell Wagner Contact and Collection of Completed Forms

If staff completing the forms have any questions they should contact:
Lora Colussi on 0447 288 917.

At the end of the 7 days please post all survey sheets with the completed Business Survey Form using the self addressed envelope included in the survey package.

Record Sheet

Business Name: _____

Date: ____/____/____ **Day:** (tick day of survey) ☐ Mon ☐ Tues ☐ Wed ☐ Thurs ☐ Fri ☐ Sat ☐ Sun

Hours of operation of the Office: Start time: _____ End Time: _____

Number of Staff working this day:	1	2	3	4	5	6
Scheduled Start time:						
Scheduled Finish time:						

Parking Area Time	Customers and Clients						Service People and other					
	Enter			Exit			Enter			Exit		
	Storage Area	Office car park or on-street	Did not drive	Storage Area	Office car park or on-street	Did not drive	Storage Area	Office car park or on-street	Did not drive	Storage Area	Office car park or on-street	Did not drive
6.30-7.00am												
7.00-7.30am												
7.30-8.00am												
8.00-8.30am												
8.30-9.00am												
9.00-9.30am												
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7.00-7.30pm												
7.30-8.00pm												

If you are experiencing difficulties with this form please contact Lora Colussi 0447 288 917.