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ENVIRONMENTAL PLANNING AND SUSTAINABLE TRANSPORT : DOES CYCLING MATTER?

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This paper examines some of the problems involved in developing local policies for sustainable transport. Municipal district planning in the Asia-Pacific region nowadays emphasises the concept of sustainable development. As an environmentally benign form of transportation, cycling promises a change in this direction; but can this be achieved and what role could strategic community planning have to play in the process? Drawing on a New Zealand case study, this paper argues that strategic district plans are necessary to achieve a long-term transformation towards more sustainable transportation. The measures necessary to achieve this aim involve projected changes in land-use patterns and provision for alternatives to the private car. To be effective, a strategic plan must identify these shifts as performance objectives.

INTRODUCTION

The 'Earth Summit' - UN Conference on Environment and Development (UNCED), June 1992 - focused world attention on the concept of sustainable development, and resulted in a number of international agreements. Among the outcomes of the Earth Summit was Agenda 21, a document which outlines a programme for environmental action for the 21st century (Grubb et al., 1993). The document has articulated sustainable development as dependent on social equity considerations and the integration of economic and ecological sustainability at local levels. Furthermore, Agenda 21 urges a decentralised, democratic approach to development *and environmental protection* (Shand, 1996).

Hamilton is a New Zealand city which has responded to the ideals and principles of Agenda 21 by incorporating Agenda 21 principles into its recently approved 20-year strategic plan. In addition it has been selected as the only New Zealand city to join the International Council for Local Environmental Initiatives (ICLEI) programme, a UN-sponsored programme that aims to develop models for sustainable development planning at local levels. Thus, politically, Hamilton is strongly committed to the principle of sustainable development.

Transportation systems are key components of sustainable development because of the extent to which modern transport systems depend on unsustainable use of resources, and their damage to natural and physical environments. Land transportation policies in New Zealand encourage the use of motor vehicles, which account for nearly 98% of all petrol consumption (Donnelly, 1995, p.5).

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This situation is reflected in most other industrialised countries in general. For example, the environmental problems caused by motor vehicle use in the UK and the European Union have become so severe that planning policies are increasingly turning away from provision for roads to alternative forms of transportation (Vigar, 1997; Southwood, 1997).

Motor vehicle transportation is the major cause of air and noise pollution in most countries, and a major cause of groundwater pollution in cities (and localised rural areas). Motor vehicles are also a major cause for the loss of productive agricultural land through urban spread, and account for a significant proportion of all accidental death and injury statistics world-wide (Banister, 1997).

Two different approaches tend to be involved in planning for more sustainable transport: those related to the 'mode' of transport (cars, buses, trains, bicycles, etc.); and those related to 'trip generating factors' or land use. Mode factors influence the design and provision of facilities and services which suit alternative forms of transport such as bicycles, buses, and pedestrians.

Land use refers to patterns of land use and urban form which tend to be correlated with lower rates of transportation energy use. They include higher urban densities, size of community (trips tend to be shorter in smaller communities), and 'quality of neighbourhoods' (people tend to travel less if their daily household needs can be met locally). Land-use planning can help to improve or decrease the efficiency of public transport modes such as buses. Low-density development, for example, makes the efficiency of bus transport more difficult, whereas urban concentration or ribbons or nodes of high-density development can help to make bus transport more efficient.

Measures to improve sustainability should involve both transport-mode and land-use factors. Land-use planning which can reduce the length or frequency of trips can help to reduce the impact of cars as much as measures to improve vehicle emission standards or road safety behaviour (Banister et al., 1997).

HAMILTON'S TRANSPORTATION

Hamilton is probably a typical New Zealand city in terms of its dependence on the private car. The key features of its transportation structure can be summarised as follows (Hamilton City Council, 1995):

- Nearly 70% of Hamilton's workforce drove to work by car. The city's streets and landform have been designed and developed with cars as the main transport mode. Close to 30% of the city's area is devoted to motor vehicles (parking and streets), and the private car has encouraged the spread of Hamilton northwards, towards Auckland.
- About 7% of Hamiltonians cycle to work, nearly twice the proportion of people who use public transport.
- Cycling accidents have risen by a fifth in the past eight years, despite an

almost equal decline in the number of cyclists. Children, especially those at intermediate school, form the largest proportion of cyclists, and are especially dependent on cycling as means of transport (at the same time as they are particularly vulnerable to cycling accidents).

- Cars pose the biggest threat to bicycle safety in Hamilton.

Hamilton's topography and urban form are generally well suited to bicycle travel. Much of the city falls within a 4- to 5-kilometre radius of the city centre, and two of the largest trip generators (the hospital and the university) are within or beside medium- and high-density residential areas. The development of Hamilton's urban form and its transportation infrastructure over the past 20 years has been to the detriment of bicycle and public transport. As in most other cities of Commonwealth countries, the development of roundabouts in Hamilton has brought a major reduction in the safety of bicycle travel as well as an increase in associated unpleasant environmental effects (noise and fumes). Measures to improve the existing street system in order to encourage cyclists have not succeeded in countering the danger posed by cars to cyclists.

Not everyone in Hamilton has access to cars. As in any other city, many school children and elderly and disabled citizens do not have access to a car. People who cannot legally drive or who are unable to drive are a significant proportion of the total Hamilton population. From the 1991 census, the proportion of people younger than 20 or older than 60 was 47% (Department of Statistics, 1991). Thus, even if some form of private, personalised vehicle continues as the main form of transport in the future, there will always be a significant minority of people in need of an alternative form of transport (O'Callahan, 1997).

Those who do not drive a car are doubly underprivileged; they suffer the lack of convenience afforded by a private car, and the inconvenience currently associated with most of the alternatives. David Engwicht (1992, p. 107) likens the noise and air pollution created by drivers of cars and trucks to the air pollution caused by tobacco smokers. He makes the point that the widespread change in smoking habits came when "a new concept took root in the collective mentality: people have a right not to be forced to breathe other people's smoke."

THE ROLE OF URBAN PLANNING

New Zealand local authorities face a number of different planning and reporting requirements that are legally independent of each other but, in principle, can be integrated in a way which makes them effective environmentally.

Sections 223C and 223E of the Local Government Act of 1974 impose an obligation on city and district councils to be accountable in their objectives and expenditure, and to report on long-term strategies in such a way that the public are able to assess the effectiveness of policies and expenditures on an annual basis. Annual plans set out the works and services that a city proposes to fund

for the year in question. This is followed by an annual report which must include audited financial statements for the year to which the report relates.

Section 122V of the Local Government Act requires councils to provide "sufficient information about the long-term financial strategy, funding policy, investment policy, and borrowing management policy as will enable an informed assessment of the extent to which the objectives and provisions of the strategy and policies have been met during the year to which the annual report relates." These provisions of the Act call for an annual planning document which can be used as a policy benchmark to assess the performance and reporting requirements of the Annual Plan. Another important planning instrument in New Zealand is the District Plan. The latter is an official document that governs the subdivision of land and other urban developments within cities over a period of ten years. The District Plan is a mandatory requirement of New Zealand's main environmental statute, the Resource Management Act of 1991. A District Plan, therefore, contains rules that have the force of a statutory regulation.

There are no statutory links between a district's Annual Plan, as mandated by the Local Government Act of 1974, and the District Plan, which is mandated by the Resource Management Act of 1991. However, an expectation has gradually developed in New Zealand planning circles to integrate a local council's functions, as articulated in its Annual Plan, with any projected urban development covered under the District Plan. Therefore, although 'strategic plans' (as these bridging blueprints have come to be known) are not required by statute, they are generally expected of local authorities as benchmarks for projected environmental activities.

Strategic plans, therefore, identify the overarching goals for both District Plans and Annual Plans. Strategic plans are particularly well suited to provide the long-term guidelines required for any development which needs to be staged in sequence, and for objectives which are cumulative or incremental in their environmental effect. In effect, strategic plans can provide the ideal means for the kind of integrated social, economic, and environmental development envisaged by the UN Conference on Environment and Development (UNCED), as denoted by Agenda 21.

Hamilton's Strategic Plan is, consequently, an important document for the long-term development and shape of the city, including its transportation system. The current plan contains a number of 'visions for a more sustainable city'. These are goals articulated by the public during a consultation process which took more than two years to complete. They form the basis for more detailed objectives and policies relating to particular aspects of the city (Hamilton City Council, 1997).

The hopes articulated by members of the public consulted in the Strategic Plan process generally reflect aspirations relating to the 'quality of life' in the city. These expectations indicated a desire for a safe, healthy, attractive, and sympathetic place to live. A key goal identified in relation to transportation was, 'good and efficient access throughout the city, including the roading network,

public transport, cycleways and walkways'. Specific goals also included 'a sustainable and balanced transport system for the city which meets the needs of all groups' and 'a city with excellent public transport and access for pedestrians and cyclists.' These goals acknowledge the importance of accessibility for quality of life, but they also appear to acknowledge a need to ensure good levels of access for everyone, including cyclists and pedestrians.

Hamilton's Strategic Plan estimates municipal expenditure over a 20-year period (from 1997 to 2017) to be in the region of NZ\$2,074,533,000. Of this amount, a sum of \$67,121,000 (32% of the total) is earmarked for transportation, with 30% tagged for streets and traffic-system development. A mere 1.3% of the budget total is to go towards footpaths and cycle-ways. In short, the budgetary provisions of the Strategic Plan do not offer significant support for non-automotive modes of transportation (Hamilton City Council, 1997).

SQUARING THE CIRCLE

There is a conflict in Hamilton's Strategic Plan between goals that call for a safe, healthy, clean, green, attractive city, and those which call for 'good and efficient access.' For most people, the most efficient access in personal terms is the private car. But private convenience is often at the cost of environment and public health and safety. It can be argued that buses and bicycles travel on streets and that street works benefit bicycles and buses as much as cars. Such an argument ignores the fact that the optimum road and street conditions for cars are not the same as those for buses or cycles.

To reconcile these goal conflicts, the transportation system will have to be carefully designed for different modes of transport. Unless these differences are acknowledged and incorporated within the planning system, cars will continue to predominate because the current design and form of Hamilton City favours cars.

In order to reconcile the conflicts between cars and alternative modes of transport, Hamilton's planners and policy makers may need to:

- redirect the form of urban growth, by resisting the development of Hamilton towards New Zealand's main urban centre, Auckland;
- encourage greater housing densities around significant work centres;
- encourage the development of local service centres within Hamilton's existing suburbs, to reduce the number of journeys from these suburbs to central service providers;
- pedestrianise many of the city's centrally located residential areas, malls and schools;
- make particular and special provision for schools, recognising that schools attract the highest proportion of cyclists, and that school-age cyclists also tend to be the most vulnerable to accident (as illustrated in Figure 1);

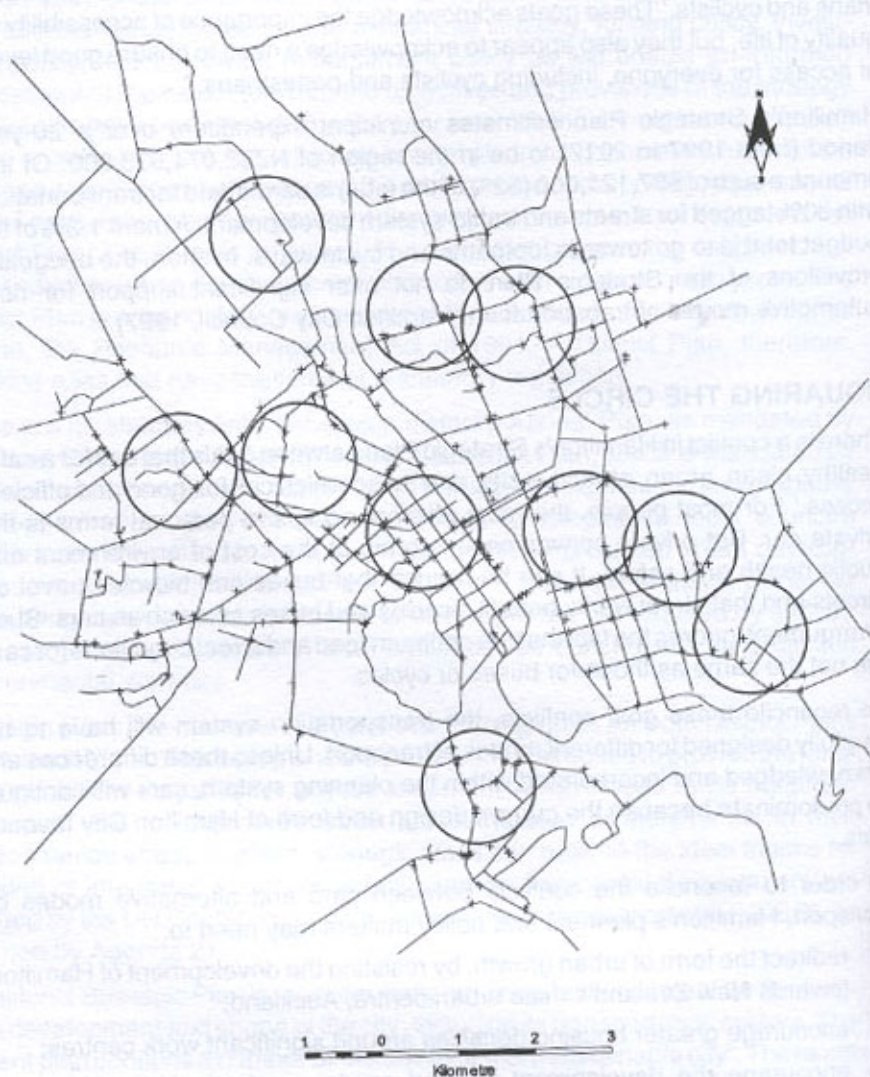


Figure 1: An outline of Hamilton City showing sites of reported cycling accidents for the period 1987-1996. + signs indicate accident sites; circles indicate school zones.

- develop better cycle connections between schools and their surrounding residential areas, to improve the safety of school children;
- for streets which must carry both cars and bicycles, improve the design, construction or marking of carriageways in a way that will make it safer for bicycles (Newman, 1997);
- include a system of arterial routes that is designed for bicycles, so that there is no or minimal mixing of cars and bicycles (Georgeson, 1997);
- reduce the availability of public car-parking, or increase the cost of car-parking within the city centre, and introduce metered car-parking at other centres;
- create multi-modal connecting points, where passengers can transfer from cars or bicycles to buses.

As argued earlier, shifts to more sustainable transportation systems necessarily involve changes in land use (and urban form) as well as changes in the levels of provision of different transportation modes. Because so much social, economic and physical infrastructure is invested in the transportation system of the private motor vehicle, it is not possible to make drastic changes overnight. Such changes will have to involve gradual implementation measures based on a range of instruments, including possible local taxation and environmental by-laws. In this context, the Strategic Plan may be the appropriate planning document available to local authorities who might wish to pursue the goal of a more sustainable transport system. A strategic plan can set out annual plan objectives and targets, as well as the guiding context for land-use policies and outcomes and performance conditions of the district plan.

In terms of the reporting requirements of the Local Government Act of 1974, goals for a more sustainable transportation system need to be articulated in terms that clearly indicate performance outcomes and reasons. Practical changes to, and impacts on, the existing street system and urban form need to be made clear, as well as the reasons for those changes. Members of the public need to know both how and why provisions for bicycles and buses are being proposed, as well as limitations to the use of the private car. Unless such goals and objectives for alternative modes are articulated clearly, budget provisions for roading, carriageways, parking, and so on, are likely to be interpreted as provision for cars as the dominant form of transport.

Equally, District Plans need to reflect objectives for more sustainable transportation, both in relation to urban form, and in relation to the physical provisions for buses, cycles and pedestrians, as well as cars. For example, in relation to Hamilton, continued urban spread in a northward direction will encourage cars and discourage bicycles unless a special effort is made to create connecting cycle routes between new residential areas and main centres of work. A more consolidated city, a city with multiple suburban centres, or a city with a safe 'arterial' cycle network can encourage cycling.

CONCLUSION

In conclusion, Hamilton is a typical Australasian city in terms of its transportation system. Because of its current social, economic and physical dependence on the private car, a shift towards alternative modes of transport must involve incremental, cumulative changes over a long period. While the Strategic Plan is a document that is ideally suited to provide the long-term guidelines and objectives for such a shift, it may be politically and legally ineffective unless goals and objectives are clearly articulated. Because the conditions required for safe cycling are different from those required for cars, the lack of specific performance objectives and targets to promote cycling (and discourage car use) may amount to a tacit support for the status quo.

The Local Government Act of 1974 calls for transparency in local government practices, and transport planners and policy makers need to ensure that any redirection of the transportation system towards sustainability should seek to discourage the car in parts of the city where pedestrians, cyclists or buses deserve to have priority, as well as provide safer, more attractive facilities for the alternative forms. In order to promote cycling, commuters need greater safety assurances before opting to cycle. Any such assurance will have to involve allocating greater funds to improve the conditions on the roads for cyclists and other non-car users. Assisting cyclists will require creating convenient and safe cycling routes, as well as organising means of parking and securing bikes at the ends of journeys.

As experience in other parts of the world has revealed, there is a need to take positive action if a community wishes to move to a position where cycling is seen as an integral part of an environmentally sustainable transport policy. Cycling ought to be placed more centrally in planning local transport strategies. The strategy will need to look at the advantages of setting local and national targets for increases in cycling. Such a strategy must consider what can be achieved over a specified period of time, in the context of strategic district planning.

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