Are Master-Planned New Urbanist Suburbs a 'Solution' for Sustainable Travel to Schools? comparing children's travel in select Australian primary schools

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Abstract: Development at the fringes of Australian cities commonly takes the form of large master-planned estates incorporating significant features of New Urbanist design. Connective street networks, off-street pathways and footpaths provided on every street, with civic buildings located in or near neighbourhood centres, are in marked contrast to 1980s suburban design. Both the theory underpinning New Urbanism and the marketing of these estates suggests they should increase rates of children walking and cycling to school. The CATCH and iMATCH studies have captured the travel behaviour and attitudes of 10-13 year old children and their parents at nine primary schools in Rockhampton, Brisbane, Melbourne and Perth. Included was a large master-planned estate in Ipswich City, in Brisbane's west, that embodies these New Urbanist design features. The research used travel diaries and attitudinal surveys amongst other methods. This paper focuses on the results from the 250 children that completed travel diaries. Key measures include mode share and children's independent mobility rates for the schools in the sample, and related variables such as bicycle ownership. The results suggest the Ipswich master-planned estate had relatively low mode shares for walking, cycling and other non-motorised travel to school, as compared to other schools in the sample. Preliminary analysis suggests that school catchment size, which is increasingly large in these new estates, the 'busyness' of parents, and a lack of supportive policy interventions may each be associated with this limited take up of children's walking and cycling to school.

Key words: children's travel behaviour, journeys-to-school, New Urbanism, master-planned estates.

Introduction

New Urbanism and its design features have significantly changed new suburban design in Australian cities since its arrival in the early 1990s. In theory, the built environment is designed to bring homes closer to destinations, and to provide safe infrastructure for non-motorised travel. These shifts are most obvious in the design of the largest master-planned estates (MPEs) produced by the large listed property developers. Evidence of New Urbanism's features are numerous. Footpaths are included on a greater proportion of small local streets. Although cul-de-sacs are used to curtail through movement by cars, pedestrian access ways (PAWs) are commonly used to increase connectivity on foot and by bicycle. Extensive off-road path networks are provided, as are parks and playgrounds. Medium-density housing remains scarce, but smaller lot sizes provide modest increases in residential density as compared to 1980's suburbia (Hall 2010). The policy intent is to provide for neighborhood centers at central locations, but in reality there is a considerable time lag in implementation, if it occurs at all (see Curtis and Punter 2004). Other social infrastructure, such as schools is also provided, often at central locations. But there remains little land use mixing. Public transport services, which are beyond the control of developers, tend to be in the form of infrequent local bus services, except where estates happen to lie on rail lines (see Curtis and Olaru 2010). And MPEs often feature larger schools, which state education departments in Western nations prefer as they are cheaper to operate per student, but which have larger catchment areas, reducing the proximity of homes to school (Giles-Corti et al. 2011:549).

This paper aims to explore the impacts of Australian MPE characteristics on children's travel. We report select findings from the CATCH (Children's Active Travel, Connectedness, and Health) and iMATCH (independent Mobility, Active Travel and Children's Health) projects, two separate Australian Research Council-funded national projects. This paper compares the children's independent mobility

(CIM) and active travel (AT) of Australian children as revealed by travel diaries and a questionnaire survey used across the two projects, and makes preliminary assessment of how a master-planned estate built with key New Urbanist design features performed in comparison to other neighborhoods. Key variables that may have influenced the results, in particular relating to the socio-demographics and lifestyle of households, are also identified.

Urban design features of MPEs are known to influence children's CIM and AT. The proximity of homes and their accessibility by path and street networks to schools is correlated with children's mode choices for journeys-to-schools. Children are much more likely to walk to school if they live within modest walking distances of less than one kilometer (Ewing, Schroeer and Greene 2004; Panter et al. 2009).

Encouraging this 'active travel' is important due to its links to child physical activity, health and well-being (see Garrard 2009) to children's personal development needs, and to traffic congestion, road safety and pollution (Tranter and Pawson 2001:30). Researchers have identified that a decline in CIM, defined as their ability to travel independent of adult supervision (Hillman 1993) is implicated in the decline of children's walking and cycling in neighborhoods, with parental attitudes and concerns also acting as important factors (Rudner and Malone 2011; Tranter and Malone 2003; Zuniga 2012). The opportunity for independent mobility in the journey to school has declined markedly in Australia over recent decades, and adult-dependent mobility (Sharpe and Tranter, 2010) now dominates most children's travel (van der Ploeg et al. 2008). Recent estimates of the proportion of travel made by different modes (the 'mode share') for children's travel in Australian cities, based on household travel survey data and a few more intensive studies (i.e. van der Ploeg et al. 2008) suggest around 75% of all journeys-to-school for primary school students are by car.

Previous research on the effects of changing neighbourhood design has suggested more walking to destinations in Australian suburbs built to New Urbanist design codes, but no marked changes in public transport use. The Residential Environments (RESIDE) study in Perth found more walking to destinations within estates built to Western Australia's *Livable Neighborhoods* design code (Giles-Corti et al. 2013). Notably, having a supportive, walkable built environment had a positive impact on children's activity spaces and their travel from home within the neighborhood (Villanueva et al. 2012). This data also confirmed the impacts of traffic volumes. Children in schools located in areas with roads that were both highly connected with high volumes of traffic were less likely to walk; but children were more likely to walk at schools with roads that were highly connected and with low volumes of traffic (Giles-Corti et al. 2011). Hurni (2012:18) explored questions of CIM more closely using qualitative approaches, suggesting that the 'independent mobility of children and young people is better understood as part of the transition to adulthood rather than a fixed state or condition'. She suggests that built environment conditions are certainly important factors, but that enabling opportunities for children and giving them the confidence to be mobile is a priority.

Methods

To explore comparative travel behaviour across neighbourhood types, the CATCH & iMATCH projects used a block design to survey children aged 10-13 years in nine primary schools in seven sites across Australia. The sites were controlled to avoid very high or very low socio-economic status neighbourhoods and were sought to be representative of the locations most Australian children reside in. Two outer suburban sites in South East Queensland were chosen, one was a master-planned estate (MPE) in Ipswich City, on the outskirts of Brisbane. The Ipswich MPE was particularly of interest as the council had required the developers to include footpaths on every street. In addition, a very comprehensive set of segregated off-street shared paths (for both walking and cycling) connected much of the estate to the central features, including the primary school site. A comparative outer-suburban school in a growth corridor that is not part of a large MPE, on the boundary of Brisbane and Logan Cities to Brisbane's south was selected. This school is sited less centrally in its neighbourhood, and the neighbourhood is less mature than the Ipswich MPE site with significant vacant land near the school itself awaiting development. Another school from Brisbane's middle suburbs was also selected, in an area laid out pre-WWII. Other schools included two from Moreland City in Melbourne (one in the inner suburbs; one in the middle suburbs), an inner city school in Perth, and three schools in the regional city of Rockhampton that are reported in aggregate in this paper.

The CATCH & iMATCH projects used travel diaries to capture all trips made by children across two weekdays and two weekend days. Surveys were conducted at times of the year conducive to active travel in each climatic zone, and students were generally sampled across many weeks to control for such vagaries as inclement weather. Trips were defined as all legs of a journey from an origin to a destination, including to change modes. Trips made within school grounds or the home were excluded. As such, a walk to a bus stop was recorded as one trip, and travel on that bus as a second, separate trip. Circuitous home-to-home journeys, such as when one walks a dog, were recorded as two trips (i.e. one trip away from home, one trip back home). The diaries asked children for the origin and destination (key landmark or street address), day, departure and arrival time, mode of travel, whether they were accompanied (and by whom), and trip purpose for all trips, in a child-friendly format. Children practiced completing a travel diary in classroom activities prior to completing their diary booklet. Further assistance was provided to the children by survey staff to query, amend and complete trip data on the forms, where possible, prior to data entry. As the diaries were filled in solely by children in many circumstances, there were significant omissions and errors on many forms, and the data quality differed across school sites due to the particular arrangements requested by school administrators at each site. Some schools provided in-class time for the project and others only allowed these activities out-of-class, which curtailed the time and attention able to be provided at some locations. In addition, children completed attitudinal surveys that captured information on bicycle ownership and their main methods of getting to/from school. The broader studies also used GIS audits of the built environments of the neighbourhoods surrounding the school sites, as well as global positioning systems (GPS), measures of physical activity, height and weight, and photo elicitation methods with the children. The focus in this paper is on the travel diary results, supplemented in part by other findings where necessary.

Following the data entry and cleaning process, a total of 250 students returned useable travel diary data for at least one day, recording 2,227 trips for all trip purposes. As the work advances we are likely to amend and edit this dataset further, but for this first preliminary analysis we retained all trips in the dataset for this paper. For the parent surveys, which we also draw on in this paper, only one parent was asked to complete the survey, responding on behalf of their household. The parental surveys sought demographic data, travel and transport data (including household car ownership, and license holding), data on 'licenses' given to children, and attitudinal/perception data from parents on CIM and the neighbourhood environment. A total of 232 parents or guardians returned useable data. Only 41 (17.6%) of these respondents were male. The data was analyzed using *SPSS* and *Excel* software.

Our working hypothesis was that the Ipswich MPE would likely have more walking and more cycling, and more children's independent mobility, than comparative schools in the middle and outer suburbs. Our assumption is that it may perform more like the traditional urbanism of the inner suburbs, given its design features and the central location of the school in the estate. Future analysis will seek to isolate and identify the influence of a range of built, social and policy influences on the children's travel behaviour, using multivariate techniques, but at this stage we are reporting only the major (one-way) differences in travel behaviour across the school sites.

Results

As shown in Table 1, students reported making more trips on weekdays than on weekend days. However, this was partly due to a proportion of children failing to complete all four days of their travel diary and should not be considered an accurate reflection of the actual rates of travel across these days. Of the 2,227 trips in the dataset, some 1,456 (65.3%) were recorded for weekdays, with 312 Saturday trips (14.0%) and 461 Sunday trips (20.7%). In schools with the highest levels of staff support and where in-class time was provided to support travel diary completion (i.e. in Perth) higher trip rates were recorded than in schools where less support was provided. On the whole the trip rates were in a similar range such that it is reasonable to compare trip making across the sites. The trip rate of 3.15 trips per child per day is similar to the rate observed in the South East Queensland Travel Survey (SEQTS) (Queensland Transport et al. 2005) for weekday travel suggesting a reasonable rate of trip reporting across the sample.

Table 1 Sample, diary days completed and reported trips for the travel diary survey

School	Number of children who completed diaries	Number of days of diary data	Number of reported trips	Reported trip rate per child per day**
Ipswich - MPE	41	97	312	3.22
Brisbane - Middle	17	65	191	2.94
Brisbane - Outer	34	120	361	3.01
Perth - Inner	49	166	603	3.63
Melbourne - Inner	17	60	159	2.65
Melbourne - Middle	30	85	249	2.93
Rockhampton*	62	115	352	3.06
TOTAL	**250**	**708**	**2,227**	**3.15**

* Represents data for three separate Rockhampton schools combined.
**Discrepancies in reported trip rates likely reflect differences in child reporting.

We report in this paper the key differences across the sites in trip purposes, mode shares and accompaniment (CIM) for the children's reported trips.

Trip purposes

Tables 2 and 3 show the number and proportion of trips reported for specific trip purposes for weekdays and weekend days. On weekdays the children in the Ipswich MPE made slightly more trips to parks/playgrounds, and for a wide range of 'other' reasons (including football, dance and music), than children at most other sites. Conversely, there was less travel for shopping purposes at the Ipswich site than at other survey locations.

Only one child in the Ipswich MPE recorded recreational bike riding, on the weekend, however few children across any of the sites reported such behaviour at any time during the week. Public transport use was only a significant component of children's travel in the Melbourne – middle suburban neighbourhood, during weekdays. Interestingly, there is a small amount of travel to schools reported on weekends, presumably for extra-curricular activities or to make use of outdoor recreation facilities.

Table 2 Children's trip purposes, weekdays (Monday-Friday)

	Go to school		Go home		Go to park/ playground		Go shopping		Visit family & friends		Go for a bike ride		Get to/ from public transport		Other		Missing
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
Ipswich - MPE	50	29.2%	59	34.5%	4	2.3%	10	5.8%	15	8.8%	0	0.0%	0	0.0%	33	19.3%	13
Brisbane - Middle	35	33.3%	32	30.5%	0	0.0%	8	7.6%	6	5.7%	0	0.0%	0	0.0%	24	22.9%	15
Brisbane - Outer	63	33.9%	68	36.6%	1	0.5%	19	10.2%	6	3.2%	1	0.5%	1	0.5%	27	14.5%	11
Perth - Inner	97	30.3%	102	31.9%	5	1.6%	34	10.6%	18	5.6%	0	0.0%	0	0.0%	64	20.0%	26
Melbourne - Inner	30	35.7%	29	34.5%	0	0.0%	6	7.1%	6	7.1%	0	0.0%	0	0.0%	13	15.5%	8
Melbourne - Middle	38	29.7%	44	34.4%	2	1.6%	11	8.6%	7	5.5%	1	0.8%	6	4.7%	19	14.8%	11
Rockhampton*	69	38.1%	77	42.5%	0	0.0%	14	7.7%	18	9.9%	3	1.7%	0	0.0%	0	0.0%	34
Total	**382**	**32.5%**	**411**	**35.0%**	**12**	**1.0%**	**102**	**8.7%**	**76**	**6.5%**	**5**	**0.4%**	**7**	**0.6%**	**180**	**15.3%**	**118**

*Represents data for three separate Rockhampton schools combined

Table 3 Children's trip purposes, weekend days (Saturdays and Sundays)

	Go to school		Go home		Go to park/ playground		Go shopping		Visit family & friends		Go for a bike ride		Get to/ from public transport		Other		Missing
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.
Ipswich - MPE	0	0.0%	27	35.5%	5	6.6%	15	19.7%	6	7.9%	1	1.3%	0	0.0%	22	28.9%	8
Brisbane - Middle	0	0.0%	18	31.6%	9	15.8%	6	10.5%	1	1.8%	0	0.0%	0	0.0%	23	40.4%	8
Brisbane - Outer	2	1.6%	45	35.7%	8	6.3%	14	11.1%	14	11.1%	0	0.0%	0	0.0%	43	34.1%	7
Perth - Inner	1	0.5%	63	28.8%	20	9.1%	44	20.1%	26	11.9%	1	0.5%	1	0.5%	63	28.8%	15
Melbourne - Inner	0	0.0%	12	21.1%	3	5.3%	6	10.5%	15	26.3%	0	0.0%	0	0.0%	21	36.8%	6
Melbourne - Middle	1	1.7%	19	32.8%	1	1.7%	7	12.1%	10	17.2%	0	0.0%	1	1.7%	19	32.8%	2
Rockhampton*	1	1.2%	44	51.2%	3	3.5%	28	32.6%	8	9.3%	2	2.3%	0	0.0%	0	0.0%	48
Total	**5**	**0.7%**	**228**	**33.6%**	**49**	**7.2%**	**120**	**17.7%**	**80**	**11.8%**	**4**	**0.6%**	**2**	**0.3%**	**191**	**28.1%**	**94**

*Represents data for three separate Rockhampton schools combined

Mode shares

Tables 4 and 5 show the mode share of each school sample for trips to school, and for trips to all other destinations.

Table 4 Mode share for trips to school

	Walk		Bike		Car		Bus/Train		Other	
	No.	%	No.	%	No.	%	No.	%	No.	%
Ipswich - MPE	10	16.9%	2	3.4%	44	74.6%	1	1.7%	2	3.4%
Brisbane - Middle	15	42.9%	0	0.0%	18	51.4%	1	2.9%	1	2.9%
Brisbane - Outer	1	1.4%	2	2.7%	68	91.9%	3	4.1%	0	0.0%
Perth - Inner	25	24.8%	3	3.0%	72	71.3%	0	0.0%	1	1.0%
Melbourne - Inner	10	32.3%	6	19.4%	14	45.2%	0	0.0%	1	3.2%
Melbourne - Middle	28	54.9%	2	3.9%	21	41.2%	0	0.0%	0	0.0%
Rockhampton*	15	21.4%	1	1.4%	48	68.6%	4	5.7%	2	2.9%
Total	**104**	**24.7%**	**16**	**3.8%**	**285**	**67.7%**	**9**	**2.1%**	**7**	**1.7%**

*Represents data for three separate Rockhampton schools combined

Table 5 Mode share for trips to all other destinations (i.e. excluding trips to school and to home), weekdays and weekend days

	Walk		Bike		Car		Bus/Train		Other	
	No.	%	No.	%	No.	%	No.	%	No.	%
Ipswich - MPE	47	18.6%	5	2.0%	177	70.0%	1	0.4%	9	3.8%
Brisbane - Middle	31	19.9%	0	0.0%	113	72.4%	3	1.9%	3	2.0%
Brisbane - Outer	11	3.8%	9	3.1%	226	78.7%	16	5.6%	6	2.2%
Perth - Inner	59	11.8%	23	4.6%	398	79.3%	0	0.0%	3	0.6%
Melbourne - Inner	20	15.7%	7	5.5%	90	70.9%	2	1.6%	0	0.0%
Melbourne - Middle	52	26.3%	9	4.5%	120	60.6%	3	1.5%	4	2.1%
Rockhampton*	46	16.9%	12	4.4%	203	74.6%	8	2.9%	3	1.1%
Total	**266**	**15.5%**	**65**	**3.8%**	**1327**	**77.2%**	**33**	**1.9%**	**28**	**1.6%**

*Represents data for three separate Rockhampton schools combined

When compared to the inner-city schools in Brisbane and Melbourne, and the middle-suburban school in Melbourne, there is significantly less travel by walking in the Ipswich MPE. There is also less cycling in the Ipswich MPE than in Melbourne (albeit there was strikingly nil bicycle travel reported by children at the middle-suburban Brisbane school). But there are less trips made by car and more by walking and cycling at the Ipswich site than in the other outer-suburban schools, including the Brisbane outer-suburban school where comparatively few children walked to school, and which had the highest proportion of car trips in the sample frame.

19% of trips to all non-school destinations made by the children in the Ipswich MPE site were completed by walking, 2% by cycling, and only around 1% by public transport. A relatively high 4% of trips were made by 'other' modes, most of which were reported as non-motorised scooter trips if additional information was provided by the student.

The low rates of cycling for transport or recreation are not due to a lack of bicycles amongst the children. Comparison with reported bicycle ownership from the student questionnaire survey suggests that most children had bicycles, they just were not using them often. Table 6 shows reported bicycle ownership at each site. Note that the samples differ slightly in that more children completed the questionnaire survey than the travel diaries and we are yet to cross-match fully the responses. Only in the Perth neighbourhood did child bicycle ownership fall slightly below 90% levels. There was very high bicycle ownership at all sites compared to actual use.

Table 6 Responses to the question 'Do you have a bike?' from the student survey (N = 305).

	'No'		**'Yes'**		**Missing**
	No.	%	No.	%	No.
Ipswich - MPE	1	2.0%	49	98.0%	0
Brisbane – Middle	1	5.0%	19	95.0%	0
Brisbane – Outer	3	7.9%	35	92.1%	1
Perth - Inner	6	11.8%	45	88.2%	0
Melbourne - Inner	1	3.3%	29	96.7%	0
Melbourne - Outer	4	9.3%	39	90.7%	1
Rockhampton*	7	9.9%	64	90.1%	0
Total	**23**	**7.6%**	**280**	**92.4%**	**2**

*Represents data for three separate Rockhampton schools combined

Children's Independent Mobility (CIM)

Tables 7 and 8 show the level of accompaniment/CIM for each school sample for trips to school, and for trips to all other destinations. Children reported if they were by themselves, with other children only, or whether an adult was present for each of their trips in the travel diary.

Table 7 Accompaniment for trips to school

	I was by myself		**Was with other children only**		**I was with an adult present**		**Missing**
	No.	%	No.	%	No.	%	No.
Ipswich - MPE	6	10.7%	6	10.7%	44	78.6%	3
Brisbane - Middle	5	14.3%	9	25.7%	21	60.0%	0
Brisbane - Outer	4	5.4%	3	4.1%	67	90.5%	0
Perth - Inner	16	16.2%	8	8.1%	75	75.8%	2
Melbourne - Inner	12	38.7%	3	9.7%	16	51.6%	0
Melbourne - Middle	13	26.5%	6	12.2%	30	61.2%	2
Rockhampton*	13	18.8%	8	11.6%	48	69.6%	1
Total	**69**	**16.7%**	**43**	**10.4%**	**301**	**72.9%**	**8**

*Represents data for three separate Rockhampton schools combined

Due largely to the high proportion of car trips involved, some 73% of journeys-to-school involved adult supervision across the total sample. Just under 17% of trips involved children travelling alone, and around 10% of travel involved accompaniment by other children. For the Ipswich MPE, rates were lower than the survey average: around 79% of travel was conducted with adult accompaniment, with just under 11% of journeys-to-school involved children travelling alone.

Compared to travel to school, the level of independent travel was much lower when looking at travel to other destinations. For the total sample over 83% of these trips were made with adult accompaniment, with only 7% conducted by the child alone. Higher rates of independent mobility for this travel were observed in the Rockhampton school neighbourhoods, and there were comparatively lower rates across all the Brisbane and Ipswich sites.

Table 8 Accompaniment for trips to all other destinations (i.e. excluding trips to school and to home), weekdays and weekend days

	I was by myself		**Was with other children only**		**I was with an adult present**		**Missing**
	No.	%	No.	%	No.	%	No.
Ipswich – MPE	16	7.3%	27	12.3%	177	80.5%	33
Brisbane - Middle	5	3.4%	15	10.3%	125	86.2%	11
Brisbane - Outer	7	2.6%	22	8.3%	236	89.1%	22
Perth - Inner	23	5.0%	29	6.3%	407	88.7%	43
Melbourne - Inner	13	11.3%	9	7.8%	93	80.9%	12
Melbourne - Middle	26	14.2%	19	10.4%	138	75.4%	15
Rockhampton*	23	8.9%	37	14.3%	198	76.7%	22
Total	**113**	**6.9%**	**158**	**9.6%**	**1374**	**83.5%**	**158**

*Represents data for three separate Rockhampton schools combined

While one explanation for reduced rates of active travel to school and CIM may be a product of neighbourhood design, the effects of parental busyness may also be a contributing factor. Where parents have a large part of their day taken up with work, voluntary work or simply travelling to and from work, this coupled with their unwillingness to permit children to travel independent of an adult, may simply mean it is easier to drive the child to school regardless of suburban design. Tables 9 and 10 report the extent of parental 'busyness' reported by parents in the related parent surveys conducted as part of the broader studies. These results show that, on average, 73% of parents spend 15 or more hours per week in work or voluntary work. Interestingly it is the inner city Melbourne site which has the 'busiest' parents, with only 5% of parents working less than 15 hours per week and this was the site with the highest mode share by walking. The travel time to work may be an important factor in determining whether outer suburban children walk to school where parent's journey-to-work is in excess of 30 minutes and will almost invariably be undertaken by car given the location in the outer suburbs – 27% of the Ipswich MPE parent's journeys-to-work are in this category and 31% of the other Brisbane outer-suburban school.

Table 9 Parents and 'busyness' – number of hours per week in work or voluntary work

	Less than 15 hours/week	**15 to 40 hours/week**	**More than 40 hours/week**
Ipswich MPE	27.3%	47.7%	25%
Brisbane - Middle	37.1%	60.0%	2.9%
Brisbane - Outer	39.1%	49.3%	11.6%
Perth - Inner	24.5%	63.3%	12.2%
Melbourne - Inner	5.3%	78.9%	15.8%
Melbourne - Middle	11.8%	58.8%	29.4%
Rockhampton*	28.7%	46.7%	24.7%
Total	**28.8%**	**54.2%**	**17.0%**

*Represents data for three separate Rockhampton schools combined

Table 10 Parents and travel time to work

	Not applicable	Less than 5 minutes	5-15 mins	16-30 mins	31mins – 1 hour	More than 1 hour
Ipswich MPE	14.6%	9.8%	14.6%	34.1%	22.0%	4.9%
Brisbane - Middle	14.7%	2.9%	29.4%	44.1%	2.9%	5.9%
Brisbane - Outer	17.6%	1.5%	23.5%	26.5%	27.9%	2.9%
Perth - Inner	14.6%	8.35	29.2%	25.0%	20.8%	2.1%
Melbourne - Inner	0%	5.3%	31.6%	31.6%	26.3%	5.3%
Melbourne - Middle	31.3%	0%	6.3%	18.8%	43.8%	0%
Rockhampton*	9.8%	5.3%	19.6%	5.3%	0.1%	59.0%
Total	**15.9%**	**5.9%**	**25.9%**	**29.7%**	**19.7%**	**3.1%**

*Represents data for three separate Rockhampton schools combined

Discussion

As expected, rates of walking to school and walking to other destinations were higher in the Ipswich MPE than in the other Brisbane outer suburban neighbourhood; but they were not as high as might have been expected by advocates of New Urbanism, and nowhere near the rates of child walking and cycling observed in the Melbourne inner-city site. The provision of footpaths on every street, a more connected street and path network, and an enviable off-road shared path network appear to have had only a marginal effect on walking and cycling rates.

The shift towards larger primary schools noted by Giles-Corti et al. (2011) is of significant concern and may partly explain the result at the Ipswich MPE. A discussion with one of the site's developers and members of the research team revealed that earlier plans for the site included a great number of smaller primary schools, which were reduced in number and increased in size later. The central school site we surveyed will soon turn into something of a 'super-school' with growing enrolments year on year as the estate expands. Student home address data suggests a significant proportion of children are well outside comfortable walking distance (>1km) of the school (see Ewing, Schroeer and Greene 2004). This policy setting of larger schools is being pursued by education departments worldwide, and includes the school amalgamations and closures in the inner and middle suburbs seen recently in cities such as Canberra, and being promoted in WA and Queensland. It is likely having an influence in stymieing children's walking and cycling, but a lack of systematic reporting of children's journeys-to-schools (as opposed to adult's journeys-to-work) makes it difficult to measure these effects.

On a more promising note, the provision of extensive parks and playgrounds throughout the Ipswich MPE did appear to influence reported travel by children to these destinations, which was proportionally more than at many other sites, especially on weekdays. Disappointingly the rates of cycling on all days of the week were extremely low for all the sites, and the design features of the MPE seemed to make no difference. This is despite strong bicycle ownership in the Ipswich site and more broadly across all the sites sampled. Another paper being provided to this conference (Wati et al.) explores this low rate of cycling in greater detail, focusing on parental and child attitudes and perceptions towards cycling from the CATCH/iMATCH questionnaire surveys.

The data also suggested that the two schools in Melbourne, both within the City of Moreland, had the highest rates of active travel and CIM in the sample. The Rockhampton site also had relatively high rates of CIM, particularly for weekend travel. The broader research effort is seeking to find out why this might be the case, with the qualitative photo elicitation exercises conducted by the children providing considerable insight. In addition, the GPS data will be used to help pinpoint where and how the children tended to travel, especially for their neighbourhood walking, cycling, and scooter trips.

A key factor that will be considered in future research is the role of policy interventions, which remain under-studied (Mitra 2012:22). The Ipswich MPE school had never benefited from a major travel behaviour intervention program, such as TravelSmart Schools, Safe Routes to School, or Active School Travel, during the survey period. The other two Brisbane schools and one of the Melbourne schools had taken part in one or more of these programs. It may be that there is significant potential for travel behaviour change in the Ipswich MPE that could be unlocked via such interventions, given the levels of path provision and bicycle ownership. This will be considered in future research,

including in a set of parental focus groups and interviews that are happening in the Brisbane and Ipswich sites. We note that Ipswich City Council have recently commenced an Active School Travel program with Commonwealth and State Government funding support. The CATCH/iMATCH researchers have provided some limited advice to council officers and the evaluation of these interventions will be watched with some interest.

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