

# Urban Roads. A Health Asset

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# 1 Introduction



## **Roads are often taken for granted.**

Roads are linear corridors between property boundaries. The space includes the footways and spaces for seats, traffic light poles and phones, grass verges, kerbs and ramps, gutters, surface for car parking, and movement of road users.

Roads and car parking areas, sealed surfaces, take up a lot of space and cost money to maintain.

Urban communities have an important, costly asset that could be used more effectively to encourage people to cycle and walk, particularly for short trips that do not need to be made by car.

Our aim for the RAPI workshop is to invite planners to contribute to achieving more livable, healthy and sustainable communities by modifying existing road space and planning particularly at the neighbourhood level for cycling and walking.

We set out the case for widening the choices for people in communities to use the road space safely and more sustainably, showing that there are healthier ways to use the roads, particularly the local roads. We also refer to the ways that the spheres of government are more gradually re-orienting their expectations about road use and planning to meet people's mobility needs

We show some examples in Australia, as well as an atypical example in Fiji.

We refer to some key mechanisms available to planners, especially in Councils, to promote cycling and invite planners to offer further ways and examples of progressing the greater use of roads as a health asset.

# 2 Roads as a Health Asset for Cycling

*Cars occupy around 16 square metres for travel. Car park allocation can be up to 27 square meters to allow for columns and manoeuvring.*

*By contrast bicycles take up no more than 2 square metres, a pedestrian 1 square metre.*

*One car parking space is equal to 6 bikes*

Cars occupy a huge amount of space in travel and in car parking. For travel they need, depending on size, around 16 square metres. Multi-deck car park allocation can be up to 27 square metres to allow for columns and manoeuvring. In terms of urban space cars and car parks can occupy 30%. This is very expensive space, which provides no aesthetic value and has a harsh impact on the environmental and urban quality we are seeking to achieve.

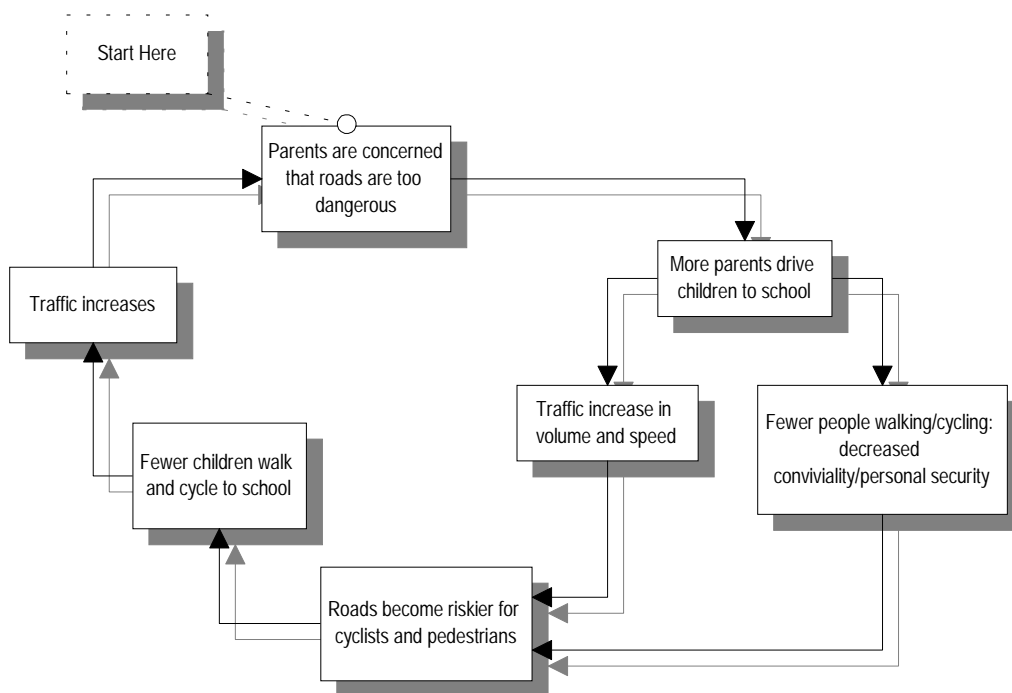
By contrast bicycles take up no more than 2 square metres, a pedestrian 1 square metre.

Cars are regularly used when they are not necessary. In some Council areas 40% of car trips are for less than 4km in distance. You can comfortably cycle this in 10 minutes and walk it in 30 minutes.

The problems of increased car dependency in urban areas simply are:

- alienation of compact centres and access by all to community facilities; and
- an increase in obesity and heart related disease due to the sedentary lifestyle of car dependency

Unfortunately the biggest growth of car trips is for protective 'chauffeuring' which is essentially school child drop off. The following illustration shows the vicious cycle of this trend toward increasing car use for school journeys.



**Figure 3: Impact of increased travel at the local level.**  
 (Source: Mason 2000, Based on Sustrans.)

*Walking or cycling when practised as part of everyday life, rather than programmed exercise at the gym, is more likely to be maintained. Physical inactivity is the second leading cause of years lost to life in Australia.*

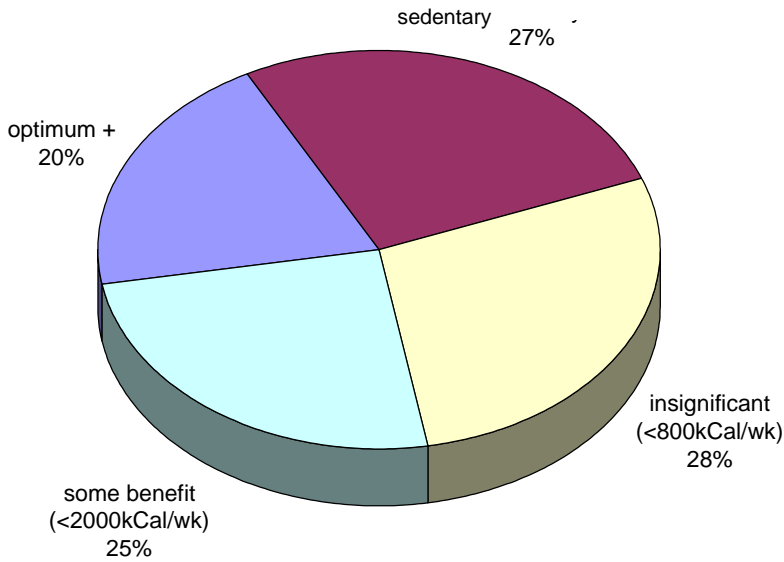
To protect health, every adult should accumulate 30 minutes or more of moderate-intensity, endurance-type physical activity - such as brisk walking or cycling - on most days of the week. It can be accumulated in 10 minute lengths - so, to the shop, the pool, the beach, the train or bus, etc.

Walking or cycling when practised as part of everyday life, rather than programmed exercise at the gym, is more likely to be maintained. Physical inactivity is the second leading cause of years lost to life in Australia (Mason 2000)

The health benefits of walking and cycling and in comparison to motor vehicle use have been well researched.

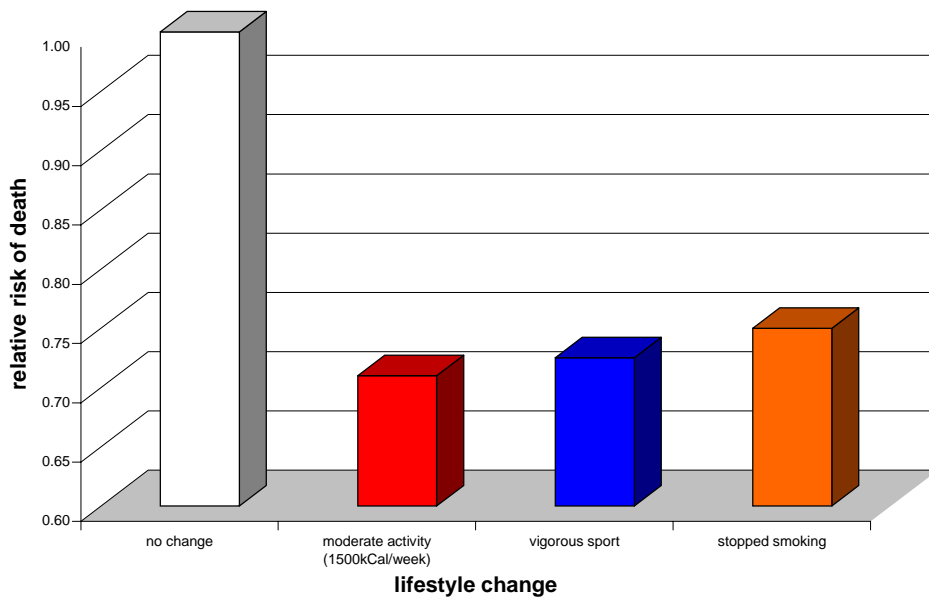
The Pedalling Health Study - Health Benefits of a Modal Transport Shift - (Roberts et al) demonstrated extensive evidence for the obvious health advantages of cycling and walking, over car use.

Figure 4 shows that 55% of the population is failing to do sufficient exercise to have any significant benefit. 80-85% of the population do not meet the basic criteria for optimum protection and fall into a high health risk groups (what is the health cost to the national budget?). Cycling and walking for transport provides a way to address this problem.



**Figure 4: Physical activity amongst Australians**  
*(Dasset 1992, contained in Roberts et al)*

Figure 5 shows the impact that a lifestyle change can have on health and longevity. The biggest impact occurs on the incidence of cardiovascular disease the earlier lifestyle change is adopted.



**Figure 5: Relative risk following changes in lifestyle**  
*(Daffenberger, Kampert et al 1994, contained in Roberts et al)*

Figure 6 demonstrates the fitness benefits of walking and cycling to work, or school, or the shops, by oxygen intake.



**Figure 6: Fitness benefits from walking and cycling to work - maximal oxygen uptake**  
(Vuori, Oja et al. 1994, contained in Roberts et al)

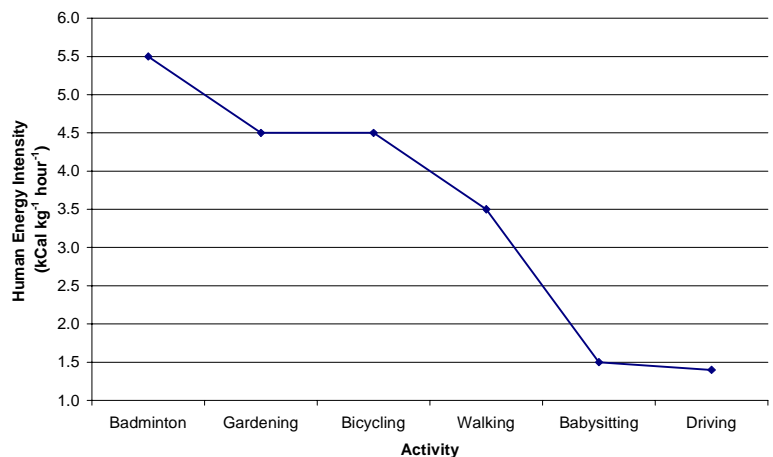
The relative contributions of car driving compared to other form of road use and some other activity is shown in Figure 7. Not surprisingly baby-sitting is more active than car driving.

### Human Energy Intensity

Activity	(kCal kg <sup>-1</sup> hour <sup>-1</sup> )
Badminton	5.5
Gardening	4.5
Bicycling	4.5
Walking	3.5
Babysitting	1.5
Driving	1.4

Source: (Caspersen et al. 1990, p1092 - contained in Roberts et al.)

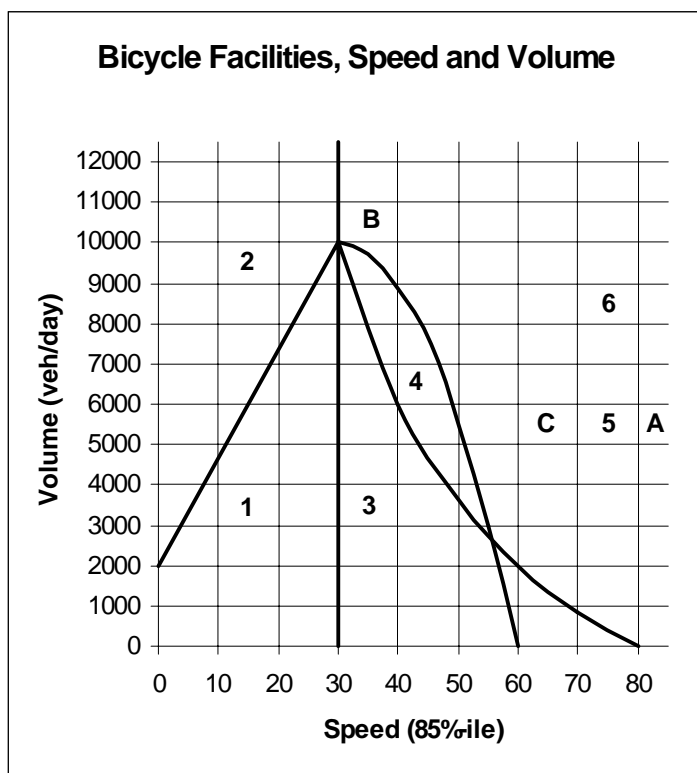
**Figure 7: Energy expenditure for various activities**



In regard to the negative views about the safety of mixing bicycling (and pedestrians) with motor vehicles, it needs to be understood that the accident rate dramatically declines with reduction in vehicle speeds and with effective vehicle segregation. Evidence shows that when considering the overall health risk, cycling / walking compare favourably to motor vehicle use.

Also cyclists in traffic suffer less exposure from exhaust emissions than car drivers due to their relative height and the position of vehicles' air intakes.

The decision on whether cycling paths should be on / off road can be helped by such analysis as that shown in Figure 8. This shows the amount of separation between cyclists and motor vehicles at various speed and volume combinations.



N.B.: The horizontal axis of the graph gives the actual speeds of motorised traffic and not the legally permitted speeds or the design speeds!

- Area 1 If the  $V_{85}$  (85 percentile-speed) of motorised traffic is lower than 30 km/h, a mixed profile is generally to be recommended. Cycle-lanes or cycle-tracks can possibly still be constructed for the sake of subjective safety or the continuity of the cycling-network. No cycle-tracks or cycle-lanes should be constructed within a 30 km/h-zone.
- Area 2 Combinations of very low speeds and very high volumes hardly ever occur. Pronouncements about cycling-situations in this area are therefore of no relevance.
- Area 3 In general, a road without cycle-lanes or cycle-tracks is acceptable.  
However, they may still be desirable, depending on other road and traffic features (RONA road-category VII and VIII, *design* speed 60 km/h; this is not equal to  $V_{85}$ ).
- Area 4 A cycle-lane or cycle-track is desirable.
- Area 5 A cycle-track is desirable, but motorised traffic volumes are so low that a road of mixed profile is acceptable. Cycle-lanes are not to be recommended.
- Area 6 At these high speeds and motorised traffic volumes, cycle-tracks are always necessary.

**Figure 8: Amount of Separation Between Cyclists and Motor-Vehicles With Various Speed-Volume Combinations**

Extract from CROW (1993). Sign Up For The Bike: design manual for a cycle-friendly infrastructure. CROW Record 10. Published by CROW, Centre for Research and Contract Standardisation in Civil and Traffic Engineering, The Netherlands. PP 80-82.

There has been recognition by all tiers of government of the need to promote a healthier use for our roads, for example:

- National Road Safety Action Plan
- National Cycling Strategy
- NSW Government's Action for Air - safe cycling target: "goal for a threefold increase in bicycle use statewide, and a 5% reduction in accidents by 2001" (p.29)
- DUAP's programs on compact urban form and promotion of sustainable access and mobility
- *Action for Transport 2010* recognises the needs of all road users, encourages walking, cycling and the use of public transport in reducing car dependency in cities.
- Department of Local Government's, Guidelines for Active Communities



# 3 Healthier and more sustainable ways of using roads: some examples

There are healthier ways to use roads, in particular for walking and cycling as well as for mass transit vehicles, which pollute far less per capita. Remember, roads are public easements to facilitate transport and movement, as well as to carry utility services. Cars are only one user group, albeit one that has become too dominant.

Research is also showing that:

- adults are more likely to resume cycling if as a child they cycled to school, rather than for mere recreation.
- improved cycling conditions results in increased levels of cycling.
- “chauffeur” other people is the purpose of trip showing the greatest growth in car use.
- Breaking the vicious cycle of increased reliance on cars for the school journey can be made.

Schools (and health services, and local recreational areas) are a priority for promoting healthy transport:

*e.g. the ‘walking bus’ (eg. in Leichhardt Council, funded by Sport and Recreation at Forest Lodge Primary School with the support of the local Health Promotion Unit, Central Sydney Area Health Service).*

Walking buses are often an element in a more comprehensive program at schools to reduce car traffic and encourage walking and cycling to school.

These comprehensive programs have been well developed by a British non-government/social profit organisation, Sustrans-  
[www.sustrans.org.uk](http://www.sustrans.org.uk).

The website has materials and newsletters, the latest one reporting that 90% of local authorities in England now have Safe Routes to Schools programs operating.

In Yorkshire, the Highways Agency has supported walking buses:  
<http://www.highways.gov.uk/news/translink/mayjune00/19.htm>



**Parents conduct new walking bus, by Sheila Perry COI Yorkshire and the Humber.**

*Youngsters and 'drivers and conductors' - made highly visible by their bright waistcoats - safely made their way across the Ring Road / Shadwell Lane junction.*

The UK Sustrans program recognises that the route needs to be surveyed, and in many cases modified physically to make it safe, and preferably pleasant for walking.

### **International**

Everybody is aware of the popular use of cycling and walking in European cities, typical examples are Amsterdam, Copenhagen, and Venice. In Denmark one out of 5 trips is made by bicycle.

Not so well known is the recent renaissance effects in the Irish cities of Galway and Dublin where city centre precincts have been re-designed for cyclists and pedestrians. Catalysts for this are recognition of the way such benign forms of transport achieve humane, interesting town centres and the transport demands of students & tourists (non-motorised). (*See European Platform on Mobility Management at [www.epommweb.org](http://www.epommweb.org)*)

Following is a recent local case study in Fiji of new approaches to the use of roads in urban sustainable design.

#### *Fiji Studio City - Yaqara (Pronounced Yang~gara)*

The Government of the Fiji Islands passed legislation in January 2001 to create financial incentives to allow Fiji to become a major international centre for audio-visual production and distribution companies. This legislation allowed for the establishment of a 'Studio City Zone' whose residents and businesses would benefit from taxation concessions.

For this 'Studio City Zone' a 2,000 hectare land parcel has been made available by the Government and native land owners on under utilised cattle and sugar cane land in the north of the main island of Viti Levu, in a relatively 'dry' area near Rakiraki some 90 minute drive from Nadi.

The site is north facing with at least 3 km of ocean frontage, undulating land rising to around 400 metres. It also contains natural spring water sources and hot springs.

The scope of the City currently is 15,000 tax free residential housing units; hotel, resort and associated leisure facilities; audio-visual business facilities including Film / TV / Music Studios, audio visual support backlot; IT / E-commerce / call centre office facilities; educational and university campuses; retail, social, health and civic functions. Brown & Root are the Project Managers and Engineers and Dickson Rothschild, Architects and Urban Designers.

The developers, Paradise Entertainment Limited, in consultation with the Government of Fiji indicated a desire to achieve the highest quality best practice performance in environmental design in developing Studio City. The design principles for the new masterplan, and stage 1 development plan were guided by ideas established in such model projects as the Environmental Guidelines for the Olympic Games and the Multi-Function Polis Feasibility Study. Principles were also incorporated from understanding design and movement in the traditional Fijian Village where 'roads' are dominated by pedestrians, and motor vehicles are kept away from living areas.

One of the fundamental lessons learned for the Studio City Project from these examples was that civic space was too valuable for human interaction and activity (whether social, intellectual, cultural and sporting) to be alienated by motor vehicle dominance.

The layout of the various components of Studio City and the principal movement corridors were designed to allow only for non-motorised access (pedestrians, cyclists, and people movers). Motor vehicles entering the zone are to be accommodated in interchange car parks - a 'valet' style service will jointly manage the transfer of heavy good and removal of solid waste. The trails will allow for rainfall infiltration and be aligned to take advantage of natural features and views. Reduced width service ways will provide secondary access for essential service vehicles to limited areas such as OB Vans and technical support to studios.

The policy of designing for energy efficient movement compliments other ecologically sustainable practices such as the desire to generate energy in the City for internal use, and to sell to the islands electricity grid from solar collectors, and potential geothermal and hydroelectric sources.

## **Australia**

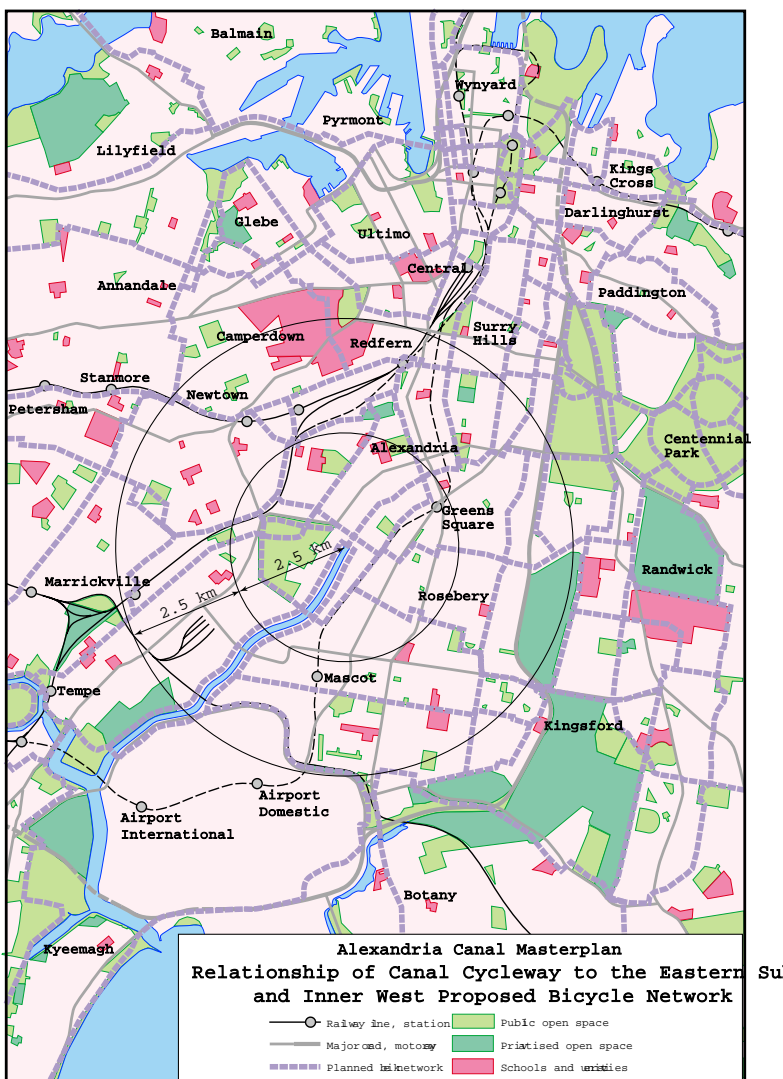
Around Australia there is an emerging trend of actively using roads for healthy transport modes. Canberra has provided for a long time a model for both on and off street bicycle networks - often ignored. Perth has instituted an extensive bicycle network along the river and coast & increased the rate of cycling threefold in one year. (*Grieg, Australian Cyclist December 2000*).



Yaqara 'Studio City' Fiji Preliminary Master Plan—April 2001

Planners in Sydney DUAP, the RTA and some Council's have been actively changing the use of road space and developing off road bicycle and pedestrian networks. Some examples include:

- Sydney Harbour Foreshores Access Program including Parramatta Foreshores
- with the proposed Cross City Tunnel allocating road space from Kings Cross to the City for a bikeway.
- the Alexandria Council draft Masterplan and cycleway. The attached figure shows the cycleway integration with local land-uses, transport arteries and the regional bicycle network.



In Regional NSW some Councils have actively co-operated with the RTA and gained grant money to develop bicycle infrastructure. Shoalhaven Council as one example has constructed a magnificent 5 km combination 'on and off road' path between Vincentia and Huskisson which for a considerable length is located between rear property boundaries and the Jervis Bay foreshore. This combined pedestrian path and cycleway is extensively used by school children, people on holiday and for visits to the shops and to see friends. It is extremely scenic with a good quality coloured pavement.

# 4 Some tools for Planners



Planners can now use a range of tools to develop & improve the bicycle and pedestrian infrastructure both on & off road.

Some of these are:

- The “Roads to Recovery” fund is available to Councils and can be used for cycleways. Some Council's have allocated the entire amount to their cycle network (eg. Gosnells Council, Perth, WA) and others a proportion such as 25% - 50% - [www.dotrs.gov.au](http://www.dotrs.gov.au). See the website for successful Councils. We encourage Councils to utilise these funds for cycleways.
- Councils need to prepare a Bike Plan that covers both the cycling network and cycling facilities
- DCP's and LEP's need to include model provisions to ensure coordinated land use & transport planning for healthier use of road space. DUAP (Sustainability Unit), Bicycle NSW, RTA can help
- Technical standards such as AUSTRROADS 14 and international publications eg: *Collection of Cycle Concepts (Denmark)*, *Sign Up for the Bike Design Manual (Holland - C.R.O.W.E)*
- DUAP has many committed cycling commuters and advocates up to the Director General. The new “Plan First” process provides an opportunity to include policies for bicycling and reduce car dependence at State level.
- State Transport Policies such as Action for Transport & Action for Bikes - Bike Plan 2010 provide overall support & policy framework.
- Guidelines for Traffic Generating Developments. These are currently being revised by DUAP, RTA & DOT. There is proposed to be a new State Policy package incorporating the local integration of land use & transport planning and new bicycle planning guidelines. Under the new Policy it is expected that alternative transport modes will need to be carefully examined by Councils & proponents in all new developments, including access & facilities for cyclists.
- Planners need to be aware of the need for such facilities as bike racks, showers (at employment locations) and wheel ramps on steps at major access ways. Requirements for cycling facilities should be incorporated into DCPs as well.



There is an outstanding need for education into bicycle use on the roads. NSW Sport and Recreation, RTA & the local health authority can help locally in this regard.

# 5 Discussion and Conclusion

## **Discussion**

Following the ideas presented in this short paper and the examples from Fiji and other locations, we should have a discussion in the remainder of the session on questions such as:

- what projects the planners, in the audience, are currently working on that can encourage healthier road use for cyclists?
- what difficulties are being encountered achieving a mode change on the roads?
- what are the opportunities to remove impediments to achieve healthier and sustainable communities?

## **Conclusion**

Roads should be used for more sustainable and healthy activity such as walking and cycling. The current dominance of the road by the motor vehicle has contributed to sedentary and unhealthy lifestyles and a massive waste of resources, particularly given the high ratio of short car journeys. This has particularly affected school children who have the highest growth rate in car dependency of any user group. Cycling in particular provides a healthy and efficient alternative use for road space in urban areas. Increasingly public authorities worldwide and in Australia are recognising this. There is now available a range of tools to assist planners in designing more sustainable and humane communities where road space is used as a health asset.

Thank you for participating.

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