

PRACTICE NOTES

CHILD CARE TRAVEL CHARACTERISTICS ... ■

BACKGROUND

The number of licensed child care facilities in Queensland has been increasing at about 4% per annum (11% pa in the Brisbane region). However, there is little up-to-date factual data on the parking demand and trip rates for child care facilities. It is important for the efficient planning and design of new child care centres that appropriate levels of on-site car parking be provided and that external traffic impacts are accurately estimated. This practice note consolidates data relating to the car parking and trip generating characteristics of child care facilities in metropolitan Brisbane collected by Adam Pekol Consulting.

DATA COLLECTION

Arrival / departure time data from existing child care centres was supplemented with information on private vehicle mode share from Queensland Transport's 2003/04 SEQ Travel Survey. Details of the child care centres from which arrival / departure time data were obtained is summarised in Table 1.

TABLE 1: SAMPLE DETAILS

Centre	Capacity (Children)	Days of Data
Aspley Early Education Centre (Aspley)	75	5
Mother Duck Child Care & Pre-school Centre (Bellbowrie)	75	49
Nursuryland Early Childhood Learning Centre (Alderley)	100	63

DESIGN OCCUPANCY

Analysis of the 117 days of data from the child care centres indicates that on over 95% of the days surveyed, actual attendance was less than 85% of centre capacity, as shown in Figure 1.

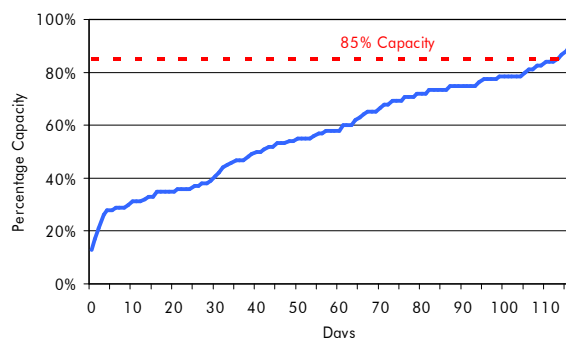


FIGURE 1: SAMPLE DETAILS

Thus, for planning purposes, the recommended occupancy is:

- Design Case: 85%
- Maximum case: 100%

STAFFING LEVELS

A review of staffing levels at a number of child care centres highlighted a variation in the number of staff / child, depending on the demographic characteristics of the area. The recommended staffing levels for planning purposes are:

- Design Case: 0.17 staff / child
- Maximum case: 0.19 staff / child

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MODE SHARE

Mode share data from the 2003/04 SEQ Travel Survey showed that 95% of child travel to/from child car facilities by car. Thus, recommended private vehicle mode share for children is:

- Design Case: 95%
- Maximum case: 100%

By comparison, the private vehicle mode share for staff reflects typical sub-urban travel behaviour, namely:

- Design Case: 85%
- Maximum case: 90%

VEHICLE OCCUPANCY

The average family size from the child care sign-in / sign-out data was found to be 1.1 children per family. This should be adopted as the vehicle occupancy value child care patrons.

The average vehicle occupancy for commuter travel in metropolitan Brisbane is also 1.1 persons per vehicle. It would therefore be reasonable to adopt this figure for staff travel.

PARKING ACCUMULATION

According to the 2003/04 SEQ Travel Survey, the average duration of stay for both drop-off and pick-up at child care facilities is 10 minutes. Figure 2 shows the accumulation of staff and parent / carer vehicles over a typical day.

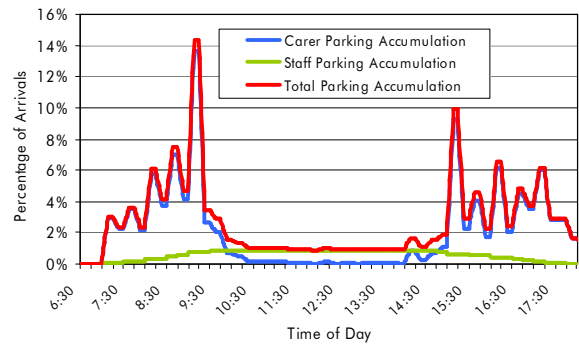


FIGURE 2: CAR PARKING ACCUMULATION

The peak parking demand occurs around 9:00, during which just under 14% of children arrive en-masse. The calculation of the parent / carer component of the peak parking demand at a typical child care centre is detailed in Table 2.

TABLE 2: PEAK PARKING DEMAND - CHILDREN

Parameter	Design	Maximum
Occupancy	85%	100%
Private vehicle mode share	95%	100%
Vehicle occupancy (per/car)	1.1	1.1
Peak accumulation (%)	13.6%	15.0%
Peak accumulation (spaces/child)	0.0998	0.136

By 9:00am, about 85% of children are on-site. Thus, a corresponding proportion of staff cars would be on-site as well. The calculation of the staff component of the peak parking demand at a typical child care centre is detailed in Table 3.

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TABLE 3: PEAK PARKING DEMAND - STAFF

Parameter	Design	Maximum
Occupancy	85%	100%
Staff / child	0.17	0.19
Private vehicle mode share	85%	90%
Vehicle occupancy (per/car)	1.1	1.1
Peak accumulation (%)	84.6%	90.0%
Peak accumulation (spaces/child)	0.0944	0.140

The combined peak car parking demand for a typical child car centre is therefore:

- Design Case: 0.194 spaces / child
- Maximum case: 0.276 spaces / child

This equates to one space for every 3.6-5.2 children (capacity). By comparison, the equivalent parking provision rate for child care uses from several Local Government planning schemes are summarised in Table 4.

TABLE 4: LGA PARKING RATE COMPARISON

LGA	Spaces / staff	Spaces / child	Net Spaces/ child*
Brisbane	-	0.20	0.20
Maroochy	0.5	0.20	0.30
Caloundra	0.5	0.20	0.30
Ipswich	1.0	0.13	0.32
Redlands	1.0	0.14	0.33

* Based on 0.19 staff / child

These range from 0.20 spaces / child for Brisbane up to 0.33 spaces / child for Redlands. Based on the data presented above, the planning scheme rate for Brisbane is towards the lower end of the observed range, while the rates for Maroochy, Caloundra, Ipswich and Redlands are significantly higher than implied by the observed data.

TANDEM PARKING

The figures quoted in Tables 2 and 3 suggest that about half of the peak parking accumulation is attributable to staff. Thus, it would not be unreasonable to nominate up to 50% of child care parking to be allocated for staff. Presumably, these spaces could be provided in tandem, without adversely effecting parent / carer car parking operations, subject to detailed design considerations.

Of the six planning schemes reviewed, only Brisbane's allows for staff parking to be provided in tandem. Although the 60% limit nominated in the Brisbane planning scheme appears to be overly generous. A limit of 50% is considered more appropriate.

TRIP GENERATION

The peak time for arrivals and departures of children tends to occur outside of the normal road peak. Table 5 lists the proportion of daily child arrivals and departures for a typical child care centre per hour, for several hours either side of the morning and evening peak.

The weekday morning road peak typically occurs between 7:00am and 9:00am. During this period, a typical child care centre generates a maximum of about 19% of daily movements in any one hour (ie 8:00am to 9:00am). However, this represents just over 70% of the absolute peak of around 27%, which occurs somewhat later (ie 8:30am to 9:30am).

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TABLE 5: MOVEMENTS PER HOUR - CHILDREN

	Hour Starting	% Daily Flow in Hour	% of Peak Hour
Morning	6:30	4.3%	16.1%
	7:00	9.8%	36.4%
	7:30	14.2%	52.7%
	8:00	19.4%	72.1%
	8:30	26.9%	100.0%
	9:00	19.4%	72.3%
Evening	3:00	16.5%	61.3%
	3:30	13.6%	50.5%
	4:00	15.1%	56.2%
	4:30	16.0%	59.5%
	5:00	13.4%	49.8%
	5:30	6.5%	24.0%

The pattern of arrivals and departures of children during the evening peak is both flatter and lower. During the typical weekday evening road peak (ie 4:00pm to 6:00pm), care centres generate a peak of about 16% of daily movements between 4:30pm and 5:30pm. However, the absolute evening peak of around 17% occurs slightly earlier (ie 3:00pm to 4:00pm).

Table 6 lists the proportion of daily movements per hour, for several hours either side of the morning and evening peak.

TABLE 6: MOVEMENTS PER HOUR - STAFF

	Hour Starting	% Daily Flow in Hour	% of Peak Hour
Morning	6:30	10.1%	19.1%
	7:00	20.9%	39.4%
	7:30	29.2%	55.1%
	8:00	40.0%	75.5%
	8:30	53.0%	100.0%
	9:00	36.5%	68.9%
Evening	3:00	33.3%	62.8%
	3:30	27.0%	50.9%
	4:00	31.4%	59.2%
	4:30	32.5%	61.2%
	5:00	25.5%	48.1%
	5:30	11.3%	21.4%

The pattern of staff arrivals and departures shown in Table 6 mirrors that for children shown in Table 5. This reflects the practice of rostering staff in response to children present at the centre.

Assuming that parents / carers who drive children to / from child care centres generate four vehicle trips ends per day, and staff generate two, the trip generating characteristics of a typical child care centre are as summarised in Table 7.

TABLE 7: TRIP GENERATION (vte / child)

Parameter	Design	Maximum
Daily Parent / Carer Trips	2.94	3.64
Daily Staff Trips	0.26	0.31
Total Daily Trips	3.20	3.95
Peak Parent / Carer Trips	0.79	1.06
Peak Staff Trips	0.14	0.16
Total Peak Hour Trips	0.93	1.23

The peak period trip generation rate for a typical child care centre ranges from 0.93 to 1.23 vte / child. This relates to the 8:30am-9:30am period. Equivalent estimates for the morning and evening road peak should be factored down by 0.72 and 0.60 respectively. This implies the following morning and evening peak period trip rates:

- Morning: 0.67 - 0.89 vte / child
- Evening: 0.56 - 0.74 vte / child

By comparison, peak hour trip generation rates sourced elsewhere include (eg Maroochy Shire Council, RTA NSW and DMR Qld range from 0.7 to 0.8 vte / child.

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The morning peak trip generation calculated from the observed data is towards the top end (or past the top end) of this range, while the evening peak rates are towards the lower end.

COMMERCIAL VEHICLE SERVICING

The data obtained from the child-care facilities did not provide any insight into commercial vehicle servicing demands. It is hoped to address this aspect of child care operations at some future time.

SUMMARY

Published data on the parking demand and trip generating characteristics of child-care facilities is somewhat dated. Recent surveys undertaken in Brisbane highlight subtle differences between the published and observed values. It is recommended that the more up-to-date local data presented here be used in the planning and design of child-care facilities in SEQ.

DISCLAIMER

The material contained in this practice note is of a general nature, for information only. Adam Pekol Consulting accepts no liability for any damage caused by any error or omission contained herein.