



Department of Infrastructure

Northern Central City Corridor Study

Social Appraisal of Strategy Scenarios

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Department of Infrastructure

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1. Summary

The social issues assessment of the various strategies developed for the Northern Central City Corridor (NCCC) has been undertaken for the Department of Infrastructure (DOI) and forms one component of the overall assessment of these strategies. The social impact assessment component has been based on the interpretation of the modelling results undertaken by the various technical specialists as well as on the issues raised in the Phase One Existing Social Issues Report (SKM June 2001).

That report identified that reducing community severance, promoting social networks and neighbouring, enhancing amenity and promoting community health are some of the key criteria for measuring the social benefits of the various strategies.

There are no specific government policies relating to any of the above measures, although more recently various local governments eg. Melbourne City Council have developed walking strategies, with the aim of promoting walking for mainly health and accessibility reasons.

Given below is a summary of the key social consequences of the various strategies.

Strategy A: Public Transport

There are considerable social benefits associated with increased transport opportunities and mode choice especially for the transport disadvantaged. East west accessibility is improved (a noted problem during the earlier study) although there is little change in internal trip-making. A reduction in car trips through the study area (12%) will reduce community severance on main roads and enhance amenity.

Strategy B: Local Street Traffic Reduction

Detailed investigations of impacts on other (main) roads and tests of local acceptability would be needed before any specific actions were taken to reduce traffic on local streets. Benefits and disadvantages may be inequitably distributed between residents and users of local compared to major roads. Severance and amenity impacts may increase on main roads at the expense of local amenity improvements.

Strategy C: Walking and Cycling

The walking strategy is likely to have social and health benefits well beyond its contribution to the reduction in car usage.

The bicycle strategy has more potential to reduce car usage and relies for its success on cultural change programs as well as physical measures to increase the separation between bikes and cars.

Strategy D: Measures to Reduce Car Dependency

The social consequences of parking policies include amenity benefits of reduced parking on local streets but potentially negative consequences for local businesses.

The spill-over effect within the study area of increased costs of CBD parking may have adverse local consequences.

There may be community resistance to pricing policies (more tolls, increased fuel taxes etc). Behavioural programs (eg. Travelsmart) require significant investment and further pilot testing – however there are spin-off community development and consciousness in raising benefits associated with behavioural programs aimed at obtaining a change in travel behaviour.

Strategy E: Land Use Initiatives

There is likely to be local community resistance to the significant land use changes needed to implement this strategy. Strategies to protect vulnerable and non-vocal groups and valued places will be particularly important as major social change occurs in the area. Behavioural programs aimed at changing travel behaviour should be introduced at new employment centres, education precincts (eg Melbourne University) and growing residential precincts in order to obtain results before car-based behaviour patterns are entrenched reinforced.

Strategy F: DART

The net social benefits of DART (Doncaster Area Rapid Transit), over and above the benefits of Strategy A, in particular, are not clear given its significant financial costs. However the associated reduced car travel in the area together with increased public transport availability would be a social benefit.

Strategy G: Arterial Road Improvement & East-West Tunnel (with Ramps)

There is not a reduction in car traffic overall under this Strategy and hence this may not be considered to be a positive social outcome overall. However, a significant number of major roads in the study area are relieved of car and truck traffic with significant local social benefits, especially if the available space is converted to community use, for example bicycle lanes. Construction impacts associated with the tunnel occur at Royal Park and Racecourse Road, and these impacts may be resisted by the local community.

2. Introduction

This social assessment report has been prepared for the Department of Infrastructure (DOI) as one input to the overall assessment of the various strategy options for the Northern Central City Corridor (NCCC). The purpose of this assessment is to consider the social implications of the various strategy options. These strategy options have been developed by the Department of Infrastructure in consultation with the Community Reference Group and the various study specialists.

Table 2-1 below indicates the strategies / scenarios that were tested.

› **Table 2-1 Strategy Elements for Scenario Appraisal**

Types of initiative	Base Case	Strategies for testing						
	A	B	C	D	E	F	G	
Significant improvements to bus, tram and rail routes/services	J	J	J	J	J	J	J	J
Measures to remove traffic from local streets and reduce community severance effects		J	J	J	J	J	J	J
Improvements to bicycle and pedestrian networks, encouragement of cycling and walking			J	J	J	J	J	J
Measures to reduce car use such as parking, pricing, policy and behavioural initiatives				J	J	J	J	J
Land use-related measures to accommodate growth and reduce or minimise the need for travel					J	J	J	J
Eastern Freeway corridor rapid transit system							J	J
Options within the inner north to improve the efficiency of the arterial network								J

The detailed elements of each strategy / scenario that were tested are described elsewhere in the technical papers prepared by other specialists. It should be noted, however that each succeeding strategy includes all the elements of the preceding strategies, ie. they are additive.

Several of the strategies, most notably Strategy A (Public Transport), B (Local Street Management), F (Rapid Transit) and G (East / West Road Tunnel), have been subjected to extensive traffic modelling to identify their effectiveness in 2021 over the “Base Case”. The Base Case assume a certain base level of committed road and public transport improvements by the year 2021 as well as various population and employment targets associated with the Metropolitan Strategy and existing Council Policies.

Strategies C (Cycling and Walking Initiatives), and E (Land Use Initiatives) were not subjected to traffic modelling.

3. Methodology

3.1 Assessing Social Impacts of Each Strategy

The social assessment of the various Strategies has relied on the first order assessments undertaken by the various transport and land use specialists as well as the information provided in the Phase One Existing Social Issues Report (SKM June 2001). For example, the conclusions drawn by the public transport specialist of the effectiveness of the various measures to improve public transport have been used as a basis for assessing the community and the social benefits of these improvements.

The Phase One Report described the diverse community of NCCC in terms of both the range of different social groups resident there and the various physical neighbourhoods within the study area, which are separated to a large extent by busy roads.

The report highlighted the fact that there are a significant number of vulnerable groups in the area, especially migrant groups living in the many public housing estates, elderly people spread across the whole area and aboriginal groups in the Collingwood / Fitzroy area. There is also a large student population especially in the Carlton area. Many of these people rely on public transport and or walking to get about and for them issues of community severance and local accessibility are particularly significant. These are key indicators of the social consequences likely to occur as a result of the various strategies. Support for local social networks and promoting neighbouring are other important measures of the potential success of the various strategies. The extent to which the general amenity / liveability of the area will be enhanced and valued places protected is another important measure.

Community health, another key indicator, was discussed in the Phase One Report in the context of both the potential health benefits of lower air pollution / noise associated with traffic reduction and the health benefits associated with increased opportunities to bicycle and / or walk in safety. It should be noted however, that any social issues outside the study area that may be influenced by the various strategies have not been considered as part of this assessment.

3.2 Assessing Health Benefits of Each Strategy – Increased Activity

The Phase One Report outlined the personal health benefits of increased personal activity. It reached the general conclusion that a moderate amount of physical activity (in the order of 30 minutes of brisk walking, 5 minutes of running or 45 minutes of playing volley ball) on most days of the week will provide significant health benefits for people of all ages. The health benefits include reduced risk of premature mortality in general and of coronary heart disease, hypertension, colon cancer and diabetes mellitus in particular.

On this basis, the health benefits of each strategy will relate positively to the increased participation by residents or workers in the area in walking or cycling as an alternative to the use of private cars for travel. This increased walking or cycling can come about as a result of:

- £ substituting walking for travel in private vehicles
- £ substituting the use of public transport where this includes walking to access the public transport system at either trip end
- £ substituting walking for public transport, with a commensurate increase in the distance walked.

Transport modelling has been used to estimate the extent of change to trip mode for most strategies. While it is possible to identify the direction of change in either walking or cycling in combination and, from this, to infer the scale of benefit, it is not possible to quantify the change in cycling or walking or to reach any except the broadest conclusions about health benefits.

In addition to the health benefits of increased activity where people choose to walk or cycle instead of travelling by public transport or car, there may be offsetting risks. These include:

- £ Increased likelihood of accidents for cyclists or pedestrians
- £ Increased risk of health effects for cyclists riding near heavy traffic flows and being affected by traffic-polluted air
- £ Increased negative effects of exposure to traffic noise for pedestrians or cyclists near heavily trafficked roads.

Again, there is no information that would allow these offsetting health effects to be quantified.

3.3 Assessing Health Benefits of Each Strategy – Air Quality and Noise

The effects of each strategy in terms of health benefits arising from changes in the noise environment or changes in air quality are considered in separate report prepared for the Department of Infrastructure by Maunsell Australia Pty Ltd.(2002)

Assessment of Changes in Noise

Maunsell Australia Pty Ltd, together with Marshall Day Acoustics predicted changes in traffic-related noise on the basis of relating noise changes to changes in traffic volumes, using an established methodology linking changes in the latter to changes in the former. In turn, changes in the traffic volume for each of the Strategies were based on the traffic modelling provided by Veitch Lister Consulting.

For each strategy, the consultants estimated the number of dwellings that would experience an increase or a decrease in noise levels, using the two levels of 15% and 30% change in traffic as the thresholds of significant change. In addition, because Strategy G in particular is likely to have a marked change in the volumes of heavy vehicular traffic, estimates of changes in heavy vehicles was undertaken separately for each strategy.

Improvements in the social wellbeing of individuals can be assumed to be directly and positively related to reductions in the noise environment (and vice versa) and, in particular, to the rate of change. As Department of Infrastructure (2002) points out, each strategy includes a combination of slow and rapid changes in the traffic

environment, as well as reducing noise levels for some dwellings while increasing it for others. The overall outcomes will, in each case, be complex.

However, it is not considered possible, within this study, to reach any quantitative conclusion about the effects on community health of any transport strategy, as a range of other factors will influence overall community health outcomes.

Assessment of Changes in Air Quality

Maunsell Australia Pty Ltd provided estimates of future vehicle emissions for the various study Strategies, based on projections of traffic projections from the Zenith model for each of the proposed Strategies, using estimated distance travelled for each class of vehicle specified in the model. The estimation of emissions in 2021 takes account of predicted reductions in fuel consumption through more efficient engines and reductions in emissions through more effective automotive technology. The estimates of changes in vehicle emissions was based on changes in metropolitan-wide travel, with qualitative assessments of likely changes for sites in the Study Area.

Improvements to individuals' health can be assumed to be directly and positively related to improvements in air quality, though it is not possible within this study to reach any quantitative conclusion about the effects for any strategy, as a range of other factors will influence health outcomes.

4. Strategy A: Significant Public Transport Improvements

4.1 Strategic Context

The key elements of this strategy (as derived from the Booz-Allen Hamilton Report “Appraisal of Transit Strategy Results” 2002) are:

- £ Substantial increases in public transport service frequencies – most study area services including some services operating in the rest of Melbourne.
- £ Improved station access improvements including improvements within Melbourne CBD
- £ Tram upgrades – reliability, stops and through routing of the Elizabeth Street tram group to St Kilda
- £ Improved bus services – improved area coverage in Doncaster and Melbourne CBD, reliability improvements better interchanges
- £ Better study area East-West links – Eastern Freeway and Johnston Street bus route groups operate to Melbourne University plus Johnson and Elgin Street Busway.

4.2 Context

The modelling of the transport effects of Strategy A provides the following outcomes.

Overall, the public transport share of corridor travel would increase substantially from 23% to 31% of all journeys, a 37% increase in public transport patronage affecting both peak and offpeak. Much of this would be attracted from car and car use would drop by 10%. These effects would be greatest for the longer journeys to and through the study area and least for travel within the study area. Walking trips within the Corridor (meaning trips entirely within or into or out of the Corridor) would decrease by 12%, and those entirely within the corridor would decrease by 5%.

4.3 Social Impacts of Strategy A

Improving public transport services has significant benefits for people without access to a car or whose destinations are beyond a comfortable walking distance (more than one kilometre for most people, although the elderly, disabled and people with small children may even find this distance too great).

The Phase One Existing Social Issues Report (SKM June 2001) highlighted in particular a perceived lack of east west public transport, for travel in and out of and through the area in an east west direction. The public transport improvements included in Strategy A have the potential to improve the position for people wishing to access destinations inside the study area (eg. Melbourne University) from the east and / or access to destinations outside the area in an east / west direction. The modelling results indicate that Strategy A does indeed cater for this type of travel.

A further benefit to Strategy A is its potential to reduce car travel within the area. This is a key objective of many in the local community to reduce the number of cars coming into and through the area and to restrict car parking on local streets. The Booz-Allen Hamilton report suggests a reduction of 12% in through car travel and a 10% reduction in NCCC car travel overall as a result of Strategy A. In social terms this is likely to improve amenity and livability and encourage a greater sense of community.

The NCCCS Issues and Trends Report (Department of Infrastructure September 2001) highlighted that only 2% of travel within the study area is currently by public transport. In 2020 this equates to 8,000 trips. However Strategy A sees this increase to 13,000 trips (or by 67%). Study area residents wishing to make internal trips by public transport will therefore also be significantly benefited by the proposals being investigated in Strategy A, thereby increasing local accessibility and destination choice.

The modelling results for Strategy A also indicate that there is a far greater increase in usage of trains and trams than buses and that a significant growth in patronage is in a north south direction (through / into the study area). One implication of the results, if all the designated service improvements were in fact provided, is that more roads in the study area may become congested by transport services and that there may be an overflow to other roads currently not used by buses or trams. Furthermore, vehicular traffic may divert to other (less congested) roads. This could have the possible consequence of further improving local accessibility (if the coverage of public transport services is expanded) but decreasing amenity and increasing severance impacts along those streets.

The Booz-Allen Hamilton Report also suggests that under Strategy A there will be a significant transfer to public transport from walking into and out of the study area, (a decrease in such walking trips of 31%). This could be seen to represent greater mode choice and hence greater accessibility to job / recreational / social opportunities outside the area than is currently the case. However less walking may have health and safety implications, as discussed below.

4.4 Health Benefits Associated with Strategy A

Significant changes in trip-making behaviour will occur both within the Study Area and across the metropolitan area. From the point of view of health effects, the important change will be the 12 % reduction in walking/cycling, this being largely substituted by public transport, which would also capture trips from car drivers and passengers.

Those who give up walking for public transport will obtain less exercise, while car drivers and passengers will gain some exercise, due to the typical public transport trip including some walking at both ends.

The car trips that will be abandoned will be those most readily substituted with public transport, but this tells us little about the extent to which the average public transport trip includes a walking component at either or both ends. Those walking trips that will

be abandoned are likely to be the longer trips which would provide commensurably greater health benefits than the shorter walking trips.

With respect to changes in traffic-related noise, Maunsell (2002) has noted that Strategy A would provide a significant improvement for 5% of dwellings and a noticeable improvement for a further 18%, as compared to the Base Case, with generally no increases in noise levels for any dwellings.

With respect to air quality, Maunsell (2002) has noted that Strategy A would provide a small metropolitan-wide reduction in Nitrogen Oxides and Volatile Organic Compounds (due to a reduction in car travel) but a small increase in particulate emissions (due to an increase in diesel buses). As the assessments were made at a metropolitan wide level, and as the traffic-related changes within the Study Area will be relatively larger than elsewhere, the air quality changes within the study area will be commensurately greater.

As a consequence of the above improvements in air quality and noise, there would be an overall improvement in community health.

4.5 Strategy A: Evaluation Matrix

GOAL	INDICATOR	POSSIBLE OUTCOME
Strategy A		
<i>Social: Improve amenity and liveability of the inner north by:</i>		
Significantly reducing the impacts of noise and air pollution from transport	Extent of noise-sensitive land uses (especially residential) exposed to low/medium/high changes in noise exposure.	Positive outcome due to lower exposure to traffic noise overall
	Concentration of air pollutants at relevant sites according to adopted standards	Positive outcome if fewer pollutants
Improving safety – reducing fatalities/casualties to or beyond state targets	Casualty accidents broken down by all modes of transport (motorised and non-motorised, people and goods movement)	Positive outcome if fewer car trips in area. Reducing accidents or fear of accidents has major social benefits.
	Safety/security risk assessment at key locations related to travel routes and/or interchanges, and sensitive land uses	Positive outcome if fewer car trips in area. Community severance potentially reduced. Access to key destinations enhanced.
Significantly enhancing urban landscape and heritage values in key areas	Effect on parklands	Social values enhanced if less car traffic and less parking. Greater enjoyment/amenity in public places.
	Effect on other public areas, streetscapes	Social values enhanced if less car traffic and less parking
	Effect on heritage protection/interpretation	Social values enhanced if less car traffic and less parking
	Effect on urban settings	Social values enhanced if less car traffic and less parking

GOAL	INDICATOR	POSSIBLE OUTCOME
Strategy A		
Minimising through traffic on local streets	Car/truck traffic levels on local/collector streets (relate to accepted standards of traffic levels on relevant streets - 'environmental capacity')	Some increases to local traffic due to increases in congestion on arterial network (space for cars taken by public transport), resulting in some negative deterioration of local amenity.
Improving access and travel choices for residents, visitors and workers, including disadvantaged groups	Indices of transport accessibility (by mode) to homes, jobs and services by all modes (including walking and cycling)	Improved mode choice and improved public transport services (both time & destination) will benefit those without access to a car - elderly, poor and young in particular.
	Sense of place/neighbourhood	Fewer cars in the area will enhance sense of place / neighbouring
Providing facilities for people with mobility disadvantages	Contribution to Disability Discrimination Act (DDA) compliance levels	Direct contribution to principles of DDA especially if public transport vehicles are upgraded.
Environmental: Protect and enhance environmental sustainability in the inner north by:		
Ensuring a contribution to overall reductions in greenhouse gas emissions	Estimated total greenhouse gas emissions (by mode of transport) - both metropolitan-wide and for travel to, from, within and through the inner north	Positive outcome if less car travel in area including fewer short journeys
Reducing car use for travel through, to/from and within the inner north	Car driver/passenger trips, trip-km and trip-hours by time period	Positive outcomes if fewer car trips, leading to enhanced local amenity.
	Car driver/passenger mode share by time period	
Substantially increasing public transport mode share	Public transport trips, trip-km and trip-hours by time period and mode	Significant social benefits for those who depend on public transport or without access to a car.
	Public transport mode share by time period and mode (rail, tram, bus)	
Increasing the use of walking and cycling	Cycling/walking trips, trip-km and trip-hours by time period	May reduce walking if public transport availability significantly enhanced. Positive in terms of choices, possible negative health outcomes
	Cycling/walking mode share by time period	As above
Protecting and enhancing biodiversity	Amount of cycling and walking infrastructure provision (lane-km, path-km)	May be less space available on road for cycling infrastructure
	Effect on natural habitats	
	Effect on exotic habitats	
	Effect on water quality	
	Effect on ground contamination	
Economic: Support growth in economic activity, especially in and around Melbourne's CBD, by:		
Enhancing access for commercial activities including tourism and recreation	Accessibility to recreational, cultural and commercial areas in and around CBD and in the inner north	Local benefits if better public transport, may improve access to the area for visitors.
Catering for increased residential population in the inner north and surrounding areas	Area of existing or potential residential land affected (ha)	Better public transport will contribute to social amenity.
	Changes of land use (eg from commercial to residential)	

GOAL	INDICATOR	POSSIBLE OUTCOME
Strategy A		
	Accessibility to/from residential areas	Potentially major social benefit.
Providing for commercial travel movements, including safe, efficient primary routes for freight	Goods vehicle-km and vehicle-hours of travel, resulting estimated overall user costs of goods movement within, to/from and through the inner north	
Efficiently serving travel needs through, to/from and within the inner north	Business/private person-km, person-hours by mode of travel, resulting estimated overall cost of travel by different modes	Benefits for people without a car outside the area wishing to access services within area and vice versa.
Maximising the economic return on investment in transport and land use initiatives	Capital and operating costs (\$M and \$M per year)	

5. Strategy B: Measures to Remove Traffic from Local Streets

5.1 Strategic Context

The key elements of this strategy are described in the Transport Specialist Scenario Appraisal Report (SKM August 2002). In effect, the model tested the effects of reducing speeds on a large number of local streets in the study area to 10km/h, and thereby assessing the extent to which traffic is diverted away from these streets.

The use of local streets in the area by through traffic is one of the issues of primary concern to the local community. Social impacts of significant volumes of through traffic using local streets include reductions in amenity on these streets, affects on real and perceived safety for local residents especially children and the elderly, affect on local neighbouring and informal social contacts and a perceived loss of privacy. Furthermore, increasing usage of local streets by through traffic is anticipated by the local community, as arterial roads become more congested and a greater number of important destinations develop in and near the study area (eg. developments at Melbourne University, Bio21 and the increasing attraction of the area for visitors and tourists).

5.2 Context

The results of the model tests for Strategy B, as reported in the Scenario Appraisal Report indicated the following:

- £ the virtual elimination of through traffic from local streets in the area
- £ increases on the remaining roads in the area by 5% overall
- £ slowing of the traffic on other roads in the area by an average of 2%
- £ consequent increases in the peak hour
- £ examples of important arterial roads within the study area affected by traffic increases include:
 - College Crescent / Cemetery Road / Alexandra Parade route
 - Curzon Street / Harker Street
 - Royal Parade
 - Nicholson Street
 - Lygon Street
 - Brunswick Street
 - Elgin Street / Johnston Street (Collingwood and Fitzroy)
- £ impact on roads carrying public transport implying a conflict between strategies aimed at improving public transport and those aimed at reducing traffic on local streets
- £ impact on main roads with sensitive land uses, retail, residential, educational (the extent of traffic management proposed would deflect large numbers of vehicles onto such roads).

5.3 Social Impact of Strategy B

The social impacts of the above are that while significant social benefits and reduction in community severance would be experienced by a section of the community living along or using facilities located on local streets, negative effects would be experienced by other residents or users of facilities on many main roads within the study area.

The Phase One Existing Social Issues Report highlighted not only the community severance impacts of traffic on local streets, but also the significant problems associated with crossing major roads, especially on foot, by vulnerable sections of the community. Strategy B has the potential to exacerbate the severance problems on major roads in addition to impacting on the performance of public transport and on communities who live along and use facilities on main roads.

From this perspective, Strategy B has disadvantages in terms of the inequitable distribution of benefits to different sections of the community. These major benefit inequities may also prove to be politically unacceptable, especially at the local government level.

The overall conclusion with respect to Strategy B is that before any widespread local area traffic measures were implemented it would be advisable to conduct an in depth assessment of the specific social consequences of the proposed actions. It would also be advisable to undertake a comprehensive program of local community consultation to identify the specific community concerns and likely impacts and local acceptability of designated actions.

5.4 Health Benefits – Strategy B

There are predicted to be only minor changes in the effect of this strategy on the amount of walking/cycling in the Corridor, with a 1% increase (or about 2,000 additional walking trips). The health effects of Strategy B in terms of additional personal exertion would be therefore be mainly reflected in local changes to the level of pedestrian safety, amenity, air quality and noise.

With respect to noise effects on health, as compared to Strategy A, Strategy B will lead to a substantial number of dwellings experiencing a significant improvement in noise environment (20% experiencing a significant improvement, 21% experiencing a noticeable improvement). However, a further 25% will experience a noticeable degradation and 1% a significant degradation of noise environment. The overall outcome would be beneficial, but a number of households would be worse off.(probably mainly those living on main roads)

With respect to changes in air quality, Strategy B, as compared to Strategy A, will lead at the metropolitan level to very small reductions in Nitrogen Oxides, Volatile Organic Compounds and Carbon Monoxide but a small increase in particulate emissions. Within the Study Area, these effects will be commensurably greater, due to the displacement of traffic from the Study Area to external regions.

5.5 Strategy B: Evaluation Matrix

GOAL	INDICATOR	POSSIBLE OUTCOME
strategy B		
<i>Social: Improve amenity and liveability of the inner north by:</i>		
Significantly reducing the impacts of noise and air pollution from transport	Extent of noise-sensitive land uses (especially residential) exposed to low/medium/high changes in noise exposure.	Redistribution of impacts from local streets to major roads- requires testing of social consequences (severance, safety) and acceptability to the community
	Concentration of air pollutants at relevant sites according to adopted standards	If air pollution along main roads increases there will be corresponding health impacts for users of these roads.
Improving safety – reducing fatalities/casualties to or beyond state targets	Casualty accidents broken down by all modes of transport (motorised and non-motorised, people and goods movement)	People on local streets will feel safer, leading to less social severance effects. Perceived safety on major roads may decrease.
	Safety/security risk assessment at key locations related to travel routes and/or interchanges, and sensitive land uses	If traffic shifts to major roads with sensitive land uses, perceptions of safety will be further reduced on these roads.
Significantly enhancing urban landscape and heritage values in key areas	Effect on parklands	Changed traffic patterns throughout the study area will have social benefits in some areas however if parklands abut more heavily trafficked roads negative effects will occur.
	Effect on other public areas, streetscapes	Main roads may incur reduced amenity affects.
	Effect on heritage protection/interpretation	
	Effect on urban settings	Redistribution of benefits across the area.
Minimising through traffic on local streets	Car/truck traffic levels on local/collector streets (relate to accepted standards of traffic levels on relevant streets - 'environmental capacity')	Social benefits in treated streets likely to be significant – increased opportunities for social contact and reduced severance.
Improving access and travel choices for residents, visitors and workers, including disadvantaged groups	Indices of transport accessibility (by mode) to homes, jobs and services by all modes (including walking and cycling)	Accessibility may be reduced on more heavily trafficked roads Disadvantaged groups using / living on main roads negatively affected.
	Sense of place/neighbourhood	Neighbouring significantly enhanced on local streets and in local precincts / neighbourhoods. Main roads may be less attractive for informal social contacts.
Providing facilities for people with mobility disadvantages	Contribution to Disability Discrimination Act (DDA) compliance levels	

GOAL	INDICATOR	POSSIBLE OUTCOME
strategy B		
<i>Environmental: Protect and enhance environmental sustainability in the inner north by:</i>		
Ensuring a contribution to overall reductions in greenhouse gas emissions	Estimated total greenhouse gas emissions (by mode of transport) - both metropolitan-wide and for travel to, from, within and through the inner north	Increased congestion on main roads may have negative consequences. Decreased traffic on local streets equals positive consequences
Reducing car use for travel through, to/from and within the inner north	Car driver/passenger trips, trip-km and trip-hours by time period	Congestion along certain roads may have adverse social effects.
	Car driver/passenger mode share by time period	
Substantially increasing public transport mode share	Public transport trips, trip-km and trip-hours by time period and mode	If public transport movement affected on main roads due to traffic displaced from local streets may have negative social outcomes.
	Public transport mode share by time period and mode (rail, tram, bus)	
Increasing the use of walking and cycling	Cycling/walking trips, trip-km and trip-hours by time period	May be more attractive to walk/cycle on local streets leading to local, social and health benefits. However, main roads may be negatively affected, and may be less attractive for these users.
	Cycling/walking mode share by time period	Peak hour trips on local streets may benefit.
	Amount of cycling and walking infrastructure provision (lane-km, path-km)	Increased opportunities to provide for cyclists / pedestrians on local roads. Reduced opportunities on Main roads subjected to displaced traffic.
Protecting and enhancing biodiversity	Effect on natural habitats	
	Effect on exotic habitats	
	Effect on water quality	
	Effect on ground contamination	
<i>Economic: Support growth in economic activity, especially in and around Melbourne's CBD, by:</i>		
Enhancing access for commercial activities including tourism and recreation	Accessibility to recreational, cultural and commercial areas in and around CBD and in the inner north	Negative effect if economic activities on main roads disrupted by additional traffic / congestion.
Catering for increased residential population in the inner north and surrounding areas	Area of existing or potential residential land affected (ha)	If population increases may become more socially unacceptable to redistribute traffic from local to main roads, but protecting local neighbourhoods may become more important.
	Changes of land use (eg from commercial to residential)	
	Accessibility to/from residential areas	Local areas benefit.
Providing for commercial travel movements, including safe, efficient primary routes for freight	Goods vehicle-km and vehicle-hours of travel, resulting estimated overall user costs of goods movement within, to/from and through the inner north	May negatively affect commercial traffic on main roads and hence business viability.

GOAL	INDICATOR	POSSIBLE OUTCOME
strategy B		
Efficiently serving travel needs through, to/from and within the inner north	Business/private person-km, person-hours by mode of travel, resulting estimated overall cost of travel by different modes	May make the area a less attractive destination for out of area traffic with both positive and negative social consequences.

6. Strategy C: Improvements to Pedestrian and Cycle Networks

6.1 Context

Strategy C in effect comprises two sections – one dealing with initiatives to enhance conditions for pedestrians in the study area and one dealing with strategies to upgrade conditions for cyclists. Details of these strategies are provided in the Transport Specialist Scenario Appraisal Report (SKM August 2002)

The State Government supports increased physical activity to improve the health of Victorians and this is reasserted in VicHealth's *Strategic Directions 1999-2002*. VicHealth complements the actions of other government and non-government bodies and supports further research and innovations in health promotion. A forum was held in November 2001, *A Step Ahead in Victoria: Setting the agenda for a State of walking*, followed by publication of a summary of papers presented at that forum. Increased participation in walking and cycling is seen as improving public health and community interaction and supporting a more balanced transport system and sustainable environment.

The government's policy on increasing the level of the community's physical activity is set out in *Active for Life: the Active for Life Physical Activity Framework*. It involves four elements: building partnerships between government, non-government and private organisations; educating and engaging the public and professionals in supporting the policy; improving opportunities for people to be physically active and removing barriers to such activity; improving places where physical activity occurs.

The State Government's role is to achieve a 3% increase over 5 years in the number of Victorians who are regularly physically active.

The 1996 Census indicated that 15% of study area residents walk to work, while VATS data suggests that nearly two thirds of trips within the area (with both origin and destination in the study area (62%) is by walking or bicycle. Furthermore, the Phase One Existing Social Conditions Report highlighted the dependence on walking of a large section of the community, most notably economically and socially vulnerable groups including residents of public housing, children and the elderly. There are large pockets of public housing in the study area – for example in 1996, nearly one fifth of Carlton residents were Office of Housing tenants.

Between 1991 and 1996 there was also a significant increase in bicycle riding among study area residents, for example the category "other modes" for journey to work (which is mainly bicycle) increased from 5% to 10% in this period in North Melbourne, Fitzroy and Carlton. However, many members of the community report the perceived dangers associated with walking in the area and the problems of crossing major roads, also the discontinuity of many bicycle routes. Implementation of elements of Strategy C will potentially have social benefits in terms of improved accessibility and increased perceptions of safety across a large section of the study area community, especially the growing elderly sector and the growing number of students and / or younger professionals choosing to live in the area who may be encouraged to undertake more journeys on foot or by bicycle.

6.2 Social Impacts of the Walking Component of Strategy C

The Scenario Appraisal Report (SKM August 2002) draws the following conclusions with respect to the Walking Strategy.

- £ walking trips can account for virtually all trips of less than 1km in length but beyond 2km, walking drops off sharply
- £ therefore the main target for the walking strategy is to convert people who make short trips by car within the study area
- £ however these represent a very small percentage of all car travel in the study area and thus the net impact of a walking strategy on reducing car travel is small

Despite the above conclusions, the social benefits of improving conditions for pedestrians within the study area are considerable, especially for vulnerable groups, as described above. Community severance effects may be reduced, perceptions of safety increased, with the consequent benefits of improving access to destinations. Furthermore, if short trip walking within the study area increases further, there is the capacity for social networks to increase and potential for social isolation associated with a transient community to be reduced. In the event that residential densities increase in future, together with a greater range of choices in local destinations and local employment, the benefits of a walking strategy will be further enhanced.

The Phase One Existing Social Issues Report also highlighted problems that are frequently experienced by pedestrians gaining access to destinations outside the study area, eg. to Victoria Market, and across Victoria Parade to the CBD. Ideally the walking strategy should also address the needs of those wishing to make walking trips in and out of the area. This would include walking for mainly recreational purposes eg. along the Yarra River or Merri Creek. Recreational walking as opposed to walking which is aimed at a specific destination is likely to continue to grow in popularity.

The Walking Component of Strategy C embodies a number of programs, rather than identifying a defined set of actions. All of these are described in the Scenario Appraisal Report and will not be repeated here in detail. However, the broad program categories include:

- £ Behavioural Programs, designed to encourage walking (but not Travel Smart which is part of Strategy D).

In addition to any specific behavioural change that may occur in trip making and consequent impacts on car usage, the main social benefits of these programs are likely to include increased opportunities for social contact and social involvement via the group activities that take place, increased opportunities for recreational walking as well as associated community health benefits and increased physical fitness.

- £ Management and Regulation

These programs aim at improving conditions along and on footpaths and have the potential for considerable social benefits for elderly or disabled people who find uneven or cluttered surfaces difficult to cope with.

£ Infrastructure along streets and at destinations

These measures include new pedestrian paths as well as new or improved pedestrian signals, new signage, better lighting and street furniture (including seating).

These measures may not alone encourage significantly more walking by study area residents and (by inference) may not encourage less usage of cars within the study area. However there are potentially considerable social benefits especially for people within the study area who depend on walking to get around. Paths through parkland may enhance local walking experiences and increase opportunities for social contact. While studies have shown that able bodied people are unlikely to divert to use pedestrian crossings, there would be significant benefits for the elderly, disabled, children, family groups or those pushing trolleys or push chairs, if there are more controlled pedestrian crossings or more pedestrian responsive crossings (Puffin style etc). Perceptions of severance would be reduced and people would feel safer as they moved around the area (especially if this were to include better lighting, surfacing of lane ways and small streets and more seating for people to rest or stop for a chat along the way).

6.3 Social Impacts of the Bicycle Component of Strategy C

The Bicycle Strategy is described in detail in the Scenario Appraisal Report (SKM 2002) and will not be repeated here. It is based upon a submission made to the study by Bicycle Victoria.

This report concludes that there is considerable scope to increase the mode share of cycling within the study area. This is based on the fact that for a cyclist the study area is reasonably small (only 3.5km between the northern and southern boundaries) while a 5km ride is well within the range of even an occasional cyclist.

This report sees the need to change cultural attitudes to cycling, especially among women. There is also the problem that while many young people ride bikes until they can obtain a drivers licence there is a significant drop off in cycling after age 18. As with the need to change cultural attitudes to cycling among women, there is also the need to develop programs to reduce the slide from bikes to cars at age 18. The Report also highlights the dangers facing cyclists on main roads and the benefits (both increased safety and reduced stress) of increasing the separation between cyclists and other vehicles. In this regard the strategy advocates a program of lane marking of arterial roads and of allowing cycling through NCCC parks.

Increasing the share of cycling not only has the potential benefit of reducing car journeys in the study area, but these are also considerable health and fitness benefits. Social benefits include enhanced recreational opportunities (many people are purely recreational cyclists as opposed to commuter cyclists) and improved access to/from

areas further afield than can be easily accessed on foot – especially valuable for those younger people without access to a car.

6.4 Health Benefits

From Increased Walking and Cycling

This strategy seeks to increase walking and cycling by improving the available routes and the safety and amenity of those using these routes. While the modelling process has not been able to identify changes in travel for this strategy, separate estimates have been prepared which indicate that there is a significant potential for increases in walking and cycling.

The Scenario Appraisal Report (SKM August 2002) notes that improved cycling conditions on arterial roads has led to dramatic increases in cyclists’ usage of such roads, furthermore that *“unlike walking there is much greater scope to increase the existing mode share of cycling”*. Increased cycling may have the negative consequences of increasing the degree of personal injury for cyclists (and pedestrians), as cyclists have slightly more likelihood of accidents and cyclists using arterial roads would be exposed to higher localised levels of air pollutants at a time when they would requiring greater oxygen intake.

To the extent that any increase could be achieved in personal exertion through walking and cycling, there would be commensurate health benefits.

From Changed Noise Environment

Maunsell (2002) notes that road traffic volume decreases due to mode shift to walking and cycling, as compared to Strategy B, are likely to be unnoticeable in terms of the assessment criteria that it has adopted for this element of the environment. However, Maunsell (2002) notes that increased likelihood of pedestrians crossing arterial roads would lead to increased braking/acceleration of heavy trucks, which could increase localised noise nuisance for some individuals.

From Changed Air Quality

Maunsell (2002) concluded that, as compared to Strategy B and on the basis of a number of stated assumptions, *“there will be a measurable reduction in the quantity of emissions released by vehicles within the region (as) significant short car trips are removed from the region.”*

6.5 Strategy C: Evaluation Matrix

GOAL	INDICATOR	POSSIBLE OUTCOME
Strategy C		
Social: Improve amenity and liveability of the inner north by:		
Significantly reducing the impacts of noise and air pollution from transport	Extent of noise-sensitive land uses (especially residential) exposed to low/medium/high changes in noise exposure.	Positive social outcome if some diversion away from car to walking and/or cycling – however some localities may experience more noise from braking if increased pedestrian crossings

GOAL	INDICATOR	POSSIBLE OUTCOME
Strategy C		
	Concentration of air pollutants at relevant sites according to adopted standards	Positive benefits if fewer short journeys
Improving safety – reducing fatalities/casualties to or beyond state targets	Casualty accidents broken down by all modes of transport (motorised and non-motorised, people and goods movement)	Health benefits of greater walking/cycling. Safer neighbourhoods created for walking / cycling. Minor negative impact due to cyclist exposure to traffic.
	Safety/security risk assessment at key locations related to travel routes and/or interchanges, and sensitive land uses	Enhanced perceptions of safety may increase feelings of community well-being and reduce severance.
Significantly enhancing urban landscape and heritage values in key areas	Effect on parklands	Social benefits of enhanced accessibility to valued places especially for recreational walking / cycling. Some people may resist cyclists using local parks.
	Effect on other public areas, streetscapes	Social benefits of more walking and cycling in public areas – more surveillance etc.
	Effect on heritage protection/interpretation	It will be important to ensure protection of heritage areas from overuse.
	Effect on urban settings	Urban areas generally more pleasant, if more local activity, more vitality.
Minimising through traffic on local streets	Car/truck traffic levels on local/collector streets (relate to accepted standards of traffic levels on relevant streets - 'environmental capacity')	Increased opportunities from walking / cycling may have some benefits in reducing local street traffic.
Improving access and travel choices for residents, visitors and workers, including disadvantaged groups	Indices of transport accessibility (by mode) to homes, jobs and services by all modes (including walking and cycling)	Social benefits of greater choice of destination. Benefits to a number of different social groups, in terms of more opportunities to cross roads, meet people, social networks etc.
	Sense of place/neighbourhood	Valued places more accessible on foot / bicycle, more pleasant to be in etc. / more opportunities for informal social contact.
Providing facilities for people with mobility disadvantages	Contribution to Disability Discrimination Act (DDA) compliance levels	Major local contribution. Disabled people will be able to move around more easily if pedestrian facilities improved.
Environmental: Protect and enhance environmental sustainability in the inner north by:		
Ensuring a contribution to overall reductions in greenhouse gas emissions	Estimated total greenhouse gas emissions (by mode of transport) - both metropolitan-wide and for travel to, from, within and through the inner north	Positive effect if less car travel, especially short trips
Reducing car use for travel through, to/from and within the inner north	Car driver/passenger trips, trip-km and trip-hours by time period	If car use reduced, major social benefits.
	Car driver/passenger mode share by time period	
Substantially increasing public transport mode share	Public transport trips, trip-km and trip-hours by time period and mode	Benefits if more walking to/from public transport services..

GOAL	INDICATOR	POSSIBLE OUTCOME
Strategy C		
	Public transport mode share by time period and mode (rail, tram, bus)	
Increasing the use of walking and cycling	Cycling/walking trips, trip-km and trip-hours by time period	Social benefits of increased safety, less severance, more opportunities for social contact, access to valued places
	Cycling/walking mode share by time period	Benefits if contributes to peak hour car travel reduction.
	Amount of cycling and walking infrastructure provision (lane-km, path-km)	Local, social benefits, for a range of walkers and cyclists. Type of infrastructure will determine who benefits.
Protecting and enhancing biodiversity	Effect on natural habitats	Less car travel and more cycling will have environmental benefits.
	Effect on exotic habitats	
	Effect on water quality	
	Effect on ground contamination	
<i>Economic: Support growth in economic activity, especially in and around Melbourne's CBD, by:</i>		
Enhancing access for commercial activities including tourism and recreation	Accessibility to recreational, cultural and commercial areas in and around CBD and in the inner north	Area more attractive to walk around, more attractive for visitors and locals.
Catering for increased residential population in the inner north and surrounding areas	Area of existing or potential residential land affected (ha)	Increased population will benefit from enhanced walking, cycling, opportunities leading to greater opportunities for social contact, less social isolation.
	Changes of land use (eg from commercial to residential)	Emphasises the need for improved pedestrian and cycling facilities.
	Accessibility to/from residential areas	Disadvantaged groups will benefit in particular.
Providing for commercial travel movements, including safe, efficient primary routes for freight	Goods vehicle-km and vehicle-hours of travel, resulting estimated overall user costs of goods movement within, to/from and through the inner north	No effect.
Efficiently serving travel needs through, to/from and within the inner north	Business/private person-km, person-hours by mode of travel, resulting estimated overall cost of travel by different modes	Greater choices of modes and destinations, for a wider range of community groups.

7. Strategy D: Measures to Reduce Car Dependency

7.1 Context

The key elements of this **strategy** include parking, pricing, policy and behavioural initiatives.

The Transport Specialist Scenario Appraisal Report describes these elements as follows:

Parking policies can be directed at a wide range of actions, including provision of and control of access to parking spaces, including allocating access rights between competing users, and the pricing of parking spaces, including increasing the price of all day parking in the CBD.

Pricing policies that could influence car travel through the Study Area include:

- £ levying access charges on drivers, eg. tolling the Eastern Freeway or a 'road user charge' cordon around the CBD
- £ reducing the price of public transport.

Behavioural initiatives designed to influence travel and parking behaviour include:

- £ facilitating businesses to inaugurate company travel plans or seeking to influence individuals' travel choices;
- £ provision of public information on the location, availability and prices of parking spaces (eg. real-time information on available parking places in and around the CBD);
- £ reinforcement of desirable associations between parking and other activities, eg shopping) by coordinating parking discounts for such activities;
- £ combining parking and free or subsidised local public transport (eg. the CBD-perimeter parking stations around the Perth CBD combined with a free bus service from stations into the CBD).

With the exceptions of local street parking and to a lesser extent the Eastern Freeway toll, these measures would impact on all residents and businesses in the metropolitan area and are not focused on the NCCCS study area.

7.2 Social Impacts of Strategy D

Parking

The model tested the effect of a significant increase in CBD parking charges. It assumed that all CBD commuters would incur an additional parking charge of \$10 per day. This is in effect an unrealistic assumption. The model test showed that while there was a significant reduction in peak car travel to the CBD, the overall result would be very small because this type of travel accounts for only a very small percentage of total peak car travel in the metropolitan area. However, because of the closeness of the study area to the CBD, the effect was a 5% reduction in peak traffic in the study area. Local study area residents could well perceive a social benefit from such a peak traffic reduction.

However, if there were to be a spill over of CBD parking into the study area, this would not be a favourable outcome for the study area community, in terms of local amenity impacts.

There is already significant pressure on available car parking/visitors parking in the study area. The older style housing often does not have off street parking so residents, their visitors as well as employees and patrons of retail outlets and restaurants all vie for available spaces.

The Phase One Existing Social Conditions Report highlighted the concern that local residents have with the extent of study area parking. In addition to the obvious amenity impacts of streets heavily parked with cars there is also a perception that the community's private space is being taken up by outsiders. There is considerable competition for parking space in the study area. Local residents perceive their streets to be used for parking by business people during the day and by people visiting restaurants and hotels at night. Restricting this form of parking could well affect the viability of local businesses which residents value for the vibrancy of interest that they bring to the area. From a community perspective it appears that whatever direct measures were implemented to restrict or redirect parking there could be negative as well as positive social consequences.

Pricing Policies

Two measures were tested in the model

- significantly reducing public transport fares
- tolling the inner end of the Eastern Freeway

Other initiatives discussed in the Transport Specialist Scenario Appraisal Report includes road pricing (eg. CBD pricing cordons) and increased fuel taxes

From a social perspective these measures raise the following concerns:

- public reaction against higher fuel prices and hence political un-acceptability
- current government opposition to tolls, along with community opposition
- economic effects (and hence social effects) of pricing cordons on access to the CBD
- the extent of government subsidy necessary if public transport fares are substantially reduced, and the question of whether this will in any case lead to significant reductions in car travel.

Behavioural Initiative

The Transport Specialist Scenario Appraisal Report states that:

“It is internationally recognised that major reductions in traffic demand are only possible if residents change their behaviour and travel habits. Approaches that are being investigated by many countries, and that do not require major changes to the cost of travel, are:

- £ Company Travel (or Green) Plans, by which the employer seeks to encourage more sustainable travel habits in commuting and business travel, and

- £ Travel Behaviour Modification Programs based on personal interview techniques (such as Travel Smart) which seek to influence individual's personal travel habits.”

It is also recognised that achieving a sustained behavioural change requires a considerable investment of time and money. It includes working directly with the target market to change attitudes and hence behaviour. It relies on the provision of relevant and consistent information to individuals to assist them in making behaviour changes.

These ideas are currently being pilot tested in Melbourne and, if proved effective, should form an important component of future strategies aimed at reducing car usage.

In addition to the potential benefits of such programs in directly changing behaviours and hence leading to reduced car usage, they have other social benefits such as increasing community awareness of the environmental impacts of car travel. They also have a community development benefit associated with the group work that is carried out as part of the program.

A Travelsmart program conducted recently in Perth showed some encouraging results, as follows:

- £ A reduction in the car share of all travel of about 6 percent from 60% to 54% (equivalent to a 10% reduction in car trips);
- £ An increase in the public transport share of 1 percent from 6% to 7% (on buses a 25% increase in passengers was observed);
- £ More walking and cycling, their share of travel increasing from 14% to 18%.

However, long term monitoring of the continued success of the program is required.

7.3 Health Benefits associated with Strategy D

The Effects of Walking

The effect of increased CBD parking costs on travel behaviour was investigated by assuming that all commuters to the CBD would incur an additional parking charge of \$10/day. Such increases in parking fees would impact on employees who commute by car to and from the CBD in the morning and evening periods. The model predicted that peak hour car trips to/from the CBD would be reduced by 80% and public transport trips would be increased by 12%. As a result, public transport would account for 95% of peak hour trips to/from the CBD.

There would be some small but unquantifiable increase in walking from the Study Area to the CBD.

Likewise, increasing the cost of, or reducing the availability of public parking spaces in the Study Area would be expected to increase the cost of, and reduce the convenience of, using cars for visits to or trips within the Study Area. This, again, is expected to result in some, though probably a small, increase in public transport use and walking/cycling in, or to/from the Study Area.

Pricing of the Eastern Freeway would not affect walking/cycling in the Study Area. Behavioural initiatives within, or affecting areas close to, the Study Area could lead to increased walking/cycling.

From the above, it is concluded that policies of reducing car dependency would lead to improved health for those transferring from car trips to public transport or walking. The extent of the shift in travel behaviour or the consequential improvement in public health cannot be reliably predicted.

The Effects of Changes to the Noise Environment

Maunsell (2002) notes that a small number of dwellings will experience a significant or noticeable improvement in their noise environment (3% and 4% respectively) as compared to Strategy C, with none generally experiencing any degradation of their noise environment. Consequently, there will be a small overall benefit to the community.

The Effects of Changes to Air Quality

Maunsell (2002) notes that metropolitan-wide emissions of major pollutants will be reduced by about 0.5%, as compared to Strategy C, and that these reductions are likely to be dispersed broadly across the metropolitan area, resulting in a smaller degree of change within the Study Area.

7.4 Strategy D: Evaluation Matrix

GOAL	INDICATOR	POSSIBLE OUTCOME
Strategy D		
<i>Social: Improve amenity and liveability of the inner north by:</i>		
Significantly reducing the impacts of noise and air pollution from transport	Extent of noise-sensitive land uses (especially residential) exposed to low/medium/high changes in noise exposure.	Positive social outcome if less on street parking, less car travel through area. Benefits from a small improvement in the noise environment overall
	Concentration of air pollutants at relevant sites according to adopted standards	Minimal effect.
Improving safety – reducing fatalities/casualties to or beyond state targets	Casualty accidents broken down by all modes of transport (motorised and non-motorised, people and goods movement)	Positive social outcome if fewer conflicts between cars and other road users.
	Safety/security risk assessment at key locations related to travel routes and/or interchanges, and sensitive land uses	Behavioural programs have educational benefits and social development spinoffs.
Significantly enhancing urban landscape and heritage values in key areas	Effect on parklands	Less on street car parking will have social amenity benefits in local area – parklands / streetscapes/ valued environments.
	Effect on other public areas, streetscapes	As above
	Effect on heritage protection/interpretation	Opportunities to enhance heritage precincts / opportunities for interpretation if fewer cars.
	Effect on urban settings	

GOAL	INDICATOR	POSSIBLE OUTCOME
Strategy D		
Minimising through traffic on local streets	Car/truck traffic levels on local/collector streets (relate to accepted standards of traffic levels on relevant streets - 'environmental capacity')	If less external parking on local streets will have local amenity benefits.
Improving access and travel choices for residents, visitors and workers, including disadvantaged groups	Indices of transport accessibility (by mode) to homes, jobs and services by all modes (including walking and cycling)	Access reduced so wider community wishing to visit study area may be disadvantaged with flow on negative consequences to local businesses.
	Sense of place/neighbourhood	Local disadvantaged groups may benefit. Greater sense of place for local community.
Providing facilities for people with mobility disadvantages	Contribution to Disability Discrimination Act (DDA) compliance levels	No direct effect
<i>Environmental: Protect and enhance environmental sustainability in the inner north by:</i>		
Ensuring a contribution to overall reductions in greenhouse gas emissions	Estimated total greenhouse gas emissions (by mode of transport) - both metropolitan-wide and for travel to, from, within and through the inner north	Positive effect if less local car travel
Reducing car use for travel through, to/from and within the inner north	Car driver/passenger trips, trip-km and trip-hours by time period	Combination of programs should have local social benefits – improved amenity.
	Car driver/passenger mode share by time period	Behavioural programs also have community development values
Substantially increasing public transport mode share	Public transport trips, trip-km and trip-hours by time period and mode	Reducing public transport fares increases patronage. Benefits those who are public transport dependent and economically vulnerable
	Public transport mode share by time period and mode (rail, tram, bus)	
Increasing the use of walking and cycling	Cycling/walking trips, trip-km and trip-hours by time period	Behavioural programs include these objectives with accompanying social benefits if walking / cycling more attractive
	Cycling/walking mode share by time period	More walking /cycling at peak periods has positive social consequences
	Amount of cycling and walking infrastructure provision (lane-km, path-km)	If leads to improved infrastructure has significant benefits.
Protecting and enhancing biodiversity	Effect on natural habitats	
	Effect on exotic habitats	
	Effect on water quality	
	Effect on ground contamination	

GOAL	INDICATOR	POSSIBLE OUTCOME
Strategy D		
<i>Economic: Support growth in economic activity, especially in and around Melbourne's CBD, by:</i>		
Enhancing access for commercial activities including tourism and recreation	Accessibility to recreational, cultural and commercial areas in and around CBD and in the inner north	Potential negative effects on CBD access; if study area parking restricted, may affect businesses viability.
Catering for increased residential population in the inner north and surrounding areas	Area of existing or potential residential land affected (ha)	Behavioural programs may be suited to new (incoming) communities – opportunities to influence behaviour patterns of new population.
	Changes of land use (eg from commercial to residential)	Parking restrictions may be resisted by new / incoming community.
	Accessibility to/from residential areas	Minimal effect, unless visitor parking is reduced, may be resisted by residents.
Providing for commercial travel movements, including safe, efficient primary routes for freight	Goods vehicle-km and vehicle-hours of travel, resulting estimated overall user costs of goods movement within, to/from and through the inner north	If parking / access restricted for commercial vehicles, could have negative economic and hence social outcomes
Efficiently serving travel needs through, to/from and within the inner north	Business/private person-km, person-hours by mode of travel, resulting estimated overall cost of travel by different modes	Road pricing has negative effects on accessibility. Cheaper public transport benefits certain groups, especially poorer and those dependent on public transport.

8. Strategy E: Land Use Initiatives

8.1 Context

The key elements of these initiatives, together with their implications, are discussed in the Land Use Technical Specialist Report (Maunsell 2002). They deal with land use strategies that can be implemented in order to achieve the goals of the NCCCS for the Base Case Land Use for 2021 and include estimations of modal shifts in travel behaviour and reduced car journeys through and within the study area.

The land use strategy is predicated to a large extent on the Department of Infrastructure (DoI) forecasts of population and employment for the study area, flowing in turn from elements of the policy-related provisions of the forthcoming Metropolitan Strategy.

The Strategy's forecasts suggest an increase in the study area population of 11,027 by the year 2021 and an increase of 8,721 dwellings. This has implications for both car parking and traffic generation.

The largest percentage increases are expected to occur in the 65 plus age groups and particularly in Abbotsford, Carlton South, Collingwood, Fitzroy and Princes Park.

Because of heritage controls over most residential areas, the Maunsell Report concludes that most new residential sites will have to come from conversion of either industrial or commercial sites outside the existing residential areas. The report suggests further that because commercial land tends to be more highly valued than residential land, there will have to be specific encouragement provided to achieve concessions for conversion from commercial to residential uses.

In terms of employment, the Maunsell Report notes that employment restructuring has been and will continue to take place, with the highest growth being in the hospitality industry. The area, in this context has a focus well beyond serving the need of the local community.

On a sub area or precinct basis, the report makes the following observations:

Abbotsford: it will be difficult to achieve an additional 1202 dwellings by 2021 without specific actions or policy directions by the City of Yarra.

Carlton: the additional 925 dwellings forecast can only be accommodated in infill development and redevelopment of the Public Housing Estates.

Carlton South: the forecast additional 321 dwellings can only be accommodated through infill development.

Clifton Hill: an additional 492 dwellings are forecast by 2021. This is an area where more infill development is seen as feasible.

Collingwood: to accommodate the forecast 1,377 additional dwellings, the City of Yarra will have to actively encourage redevelopment of sites to higher density dwellings.

Fitzroy: the report suggests that it will be difficult to achieve the 2051 additional dwellings forecast.

North Fitzroy: the report suggests that North Fitzroy has the potential to accommodate more infill development than the forecast 996 dwellings.

Parkville: this area is forecast to have a reduction in both population and dwellings, reflecting the emphasis being placed on this area for research institutions such as Bio21.

West Melbourne: the forecast 714 additional dwellings can be accommodated in this area.

Royal Park: the future of this area is dominated by the potential redevelopment of the former Royal Park Psychiatric Hospital.

Princes Park: the report indicates that adequate sites to accommodate 351 additional dwellings in this area are extremely limited.

In terms of employment in the study area the Bio21 precinct is the most significant. Furthermore, planned expansion to both Melbourne University and RMIT will increase the concentration of people and travel movements in this general section of the study area.

8.2 Social Impacts of Strategy E

The social implications of the above **strategy** are as follows:

- £ Likely resistance to the significant land use changes that will be needed to achieve the higher densities forecast, by those who currently live in the area and value its historic character
- £ If people who move into the area are more affluent than existing residents and have at least one and maybe two cars, issues of car parking will become paramount, with increased competition for spaces and decreases in local amenity.
- £ Increasing densities will further emphasise the need to implement walking and cycling strategies in order to maintain the liveability of the area and ensure accessibility for all sections of the community. Decisions regarding the location of important community destinations should be part of overall land use planning to ensure that they are accessible by foot.

- £ Strategies to ensure the efficiency of public transport through, into and out of the area will become more significant, such that public transport usage is encouraged and the need for multiple car ownership reduced.
- £ Strategies to protect valued public spaces, parklands and streetscapes will become more important as they are progressively threatened by land use changes.
- £ Behavioural Programs will become more important and also possibly easier to implement as new communities move into the area and before behaviour patterns become entrenched. Green Travel Plans should be introduced at the newly developing Bio21 and other major new employment centres. Other behavioural programs, eg. Travelsmart could be trialed with Melbourne University students and also introduced at the community level on a precinct by precinct basis.
- £ Strategies to ensure the protection of vulnerable groups will become most important. Where major social changes occur, including major population increases and the development of new businesses and employment precincts, there is the danger that the interests of small non vocal groups will be overlooked.

8.3 Health Benefits Associated with Strategy E

This strategy reflects the general pattern of land use that provides the Base Case 2021 situation. As compared to the existing situation, increased densities will provide increased opportunities for walking and cycling as a result of a greater number of trip destinations being within any given distance of dwellings. The extent to which this will actually lead to increased walking or cycling will depend on the nature of other supporting actions, eg. as referred to in the preceding section.

Changes to Noise Environment and Air Quality

Strategy E does not provide any basis for quantifying any change in traffic volumes in relation to those of Strategy D. Consequently, there is not likely to be any noticeable or predictable change in the noise environment or air quality.

8.4 Strategy E: Evaluation Matrix

GOAL	INDICATOR	POSSIBLE OUTCOME
Strategy E		
<i>Social: Improve amenity and liveability of the inner north by:</i>		
Significantly reducing the impacts of noise and air pollution from transport	Extent of noise-sensitive land uses (especially residential) exposed to low/medium/high changes in noise exposure.	Potentially negative consequences unless actions to curb car use are implemented
	Concentration of air pollutants at relevant sites according to adopted standards	As above
Improving safety – reducing fatalities/casualties to or beyond state targets	Casualty accidents broken down by all modes of transport (motorised and non-motorised, people and goods movement)	Increased population plus higher densities may reduce perceptions of safety.

GOAL	INDICATOR	POSSIBLE OUTCOME
Strategy E		
	Safety/security risk assessment at key locations related to travel routes and/or interchanges, and sensitive land uses	
Significantly enhancing urban landscape and heritage values in key areas	Effect on parklands	Strategies to protect valued places from land use changes may be needed – increased pressure on parkland etc.
	Effect on other public areas, streetscapes	New areas of parkland may be needed.
	Effect on heritage protection/interpretation	Measures to protect heritage and urban values will be required.
	Effect on urban settings	Changes to urban character may be resisted by the local community.
Minimising through traffic on local streets	Car/truck traffic levels on local/collector streets (relate to accepted standards of traffic levels on relevant streets - 'environmental capacity')	Local area traffic plans to protect local neighbourhoods will become more important as densities increase.
Improving access and travel choices for residents, visitors and workers, including disadvantaged groups	Indices of transport accessibility (by mode) to homes, jobs and services by all modes (including walking and cycling)	Walking, cycling and behavioural programs to improve local access will be important if social amenity is to be protected.
	Sense of place/neighbourhood	Specific actions will be needed to enhance the protection of disadvantaged groups and vulnerable groups through a process which may include major social change in the area.
Providing facilities for people with mobility disadvantages	Contribution to Disability Discrimination Act (DDA) compliance levels	The disabled community will require particular attention. There is a danger that small groups will be overlooked when major changes occur in the area.
<i>Environmental: Protect and enhance environmental sustainability in the inner north by:</i>		
Ensuring a contribution to overall reductions in greenhouse gas emissions	Estimated total greenhouse gas emissions (by mode of transport) - both metropolitan-wide and for travel to, from, within and through the inner north	If more car travel, negative impacts
Reducing car use for travel through, to/from and within the inner north	Car driver/passenger trips, trip-km and trip-hours by time period	Programs to redirect travel away from cars will be important as densities increase.
	Car driver/passenger mode share by time period	
Substantially increasing public transport mode share	Public transport trips, trip-km and trip-hours by time period and mode	Greater population densities should increase viability of public transport
	Public transport mode share by time period and mode (rail, tram, bus)	As above
Increasing the use of walking and cycling	Cycling/walking trips, trip-km and trip-hours by time period	Behavioural programs to promote walking and cycling should be more viable with new and denser communities and should be introduced at an early stage at both the residential and business level..
	Cycling/walking mode share by time period	

GOAL	INDICATOR	POSSIBLE OUTCOME
Strategy E		
	Amount of cycling and walking infrastructure provision (lane-km, path-km)	Walking / cycling infrastructure needs to be enhanced to maintain local access for disadvantaged groups.
Protecting and enhancing biodiversity	Effect on natural habitats	
	Effect on exotic habitats	
	Effect on water quality	
	Effect on ground contamination	
<i>Economic: Support growth in economic activity, especially in and around Melbourne's CBD, by:</i>		
Enhancing access for commercial activities including tourism and recreation	Accessibility to recreational, cultural and commercial areas in and around CBD and in the inner north	Greater population numbers will support local businesses but parking pressures may increase.
Catering for increased residential population in the inner north and surrounding areas	Area of existing or potential residential land affected (ha)	Important to protect interests of minority groups
	Changes of land use (eg from commercial to residential)	This may be hard to achieve on a wide scale in practice.
	Accessibility to/from residential areas	Measures to ensure accessibility is maintained are important.
Providing for commercial travel movements, including safe, efficient primary routes for freight	Goods vehicle-km and vehicle-hours of travel, resulting estimated overall user costs of goods movement within, to/from and through the inner north	
Efficiently serving travel needs through, to/from and within the inner north	Business/private person-km, person-hours by mode of travel, resulting estimated overall cost of travel by different modes	Greater population should enhance public transport viability
Maximising the economic return on investment in transport and land use initiatives	Capital and operating costs (\$M and \$M per year)	

9. Strategy F: Doncaster Area Rapid Transit (DART)

9.1 Context

This strategy is described in the Public Transport Specialist Report (Booz-Allen Hamilton 2002) as follows.

Strategy F involves the addition of new rapid transit service on the Eastern Freeway termed the Doncaster Area Rapid Transit (DART). Key features are:

- £ Alignment – The new transit route follows: Doncaster Shopping town along Doncaster Road, Eastern Freeway, Alexandra Parade, Nicholson Street, Elgin Street, Melbourne University and the CBD via Swanston Street.
- £ Mode – The Eastern Freeway rapid transit system has been added as a new mode and is considered to be a high performance light rail, that is half way between a train and a tram. Express buses and heavy rail have also been considered, with similar results.

9.2 Social Impacts of Strategy F (high performance, light rail option)

The results of the model testing of this strategy are reported by the Public Transport Specialist as follows:

- £ Total public transport travel increases by 4,600 journeys, sourced totally from reduced car travel.
- £ NCCC public transport use increases by 1,900 journeys, sourced entirely from car drivers – most growth coming from through travel (1,600 journeys) – virtually all between the east and the south.
- £ NCCC car travel (through, to, from and within the study area) reduces by 2,000 journeys.
- £ There is a negative effect on Bus Boarding's, especially the Eastern Freeway group of routes (a decline of over 50% largely because these are replaced by the Strategy F projects), however, the Johnston Street group buses have a boarding's increase of 16%.
- £ Most of the usage of DART is between Doncaster and the CBD.

The overall conclusion drawn by the Public Transport Specialist is that the main contribution to the increase in public transport use is made by Strategy A. Strategy F makes a far smaller additional contribution.

The implication is that the overall community benefits offered by Strategy F may not be significantly more than those offered by Strategy A. There is minimal change in the amount of car travel through the study area, over and above other strategies, and

only a limited amount of additional travel choices, given that buses already operate on the Eastern Freeway.

9.3 Health Benefits associated with Strategy F

As this strategy's effects are directed mainly towards travel into the Corridor from areas outside, there is not likely to be any discernible direct change to the amount of walking and cycling within the Corridor and hence health benefits at the local level are likely to be small.

Strategy F would lead to a further significant improvement in the noise environment, as compared to Strategy D, for 1% of dwellings and a noticeable improvement for 4%. However, it would also lead to a noticeable degradation for 2% of dwellings, giving a small overall net improvement.

Strategy F would, in respect to air quality, lead to an additional reduction in emissions for most pollutants of between 0.5% and 1.0% over Strategy D (the next preceding strategy for which traffic modelling was undertaken).

9.4 Strategy F: Evaluation Matrix

GOAL	INDICATOR	POSSIBLE OUTCOME
Strategy F		
<i>Social: Improve amenity and liveability of the inner north by:</i>		
Significantly reducing the impacts of noise and air pollution from transport	Extent of noise-sensitive land uses (especially residential) exposed to low/medium/high changes in noise exposure.	If through car travel is reduced this represents a social benefit to the area. Noise improvements in some locations however conditions worse in some localities
	Concentration of air pollutants at relevant sites according to adopted standards	Small improvements overall has positive health outcomes
Improving safety – reducing fatalities/casualties to or beyond state targets	Casualty accidents broken down by all modes of transport (motorised and non-motorised, people and goods movement)	Reducing through car travel may improve perceived safety and hence enhance social amenity.
	Safety/security risk assessment at key locations related to travel routes and/or interchanges, and sensitive land uses	Having a designated public transport route from the Eastern Suburbs may be perceived to increase safety and security.
Significantly enhancing urban landscape and heritage values in key areas	Effect on parklands	If car travel is reduced this will enhance local amenity of valued places and improved accessibility to these areas.
	Effect on other public areas, streetscapes	As above
	Effect on heritage protection/interpretation	As above
	Effect on urban settings	As above
Minimising through traffic on local streets	Car/truck traffic levels on local/collector streets (relate to accepted standards of traffic levels on relevant streets - 'environmental capacity')	If public transport infrastructure causes cars to displace to local streets this will reduce local amenity.

GOAL	INDICATOR	POSSIBLE OUTCOME
Strategy F		
Improving access and travel choices for residents, visitors and workers, including disadvantaged groups	Indices of transport accessibility (by mode) to homes, jobs and services by all modes (including walking and cycling)	This service will enhance transport choices to, through and from the NCCC
	Sense of place/neighbourhood	Minimal effect.
Providing facilities for people with mobility disadvantages	Contribution to Disability Discrimination Act (DDA) compliance levels	Service would need to be DDA Compliant, thereby enhancing public transport services for disabled people
Environmental: Protect and enhance environmental sustainability in the inner north by:		
Ensuring a contribution to overall reductions in greenhouse gas emissions	Estimated total greenhouse gas emissions (by mode of transport) - both metropolitan-wide and for travel to, from, within and through the inner north	Reducing car travel has positive effects
Reducing car use for travel through, to/from and within the inner north	Car driver/passenger trips, trip-km and trip-hours by time period	Service makes a small positive contribution to reducing car trips with consequent local social benefits.
	Car driver/passenger mode share by time period	
Substantially increasing public transport mode share	Public transport trips, trip-km and trip-hours by time period and mode	Has benefits in a particular corridor – especially from east to/from NCCC – thereby increasing opportunities for these social connections.
	Public transport mode share by time period and mode (rail, tram, bus)	Likely to have benefits especially for peak travel.
Increasing the use of walking and cycling	Cycling/walking trips, trip-km and trip-hours by time period	This strategy has some positive spinoffs for walking
	Cycling/walking mode share by time period	This Strategy has some positive spinoffs for walking
	Amount of cycling and walking infrastructure provision (lane-km, path-km)	If road space consumed by Public Transport Infrastructure, this could impact on plans for pedestrian / cycle infrastructure.
Protecting and enhancing biodiversity	Effect on natural habitats	
	Effect on exotic habitats	
	Effect on water quality	
	Effect on ground contamination	
Economic: Support growth in economic activity, especially in and around Melbourne's CBD, by:		
Enhancing access for commercial activities including tourism and recreation	Accessibility to recreational, cultural and commercial areas in and around CBD and in the inner north	Greater mode choice available and greater choice of destinations.
Catering for increased residential population in the inner north and surrounding areas	Area of existing or potential residential land affected (ha)	Should have benefits for larger population - especially those who wish to travel to, through and from the area (especially the Eastern Corridor).
	Changes of land use (eg from commercial to residential)	
	Accessibility to/from residential areas	As above

GOAL	INDICATOR	POSSIBLE OUTCOME
Strategy F		
Providing for commercial travel movements, including safe, efficient primary routes for freight	Goods vehicle-km and vehicle-hours of travel, resulting estimated overall user costs of goods movement within, to/from and through the inner north	If relieves roads, may improve conditions for commercial vehicles
Efficiently serving travel needs through, to/from and within the inner north	Business/private person-km, person-hours by mode of travel, resulting estimated overall cost of travel by different modes	Provides greater mode choice for travel to/from study area.
Maximising the economic return on investment in transport and land use initiatives	Capital and operating costs (\$M and \$M per year)	Overall social benefits may not be worth total costs of construction.

10. Strategy G: Options to Improve Arterial Road Network Including E/W Tunnel Option (and Ramps at Nicholson Street and Royal Parade)

10.1 Context

The Transport Specialist Scenario Appraisal Report (SKM 2002) describes Strategy G as follows:

The east west tunnel proposal used in this strategy was an *example* of the effects of a major road building project within the study area. Strategy G involves a direct tunnel link between the Eastern Freeway and City Link.

The major road concepts investigated as part of the study have focused on the arterial road network as defined by the VicRoads declared road system. This declared road system, as previously detailed in the NCCCS Engineering Existing Conditions Report, includes the following key roads in the Study area:

- Hoddle Street
- Nicholson Street
- Royal Parade
- Flemington Road
- Various roads in North Melbourne
- Victoria Street
- Alexandra Parade/Princes Street/College Crescent/Macarthur Road/Elliott Avenue
- Brunswick Road
- Queens Road
- St Georges Road
- City Link
- Eastern Freeway

Two further variations of this Strategy - G1 has intersections with surface streets near Royal Parade and Nicholson Street, and G2, a tunnel between the Eastern Freeway and the eastern side of the CBD at Albert Road, were also investigated.

10.2 Social Impacts of Strategy G

The Phase One Existing Social Conditions Report highlighted a number of problems relating to the Arterial Road network. Overall, there was a general belief that any through traffic should be confined to the arterial roads; at the same time many of the arterial roads were perceived as acting as major barriers to movement creating community severance and inhibiting access to important destinations. Hoddle Street, Alexandra Parade / Princes Street, Nicholson Street and Flemington Road are

examples of such roads. These are also roads where significant congestion and / or conflict with public transport operations occur.

The Transport Specialist Report considers the role that traffic management measures could play in improving the traffic operation of such roads and concludes that such measures would not have a major effect.

In any case (from a local social impact perspective) improving the traffic function of major roads can only increase their community severance effects.

Under **Strategy G** the decision was taken to model the effect of a new dual 2 lane tunnelled link from the Eastern Freeway east of Hoddle Street to near Flemington Road. Strategy G1 includes interchanges with some arterial crossing roads.

The concept is designed to contribute significantly to reducing the through traffic role of the Alexander Parade / Princes Street / Elliot Avenue route and to provide an improved CBD access route to / from the Eastern Freeway. In this regard a full diamond interchange is provided at Nicholson Street and half diamond at Royal Parade under Strategy G1.

There are various social impacts and consequences of this proposal, both during construction and when it is in operation.

In order to construct the western exit portal, some acquisition of commercially zoned land would be required in Racecourse Road.

To construct the eastbound entry portal near Flemington Road, work would be required in Royal Park – but this would be fully reinstated afterwards. Even so, it is possible that this proposal could raise some community opposition.

The Royal Parade interchange can be constructed within the existing road reservation with Cemetery Road west being closed at College Crescent.

The interchange at Nicholson Street can be constructed within the Alexander Parade Road reservation.

Portals at the eastern end can be constructed within the Eastern Freeway median.

Operational impacts include significant traffic increases on the Eastern Freeway and City Link north of Flemington Road.

Traffic relief occurs however on several roads as follows:

- £ Princes Street/Alexander Parade traffic levels halve from the base case of up to 100,000 vpd to 25-50,000 vpd depending on the location.
- £ Only local traffic remains on Cemetery Road, College Crescent and Elliott Avenue.
- £ The Hoddle Street/Victoria Parade route to the CBD from the Eastern Freeway reduces by 8-10,000 vpd.
- £ Brunswick Road traffic reduces by up to 10,000 vpd.
- £ Flemington Rd traffic reduces by 4-7,000 vpd.

Some of the roads that connect with the tunnel are forecast to experience traffic increases, in particular:

- £ Macaulay, Racecourse, Boundary and Mt Alexander Roads.
- £ Royal Parade south of the tunnel

Traffic relief on the nominated roads will have significant local social benefits. These include reduced community severance effects, increased opportunities to access facilities and desired destinations, increased opportunities to establish social networks and to enhance the streetscape and urban character of neighbourhoods by plantings, provision of seating etc. Benefits will flow to vulnerable groups, pedestrians and cyclists in these areas, especially if wider pedestrian / cyclist paths can be provided along these roads.

Another significant effect of the tunnel will be to remove through trucks from Alexandra Avenue / Princes / Cemetery / Macarthur / Elliott Streets. This is a very significant benefit for those living along /using facilities along the route.

Other roads where traffic is predicted to increase will require special investigation to identify ways to reduce adverse effects especially if roads become more difficult to cross and access to important destinations is made more hazardous.

Furthermore, if traffic builds up on the available road space and on roads relieved of traffic by the tunnel option, this will have a negative effect on the social environment of the study area. It will be essential to resume the available road space for other community uses (landscaping, walkways, cycle-ways etc) to prevent this from occurring.

Strategy G does not aim to reduce the amount of vehicular traffic overall. As such it does not have social benefits in terms of reducing greenhouse gases and other current environmental impacts associated with large numbers of car travel.

10.3 Health Benefits associated with Strategy G

This strategy's effects are directed mainly towards removing arterial traffic from the surface roads within the Corridor, with the effect of substantially reducing traffic flows on some arterial roads within the Corridor while increasing flows on some others (but with a net reduction in overall flows on surface arterials).

The noise environment effects of this strategy are influenced by whether the intermediate interchanges or additional link-tunnel to the CBD are included. Strategy G would provide substantial improvements in the noise environment, with a significant improvement for 14% of dwellings and a noticeable improvement for a further 27% (ie a noticeable or better improvement for 41% of dwellings) as compared to a significant and noticeable degradation for 3% and 3% each. Each of the other options of intermediate connections and a CBD tunnel link provide further improvements for a small number of dwellings but degradation for a large number, with respectively 13% (Strategy G1) and 33% (Strategy G2) of dwellings experiencing a noticeable or worse degradation of their noise environment over the previous sub-strategy.

Consequently, Strategy G would provide substantial benefits to dwellings' noise environment, while Strategies G1 and G2 would create increasing net disbenefits.

Emission of most air pollutants would increase around 0.1-0.2% for this strategy, as compared to strategy F. Although a proportion of locally generated air pollutants would be emitted from the tunnel exhaust stacks, they are not likely to cause significant local pollution. Maunsell (2002:38) notes that research undertaken by Melbourne City Council, in relation to air emissions from the exhaust stacks to the City Link tunnels, has not been able to identify pollutant emissions in areas near the stacks at levels above existing ambient levels.

10.4 Strategy G: Evaluation Matrix

GOAL	INDICATOR	POSSIBLE OUTCOME
Strategy G		
<i>Social: Improve amenity and liveability of the inner north by:</i>		
Significantly reducing the impacts of noise and air pollution from transport	Extent of noise-sensitive land uses (especially residential) exposed to low/medium/high changes in noise exposure.	Reduced traffic on surface roads has positive social consequences, less severance, improved amenity. Significant reductions in traffic (including trucks along Alexandra Parade/Princes Street/ Elliott Avenue route has benefits in terms of noise reduction and local air quality improvements along this route.
	Concentration of air pollutants at relevant sites according to adopted standards	May have small concentrations of noise and pollution at portals which may lead to problems at these sites.
Improving safety – reducing fatalities/casualties to or beyond state targets	Casualty accidents broken down by all modes of transport (motorised and non-motorised, people and goods movement)	Traffic diverted from sensitive land uses in many cases positive benefits. Increased perception of safety along these routes.
	Safety/security risk assessment at key locations related to travel routes and/or interchanges, and sensitive land uses	Increased sense of personal safety along routes relieved of traffic.
Significantly enhancing urban landscape and heritage values in key areas	Effect on parklands	Opportunity to take back some road space for landscaping. Construction impacts on parkland
	Effect on other public areas, streetscapes	May be able to enhance surface roads where traffic reduced – social amenity benefits.
	Effect on heritage protection/interpretation	Potential to enhance heritage values where traffic reduced.
	Effect on urban settings	Potential local amenity improvements.
Minimising through traffic on local streets	Car/truck traffic levels on local/collector streets (relate to accepted standards of traffic levels on relevant streets - 'environmental capacity')	May enable local area traffic planning thereby benefiting local neighbourhoods, and social interaction at neighbourhood level.

GOAL	INDICATOR	POSSIBLE OUTCOME
Strategy G		
Improving access and travel choices for residents, visitors and workers, including disadvantaged groups	Indices of transport accessibility (by mode) to homes, jobs and services by all modes (including walking and cycling)	Greater choices, greater accessibility for cars. Potential benefits to other road users also.
	Sense of place/neighbourhood	Safer surface access for vulnerable groups – children elderly etc.(except on roads where traffic increased)
Providing facilities for people with mobility disadvantages	Contribution to Disability Discrimination Act (DDA) compliance levels	Disabled people may experience a safer more pleasant environment on some streets Where traffic reduced.
<i>Environmental: Protect and enhance environmental sustainability in the inner north by:</i>		
Ensuring a contribution to overall reductions in greenhouse gas emissions	Estimated total greenhouse gas emissions (by mode of transport) - both metropolitan-wide and for travel to, from, within and through the inner north	Car travel is not discouraged, but is more efficient.
Reducing car use for travel through, to/from and within the inner north	Car driver/passenger trips, trip-km and trip-hours by time period	Car use not discouraged, but up to 100,000/day via tunnel, rather than on surface roads.
	Car driver/passenger mode share by time period	
Substantially increasing public transport mode share	Public transport trips, trip-km and trip-hours by time period and mode	Public transport operation on some roads may be improved with positive social spinoffs.
	Public transport mode share by time period and mode (rail, tram, bus)	As above
Increasing the use of walking and cycling	Cycling/walking trips, trip-km and trip-hours by time period	Improved environment for walking and cycling on and across relieved roads is a social benefit.
	Cycling/walking mode share by time period	May enable 'freed' road space to be given back to community uses including bicycle lanes.
	Amount of cycling and walking infrastructure provision (lane-km, path-km)	As above
Protecting and enhancing biodiversity	Effect on natural habitats	
	Effect on exotic habitats	
	Effect on water quality	
	Effect on ground contamination	
<i>Economic: Support growth in economic activity, especially in and around Melbourne's CBD, by:</i>		
Enhancing access for commercial activities including tourism and recreation	Accessibility to recreational, cultural and commercial areas in and around CBD and in the inner north	Access to and through the area enhanced. If traffic removed from tourist precincts this is a benefit.
Catering for increased residential population in the inner north and surrounding areas	Area of existing or potential residential land affected (ha)	May encourage more car usage by local community – not necessarily a local, social benefit.
	Changes of land use (eg from commercial to residential)	
	Accessibility to/from residential areas	Accessibility potentially improved – less local congestion.

GOAL	INDICATOR	POSSIBLE OUTCOME
Strategy G		
Providing for commercial travel movements, including safe, efficient primary routes for freight	Goods vehicle-km and vehicle-hours of travel, resulting estimated overall user costs of goods movement within, to/from and through the inner north	Significant improvements for this section of the community
Efficiently serving travel needs through, to/from and within the inner north	Business/private person-km, person-hours by mode of travel, resulting estimated overall cost of travel by different modes	Significant improvement for through vehicles travel, including trucks. Major disbenefit is that the amount of car travel is not reduced.

11. Evaluation Matrix

GOAL	INDICATOR	POSSIBLE OUTCOME						
		Strategy A	Strategy B	Strategy C	Strategy D	Strategy E	Strategy F	Strategy G
Social: Improve amenity and liveability of the inner north by:								
Significantly reducing the impacts of noise and air pollution from transport	Extent of noise-sensitive land uses (especially residential) exposed to low/medium/high changes in noise exposure.	Positive outcome due to lower exposure to traffic noise overall	Redistribution of impacts from local streets to major roads- requires testing of social consequences (severance, safety) and acceptability to the community	Positive social outcome if some diversion away from car to walking and/or cycling- however some localities may experience more noise from braking if increased pedestrian crossings	Positive social outcome if less on street parking, less car travel through area. Benefits from a small improvement in the noise environment overall	Potentially negative consequences unless actions to curb car use are implemented	If through car travel is reduced this represents a social benefit to the area .Noise improvements in some localities however conditions worse in some locations	Reduced traffic on surface roads has positive social consequences, less severance, improved amenity. Significant reductions in traffic (including trucks along Alexandra Parade/Princes Street/ Elliott Avenue route has benefits in turn of noise reduction and local air quality improvements along this route.
	Concentration of air pollutants at relevant sites according to adopted standards	Positive outcome if fewer pollutants	If air pollution along main roads increases there will be corresponding health impacts for users of these roads.	Positive benefits if fewer short car journeys	Minimal effect.	As above	Small improvements overall has positive health outcomes	May have small concentrations of noise and pollution at portals which may lead to problems at these sites.

GOAL	INDICATOR	POSSIBLE OUTCOME						
		Strategy A	Strategy B	Strategy C	Strategy D	Strategy E	Strategy F	Strategy G
Improving safety – reducing fatalities/casualties to or beyond state targets	Casualty accidents broken down by all modes of transport (motorised and non-motorised, people and goods movement)	Positive outcome if fewer car trips in area. Reducing accidents or fear of accidents has major social benefits.	People on local streets will feel safer, leading to less social severance effects. Perceived safety on major roads may decrease.	Health benefits of greater walking/cycling. Safer neighbourhoods created for walking / cycling. Minor negative impact due to cyclist exposure to traffic.	Positive social outcome if fewer conflicts between cars and other road users.	Increased population plus higher densities may reduce perceptions of safety.	Reducing through car travel may improve perceived safety and hence enhance social amenity.	Traffic diverted from sensitive land uses in many cases positive benefits. Increased perception of safety along these routes.
	Safety/security risk assessment at key locations related to travel routes and/or interchanges, and sensitive land uses	Positive outcome if fewer car trips in area. Community severance potentially reduced. Access to key destinations enhanced.	If traffic shifts to major roads with sensitive land uses, perceptions of safety will be further reduced on these roads.	Enhanced perceptions of safety may increase feelings of community well-being and reduce severance.	Behavioural programs have educational benefits and social development spinoffs.		Having a designated public transport route from the Eastern Suburbs may be perceived to increase safety and security.	Increased sense of personal safety along routes relieved of traffic.
Significantly enhancing urban landscape and heritage values in key areas	Effect on parklands	Social values enhanced if less car traffic and less parking. Greater enjoyment amenity in public places.	Changed traffic patterns throughout the study area will have social benefits in some areas however if parklands about more heavily trafficked roads negative effects will occur.	Social benefits of enhanced accessibility to valued places especially for recreational walking / cycling. Some people may resist cyclists using local parks.	Less on street car parking will have social amenity benefits in local area – parklands / streetscapes valued / environments.	Strategies to protect valued places from land use changes may be needed – increased pressure on parkland etc.	If car travel is reduced this will enhance local amenity of valued places and improved accessibility to these areas.	Opportunity to take back some road space for landscaping. Construction impacts on parkland
	Effect on other public areas, streetscapes	Social values enhanced if less car traffic and less parking	Main roads may incur reduced amenity affects.	Social benefits of more walking and cycling in public areas – more surveillance etc.	As above	New areas of parkland may be needed.	As above	May be able to enhance surface roads where traffic reduced – social amenity benefits.

GOAL	INDICATOR	POSSIBLE OUTCOME						
		Strategy A	Strategy B	Strategy C	Strategy D	Strategy E	Strategy F	Strategy G
	Effect on heritage protection/interpretation	Social values enhanced if less car traffic and less parking	It will be important to ensure protection of heritage areas from overuse.	Opportunities to enhance heritage precincts / opportunities for interpretation if fewer cars.	Measures to protect heritage and urban values will be required.	As above	Potential to enhance heritage values where traffic reduced.	
	Effect on urban settings	Social values enhanced if less car traffic and less parking	Urban areas generally more pleasant, if more local activity, more vitality.	Urban areas generally more pleasant, if more local activity, more vitality.	Changes to urban character may be resisted by the local community.	As above	Potential local amenity improvements.	
Minimising through traffic on local streets	Car/truck traffic levels on local/collector streets (relate to accepted standards of traffic levels on relevant streets - 'environmental capacity')	Some increases to local traffic due to congestion on arterial network (space for cars taken by public transport), resulting in some negative deterioration of local amenity.	Social benefits in treated streets likely to be significant – increased opportunities for social contact and reduced severance.	If less external parking on local streets will have local amenity benefits.	Local area traffic plans to protect local neighbourhoods will become more important as densities increase.	If public transport infrastructure causes cars to displace to local streets this will reduce local amenity.	May enable local area traffic planning thereby benefiting local neighbourhoods, and social interaction at neighbourhood level..	
Improving access and travel choices for residents, visitors and workers, including disadvantaged groups	Indices of transport accessibility (by mode) to homes, jobs and services by all modes (including walking and cycling)	Improved mode choice and improved public transport services (both time & destination) will benefit those without access to a car - elderly, poor and young in particular.	Social benefits of greater choice of destination. Benefits to a number of different social groups, in terms of more opportunities to cross roads, meet people, social networks etc.	Access reduced so wider community wishing to visit study area may be disadvantaged with flow on negative consequences to local businesses..	Walking, cycling and behavioural programs to improve local access will be important if social amenity is to be protected.	This service will enhance transport choices to, through and from the NCCC	Greater choices, greater accessibility for cars. Potential benefits to other road users also.	

GOAL	INDICATOR	POSSIBLE OUTCOME						
		Strategy A	Strategy B	Strategy C	Strategy D	Strategy E	Strategy F	Strategy G
Providing facilities for people with mobility disadvantages	<p>Sense of place/ neighbourhood</p> <p>Contribution to Disability Discrimination Act (DDA) compliance levels</p>	<p>Fewer cars in the area will enhance sense of place / neighbouring</p>	<p>Neighbouring significantly enhanced on local streets and in local precincts / neighbourhoods. Main roads may be less attractive for informal social contacts.</p>	<p>Valued places more accessible on foot / bicycle, more pleasant to be in etc. / more opportunities for informal social contact.</p>	<p>Local disadvantaged groups may benefit. Greater sense of place for local community.</p>	<p>Specific actions will be needed to enhance the protection of disadvantaged groups and vulnerable groups through a process which may include major social change in the area.</p>	<p>Minimal effect.</p>	<p>Safer surface access for vulnerable groups – children elderly etc. (except on roads where traffic increases)</p>
	<p>Contribution to Disability Discrimination Act (DDA) compliance levels</p>	<p>Direct contribution to principles of DDA especially if public transport vehicles are upgraded.</p>		<p>Major local contribution. Disabled people will be able to move around more easily if pedestrian facilities improved.</p>	<p>No direct effect</p>	<p>The disabled community will require particular attention. There is a danger that small groups will be overlooked when major changes occur in the area.</p>	<p>Service would need to be DDA Compliant, thereby enhancing public transport services for disabled people</p>	<p>Disabled people may experience a safer more pleasant environment on some street9where traffic reduced)</p>

GOAL	INDICATOR	POSSIBLE OUTCOME						
		Strategy A	Strategy B	Strategy C	Strategy D	Strategy E	Strategy F	Strategy G
Environmental: Protect and enhance environmental sustainability in the inner north by:								
Ensuring a contribution to overall reductions in greenhouse gas emissions	Estimated total greenhouse gas emissions (by mode of transport) - both metropolitan-wide and for travel to, from, within and through the inner north	Positive outcome if less car travel in area including fewer short journeys	Increased congestion on main roads may have negative consequences. Decreased traffic on local streets equals positive consequences	Positive if less car travel especially short trips	Positive effect if less local car travel	If more car travel, negative impacts	Reducing car travel has positive effects	Car travel is not discouraged, but is more efficient.
Reducing car use for travel through, to/from and within the inner north	Car driver/passenger trips, trip-km and trip-hours by time period	Positive outcomes if fewer car trips, leading to enhanced local amenity.	Congestion along certain roads may have adverse social effects.	If car use reduced major social benefit	Combination of programs should have local social benefits – improved amenity.	Programs to redirect travel away from cars will be important as densities increase.	Service makes a small positive contribution to reducing car trips with consequent local social benefits.	Car use not discouraged, but up to 100,000/day via tunnel, rather than on surface roads.
	Car driver/passenger mode share by time period				Behavioural programs also have community development values			
Substantially increasing public transport mode share	Public transport trips, trip-km and trip-hours by time period and mode	Significant social benefits for those who depend on public transport or without access to a car.	If public transport movement affected on main roads due to traffic displaced from local streets may have negative social outcomes.	Benefits if more walking to/from Public Transport Services	Reducing public transport fares increases patronage. Benefits those who are public transport dependent and economically vulnerable	Greater population densities should increase viability of public transport	Has benefits in a particular corridor – especially from east to/from NCCC – thereby increasing opportunities for these social connections.	Public transport operation on some roads may be improved with positive social spinoffs.
	Public transport mode share by time period and mode (rail, tram, bus)					As above	Likely to have benefits especially for peak travel.	As above

GOAL	INDICATOR	POSSIBLE OUTCOME						
		Strategy A	Strategy B	Strategy C	Strategy D	Strategy E	Strategy F	Strategy G
Increasing the use of walking and cycling	Cycling/walking trips, trip-km and trip-hours by time period	May reduce walking if public transport availability significantly enhanced. Positive in terms of choices, possible negative health outcomes	May be more attractive to walk/cycle on local streets leading to local, social and health benefits. However, main roads may be negatively affected, and may be less attractive for these users.	Social benefits of increased safety, less severance, more opportunities for social contact, access to valued places	Behavioural programs include these objectives with accompanying social benefits if walking / cycling more attractive	Behavioural programs to promote walking and cycling should be more viable with new and denser communities and should be introduced at an early stage at both the residential and business level.	This Strategy has some positive spinoffs for walking	Improved environment for walking and cycling on and across relieved roads is a social benefit.
	Cycling/walking mode share by time period	As above	Peak hour trips on local streets may benefit.	Benefits if contributes to peak hour car travel reduction.	More walking /cycling at peak periods has positive social consequences		This Strategy has positive spinoffs for walking	May enable 'freed' road space to be given back to community uses including bicycle lanes.
Protecting and enhancing biodiversity	Amount of cycling and walking infrastructure provision (lane-km, path-km)	May be less space on arterial roads for cycling/walking infrastructure	Increased opportunities to provide for cyclists / pedestrians on local roads. Reduced opportunities on Main roads subjected to displaced traffic.	Local, social benefits for a range of walker and cyclists. Type of infrastructure will determine who benefits.	If leads to improved infrastructure has significant benefits.	Walking / cycling infrastructure needs to be enhanced to maintain local access for disadvantaged groups.	If road space consumed by Public Transport Infrastructure, this could impact on plans for pedestrian / cycle infrastructure.	As above
	Effect on natural habitats			Less car travel and more cycling will have environmental benefits.				
	Effect on exotic habitats							
	Effect on water quality							
	Effect on ground contamination							

GOAL	INDICATOR	POSSIBLE OUTCOME						
		Strategy A	Strategy B	Strategy C	Strategy D	Strategy E	Strategy F	Strategy G
Economic: Support growth in economic activity, especially in and around Melbourne's CBD, by:								
Enhancing access for commercial activities including tourism and recreation	Accessibility to recreational, cultural and commercial areas in and around CBD and in the inner north	Local benefits if better public transport, may improve access to the area for visitors.	Negative effect if main roads disrupted by additional traffic / congestion.	Area more attractive to walk around, more attractive for visitors and locals.	Potential negative effects on CBD access; if study area parking restricted, may affect businesses viability.	Greater population numbers will support local businesses but parking pressures may increase.	Greater mode choice available and greater choice of destinations.	Access to and through the area enhanced. If traffic removed from tourist precincts this is a benefit.
Catering for increased residential population in the inner north and surrounding areas	Area of existing or potential residential land affected (ha)	Better public transport will contribute to social amenity.	If population increases may become more socially unacceptable to redistribute traffic from local to main roads, but protecting local neighbourhoods may become more important.	Increased population will benefit from enhanced walking, cycling, opportunities leading to greater opportunities for social contact, less social isolation.	Behavioural programs may be suited to new (incoming) communities – opportunities to influence behaviour patterns of new population.	Important to protect interests of minority groups	Should have benefits for larger population - especially those who wish to travel to, through and from the area (especially the Eastern Corridor).	May encourage more car usage by local community – not necessarily a local, social benefit.
	Changes of land use (eg from commercial to residential)			Emphasises the need for improved pedestrian and cycling facilities.	Parking restrictions may be resisted by new / incoming community.	This may be hard to achieve on a wide scale in practice.		
	Accessibility to/from residential areas	Potentially major social benefit.	Local areas benefit.	Disadvantaged groups will benefit in particular.	Minimal effect, unless visitor parking is reduced, may be resisted by residents.	Measures to ensure accessibility is maintained are important.	As above	Accessibility potentially improved – less local congestion.
Providing for commercial travel movements, including safe, efficient primary routes for freight	Goods vehicle-km and vehicle-hours of travel, resulting estimated overall user costs of goods movement within, to/from and through the inner north		May negatively affect commercial traffic on main roads and hence business viability.	No effect.	If parking / access restricted for commercial vehicles, could have negative economic and hence social outcomes		If relieves roads, may improve conditions for commercial vehicles	Significant improvements for this section of the community

GOAL	INDICATOR	POSSIBLE OUTCOME						
		Strategy A	Strategy B	Strategy C	Strategy D	Strategy E	Strategy F	Strategy G
Efficiently serving travel needs through, to/from and within the inner north	Business/private person-km, person-hours by mode of travel, resulting estimated overall cost of travel by different modes	Benefits for people without a car outside the area wishing to access services within area and vice a versa.	May make the area a less attractive destination for out of area traffic with both positive and negative social consequences.	Greater choices of modes and destinations, for a wider range of community groups.	Road pricing has negative effects on accessibility. Cheaper public transport benefits certain groups, especially poorer and those dependent on public transport.	Greater population should enhance public transport viability	Provides greater mode choice for travel to/from study area.	Significant improvement for through vehicles travel, including trucks. Major disbenefit is that the amount of car travel is not reduced.

Appendix A References

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