

A Child Friendly Focus for Transport Reform: children's travel freedoms and urban form.

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Abstract:

This paper demonstrates how a 'child friendly' transport focus has benefits for the wider environment and the whole urban community. It explores levels of children's independent mobility (their freedom to explore their own neighbourhood and city without adult supervision) in cities in Australia, New Zealand, England and Germany. Trends towards the reduction of children's independent travel freedoms are noted, even over the last generation. International differences as well as local differences are also evident. The paper develops the argument that urban transport and land use systems that require car dependent access for children, have a range of negative economic, social and environmental implications. The design of more child friendly urban environments, which could facilitate higher levels of children's independent mobility, would be associated with: considerable savings in the economic resource cost of transporting children; reductions in the environmental costs associated with pollution and energy use from cars; and the encouragement of a social environment with more meaningful local communities. An important part of the argument is the link between the levels of traffic and the way in which streets are used by the local community for walking, cycling, social interaction and playing (all of which are important activities for children). When residential streets are seen simply as corridors of movement for the car, they become deserted places, where parents' fears of assault and molestation of their children are increased. The paper also explores ways in which children's independent mobility may be enhanced.

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1. INTRODUCTION

Urban transport and land use systems and policies in Australia have long been emphasising economic aspects at the expense of environmental and social aspects. Policies which encourage increased car use in urban areas, increasing commuting distances and increasing journey lengths to shops and other services, are often justified on the basis of their role in enhancing economic growth. Undoubtedly, road building promotes the growth of the construction industry, the car manufacturing industry and the myriad of other businesses associated with private motor vehicles. The development of capitalism in Australia seems to be inextricably linked with road transport, and with mass car usage in particular. The low density urban form which is facilitated by such transport systems is very effective at promoting consumption (Eliot-Hurst, 1981). Not only do low density suburbs necessitate heavy consumption of fuel for cars, but they also encourage greater spending on a range of household items (e.g. carpets, lawn mowers, garages). Thus there is substantial support for the argument that our current transport systems assist economic growth, at least in terms of their boost to the domestic trade.

The ways in which such systems may affect the environment and the community in negative ways have been widely researched and well documented (e.g. Whitelegg, 1993; Tolley, 1990; Engwicht, 1992; CART, 1989; Davis, 1989; Allan, 1993; and Roberts and Norton, 1993). However, by taking a focus which makes explicit reference to the impact of transport policies on children, it is possible to gain a whole new appreciation of the trade-offs between economic, environmental and social aspects of urban transport and land use systems. By focusing on children (e.g. primary school children), we can see how children benefit from mass car usage, but also how they are disadvantaged by urban transport and land use systems which are predominantly concerned with meeting the apparently insatiable demands of the car. Then, by exploring the complex interaction between the effects on children themselves, and the effects on their parents, the wider environment and the whole community, an even greater insight can be gained into the trade-offs. By taking a holistic approach, which incorporates an understanding of the feedback implications of transport policies (over the long term as well as the short term), it is possible to envisage a transport system which is not only child friendly, but which has benefits for the whole community.

This paper focuses on the issue of the independent mobility of primary school children (i.e. their freedom to travel around their own neighbourhood or city without adult supervision). It refers to data from Australia, New Zealand, England and Germany. It explores the way in which children's independent access to their own neighbourhoods has been changing, and how this might be related to the level of traffic (both directly and indirectly). Differences in children's independent mobility even within an urban area are related to parents' perceptions of the levels of danger their children are exposed to on the streets. International differences in children's independent mobility point to some possible strategies for guidelines for the creation of more child friendly urban transport and land use systems.

It is shown that urban transport and land use systems in Australia are encouraging a high level of car dependency, not only for adults, but for children as well. Primary school children are becoming more dependent on cars (and hence on their parents) to get to school, sport, recreation and entertainment, and even to their friends' homes. The negative implications of this (including economic, social and environmental) are outlined. The paper concludes with some suggestions as to the type of changes in urban transport and land use systems that would enhance the levels of independent mobility for children, while at the same time producing harmonious improvements in the economic, environmental and social well being of our cities

2. DATA ON CHILDREN'S INDEPENDENT MOBILITY

Three sources of data on children's independent mobility are referred to in this paper:

- 1 a study conducted in five areas in England in 1971 (see Hillman *et al.*, 1990). (The five areas included: Islington (a London Borough), suburban Nottingham, Stevenage (a post-war new town), Winchester, and rural Oxfordshire.)
- 2 a study conducted in the same five areas and also in similar areas in West Germany (Koln, Bochum, Chorweiler New Town, Langenfeld/Schwelm and Witten) in 1990 (Hillman *et al.*, 1990); and
- 3 research conducted recently in Australia and New Zealand (e.g. Tranter, 1993a, 1993b; Tranter and Whitelegg, 1994 (forthcoming)). The cities investigated in this research were: Sydney, Canberra and Christchurch. A total of 21 schools were involved in surveys for these cities. These are not claimed to be representative of all Australasian cities, yet the data from these cities can provide important insights, especially in relation to changes in children's independent mobility

The way in which independent mobility was examined in each of these studies was by examining a number of 'licences' which parents give their children. For example, parents give their children a licence to:

- cross main roads alone;
- come home from school alone;
- go to places other than school alone;
- go out after dark;
- cycle on main roads; and
- travel on buses alone.

The age at which children are given these licences, and the percentage of children in certain groups who have them, are indicators of the independent mobility of children in different areas.

In each of the studies mentioned above, the research methodology was based on two questionnaires, one for the parents of children at the schools, and the other for the children at the school. The English and German studies included children aged from 7 to 15 years, while the surveys in the Australasian schools concentrated on children aged 9 to 12 years. The children's questionnaire consisted of simple factual questions concerning how children travelled to and from school, and the level of accompaniment for their day to day travel activities. This was completed in class, and collected by the teachers.

Each child at the school was also given a questionnaire for one of their parents to complete. The parents' questionnaire asked about the level of freedom children were given, as well as the reasons for deciding the age at which children were given various freedoms (for example to travel to school alone). There were some questions about the level of parent involvement in transporting or escorting their children to school or to other locations. There were also questions about the parents' own school aged travel and freedom, as well as background questions on variables such as age, sex, level of education, occupation and car ownership. The questionnaires for the surveys in Canberra, Sydney and Christchurch also included questions on attitudes to some possibilities for improving children's road safety.

Indicators of changes in levels of children's independent mobility

The loss of opportunity for children to independently explore their local neighbourhoods has been asserted and documented in a number of studies overseas (e.g. Lynch 1977; Hart 1986; Hillman *et al.* 1990; and Gaster 1991). Gaster for example, who investigated a New York neighbourhood, found substantial changes between the 1930s and the 1960s in terms of: the age at which children are first allowed outdoors without supervision; the number of neighbourhood sites visited; and parent imposed restrictions on their mobility. The reasons for the changes were related to an increased level of hazards such as vehicular traffic as well as the loss of local play spaces such as vacant blocks. There is also considerable anecdotal evidence that the levels of independent mobility for children in Australia have been decreasing over this century (Engwicht, 1992).

One indicator of the degree to which children's independent mobility had changed since parents were at school was provided by the responses to the question: "Do you think you had more or fewer opportunities for going out on your own compared with your child today?" The results for this question provided an indication that today's children have fewer opportunities for independent travel. When data for the Australasian cities was averaged, 67% of parents believed that they had more or far more opportunities than their children (see Figure 1).

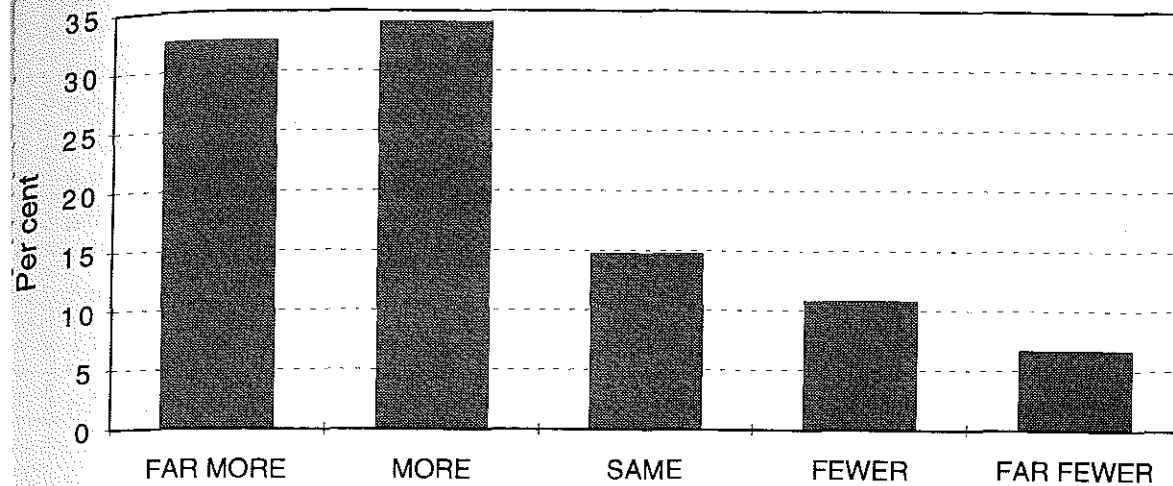


Figure 1 Parents' opportunities for going out on their own (when they were children) compared with their own children today (average ratings for Sydney, Christchurch and Canberra data)

These data suggest a significant decline in the level of children's freedom, even over the last generation, in three cities in Australasia. However, such data are only indicative of likely changes in independent mobility. They may be affected by distorted memories of childhood experiences. A more reliable indicator of such changes can be provided using data from England, which does not rely on parents' memories and perceptions. Primary school children in 1990 were asked the same questions that had been asked of children in the same schools in 1971 (Hillman *et al.* 1990). An example of the extent of the changes in children's freedom is provided in Figure 2, which shows the percentage of English school children who went to school unaccompanied in 1971 and 1990, for each age level. The reduction in children's freedom in this 19 year period is dramatic, for every age group. For example, in 1971, 88% of nine year old children went to school unaccompanied, but only 27% were unaccompanied in 1990. The reduction in children's freedom as indicated by this licence was typical of the reductions indicated by other licences.

Thus there is cogent evidence to support the anecdotal evidence that the levels of independent mobility for children have been decreasing, even over the last generation. The reasons for this reduction are complex, but the increase in the levels of motorised traffic are likely to be at least an important part of the explanation. Apart from the risk to children from traffic danger, another major concern for parents is the risk of assault and molestation. Yet there may be an important link between traffic and fears of assault and molestation in residential streets. As traffic levels increase, more and more people (adults as well as children) cease to use the streets as pedestrians. This is partly a response to traffic danger, but also a response to the loss of local shops and services, and hence the reliance of more people on the motor vehicle for access to such services as shops, schools and even play grounds. Eventually, residential streets are perceived as being deserted, lonely and hence dangerous places for children, in terms of the fear of assault and molestation. There are few adults around to provide surveillance and support for children. In particular, there are few adults who know their neighbours children and can

look out for them. In contrast, if traffic levels are low enough to allow streets to be used for walking, cycling, social interaction and playing (all of which are important activities for children) then streets become reinvigorated with supportive community life.

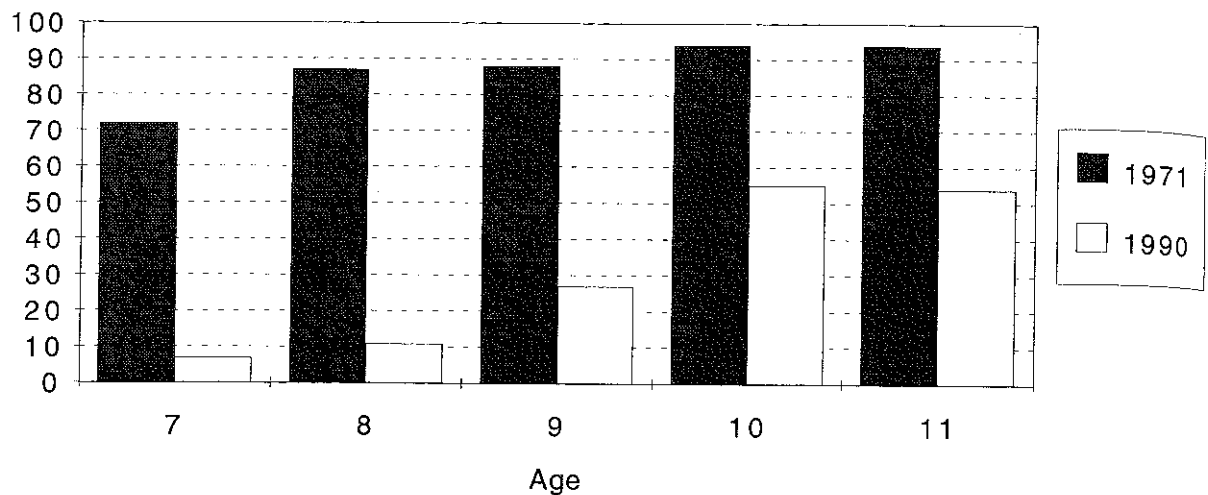


Figure 2 Percentage of English school children who went to school unaccompanied in 1971 and 1990
(Source: Hillman *et al.*, 1990, p45)

As Hillman and Adams (1992, p20) explain:

"The rise in the volume of traffic and its accompanying noise pollution, danger and unpleasantness have contributed to a feeling of insecurity owing to the continuing retreat of street life and, at the same time, to a rise in the proportion of people outside the home who are strangers".

Thus the increasing use of the car contributes to a more privatised lifestyle, where residents lock themselves away in the private spaces of their own homes and backyards, and avoid the more public spaces of the street. Consequently, the strength of local neighbourhood based community is reduced. This has serious implications for children, especially as traffic levels are forecast to continue increasing (e.g. by 142% for the year 2025 in Britain (Hillman and Adams, 1992)).

Variations in the levels of children's independent mobility within urban areas: the importance of parents' perceptions of the levels of danger

To determine the relative impact of various factors on children's independent mobility within an urban area, a number of logistic regression analyses were conducted for the Canberra data set. Logistic regression modelling allowed the estimation of the relative effect of a number of independent variables (e.g. age of child, sex of child, location of

school, parents perception of safety in their suburb), on each dependent variable (e.g. the licence to travel to school alone, the licence to cross main roads alone, the licence to travel to places other than school alone). In other words it enabled the identification of the factors which were most significant in determining children's independent mobility. Details of these logistic regression analyses, including tables of regression coefficients and odds ratios, and examples of estimated probabilities can be found in Tranter (1993b).

The independent variables which were included in the logistic regression analyses included:

- the school location, whether it was in an inner or an outer area;
- the type of school (whether Catholic or government);
- the age and sex of the child;
- the distance from the school;
- the age and sex of the parent completing the survey;
- various socio-economic indicators such as:
 - parents' education,
 - whether both parents worked full time,
 - length of residence,
 - housing tenure (owning or renting); and
- parents perception of levels of danger in the local environment

From this list of independent variables, the variables which were repeatedly (for different licences) shown to be related to levels of children's freedom were:

- gender (boys had more freedom than girls);
- age of children;
- type of school (Catholic school children had consistently much lower levels of freedom than children in government schools);
- location of schools (schools in the established neighbourhood areas tended to provide more freedom for children; thus different suburban designs appeared to have a significant influence on children's freedom); and
- parents perceptions of levels of danger.

Parental perceptions of levels of traffic danger seemed to have a more pronounced effect than variables such as distance from school, sex of the child, and indicators of socio-economic status. This suggests that parents are compensating for the perceived increases in danger their children are exposed to, by reducing the levels of independent mobility. If they see their local area as being unsafe, then they reduce their children's freedom, sometimes quite dramatically.

This is illustrated in Table 1 which shows the relationship between parents' perception of children's safety in their suburb, and the freedom given to children to travel to places other than school alone. The parents' perception of safety is indicated here by their level of agreement with the statement: "The streets in the suburb I live in are well designed for children's safety".

Table 1 Percentage of children allowed to travel to places other than school alone, according to parents' level of agreement with the statement: "The streets in the suburb I live in are well designed for children's safety".

Level of agreement	Percentage
Strongly agree	52
Agree	31
Uncertain	25
Disagree	22
Strongly disagree	13

It is of course possible to identify the importance of traffic levels and traffic danger in restricting children's independent mobility without having to conduct a logistic regression analysis. For example, in the Sutherland area of Sydney, schools in two contrasting areas in terms of traffic levels produced very different data in terms of children's travel freedoms. Schools in Miranda and Miranda North had high levels of through traffic (including some heavy vehicles) with six lane roads running past the schools. Schools in Menai and Illawong (more isolated outer suburbs) had significantly lower levels of traffic, mainly because of the lack of through traffic in the area. Table 2 illustrates the considerably higher levels of freedom for the low traffic environments, for a range of licences of children's independent mobility. The difference in the perception of traffic danger in the two areas is evident in the second row of the table, which shows the percentage of parents stating traffic danger as the main reason for not allowing their children to visit places other than school alone. Even the children seem to be aware of the increased dangers involved in the Miranda/Miranda North areas. When children with cycles who were not allowed to cycle on main roads were asked whether they would like to be allowed to, there was a greater level of acceptance of the restriction on mobility by children in the high traffic areas (see Table 2). For each "licence" depicted, there are considerable differences between schools in the two areas. The magnitude of these differences could well have been larger if there had been a greater contrast between the traffic levels in the areas investigated.

Table 2 Licences of independent mobility in two contrasting areas in the Sutherland area of Sydney, for children aged 9 to 12 years.

Traffic conditions	MENAI/ ILLAWONG	MIRANDA/ MIRANDA NORTH
	Low traffic levels, apart from near some local shops, mainly local traffic	High traffic levels throughout suburb, some heavy vehicles, through traffic
% parents stating traffic as main reason for not allowing child to visit places other than school alone	23.8	50.7
% children allowed to visit places other than school alone	40.4	18.0
% children taken to school by an adult	50.7	72.8
% children with cycles allowed to ride on main roads	28.7	19.8
% children not allowed to ride on main roads who would like to	40.8	29.3
% children allowed to catch buses alone	25.2	11.4
% children allowed to play in the street in front of their house	74.2	46.9

The extent of independent mobility for children in Australasia, compared with children in England and West Germany.

To provide an indicator of the level of independent mobility for children in Australasia, compared with children in Germany and England, the data for schools surveyed in Sydney, Canberra and Christchurch were combined. It is clearly not claimed that such data can be seen as representative of all areas within Australia and New Zealand. Indeed, personal observation suggests that other cities (or parts of other cities) may have much lower levels

of children's freedom. (Thus the differences between the Australasian schools and the German schools to be outlined below, may well be understated)

For almost every licence investigated the children in the German schools were given significantly more freedom than the children in schools in England or in Australasia. (The exception to this was that more children in the Australasian schools cycled than in the German or English schools. This was due mainly to the very high level of cycle usage in Christchurch) For the licences to come home from school alone, go to places other than school alone, cross roads alone, use buses alone or go out after dark alone, the German children seemed to have a great deal more freedom.

Figure 3 provides an illustration of the much higher level of freedom allowed children in the German schools, for the licence of being allowed to come home from school alone. While there is little difference between the averages for the English schools and the Australasian schools, the averages for the German schools are clearly much higher.

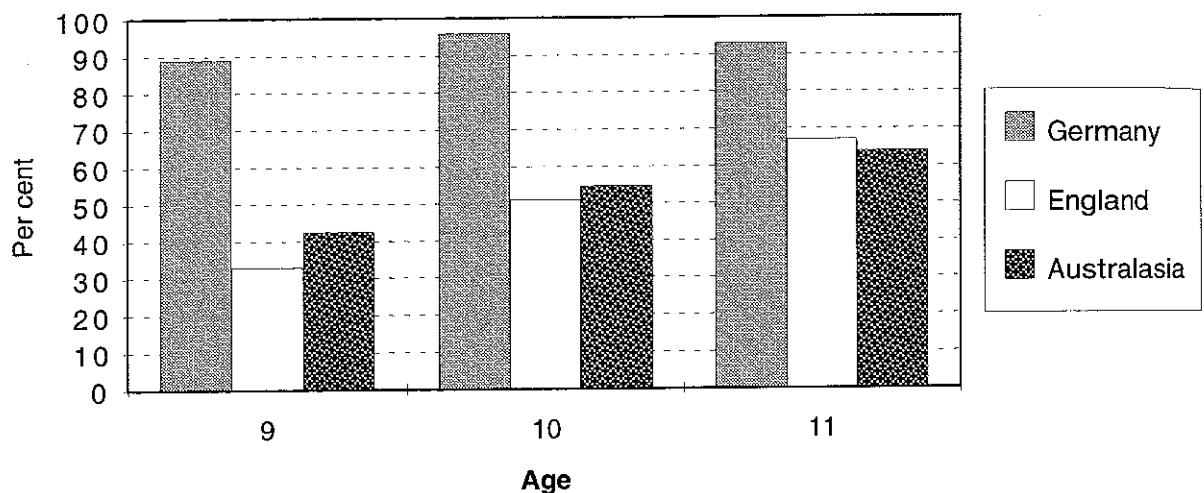


Figure 3 Licence to come home from school alone (German, English and Australasian averages)

(Source: Hillman *et al.*, 1990, p131)

There were also some interesting differences between the samples from the three areas in terms of gender differences for the various licences. For the schools surveyed in Australasia and England, boys were given much more freedom than girls for most types of independent mobility. However, in Germany, there was little difference in the levels of freedom enjoyed by girls and boys, apart from cycling and going out after dark, where the German boys had more freedom (Hillman *et al.* 1990, p70)

The findings from the research on children's independent mobility discussed above can be summarised as follows:

- there is convincing evidence that the levels of children's independent mobility has been reducing significantly, even over the last generation;
- there is considerable variation within urban areas, and this is strongly related to parents' perception of the levels of danger in the local streets;
- not all countries have experienced the same levels of decline in children's freedoms. Children in the German schools surveyed still had very high levels of freedom.

The significance of these findings for this paper are as follows. It appears that factors are operating in Australasian cities to force primary school children into a high level of car dependent travel. An important part of the reason for this appears to be related to changes in the levels of traffic, and hence traffic danger and associated problems. The fact that children in the German schools surveyed had high levels of freedom, suggests that there may be some important factors which can be identified if planners (or the general community) decide to try to improve the levels of children's independent mobility in Australian cities.

At this stage in the paper it is important to reflect on the question: is it of any real consequence that children now have less freedom to travel independently around their own neighbourhood or city than they did a generation ago? After all, most children have access to a car, and they can travel to more (and more distant) locations than they could otherwise. Children may enjoy being taken by their parents, especially by car, and at least it means that parents are spending some time with their children. Also, today's children generally have better access to other resources than children in previous generations (e.g. computers and videos). However, children's independent mobility may be of considerable value, not only for the children themselves, but also for their parents, the wider environment, and for the whole community. In other words, there may be considerable social, economic, or environmental significance attached to this loss of independent travel for children.

The following section will outline the way in which the apparent benefits of increased car ownership and dependence in urban areas need to be seen in the context of the disadvantages associated with this car dependence and hence the reduction of the independent mobility of children.

3. THE VALUE OF CHILDREN'S INDEPENDENT MOBILITY.

Children's independent mobility may be important for a number of reasons. It may be of value for the children themselves, for their parents, for the wider environment and for the community at large. Indeed the entire city may suffer from denying children the freedom to explore their own neighbourhood.

Children

The importance of independent mobility for children's personal, intellectual and psychological development, and for allowing them to get to know their own neighbourhood and community, has been widely recognised (van Vliet, 1983; Kegerreis,

1993; Moore, 1986, p236, p239; Elliot, 1985, p149) Kegerreis (1993) for example, provides a child psychotherapist's perspective of the importance of this independent mobility. She presents a case study of how a child who is allowed to walk to school by himself has a number of experiences which are important for his personal and intellectual development. Kegerreis (1993, p30, p32) argues:

"If Ben were always escorted, he simply would not have to take responsibility for himself in this way, and would not learn how to act responsibly. He could not internalise adequately, no one can, if never left alone to process the experience himself. In addition his self-esteem has been enhanced by the gradual granting of more responsibility."

"A child on his own has to be making choices all the time, encountering aspects of himself he could avoid if always escorted."

"He also sees much more of the adult world, and learns about a wider range of other people and their behaviour."

The development in children of a sense of their own neighbourhood and community, depends on "active exploration", which is not provided for when children are passengers in cars. Such children may "see more", but they "learn less" (Nicholson-Lord, 1987, pp195-196). As Lynch (1977, p58) suggests, children should be "able to use the diverse city as a learning ground".

The importance of independent mobility for children is expressed very powerfully by Engwicht (1992, p39):

"... freedom to explore the local neighbourhood ... gives [children] an opportunity to develop a relationship with the placeness of their physical environment. Robbing children of a sense of place robs them of the very essence of life".

Another consideration is that if children are constantly driven to school and to other places, they lose one regular way of maintaining their physical fitness. The effect of this lack of fitness on self esteem and obesity has been noted by a Sydney paediatrician, Dr Simon Clarke:

"... their parents bring them to see me because they are overweight and have self esteem problems. Of course they are overweight. They are all ferried about by car to organised sport and organised music" (Donaghy, 1994, p15)

Finally, not only is it important that children be able to get to local play areas by themselves, but walking or cycling journeys to school and to other destinations provide genuine play activities in themselves (de Monchaux, 1981, pp97 - 99).

Parents

Parents may also benefit if children are given more freedom. There are two types of "costs" for parents associated with transporting their children to school and to other locations: "economic resource costs" and "opportunity costs". The economic resource cost of parents transporting children is higher than most people would expect. Recent research in the United Kingdom estimated that this cost in Britain, in 1990, was between £10b and £20b (approximately \$AUD400 to \$AUD800 per capita) (Hillman *et al.*, 1990).

Apart from these economic resource costs, there are the opportunity costs for parents. Other activities may be excluded because of commitments to transport or escort children (especially home from school). Sometimes this is simply an inconvenience. For example, if a mother is at home, with her baby asleep, she has to wake the baby up and put her in the car to drive to school to pick up her other child. However, at other times it may mean that a parent feels unable to take on employment.

The wider environment

The environment also suffers when children's independent mobility is replaced by "Mum's or Dad's taxi". There are traffic congestion, pollution and safety costs associated with the extra traffic involved in transporting children. As our roads become more dangerous, more parents drive their children, thus contributing to increased levels of danger for the remaining pedestrians. Parents driving children to school can account for 10% to 20% of vehicles in the morning peak (Hillman *et al.*, 1990). Reducing or eliminating this component will provide more 'relief' than most new roads. Anyone who has experienced either the reduced volume of traffic in peak hour during school holidays, or the traffic jams near schools at the end of a school day will not need convincing about these points. Thus, there are also important environmental implications of children's loss of freedom.

The community

There may also be community benefits in creating residential environments which allow children more independent mobility. If more children use the streets as pedestrians, this may help to generate a stronger local community. The presence of children is an effective way of breaking down the natural reserve between adults. Streets become more interesting, more livable, more communal places (Vreugdenhil, 1976, p1). This can be self-reinforcing: if more pedestrians use the streets, this in itself creates a situation which is far more conducive to independent travel. As Young (1980, p93) discovered, "the busier the street [with pedestrians] the more appealing to children."

Thus independent mobility may be of value for children, for parents and for the environment and community. Also, if we create an environment in which it is safer for children to travel around, then this provides parents with more choice. At present, many parents feel that they have little choice; they must drive or accompany their children to school because the journey to school is perceived as being too dangerous.

The data discussed above suggest that trends in levels of independent mobility have been consistently downwards till now. If these trends continue, primary school children will be even more restricted, and their parents will be increasingly pressured to drive or accompany them wherever they go. This could create a situation of increasing inequity in exposure to

danger. Those children whose parents have cars are driven more and more, thus exposing the remaining children to ever increasing danger.

4. A CHILD FRIENDLY FOCUS FOR TRANSPORT REFORM?

An important goal of transport planners has been to facilitate the mobility of the population, and hence its accessibility to the resources provided in the community. However, there has been a differential impact of transport planning on certain groups in the community. Transport systems in cities have been criticised as being overly oriented towards the needs of particular groups, especially adult male car users (e.g. Short, 1989). Children can be categorised with other disadvantaged groups (including people with disabilities, the elderly and women) which have not been the main beneficiaries of developments or improvements in transport. Children do not drive, they have particular problems coping with traffic, and as pedestrians they are particularly vulnerable to injury and death caused by cars. It is largely because of these problems, as well as fears of assault and molestation, that their parents place considerable restrictions on their independent travel. Although children can travel as car passengers, their "independent mobility" is usually reduced with every new road or increase in traffic. Indeed, increased mobility via the car, when a parent is acting as a 'conscript chauffeur', has helped to shift facilities to which children might otherwise have had greater proximity.

The issue of increasing children's independent mobility is a complex one, and one in which there is a danger of arguments based on crude environmental determinism. However, environments do exist where children still have very high levels of independent mobility. By identifying some features of these "child friendly" environments, it may be possible to identify the features which we need to change in Australian cities.

A child friendly focus for transport reform would ensure that children were not cut off from large sections of their city unless they are taken by an adult. It would ensure that children were freer to explore, in ever increasing circles as they matured, without constant threats of traffic danger. Children would also be protected from less obvious dangers such as lead poisoning and tropospheric ozone. It would provide environments where local communities were not destroyed by transport systems, and thus where children could experience neighbourhoods with a strong sense of community, and feel that they were an important part of that community. Perhaps it would also include the provision of a denser network of more localised services (including schools) so that children could walk or cycle to them more easily. Where such facilities have a more dense provision, independent trips are more likely. Finally, it would incorporate a safe, frequent and reliable public transport system, which facilitated use by both adults and children.

Many of these features are already features of German cities, where "the combination of better public transport, the provision of more local facilities, including schools, close to children's homes, and the large number of people about creates a situation which is far more conducive to independent travel" (Hillman *et al.*, 1990).

xpos A child friendly urban transport and land use system would be characterised by the reversal of the current dominance of motorists over pedestrians and cyclists (including children), at least in residential areas and areas where children congregate (e.g. near schools, swimming pools and shopping centres). This change can occur at a very local level, with local area "traffic calming", aimed at creating "environments of care" (Brindle, 1982) in many streets. Alternatively, it can occur at a city wide level, with any widespread policy which is aimed at the reduction of the dominance of the car, and an increase in the modal share of walking, cycling and public transport. Each of these modes are "child friendly", as children can travel by them without adult supervision, and even when adults use them, this does not greatly impair children's safety (and hence their freedom).

ent The key elements in the creation of a child friendly transport system thus seem to be localised traffic calming and the vigorous upgrading of public transport systems (especially light rail). It may also be necessary to increase the urban densities of Australian cities if the second of these elements is ever to be realised.

Probably the most immediate benefits for children are likely to come from a range of more local traffic calming measures. There is a variety of specific techniques which can be used to reduce and slow traffic, and to change the psychological feel of the street. These include changes in road surface, paved street tables, neck downs, speed humps and chicanes. These traffic calming approaches are distinctive in terms of their approach to both traffic management and road safety. They represent "a different philosophy of 'traffic management' in that they are not designed to get the best out of the street system for traffic ... but instead are designed to manage the traffic for the benefit of residents and the environment". Also, they challenge the conventional belief that the only way to protect pedestrians from motor vehicles is to separate them. Traffic calming strategies can allow the mixing of cars and people, "but under radically different assumptions about their relationship ... one of equality rather than one of car dominance" (Tolley 1990, p26).

Many communities in European cities are successfully challenging the view that streets are for cars. The dominance of cars over pedestrians has been reversed in many traffic calmed areas, particularly in the Dutch *Woonerven* and similar areas in Germany where cars must give way to pedestrians, and children are permitted by law to play on the streets (Schweig, 1990). Traffic calming techniques have been successful in a range of European countries, especially in the Netherlands and Germany. The Germans have experimented with a range of area-wide traffic restraint precincts (including a 120 ha. area in Berlin with 30,000 people). Traffic calming has worked in low density as well as high density areas. It also made the streets safer: study after study has shown that there are fewer deaths and injuries in traffic calmed areas (Engel and Thomsen, 1992; Faure and de Neuville, 1992; Whitelegg, 1988).

Traffic calming initiatives have had many complex interactive effects, leading to a sense that children have been able to 'recapture' the street, and more importantly, that they have been able to do this in safety. (It is not only children who use the streets. More adults also use the streets, thus providing better opportunities for the surveillance of children.)

Over the long term, traffic calming may help to develop a sense of local neighbourhood based fellowship, by facilitating recurring spontaneous exchanges between people which serve to build up a sense of community. This is more likely to occur in a situation where streets are used by the local community for walking, cycling, social interaction and for playing. In an even longer term perspective, traffic calming may encourage the provision of more local services, that people can walk or cycle to, rather than a smaller number of larger complexes that compel people to drive.

The above discussion has concentrated on localised traffic calming, where the main aim is to reduce traffic speed or deter traffic from specified areas. However, such localised traffic calming may not be enough in itself to make cities truly child friendly (Whitelegg, 1990). If traffic levels continue to grow, it is possible that there will still be large areas which are unsafe for children, with children confined to "traffic calmed ghettos". It is important to develop a city wide policy as well as a series of local ones, designed to reduce the overall reliance on and dominance of the motor vehicle.

The reason this second type of city wide traffic calming is so important has been outlined by Whitelegg (1990). He explains that even in Germany, where there are impressive area-wide traffic calming schemes (or *Verkehrsberuhigung*), the conditions for pedestrians outside these areas can still be very poor indeed, with "danger at a high level and physical problems of crossing roads and negotiating blocked pavements" (Whitelegg 1990, p85). He also explains the inconsistency in some German transport planning, where "the same authorities that are pursuing *Verkehrsberuhigung* are in many cases also pursuing the construction of additional car parking space and more road space" (85). Despite the clear benefits of widespread traffic calming, children and pedestrians as a group are still being disadvantaged. There is still a need for a fundamental shift from car based transport to more child-friendly modes, such as walking, cycling and light rail.

5. THE TRADE OFFS IN CHILD FRIENDLY TRANSPORT REFORM

It appears from the arguments presented in the above section that a child friendly focus for transport reform may be justified in terms of potential social, economic and environmental benefits. The social benefits would not be solely for the children, but could eventually provide a more livable environment for all city residents. The economic benefits could be measured in terms of considerable cost savings for parents, and ultimately for the whole community, which pays for road building and other costs associated with car travel (e.g. accidents). The environmental benefits would be shared by adults and children, and may include lower levels of pollution and energy use.

However, before we can justify a switch to an urban transport policy which had as an explicit focus the creation of a more child friendly city, it is important to explore some of the trade offs which may be involved in such a switch. It would be necessary to be confident for example that the "economic or social costs" of the creation of a child friendly land use and transport system did not outweigh the potential economic, social, environmental benefits.

In this section the focus will be on two aspects of a child friendly transport focus: traffic calming and a substantial upgrading of public transport. The main advantages of such a transport focus lie within the environmental and social aspects (especially in relation to children), but there are economic benefits as well.

It is useful to list some of the advantages and possible costs associated with a move to a more child friendly transport system.

ADVANTAGES OF A CHILD FRIENDLY TRANSPORT SYSTEM

Environmental

- Substantially reduced pollution levels (assuming that traffic calming and public transport are effective enough to reduce the total level of car usage)
- Substantially reduced energy usage on transport
- Reduced traffic noise, particularly in residential areas

Social

- Increased independent mobility for children
- Safer residential streets, allowing children to play on the streets
- More local play opportunities for children
- A fitter, healthier community, especially children
- Lower accident levels
- Stronger local neighbourhood-based community, and hence more support for children by neighbours who know local children
- In the long term, better provision of more local services, allowing people to walk or cycle, rather than drive
- Lower car dependency in general, hence more freedom for parents from chauffeuring

Economic

- Lower economic resource costs for parents transporting children
- Lower road accident costs
- Lower road building costs (for major roads)
- Lower road maintenance costs
- Increased viability of small businesses in local areas (e.g. corner stores)

COSTS OF A CHILD FRIENDLY TRANSPORT SYSTEM

Environmental

- Some localised pollution increases (only if traffic calming is not extensive enough, and simply forces more traffic onto some roads)

Social

- Increased travel time for those dependent on cars to drive out of local traffic calmed areas (This would be minimal if a clear hierarchy of streets was established, so that drivers would soon reach an arterial road)
- Reduced contact with children for some parents who spend a significant amount of time transporting them by car

- Disturbance for some drivers who see that their freedom to drive at high speeds through residential areas is reduced.

Economic

- Costs of streetscape changes (this need not be problem if retro-fitting of existing residential streets could be performed during periods when maintenance work was necessary on existing kerbing or road surfacing, thus reducing the costs)
- Increased costs for service providers (e.g. more local post offices would be needed)
- Initial costs of new public transport systems (e.g. light rail) (For light rail these would be negated over the long term, as operating costs for light rail are lower than for buses)

The above listing of possible costs and advantages of a child friendly transport system is clearly not exhaustive. It also does not adequately consider the complex feedback effects of changes in a system. For example, if light rail systems were introduced, this would be likely to increase residential densities, especially around the light rail stations, and this would in turn promote more walking and cycling, and a higher density of provision of a range of shops and services.

However, despite the limitations of the above exercise, it would appear that the advantages of a child friendly transport system, for all city inhabitants, outweigh the costs. The evidence presented here would at the very least warrant further consideration by transport planners and policy makers, in terms of decisions about local and city wide traffic calming, new road building, and the provision of more extensive public transport systems, all supported by a more dense provision of local shops and services (including schools, post offices and other community facilities).

6. CONCLUSION

Despite allowing our urban transport and land use systems to develop in ways which are arguably unfriendly to children, parents (as individuals) are very concerned for the well-being of their children. Evidence of this is the number of parents who now drive or accompany their children to school or to other locations which are within walking distance, so that they protect their children from traffic and other dangers. However, while this may reduce the dangers for individual children, at a societal level it simply compounds the problems. An immediate impact of the extra traffic on the roads is the increase in the danger to those children (or adults) who still walk or cycle. Also, in the longer term, the increased reliance on private motorised transport has the effect of reducing the use of public spaces such as streets, local parks, and bus and train stations.

It is possible that the reduction of the levels of freedom given to children to travel around their own neighbourhood or city, is simply the first stage (or perhaps a small aspect) of a trend toward extreme privatism and isolationism in our societies. The loss of children's travel freedoms is also something which has happened gradually, so that few parents are really aware of the extent to which their children (and themselves) are disadvantaged.

compared to children (and parents) a generation ago. If the perception of the level of danger in cities (from both traffic and assault and molestation) had changed within a year as much as it has over the last generation, there may well have been more public debate or outcry. Instead, we have accepted the perceived changes, and adapted our own behaviour accordingly. The issue of danger has been portrayed as the individual responsibility of parents by road traffic authorities, not as a community concern. We have retreated from our public spaces, including our streets, and we lock ourselves away in our private homes and private motor cars. Our adaptations support a move to a US style "fortress in the suburbs" lifestyle (Hillier and McManus, 1994).

A focus on children and their levels of independent mobility allows adults to appreciate more fully some of the disadvantages of modern cities. It is not just children who have suffered from the giving over of cities to the motor vehicle. Major parts of our cities have become less livable places for all city residents. There are fewer opportunities for accidental meetings between people, which serve to reinforce a sense of community (Newman *et al.*, 1992, p63). Parents have become trapped into providing transport for children because they can not go to places alone any more. Whole neighbourhoods have lost their meaning, as cities are redesigned to facilitate even longer shopping trips to isolated suburban shopping centres.

While this situation may benefit some "players" in the capitalist system (e.g. owners of large suburban shopping centres and car manufacturers) it has many disadvantages for the wider community. If enough people become aware of the way in which city residents are being disaffected by car dominated environments, then there may be some optimism about changing our transport systems. Through a new understanding of the issues, the general public may eventually provide the political counterweight to the road lobby that will be needed before any substantial changes in transport systems are likely to be implemented. However, lobbying by the general public does not happen spontaneously; there is a need for concerted efforts from committed interest groups.

A number of groups and organisations are currently aiming to enhance an understanding of the negative implications of car dominated environments, both for communities in general and for children in particular. Some of these groups are also engaging in lobbying activities on behalf of children. In Australia, these groups include Citizens Advocating Responsible Transport (CART), the Play Alliances in various Australian states, as well as the Australian Play Alliance, which is currently working on a project to "reclaim residential streets for children". Evidence that a new understanding of transport issues is developing among some groups can be found in Armidale (N.S.W.), where the majority of City Councillors are supporting a proposal for a universal speed limit of 40 km/h over the whole urban area, excluding expressways (Cunningham, pers. comm., 1994). If this proposal is effected, then it may provide an important "in action" model of what can be achieved to make urban transport systems more child friendly.

A child friendly focus for transport reform may provide harmonious results in terms of the economic, social and environmental aspects of our cities. If we implement local and city wide traffic calming, if we encourage the development of a vigorous public transport system, if we have more local activities, and encourage more people to use our streets as

pedestrians, then our cities would become less costly, less polluted and more sociable places for all city residents, not just our children. Yet it may be our concern for our *children's* welfare which convinces us that this is the way our cities should develop in the future.

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