Conservation, Heritage and Environment Standing Committee

Integrated Energy Resources and Environment Policy for the ACT.

ACTION submits the following statement relevant to part (d) of the above inquiry:

The environmental impact of energy use aspects of urban planning and transportation.

Introduction

If we accept the premise that persons need to move around a metropolitan area, public transport is an energy efficient means of moving people for the majority of trip purposes, such as to work and to school. ACTION believes that more can be achieved in the planning of Canberra to minimise travel and maximise the opportunities to develop an efficient public transport system thus reducing the total consumption of energy.

A. Why attempt to develop public transport?

Apart from providing a primary means of transport for all persons too young or too old to drive a car, ACTION offers a fuel efficient means of transport!

In its submission to the Joint Committee on the ACT - Inquiry into Energy 1980, the following facts were presented -

> "an articulated bus can move up to 106 persons using 4.5 litres of fuel on a 10km trip from Woden to City. This compares with 1.1 litres of fuel in an average four cylinder car carrying an average of 1.2 persons. The articulated bus is 21 times more fuel efficient than the private car for the journey from Woden to City. Standard size buses also consume 4.5 litres of fuel for an average 10km feeder journey carrying up to 60 passengers. Whilst not as fuel efficient as the articulated bus, the standard feeder bus is 12 times more efficient than a car in the use of fuel on the local suburban trip. The better passenger load capacity per vehicle of a bus when compared with a car places the former in the superior position when examining energy conservation."
> Joint Committee on the ACT - Inquiry into Energy 1980. Submission by DCT, p 10.

ACTION also offers a tangible means of minimising air pollution in the ACT. Concern has been expressed in the past about the level of air pollution in Canberra City. The former National Capital Development Commission has reported that,

"on a number of occasions in the past decade, intermittent monitoring of air quality in City has shown that carbon monoxide and ozone standards of the World Health organisation have been exceeded. Lead levels in City have been found by the Capital Territory Health Commission to exceed National Health and Medical Research Council standards." (Metropolitan Canberra NCDC p 120)

"Canberra has a high potential to accumulate air pollution because of the high percentage of calm periods of low wind speed and frequent temperature inversion. Whilst the decrease in growth rate of City may have indirectly assisted in controlling air pollution, a growth in the number of motor vehicles entering City in future years will undoubtedly exacerbate the problem." (Metropolitan Canberra NCDC p 119)

B. Alternative forms of public transport

As a function of its ongoing planning and development activity, ACTION has investigated, and is continuing to investigate, forms of transport using energy other than diesel fuel.

(i) Alternative Fuel Buses

Trials of LPG (Liquid Petroleum Gas) in six Adelaide buses have ceased and the State Transport Authority has deemed LPG to be an unsatisfactory alternative fuel for heavy buses.

ACTION is now monitoring closely the trials of CNG (Compressed Natural Gas) buses in Perth, Sydney and Brisbane. It would appear that there is a likelihood that CNG may be a viable long term alternative to diesel fuel for buses, especially as Australia has plentiful supplies of natural gas and dwindling reserves of the crude oil used for refining diesel fuel.

(ii) Trolley Buses

The trolley bus has several very desirable features which places it above other forms of street transport vehicles, features which are causing a renewed interest in this form of traction in many parts of the world. The trolley bus is extremely quiet and it has a swift, smooth acceleration with unexcelled hill climbing ability. Compared with the diesel bus the trolley bus is free from vibration and all exhaust fumes. Successful operators of trolley buses have acknowledged that the electric vehicle has a high degree of availability and reliability and has a comparatively low cost of maintenance. Like the tram it does not require refuelling and therefore can stay out on the road all day if necessary.

Trolley bus capital costs are high, both for vehicles and overhead wiring, although vehicle life easily exceeds that of a diesel bus. Whilst energy costs and vehicle maintenance cost of trolley buses are lower than those of diesel buses, the total costs of maintenance per kilometre for a trolley bus system would be approximately 30% higher than for a diesel bus system because of the maintenance requirements of the overhead lines and electrical system.

In general terms, trolley buses appear to be favoured as a means of transport in the following urban, institutional and political environments:

(a) in cities with steep hills eg Seattle, San Francisco, Wellington;

(b) in cities where governments wish to provide a degree of transport security for citizens (usually in countries with no indigenous liquid fuel supplies) eg cities and towns in Switzerland, Austria;

(c) in cities where governments are environmentally conscious and/or there has been a long history of management and citizen interest in electric transport eg Bergen (Norway), Dayton (Ohio USA), Grenoble and St Etienne (France).

Costs of installing overhead on the intertown route 333 could be of the order of $20-25m.

Because there are no overall labour economies in the operation of trolley buses compared with diesel buses, a massive increase in number of passengers travelling, or a threat to diesel fuel supplies, would be required to justify the extra cost of the electric vehicles.

(iii) Dual Mode Buses

These vehicles operate in a similar manner to trolley buses except they possess a power system to allow them to operate in areas away from the overhead power supply. The on-board power system can be provided by either batteries - which are re-charged from the overhead system - or by a diesel engine. Both types of vehicle have weight problems and capital cost penalties because of the duplication of power systems. Several manufacturers are conducting research projects in Europe aimed at perfecting an operational vehicle. Manufacturers are keeping ACTION informed of developments.

(iv) Light Rail

Costs of a rail line range according to the construction standards adopted, the degree of segregation from other traffic, the size and type of vehicle operated.

Track costs range from $2m per km for at-grade light rail (tram) upwards.

It is suggested that the population of Canberra may never reach a level which would justify construction of a heavy commuter rail line. However, if the passenger flow on intertown route 333 was estimated to reach 10,000-12,000 per hour (cf 1,500 per hour in 1989) the problems of operating a complete bus system with single line passenger volumes of this magnitude could be such that alternative modes such as light rail could be introduced. There are also considerable labour economies to be derived from replacing bus routes with light rail if passenger traffic reaches 10,000-12,000 persons per hour.

ACTION is following closely recent developments in North America where the widespread adoption of light rail has resulted in some cities reporting a significant reduction in private car commuting. Car drivers and passengers have switched to the more attractive light rail mode, expressed in terms of passenger satisfaction, thus further reducing the consumption of liquid fuels and lessening the production of air pollutants.

In summary, light rail does bear serious consideration for installation on the intertown route as a means of:

(a) reducing the net community cost of commuter transport in the event of a continued increase in city employment levels and numbers of persons commuting to City;

(b) providing a degree of security to the intertown public transport route in the event of disruption to liquid fuel supplies to the ACT; and

(c) reducing the production of air pollutants.

(v) Non Conventional Automatic Train Operation Systems

In 1976 an interdepartmental Task Force examined alternative transport systems for intertown public transport in Canberra.

The task force attempted to determine whether a suitable, reliable automated public transport system, capable of year-round 18 hour operation was available for installation.

> "On the basis of its own researches and the information supplied by manufacturers in reply to the survey, the task force came to the conclusion that it was not convinced as to the reliability of any such system at this time."

The 1980s has seen considerable progress in research and development in number of countries and there are now significant fully automatic electric rail lines operating in Lille, France (VAL), London, England (Docklands Light Rail) and Vancouver, British Columbia, (Skytrain). Other automatic lines are being considered.

Capital costs are extremely high but are offset against lower operating costs (no drivers).

(vi) Monorails

Much has been written about monorails but there are still very few monorails in the world.

The concept is not new - the Wuppertal Schwebebahn was built in 1901 although the line was re-equipped with new rolling stock a few years ago.

Since the 1960s a small number of monorails have been built, mainly to provide service in amusement parks, fairgrounds, to hotels and at airports. Notable exceptions have been Harbour Link Sydney and Kita Kyushu, Japan, the latter being a 8.4km urban line opened in 1985. An urban monorail is under construction on the Queensland Gold Coast for the TNT Group, operators of Sydney's Harbour Link.

Monorails comprise two basic types -

(i) where the cars straddle the track, as in Sydney, and
(ii) where the cars hang from a beam, as in Ofuna, Japan.

In general these operations comprise a single track in each direction or a single track loop. Most do not even incorporate a cross-over and each car operates up and down the same line. Point work is usually limited to the depot.

The reasons for this seemingly basic operation is the very complex and expensive pre-stressed concrete beam switching mechanism required for monorails compared with the equipment used on a conventional duo-rail system.

There has always been much discussion as to whether a monorail offers any advantages over light rail. The monorail has always appeared to be an unduly complex solution to a simple task of moving people. For example, a typical bogie of a monorail comprises 10 rubber tyred wheels : there are four vertical running wheels each driven by an electric motor (the equivalent of the four steel wheels on a light rail bogie) but there are also four horizontal guide wheels and two horizontal stabilising wheels. The two tracks, upon which the light rail vehicle runs, act as both "guide" and "stabiliser" thus eliminating the need for six wheels per bogie.

Monorails can be quieter than some light duo-rail vehicles because of the rubber tyres of the monorail and, because the electricity supply is incorporated in the guide beam, there is no need for any overhead wiring. Because of the bulkiness of the guide beam (usually up to 1.5m high) and the conduct of the electric supply through the beam, monorails are elevated.

Monorails are not recommended for Canberra because of the high capital costs. Other forms of electric transport can achieve similar goals at lower costs in the Canberra environment.

C. Land Use and Transportation Planning

A Transport Policy was formulated by the then Department of the Capital Territory, in harmony with the planning and development policies of the former National Capital Development Commission, and agreed to by those bodies in July 1974.

The policy is:

"In mutual support of broader social, environmental and economic goals, the objectives underlying Canberra's transport policy are fivefold:

1. to develop transport facilities which best serve the complex pattern of activities necessary to the well-being of the community.

2. to encourage the development and use of a high quality public transport system.

3. to provide for freight and essential private car movements at minimum cost to the community, and with minimum impact on the social and physical environment.

4. to promote public safety and amenity and the conservation of resources.

5. to ensure public understanding of, and support for, the transport policies developed."

The major elements of this policy, relating specifically to public transport, to be implemented within the framework of the Y Plan, are defined:

(a) "The early build-up of new employment centres adjacent to public transport terminals will continue so as to reduce progressively the need for excessive travel. More medium density housing will be constructed close to employment centres and along major public transport routes."

(b) "Local bus services will be improved through the provision of frequent, attractive and reliable services which minimise waiting and travel times for all users. Where appropriate, public transport will be given priority of movement over private transport on busy roads and at junctions."

(c) "An express intertown public transport system will be developed, operating on a reserved right-of-way as necessary. Its stations will cater for interchange with pedestrian feeder bus, taxi and park-and-ride traffic movements."

(d) "The unnecessary use of the private car for commuting purposes will be discouraged. Any shortfall in peak-hour road capacity or parking space will be offset by the provision of improved public transport facilities. The provision of car parking in the main centres will be maintained at the minimum necessary to protect the environment and promote public transport usage."

Although formulated 15 years ago the elements of the above Transport Policy relating to public transport are, in many respects, more relevant to the Canberra of 1989 than the Canberra of 1974.

Despite the existence of this policy, the relationship between land use (the development of housing and employment nodes) and public transport continues to be under stress.

In metropolitan terms, relatively little medium density housing has been constructed close to employment centres, and almost no medium density housing has been constructed along major public transport routes, interpreted as the intertown public transport route, as suggested in (a) above. Some medium density housing is under construction in Greenway, to the north of Tuggeranong Town Centre. However no consideration has been given to access to public transport and it would appear, at this stage, residents in this area will have to rely on private transport.

Despite the existence of the abovementioned Transport Policy there remains a tendency by planners to define and review the relationship of land use and transport in terms of access by the private motor car only. ACTION acknowledges that the private car is the primary means of transport in the Territory but the siting of some major institutions and the design of some roads has resulted in major difficulties for ACTION to provide any form of viable public transport. Location of employment modes and the design of the associated road network should be based on the needs of public transport, first and foremost. Private car transport, being the more flexible mode, can then be modified to suit the resultant plan. The existing arrangements force ACTION to do the best it can in a less than ideal environment. The entire suburb of Bruce is an example of very poor overall land use/transport planning, the implementation of part of an early plan mixed with some later modifications, resulting in a poor supply of public transport to most of the institutions in the area and no effective public transport to the residential component of the suburb. A key component of the original plan for Bruce, the intertown passenger transport (IPT) route, has now been omitted altogether creating an even greater void in the relationship between land use and provision of public transport.

As outlined in the opening paragraphs of this submission, public transport is a more fuel efficient means of moving large numbers of persons. In land use/transportation planning terms, the first element of the 1974 Transport Policy [(a) above] is an essential ingredient of a proposal which promotes, as one of its objectives, the conservation of resources.

If higher density housing is constructed along the path of the 333 intertown transport route, operation of that route by more energy-efficient electric vehicles may become a more viable proposition than if the public transport system was dependant for its patronage upon a settlement pattern based predominantly on low density housing.

ACTION recommends that as soon as the current review of the alignment of the intertown passenger transport route is completed, the Territory Planning Authority and the Office of Industry and Development jointly prepare a plan for high and medium density housing adjoining the town centres, stopping places and transfer stations on the intertown passenger transport route.

Such a development would reduce progressively the need for excessive travel and thus automatically lead to a reduction in the consumption of energy for transportation and a reduction in air pollutants.

ACTION
Planning and Development Branch

1 September 1989