

# **SENATE RURAL & REGIONAL AFFAIRS & TRANSPORT REFERENCES COMMITTEE**

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**Inquiry into the role of public transport in delivering productivity outcomes**

**Melbourne, Tuesday, 18 February 2014**

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# TRANSFORMING AUSTRALIAN CITIES

FOR A MORE  
FINANCIALLY VIABLE AND  
SUSTAINABLE FUTURE

Transportation and urban design



May 2009

Updated March 2010



# TRANSFORMING AUSTRALIAN CITIES FOR A MORE FINANCIALLY VIABLE AND SUSTAINABLE FUTURE

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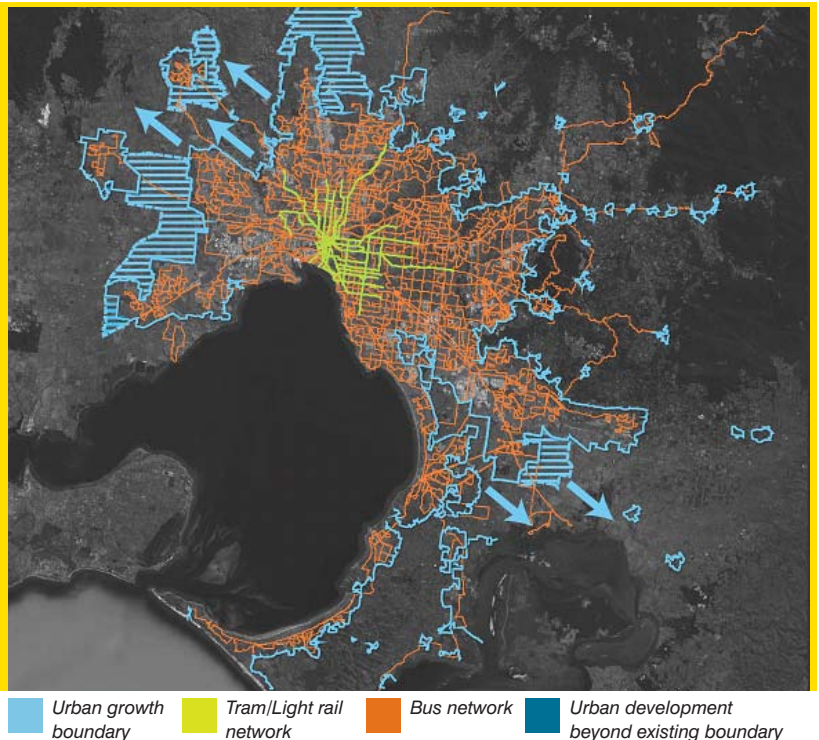
## Introduction

This study was jointly commissioned by the Victorian Department of Transport and the City of Melbourne to establish the potential to transform metropolitan Melbourne to meet the projected population of 8 million by 2050. The study specifically does not deal with rail based public transport and Activity Centres as these have been the subject of extensive investigation over the last ten years. Known capacity figures for Activity Centres and some redevelopment sites have been referenced to allow a more comprehensive understanding of existing capacity with the current Melbourne Metropolitan Boundaries.

The Victorian Government's Melbourne 2030 Strategy and more recently Melbourne @ 5 Million are both based on the Activity Centre or Transport Orientated Design principles and are widely regarded as both important and necessary strategies to meet the future needs of metropolitan Melbourne. This study concentrates on the 'missing links' in the above strategies, namely the potential of the tram and bus corridors to not only accommodate a significant proportion of Melbourne's future growth, but to do so in a way that will help to meet the aspirations and needs of the greater population while enhancing the performance of the existing infrastructure of the City, particularly the existing public transport infrastructure.

To be successful the strategy offered by this study needs to be not only pragmatic in its implementation but politically 'palatable'.

*Melbourne at 5 million if status quo development patterns prevail*





## Context

We are today part of a new revolution, 'The Urban Revolution'. Cities that housed 200 million people or ten percent of the world's population in 1900 now accommodate 3.5 billion people or fifty percent of the world's population and will, by 2050, accommodate 6.4 billion people or over seventy percent of the world's population. Many developing cities will have to grow at over six times their current growth rate to accommodate this population explosion. More than 80% of Australians already live in cities that are projected to double their size in the next 40 years.

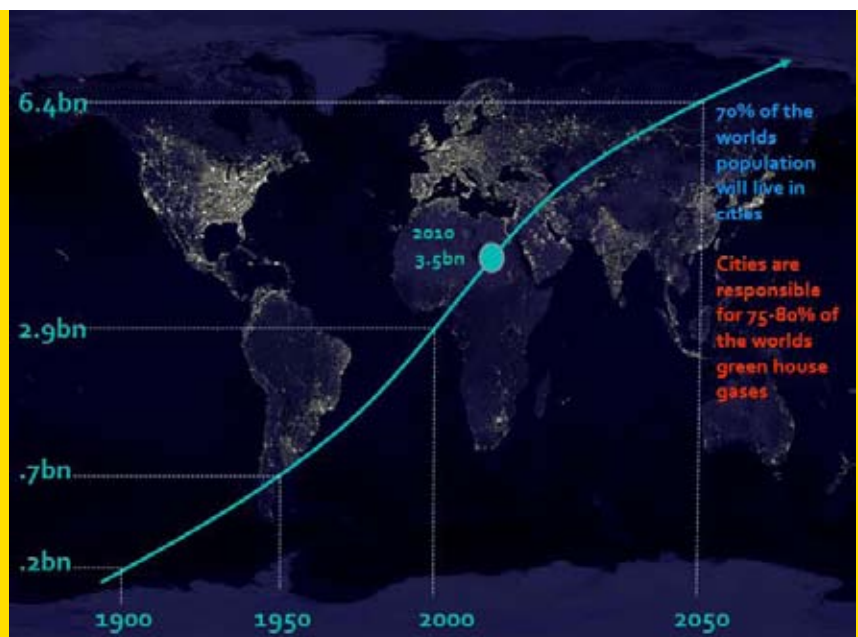
Melbourne, a city of 4 million, in 2009 has seen a 40% increase in the demand for housing at a time when, as a result of the Global Financial Crisis, house starts have declined by 3%. The enormity of the challenge of building the equivalent city and infrastructure that has taken 175 years in under 40 years is daunting. Add to this the fact that cities today are directly or indirectly responsible for over seventy five percent of the world's Green House Gases and we are starting to realise that our cities, as in the Industrial Revolution, are slowly 'choking us to death'.

Insidiously, where the smog, pollution, poor health, loss of landscapes and social difficulties were easily linked to the form and infrastructure of the Industrial City today, these similar impacts are less visibly linked to the form of our modern cities.

The challenge for our generation is the need to not only build the equivalent capacity of existing cities, that have taken centuries to develop, but to do this in only 40 years and in a socially successful model while at the same time transforming our existing cities to a low carbon future.

*'This will require the building of the equivalent urban development capacity and infrastructure in forty years that has been built since humans first established urban settlements'.*

– Rob Adams  
Director, City Design  
City of Melbourne



In meeting this challenge, it is important to realise that in 2050, it is likely that up to 80% of the infrastructure of Australian cities would have been built prior to 2010. Transformation by this definition cannot simply be read as rebuilding infrastructure but rather will need to, in the main, involve the rationalisation and better utilization of our existing infrastructure.

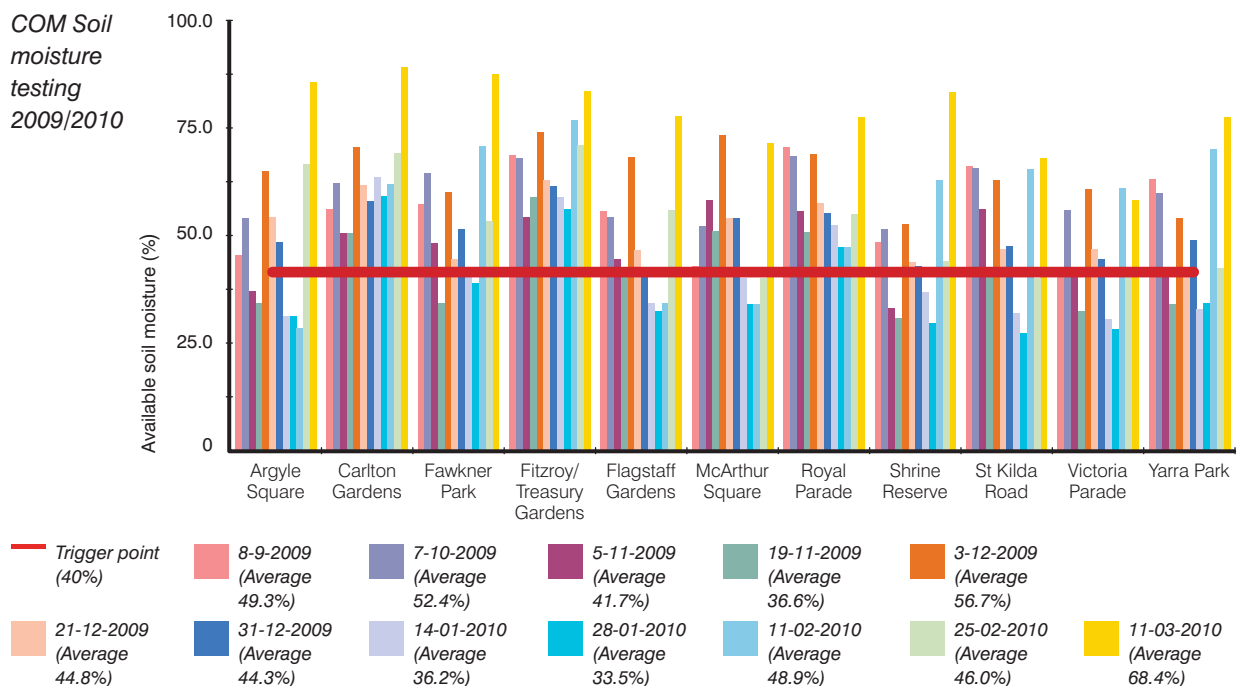
Buildings, roads, railways, parks, waterways, energy, communications and fluid distribution systems will all need to be looked at in a new and open minded way. Only one thing is certain: if we continue to understand, develop and utilise our infrastructure in the traditional ways of the 20th century we are doomed to perpetuate our current problems.

On a daily basis we are witnessing the failure and short comings of these traditional systems.

It is no longer simply an argument about economy of production but increasingly an argument about capacity – the capacity of our cities to withstand the pressures of the future, notably population expansion, climate change and outdated modes of operation.

As recently as February 2009, Melbourne experienced some of these limitations. As temperatures rose, and then settled in the 40s, the city experienced a number of failures:

- > Pressures on the electrical generation and distribution network saw blackouts and failures affect large areas of the city.
- > Rail systems designed for cooler conditions overheated and failed, with up to half of the scheduled trips being cancelled.
- > Fires threatened not only lives and property but also narrowly missed bringing down the main power distribution network from the Latrobe Valley – an occurrence that would have closed down the whole city.
- > Water consumption trebled at a time when the water storage levels sat at a perilous 33%.
- > The soil moisture levels in all the major parks and gardens fell to below 40%, the trigger point to significant stress for the central city's 60,000 trees (including over 15,000 hundred year-old tree stock).



**‘Power generation at its peak could have been better secured and offset by distributed solar power generation fed into the grid from the suburban roofs’**

These were some of the most significant recorded impacts on the city and surrounds, leading to loss of life and potentially 100s of millions of dollars of lost income, productivity and property damage. The biggest regret should be the realisation that much of this was avoidable. For example, power generation at its peak could have been better secured and offset by distributed solar power generation fed into the grid from the suburban roofs. The collection and filtration of stormwater and greywater closer to source could also have provided the necessary backup during peak demands, while protecting the capacity of our long term storage and river flows.

Why then, are these alternatives not being developed and implemented? Why do we continue to focus excessively on the short term, refusing to factor in all the adverse long term economic, social and environmental impacts of traditional technologies, transport, city form and energy distribution systems which are becoming more apparent on a daily basis? Clearly in this study it is not possible to deal with all of these issues. Instead, it seeks to identify the potential for the economic, social and environmental transformation of our existing cities, in the main built after the industrial revolution and in the model of the garden city movement and modernism.

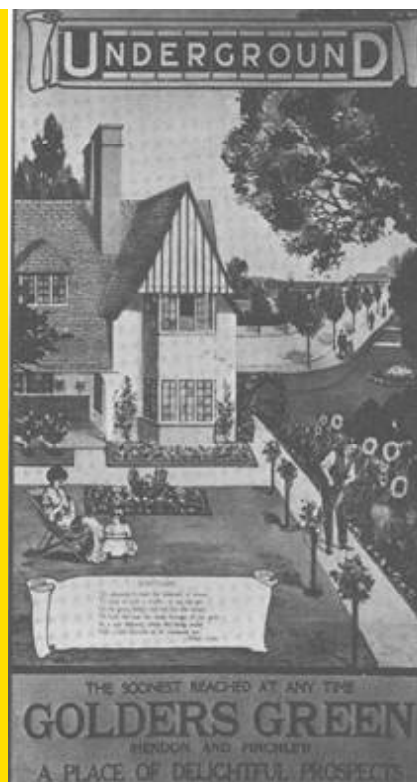
It also looks at testing the proposition that by getting better utilization out of our existing land-use and infrastructure we will be able to meet the projected growth pressures on our cities. While the study looks in detail at the relationship between land-use and road based public transport infrastructure, I would suggest the principles are as easily applied to water and energy infrastructure.

The garden city movement promised us the dream that we could live in the countryside and work in the city, while modernism turned us away from pragmatic locally based solutions and towards the international solutions supported by technologies (such as air conditioning) that no longer made appropriate 'place influenced design' a necessity. Overlay this mindset with an over-reaction to the ills of the industrial city and the emergence of the motor car and you have the root causes of the current form of our cities – namely low density, widely spread, activity zoned cities where the motor car dominates our public realm and public transport has been largely marginalised.

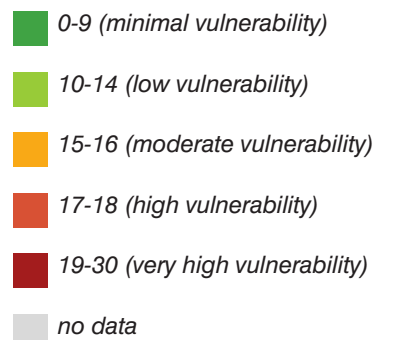
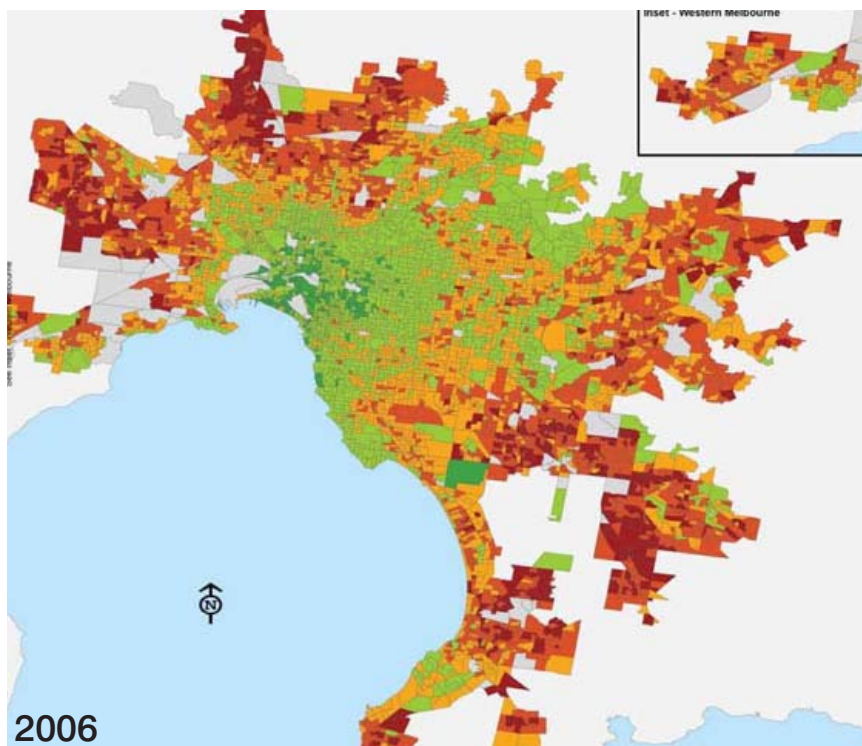
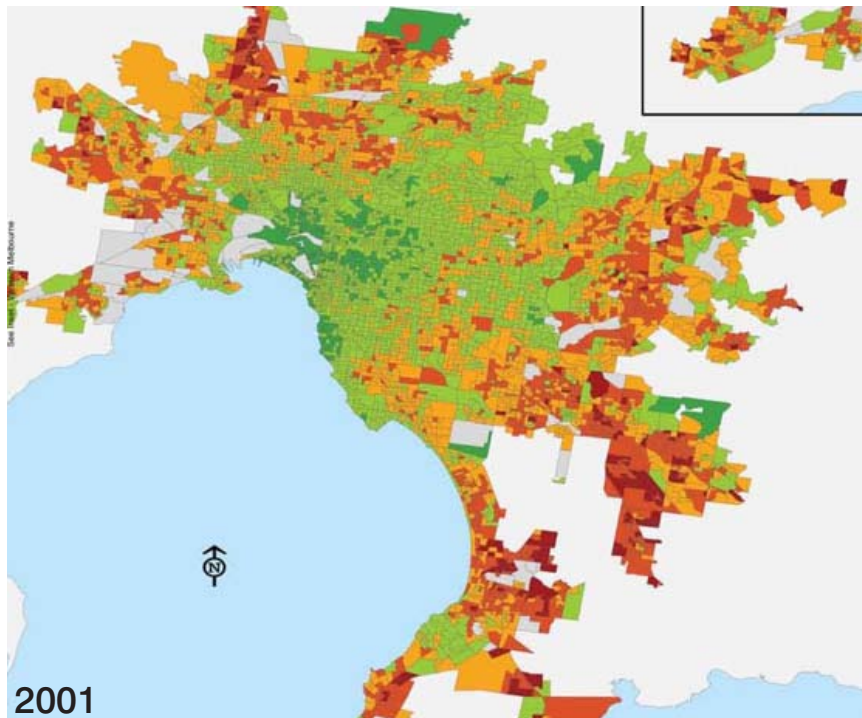
This is not to deny the obvious qualities of the Australian dream of living in a detached house in the well-treed suburbs, a typology that Australian Cities have perfected with its Capital Cities regularly featuring in the top ten most livable cities internationally. Dreams are important but ultimately need to be supportable if they are not to lead to economic, social and environmental disaster.

So how do we sustain the Australian dream and make it an exemplar to all other post industrial cities worldwide? Is it possible?

*The Garden City movement promised we could live in the countryside and work in the city. Sustaining this dream today increasingly relies on efficient public transport.*



*Oil and mortgage vulnerability comparison –  
by building on the fringe we are building in future poverty*



Griffith University Urban Research Program VAMPIRE index,  
Dr Jago Dodson and Dr Neil Sipe 2008,  
*Unsettling Suburbia: The New Landscape of Oil and Mortgage Vulnerability in Australian Cities*



## Saving the Australian dream

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To save the Australian dream we first need to genuinely understand the current costs and vulnerabilities of our existing cities and then develop transformational strategies that will retain the quality of lifestyle we desire while producing cities that are livable, economically viable, socially inclusive and ecologically sustainable.

So what are some of the short and long term costs of our urban developments when viewed through the new realities of climate change, rapid growth and diminishing fossil fuels?

Climate change and rapid growth will undoubtedly impact on infrastructure and urban development in the near future. Some of the issues that will need to be considered when developing any future proofing strategy are:

- > Climate change is already delivering more extreme weather events, such as flooding, storm surges, reduced rainfall in certain areas, increased wildfires and extreme temperature variations.
- > Existing urban settlements and infrastructure are increasingly vulnerable and will need to be protected against these events (e.g. buckling rail lines and exposed overhead wires).
- > Sea levels are likely to rise 1-2 meters in the next 100 years.
- > Future rapid growth, if poorly located, will lead to inefficient and unsustainable city forms.

Recent research undertaken by Curtin University found that for every 1000 dwellings, the costs for infill and fringe developments are \$309 million and \$653 million respectively (Trubka et. al. 2008). Additional fringe development costs incurred include hard infrastructure such as power and water, increased transport and health costs, and greenhouse gas emissions.

Therefore by encouraging infill development, the economic savings to society would equate to over \$300 million per 1000 housing units, or in Melbourne's case, if the next million people were located within existing developed areas, \$110,000,000,000 over the next 50 years. This figure does not take account of the indirect benefits to society of factors such as increased social capital and economic productivity as a result of better health and closer knit communities. This research adds considerably to concerns about the unending sprawl of our cities and strengthens the case for more compact settlement patterns. In addition to this figure an Access Economics report prepared for Diabetes Australia estimates the total economic cost of obesity in Australia in 2008 was a staggering \$58 billion. This includes 'productivity, direct health, carer and other costs, as well as years of healthy life lost to disability or premature death.' The report also found that 17.5% of Australians are obese. *The Australian* 22 August 2008

A recent survey by Chris Loader draws a direct correlation between the use of public transport and exercise. 'Our analysis of household travel data from the Victorian Integrated Survey of Travel and Activity (VISTA) found that people who used public transport on a particular day, also spent an average 41 minutes walking and/or cycling as part of their travel. Those people who used public transport but not private transport (cars, taxis or motorcycles) averaged 47 minutes of physical activity. The Australian Government's physical activity guidelines recommend that adults spend at least 30 minutes doing moderate-intensity physical activity on most, preferably all, days.'

BusSolutions Issue no 2 March 2010

THE AGE 7  
FRIDAY, MARCH 12, 2010  
**NEWS**

## Public transport users vote with feet

By **CLAY LUCAS**  
TRANSPORT REPORTER

PUBLIC transport users get a daily average of 41 minutes physical exercise, compared with an average of eight minutes for those who only drive, according to an analysis of Victorian travel data.

Research completed by the Bus Association of Victoria has found that those who use public transport in Melbourne are likely to get their recommended daily dose of physical activity as a "side effect" of their travel.

Exercise guidelines produced by the federal government recommend that adults spend at least 30 minutes a day walking, cycling or doing another activity that increases their heart rate.

An Access Economics report prepared for Diabetes Australia estimated the total economic cost of obesity in Australia was about \$58 billion in 2008.

A map produced as part of

**INNER HEALTH**  
Average minutes walking and cycling per person per day by council.

33-37 24-33 17-24 13-17 11-13 8-11 7 or less

that it brings significant public health benefits," he said. "We need better public transport in Melbourne's middle and outer suburbs."

The Heart Foundation's chief executive, Kathy Bell, said the survey highlighted the need for more outer-suburban transport services, because one impact would be improved health.

"People in Melbourne's growing outer suburban areas are missing out on satisfactory levels of public transport services and also on the health benefits of walking and cycling that are associated with regular public transport use," she said.

The study's figures are derived from the state government's Victorian Integrated Survey of Travel and Activity, released last year. It surveyed 43,800 people in households in Melbourne and regional Victoria. The Bus Association analysis compared public transport users with those who used a vehicle to get around.

the Bus Association's study also indicates how much people who live in each of Melbourne's council areas either walk or cycle. It shows that those in Melbourne's inner areas, which in most cases have easier access to public transport, get much more

exercise as part of their daily travel routine than those who live in outer Melbourne.

Bus Association policy manager Chris Loader said the study showed that improving public transport services was crucial. "The research demonstrates

*This research adds considerably to concerns about the unending sprawl of our cities and strengthens the case for more compact settlement patterns.*



*This built form and transport mode are no longer sustainable*

If Australia's major cities are to meet future demands for population growth without simply repeating past practices of taking over farmland on the urban fringe, a new paradigm needs to be found. This needs to involve containing future development and infrastructure within the current city boundaries to the greatest extent possible, while achieving greater efficiencies and affordability. This is the aspiration of most cities but achievement typically falls short.

Strategies to achieve livability and sustainability within the confines of existing city boundaries need to comprise the six key ingredients of existing successful cities, namely:

- > Mixed use
- > Density
- > Connectivity
- > High quality public realm
- > Local character
- > Adaptability

*'We have reached an interesting time when the drivers of sustainable cities are the same as the drivers of livable cities, namely, mixed use, connectivity, high quality public realm, local character and adaptability. When these characteristics come together as they do in Barcelona, they provide an alchemy of sustainability, social benefit and economic vitality. These cities reduce their need for car travel, reduce energy consumption and emissions, use local materials, support local businesses and create identifiable communities.'*

– Rob Adams, *The Age*, 2009





Of the elements listed above, the question of city density is arguably the most important. Compact cities with high densities are emerging as the most robust in the challenges posed by climate change. They are capable of operating on lower consumption and often produce more equitable social characteristics and access to essential services.

Cities such as Barcelona with 200 persons per hectare, and more recently Malmö Bo01 in Sweden, are examples worth reflecting on. Built in 2001, Bo01 is an exemplar of a low carbon footprint. The development's density of 120 persons per hectare equates to about eight times the typical Australian urban density. Bo01 is comprised of highly sustainable buildings of 2-5 storeys in height. As with Barcelona, this low rise high density dispels the myth that high density requires high rise.

It is arguable that no new building needs to be higher than 6-8 storeys to achieve high density compact cities for the future. This built form is not only more sustainable but reduces the need for excessive embedded and operating energy; for example: windows can be operable and used for passive ventilation and cooling; stairs become alternatives to lifts for the lower floors; and the reduced height helps ameliorate excessive wind effects at ground level, which is characteristic of much taller buildings.



*Malmö Bo01  
Density = 120  
persons per  
hectare*

**449**  
people/ha

*High density does not necessitate high rise.  
(NB: densities shown relate to specific buildings depicted)*

*(DBook. Density, Data, Diagrams, Dwellings.  
A Visual Analysis of 64 Collective Housing Projects.  
Authors: Aurora Fernandez Par, Javier Mozas, Javier Arpa  
Printed, 2007.)*



**MEXICO CITY MEXICO**

**553**  
people/ha



**VANCOUVER CANADA**

**903**  
people/ha



**VIENNA AUSTRIA**

A new paradigm for Australian Cities should recognise the need to not only direct future development to Activity Centres around rail infrastructure (which most are planning) but also to recognise the enormous development potential of the road based public transport corridors created by bus and tram movements. Curitiba in Brazil, for example, has pioneered development of the 'linear city', using a Bus Rapid Transit network as the foundation for medium rise high density development, surrounded by low density development.

**'In Australian cities, the aim should be to maximize development along new and future road public transport corridors'**

These, as with activity centres and redevelopment sites, would become 'key development areas', producing urban corridors that would utilise only 3% of the existing city area. This is not a new phenomenon but rather a recognizable trend that needs to be facilitated. In Melbourne, successful activity centres and transport corridors already exist, as is apparent in Coburg and along Sydney Road, Brunswick. They are increasingly vibrant and sought after areas to live in with successful communities that support urban living for a wide cross section of nationalities and needs.

Importantly they exist in close proximity to suburban areas which make up the remaining 90% of the city which could be designated as 'areas of stability', protected from high density development and encouraged to become the 'green lungs' of the city through increased street tree plantings, water collection, passive solar energy generation and productive back yards.

## Key Development areas of the city

Over the next decade, Urban Corridors, redevelopment sites and Activity Centres, which together account for only 7.5% of the land area within the Urban Growth Boundaries, will need to become known as the most desirable locations for new urban development.

This study did not look in depth at the capacity within Melbourne's Activity Centres and redevelopment sites. Research undertaken by Melbourne University (Kim Dovey et al) indicates that the current area available in the Activity Centres without any further extension of their boundaries is 6895 ha. It is of interest to note that this area is similar to the land potentially available for development along the urban corridors and is equivalent to 3% of the available land within the Urban Growth Boundary. If this resulted in 60% take up for residential development this would equate to 4200ha which could reasonably accommodate 840,000 people at a density of 200 people per hectare.

The State Governments Urban Development Program database identifies 1,486 key development sites that either have planning approval or are under construction. The area covered by these sites is 3161 hectares and based on the developments where there are known dwelling numbers the average density is over 200 dwellings per hectare.





Using these figures and preliminary studies carried out within the City of Melbourne (one of the 31 municipal areas included within this study) where a potential for residential development from existing known redevelopment sites, excluding the CBD, add up to an additional 110,000 residents. It would not be unrealistic to assume that the City of Melbourne figures would conservatively represent less than 20% of the capacity available within the Metropolitan Area. This would equate to a capacity within redevelopment sites of approximately 550,000 people. When these numbers are combined with the Activity Centres figures above, there would appear to be a capacity for a further 1.4 million people able to be accommodated within the existing fabric of the metropolitan area.

Add to this the aim that, by 2050, all major road based public transport corridors should have developed into medium rise high density corridors containing a further 2.5 million people in close proximity to activity centres, and the adjacent 'productive suburbs', and you would have gone a long way towards accommodating future growth without significantly changing the shape and form of the city.

Development of these corridors would take development pressure off the existing suburbs, which can then develop as the new 'green lungs' of our metropolitan areas.

The success of these high density corridors will rely on clear communications and a widely understood implementation strategy. The lessons from existing urban development strategies, like Melbourne 2030, are that unless the parameters of engagement are clearly understood by all the affected parties, the roll out will become bogged down and ineffectual. One of the issues is that the current planning process is not well equipped to handle rapid development approvals. Planning Controls will need to move from the current cumbersome model of 'Development Assessment' to one of a more proactive but targeted 'Development Facilitation' system.

*A possible future for Elizabeth Street and inset as it is currently*



**'Development of these corridors  
would take development pressure  
off the existing suburbs'**

Some of the requirements for this to work successfully are as follows:

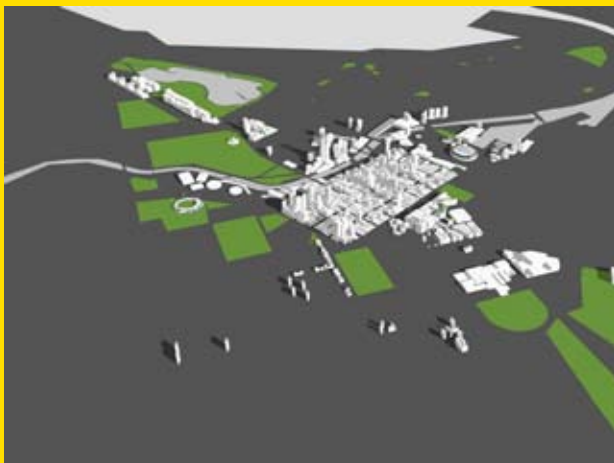
- > All the existing Key Development Sites including Activity Centres, redevelopment sites and future major road-based public transport corridors need to be clearly identified, so that there can be no confusion as to the extent of the key development areas.
- > Existing Suburban Areas or Areas of Stability need to be further protected against invasion by higher density housing.
- > All heritage buildings and public open spaces need to be protected.
- > The extent of the footprint for redevelopment needs to be clearly identified.
- > The appropriate level of development, 4 to 8 storeys, needs to be determined up front and where possible be given as of right development approval, subject to specified Urban Design criteria that ensure quality engagement with the adjacent properties; particularly the public realm.
- > Clear principles around the transition and overlooking conditions in relation to the properties running along the back boundaries of the designated sites need to be established.
- > All new development will be required to provide no less than 80% active frontages along all street frontages. Vehicle access to sites should preferably be from rear lanes or side streets.
- > All developers will be required to provide a percentage of affordable housing in any residential redevelopment (ie. a form of value capture).
- > All new development will be required to meet high environmental standards, including integrated energy/water/sewer systems.
- > Streets will be modified to favour rapid public transport, bicycles and pedestrians over motor vehicles.

*Combining  
dedicated tram  
corridors with  
extended dedicated  
bus corridors  
could achieve a  
rapid expansion  
of Melbourne's  
public transport  
infrastructure.  
(Shown:  
Curitiba, Brazil)*

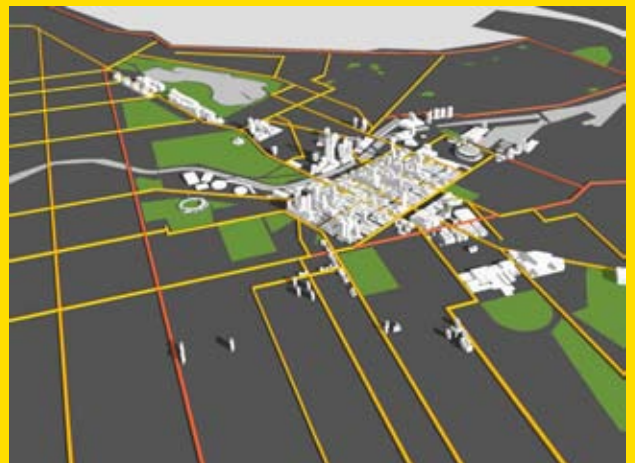


The advantage of these prescriptive controls over the current approach to planning is that it will be very easy for the land value to be determined. This will avoid developers 'over bidding' in the hope that additional development potential can be achieved through the planning process. This approach would also work in favour of small scale builders and developers, thus providing greater variety and a smaller scale that is all too often absent from new large scale developments.

*3D model of the evolution of the new paradigm in inner Melbourne*



1 Central city built form with open spaces shown



2 Existing and proposed road based transport corridors



3 As of right development along corridors (early development)



4 Areas of stability between corridors





*Maribyrnong Road, Maribyrnong study area, currently*



*Possible future*

Affordability could be further enhanced if small scale domestic builders could achieve special registration for developments up to 5-6 storeys. Current costing processes would indicate that this approach is only financially viable for 1-3 storey developments. New construction methods, such as factory fabrication of units, and/or the correct costing of all benefits are some of the main challenges that should be addressed.

Offsets need to be considered in the light of the over \$300 million additional cost per 1000 houses if built on the fringe (Trubka et. al. 2008). A small proportion of this \$300 million, if invested in the corridors, would both help ensure the viability of this approach and go some way to remedying market failures with current development patterns (e.g. external costs that are ignored), including infrastructure pricing (that does not reflect marginal social costs).

A key challenge for this approach is achieving public acceptance. The principles above will assist in this regard, since they are intended to help assure the wider community that these corridors are fixed and will not spill over into the suburban areas in between. There will also need to be good visualisation of the outcomes (such as above) so as to overcome a concern that high density inevitably equates to high rise.

'Selling' the idea should be helped by the reality that these development concepts are not new, as they are starting to take place in many locations around the country. The proposition in this study is that it is time to considerably speed up the process.

By encouraging infill development rather than urban fringe development, the economic savings to society would equate to over \$300 million per 1000 housing units.



*Nicholson Street, East Brunswick study area*



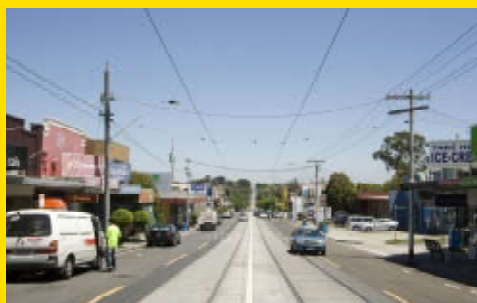
*Current*



*Possible future*



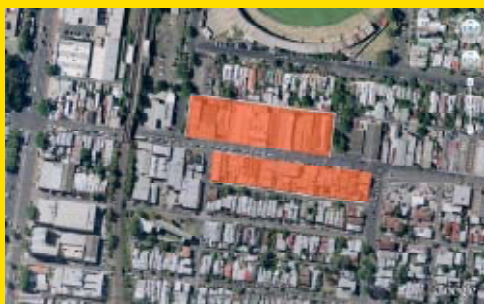
*Riversdale Road, Hawthorn study area*



*Current*



*Possible future*



*Johnston Street, Abbotsford study area*



*Current*



*Possible future*

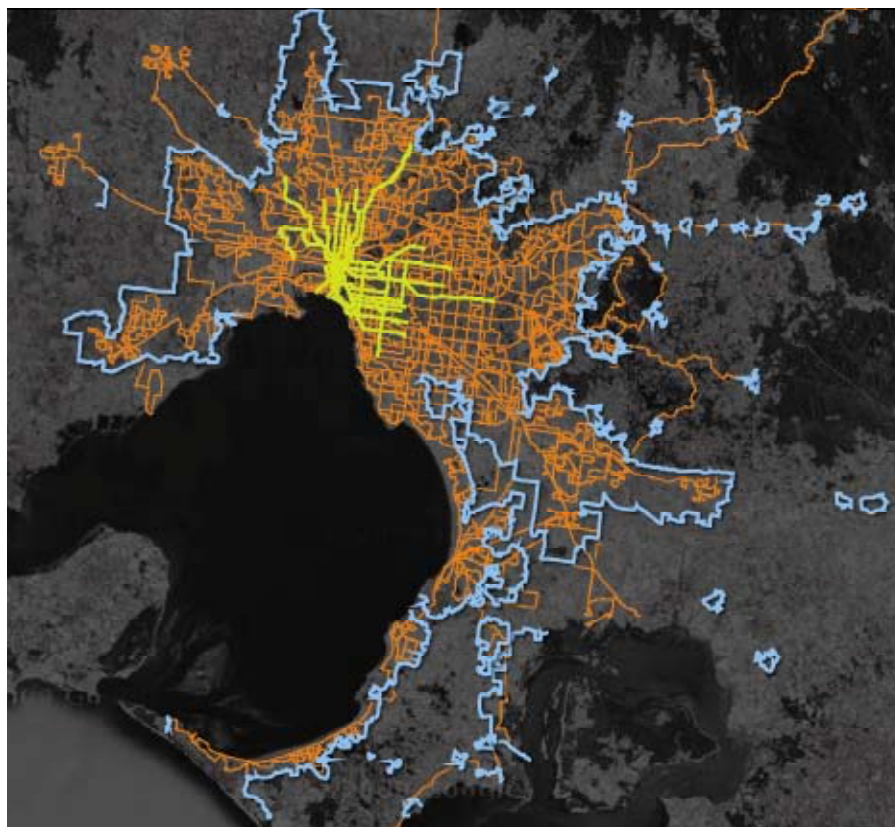


## Development capacity of Urban Corridors

This study looks at the potential yield that could accrue from this approach to intensification of the urban corridors. A number of assumptions, as illustrated below, were made in determining the potential for future development along these tram and bus corridors.

The results, as can be seen below, is that 2.5 million people could be accommodated along these routes – providing affordable, well positioned accommodation without the need to subdivide any further land or extend the current growth boundaries. This could all take place using existing commercial delivery modes and saving up to \$110,000,000,000 over 50 years, if all of the next million people were located within existing developed areas.

The secret is to recognise the need to transform our existing infrastructure rather than building and expanding in the hope that increased size will improve our capacity.



*Urban centre  
= 3,371,888 (2006)  
Melbourne Statistical  
District = 3.9 million  
(2009)*

*Note: entire bus  
network is shown*

Urban growth boundary  
Tram/Light rail network  
Bus network

## Steps in calculating developable sites along Urban Corridors

*Refer to Appendix 1 for extended methodology*



**1**

Identify cadastral parcels

Melbourne metropolitan  
cadastral parcels: 1,571,532



**2**

Remove special building zones  
(CBD, Southbank, Docklands, St Kilda Rd)

Total Melbourne  
metropolitan sites = 1,569,116



**3**

Then select parcels along tram  
and priority bus routes

Potential sites (tram routes) = 27,156  
Potential sites (bus routes) = 98,132  
Total = 125,288



**4**

Remove areas in parks

Potential sites (tram routes) = 23,505  
Potential sites (bus routes) = 95,450  
Total = 118,955

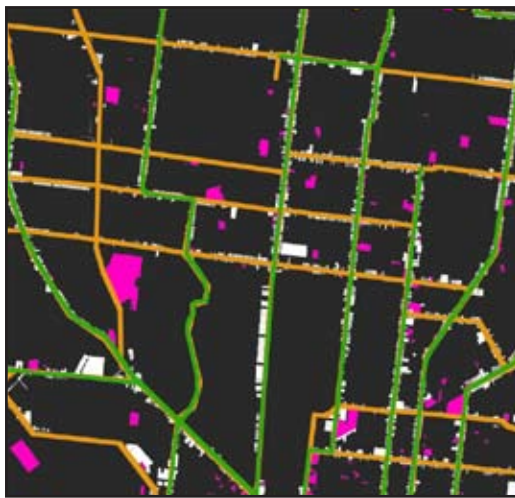




- 5** Remove public use and industrial zones  
 Potential sites (tram routes) = 23,202  
 Potential sites (bus routes) = 91,252  
 Total = 114,454



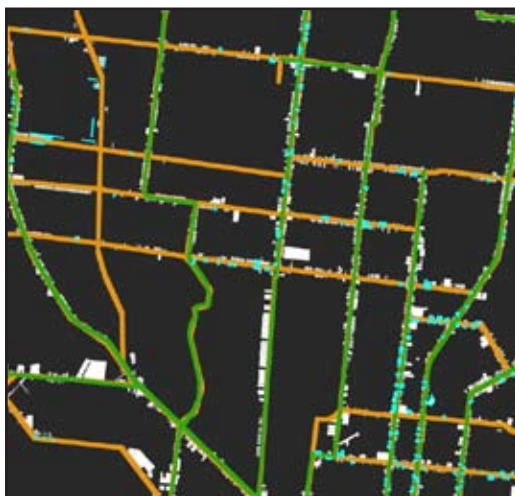
- 6** Remove sites without rear laneway access  
 Potential sites (tram routes) = 18,188  
 Potential sites (bus routes) = 22,440  
 Total = 40,628



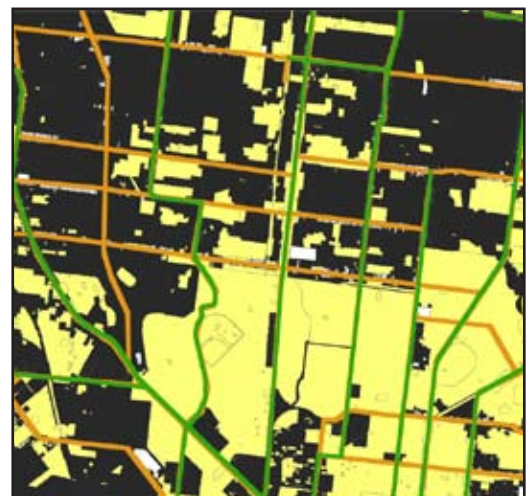
- 7** Remove recently developed sites and sites in planning (DPCD)  
 Potential sites (tram routes) = 18,118  
 Potential sites (bus routes) = 22,138  
 Total = 40,256



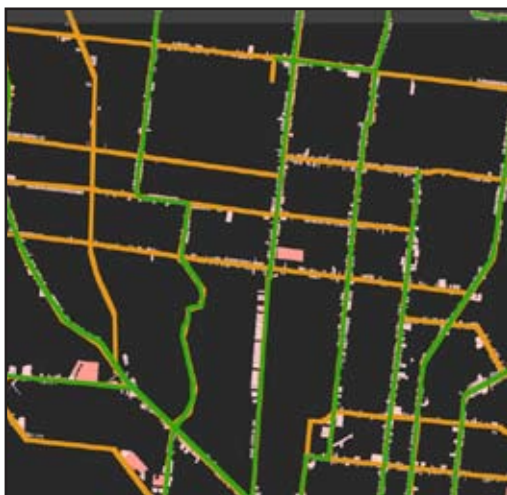
- 8** Remove heritage register buildings  
 Potential sites (tram routes) = 17,726  
 Potential sites (bus routes) = 22,038  
 Total = 39,764



- 9** Remove sites with frontage <6m  
 Potential sites (tram routes) = 16,307  
 Potential sites (bus routes) = 21,973  
 Total available sites = 38,280



- 10** Remove 50% of sites within the heritage overlay  
 Potential sites (tram routes) = 13,439  
 Potential sites (bus routes) = 21,038  
 Total = 34,477



11

Available sites

Final total = 34,477

## Developable sites along Urban Corridors – study results

As outlined here, urban design criteria were applied to identify the developable sites adjacent to Melbourne's transport infrastructure (tram line, priority bus line) with a view to calculating the potential developable sites along urban corridors.

	Adjacent to tram lines	Adjacent to Priority Bus Lines	Total
<b>Developable sites – as per urban design criteria</b>	<b>13,439</b>	<b>21,038</b>	<b>34,477</b>
<b>Area of developable sites (ha)</b>	<b>1,418</b>	<b>5,275</b>	<b>6,693</b>
<b>Current population of developable sites</b>	<b>42,540</b>	<b>158,250</b>	<b>200,790</b>

## Development capacity of Urban Corridors

The number of developable sites was then used to calculate the development capacity of the urban corridors if two alternative density scenarios are applied.

	Net population increase
<b>Low density (180 people per hectare)</b>	<b>1,003,950</b>
<b>High (400 people per hectare)</b>	<b>2,476,410</b>

In summary this demonstrates that Melbourne's Urban Corridors could accommodate a potential population increase of up to 2,476,410 people.

### Disclaimer

Data has been collected from a variety of sources including VicRoads, Department of Planning and Community Development (DPCD) and Department of Transport.

Each dataset has been collected to various levels of accuracy, completeness and currency.

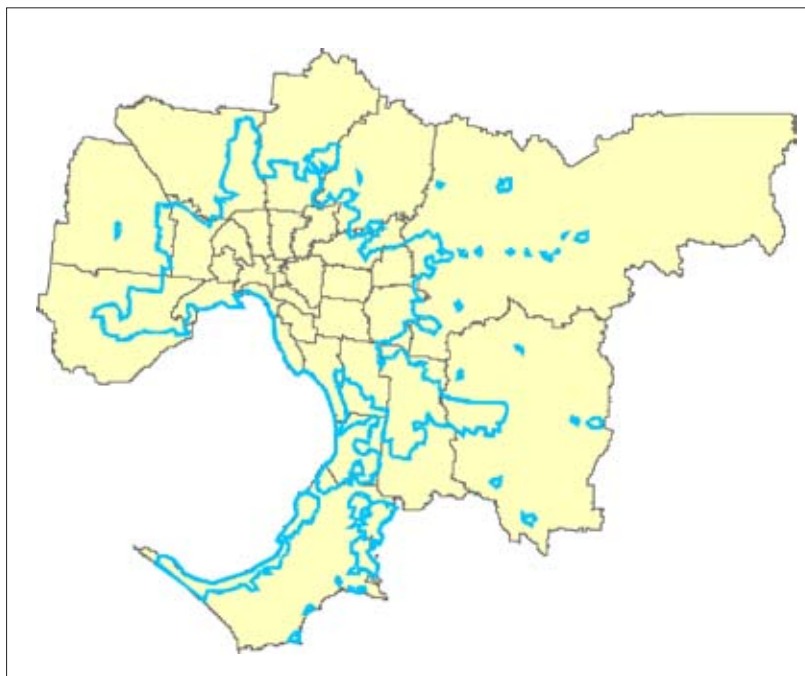
Where data is not available it has been derived. For example rear laneways have been derived based on gaps between cadastral parcels.

## **Distribution of Urban Corridors in Melbourne Local Government Areas**

Local Government Areas (LGAs) are responsible for assisting the State Government in planning for Melbourne's future growth. Using the LGA boundaries, the potential distribution of urban corridors was determined in order to attribute potential development opportunities to each LGA within the Urban Growth Boundary.

### **Background**

The area within the Urban Growth Boundary consists of approximately 224,895ha of land and contains 12 LGAs and intersects a further 19 LGAs.



*Intersection between LGAs and the Urban Growth Boundary across Metropolitan Melbourne*

— UGB

This table illustrates the proportion of each LGA that falls within the UGB as well as the area for potential development along the transport corridors.

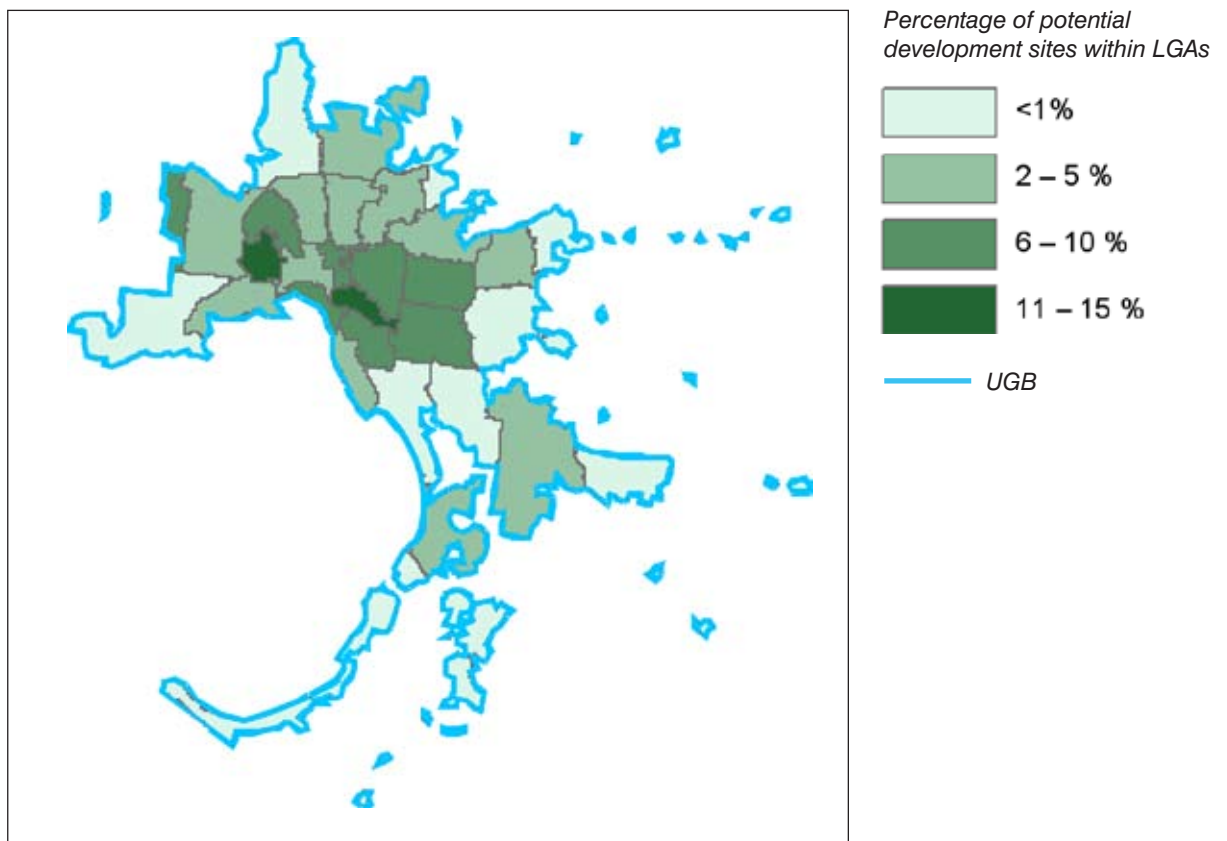
LGA	LGA area (ha)	LGA area within UGB (ha)	% LGA within UGB	Area (ha) along urban corridors	% impact on LGA area within UGB
Banyule	6,253	6,253	100	205	3
Bayside	3,698	3,620	98	192	5
Boroondara	5,999	5,999	100	537	9
Brimbank	12,342	11,120	90	190	2
Cardinia	128,100	8,304	6	1	0
Casey	40,997	17,710	43	398	2
Darebin	5,345	5,345	100	288	5
Frankston	12,958	8,554	66	141	2
Glen Eira	3,869	3,869	100	312	8
Greater Dandenong	12,958	9,088	70	100	1
Hobsons Bay	6,425	5,683	88	112	2
Hume	50,392	12,434	25	185	1
Kingston	9,136	8,513	93	108	1
Knox	11,388	9,433	83	91	1
Manningham	11,351	7,143	63	226	3
Maribyrnong	3,123	3,123	100	432	14
Maroondah	6,139	5,933	97	94	2
Melbourne	3,623	3,604	99	128	4
Melton	52,771	3,606	7	202	6
Monash	8,148	8,148	100	480	6
Moonee Valley	4,427	4,427	100	244	6
Moreland	5,097	5,097	100	217	4
Mornington Peninsula	72,373	19,175	26	51	0
Nillumbik	43,303	3,416	8	35	1
Port Phillip	2,062	2,052	100	120	6
Stonnington	2,565	2,565	100	309	12
Whitehorse	6,428	6,428	100	613	10
Whittlesea	49,012	10,800	22	362	3
Wyndham	54,223	14,491	27	116	1
Yarra	1,954	1,954	100	194	10
Yarra Ranges	247,000	7,007	3	11	0

**Total Area within UGB = 224,895ha**

**Total Area along urban corridors = 6693ha**

**Urban corridors represent 3% of land within UGB**





*Percentage potential urban development sites by LGA within the UGB*

The above map illustrates the percentage of potential development sites by LGA within the UGB as a thematic map.

Based on the calculations, the inner LGAs host a higher proportion of tram and bus lines and thus the opportunities for increased density is present on a greater number of small sites as reflected in the map. In contrast, when urban corridor sites are located in the outer LGAs they tend to be very large and also provide significant opportunities.

The development potential of each LGA was then explored in terms of two density scenarios previously applied to the total available area.

The following assumptions were made:

1. High scenario 400 people per hectare
2. Low scenario 180 people per hectare
3. Each dwelling contains 2 people
4. Currently there are 30 people per hectare living along the transport corridors

Local Government Area (LGA)	Net Population Increase		Net Dwellings Increase	
	Low (180 people/ha)	High (400 people/ha)	Low (90 dwellings/ha)	High (200 dwellings/ha)
Banyule	30,783	75,932	15,392	37,966
Bayside	28,759	70,939	14,379	35,469
Boroondara	80,561	198,718	40,281	99,359
Brimbank	28,481	70,253	14,241	35,127
Cardinia	187	462	94	231
Casey	59,693	147,242	29,846	73,621
Darebin	43,131	106,391	21,566	53,195
Frankston	21,183	52,251	10,591	26,126
Glen Eira	46,781	115,392	23,390	57,696
Greater Dandenong	15,026	37,064	7,513	18,532
Hobsons Bay	16,796	41,431	8,398	20,715
Hume	27,773	68,508	13,887	34,254
Kingston	16,228	40,028	8,114	20,014
Knox	13,580	33,497	6,790	16,749
Manningham	33,895	83,608	16,948	41,804
Maribyrnong	64,866	160,003	32,433	80,002
Maroondah	14,056	34,671	7,028	17,335
Melbourne	19,164	47,272	9,582	23,636
Melton	30,240	74,592	15,120	37,296
Monash	72,005	177,614	36,003	88,807
Moonee Valley	36,623	90,336	18,311	45,168
Moreland	32,543	80,273	16,272	40,137
Mornington Peninsula	7,598	18,741	3,799	9,370
Nillumbik	5,288	13,044	2,644	6,522
Port Phillip	18,074	44,582	9,037	22,291
Stonnington	46,322	114,260	23,161	57,130
Whitehorse	91,942	226,791	45,971	113,395
Whittlesea	54,231	133,771	27,116	66,885
Wyndham	17,405	42,933	8,703	21,466
Yarra	29,118	71,824	14,559	35,912
Yarra Ranges	1,617	3,988	808	1,994

	Low	High
<b>Total population increase (people)</b>	<b>1,003,950</b>	<b>2,476,410</b>
<b>Total dwelling increase (dwellings)</b>	<b>501,975</b>	<b>1,238,205</b>



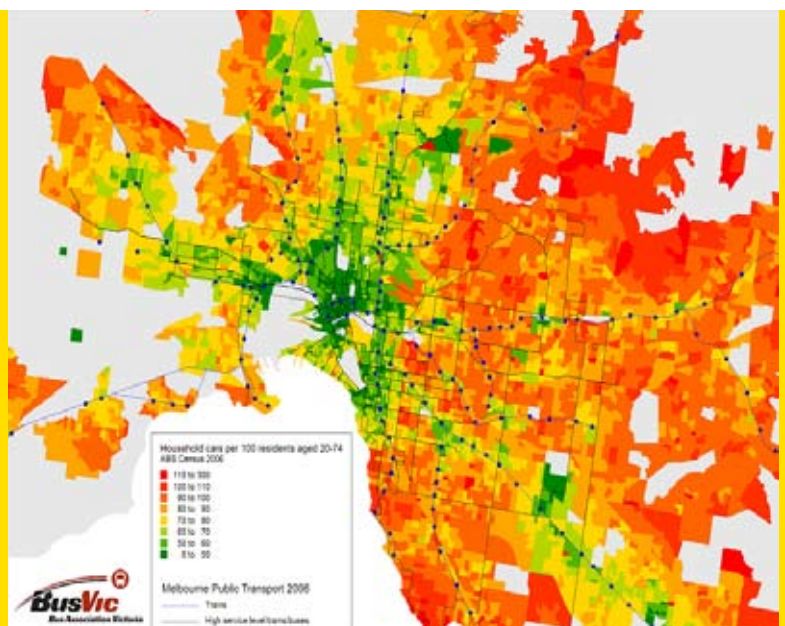
## Benefits of Urban Corridors

The major benefit of this approach is that Australian cities could immediately start to move to improve their long term livability, economic productivity and environmental sustainability, through the positive forces of the private market system, and achieve this by only changing about 3% of the existing footprint of the city. More specific benefits include the following:

- > With increased densities resulting from medium rise development along corridors, substantial population growth can be accommodated in the existing urban area, easing pressures on fringe green space and agricultural land.
- > These increased densities will make better use of existing infrastructure and support a wider array of services and experiences for residents and visitors.
- > The economics of providing high quality public transport services along denser corridors would improve and assist in reducing car ownership.
- > High quality, calmed public transport streets with continuous active frontages would provide a safe and vibrant pedestrian environment.
- > Environmental excellence in energy, water and waste management would minimise the need for upgrading existing or new infrastructure.
- > Reduced car dependency would assist transport disadvantaged people.
- > An increased pool of affordable housing would become available, provided through the market.
- > The application of good urban design principles, such as high quality public realm, clear definition between public and private space, active street frontages, sun and weather protection would improve the quality of urban space.
- > Production of mixed use development would result in greater accessibility to local work, services and recreation opportunities.
- > New 'high streets' connecting activity centres provide an urban experience close to suburbia.

*'Increased access to quality public transport (less than 16 minute headway) in Melbourne clearly indicates a reduction in the number of cars owned per household. If this capacity could be extended to the entire existing public transport network it could dramatically ease congestion.'*

– Chris Loader



## Productive suburbs: areas of stability

Australians have a love affair with the suburban block with its detached single dwelling and extensive greenery. This deep seated empathy is not going to change in the short term nor are these areas going to be rebuilt by 2029. Attempting to retro-fit significantly increased density development in areas not well serviced by public transport is unlikely to be a viable proposition. Instead we need to enhance the quality of these areas, while introducing greater sustainability.

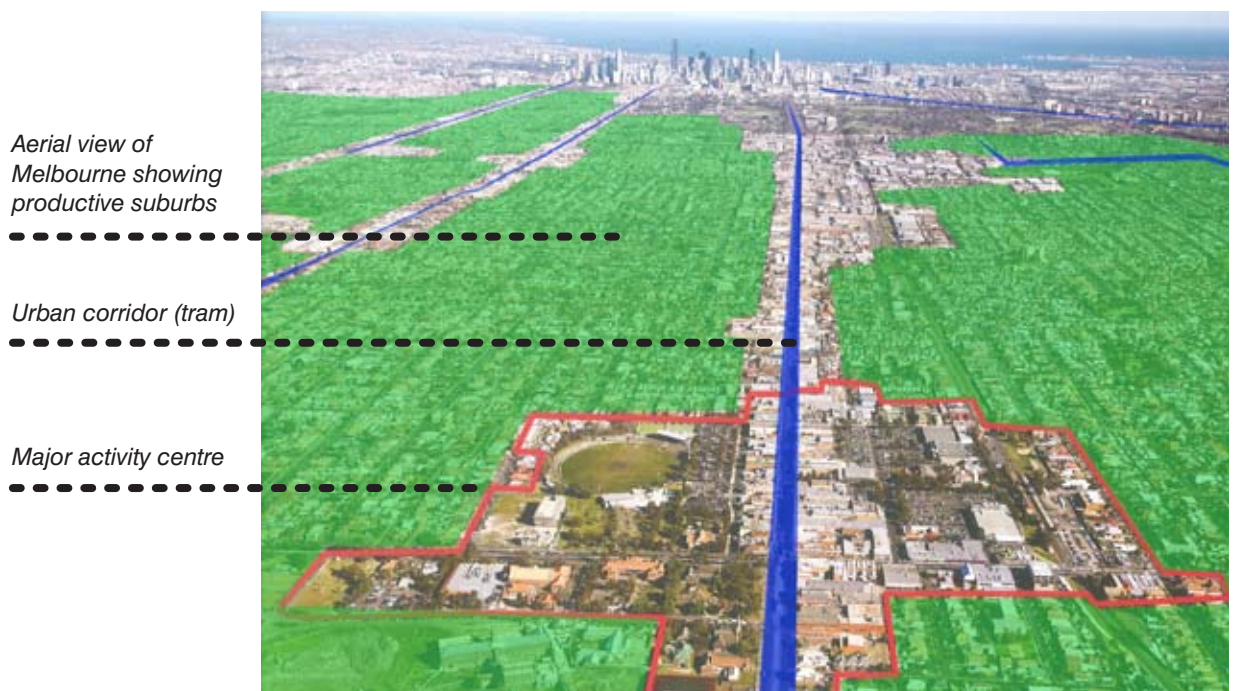
These areas can become the new 'green wedges' of our future cities, working in conjunction with the urban corridors and activity centres, and providing alternative but complementary qualities of residential experience. These areas should become greener, capable of collecting and purifying storm water, generating renewable energy and with more productive back yards so as to reduce the overall ecological footprint of the city, making it more sustainable.

*New 'green wedges'*



**‘This approach will see the majority of the city, namely the suburbs, remain largely in their current although improved form’**

While corridor development is not a new idea, the idea of linking it to a consolidation of suburbia is. If this part of the ‘new paradigm’ is to receive community acceptance, then it needs to be clearly understood that creating the suburbs as ‘areas of stability’ is fundamental to successful implementation. It is also important to reinforce the idea that this approach will see the majority of the city, namely the suburbs, remain largely in their current although improved form.



**'If a comprehensive approach to change becomes mandatory... the community will usually accept this change'**

Some of the requirements for areas of stability to work successfully are as follows.

- > The areas of stability need to be clearly designated.
- > Any new development within these areas needs to reinforce the character of these areas, namely as green suburbs.
- > The streets within these areas need to become well-treed 'bio links' and slow speed, safe pedestrian environments. Water sensitive urban design treatments need to be installed to slow over ground water flows and allow time for stormwater to be cleansed and absorbed into the groundwater.
- > All properties, old and new, should be required to collect their stormwater and greywater.
- > Precinct-wide sewer mines should be introduced to water local parks and gardens.
- > Wind and solar energy generation on all properties should be a requirement and be facilitated through standard nationwide feed in tariffs.
- > Waste collection from properties should be minimised and infrequent so as to encourage recycling and reuse.
- > Back yards should be encouraged to become water sensitive and productive.
- > All new and old houses should be required to become energy and water efficient to the highest possible standards.

As has often been illustrated, if a comprehensive approach to change becomes mandatory, such as water rationing, the community will usually accept this change. This is where political leadership and courage are required.





*Corner of Curtain and Station Streets, North Carlton, before*



*After (demonstrates the minimising of the impact of the corridor development on the streets behind)*

## Potential resources of productive suburbs

A study of inner, middle and outer suburban areas would indicate that they have the ability to not only be self-sufficient but capable of supporting the adjacent dense corridors. The following is a summary of the key findings:

- > The gross energy demands in these areas by 2036 will increase by 14%, 50%, and 44% for inner, middle and outer case study areas respectively, assuming a 25% decrease in demand-side usage.
- > The total roof space required to service existing and increased demand per dwelling is 16, 22 and 28 square meters for inner, middle and outer case study areas.
- > With stringent demand-side management (eg. reduction by 45%), rainwater collection off 100% of residential roof space, supported by greywater collection and reuse, could meet 100% of our domestic requirements.

**‘This design approach plays to one of the strengths of all Australians, namely the do-it-yourself culture of our country’**

## **Benefits of productive suburbs**

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If well-articulated, the major benefit of this approach will be community acceptance and buy-in. This is crucial as currently the conventional approaches to development and climate change are placing the responsibility for action beyond the reach and consciousness of the general public – it is seen as the government’s problem not ‘our’ problem.

By crafting the solution back into the Australian dream – the suburban block – this design approach plays to one of the strengths of all Australians, namely the do-it-yourself culture of our country. Besides the community benefit described above, the following are some of the detailed benefits accruing from productive suburbs:

- > The existing housing stock is valued and upgraded with a view to the future.
- > Houses become less consuming of energy and water and each household becomes more self-sufficient. Australia becomes a country where every house generates much of its own energy, which it feeds into the grid at peak demand times and draws out of the grid at low demand times. The income from feed-in tariffs reduces the burdens of utilities on low income families.
- > Greater tree planting reduces the heat island effect of our cities and increases carbon sequestration. It is estimated that \$1 spent on tree planting yields \$5.6 in benefit to a city. Also, if street trees were to provide bio-links for fauna and flora, we would assist in retaining our biodiversity.
- > By harvesting stormwater and wastewater, less pressure is placed on our natural systems in terms of both demand and pollution.
- > Precinct-based sewer mines provide water for parks and gardens but, more importantly, free up capacity in existing sewer systems for increased densities, avoiding the need for significant investment in new infrastructure. Also, the by-products of sewer mining are dealt with through existing treatment plants.
- > The increase in productive back yards and a reduction in hard waste both have beneficial long term impacts on reduction of travel and landfill.
- > Recent experience has shown that incentives applied to renewable energy installation and use dramatically reduce the costs of these products and help stimulate local industry and employment.

## Implementation

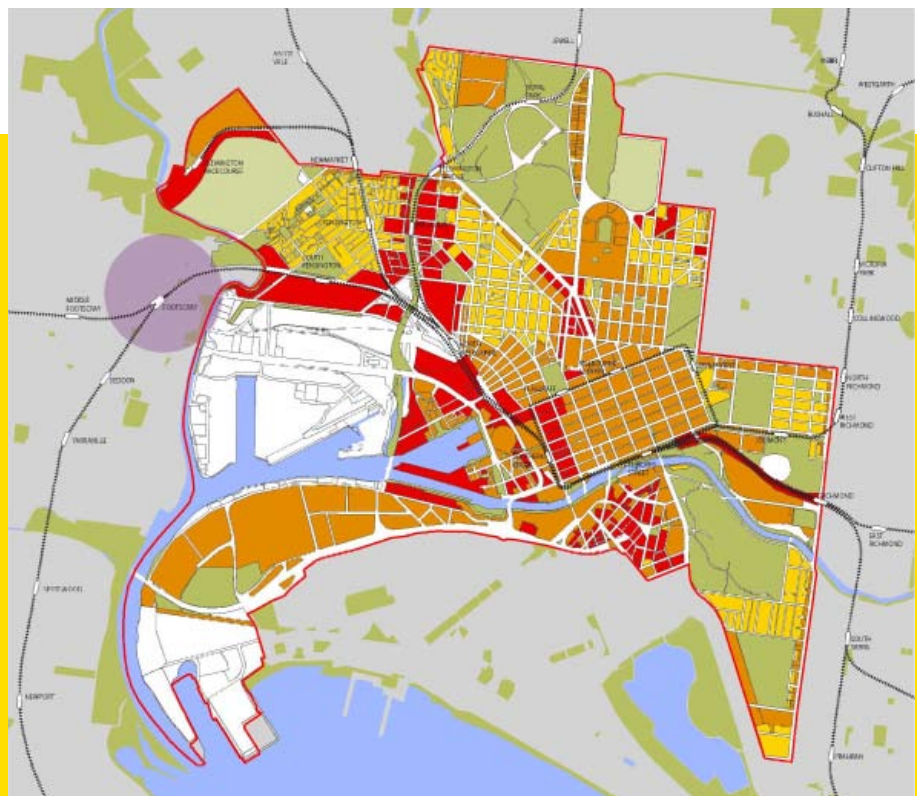
One of the key issues arising from Melbourne 2030 was the inability to implement the strategy rapidly enough to give confidence to the community and the development industry. The key to implementation is the ability to provide simple pragmatic guidelines and then use exemplar projects that can quickly and successfully produce results that demonstrate the efficacy of the new approach.

In a recent study produced for the Victorian Department of Planning and Community Development by SGS et al. a simple one page set of Urban Design Guidelines were developed that were capable of ensuring high quality urban design outcomes. If these guidelines were to be tested along a designated tram route such as Nicholson Street in North Fitzroy or Lygon Street in North Carlton, where there is sufficient road width to give dedicated road space to trams, it would be possible to illustrate the results within a few years.

A similar exercise was trialled in Swanston Street, Carlton during the late 90s where height limits were increased along the tram corridor. The result was a rapid increase in densities with little impact on the adjacent residential area. Another area currently under consideration is the Coburg Initiative which has the advantage of both a mature Activity Centre as well as a mature Urban Corridor. The only limitation would be the need to limit car access to Sydney Road during commuter times so as to give preferential treatment to public transport.

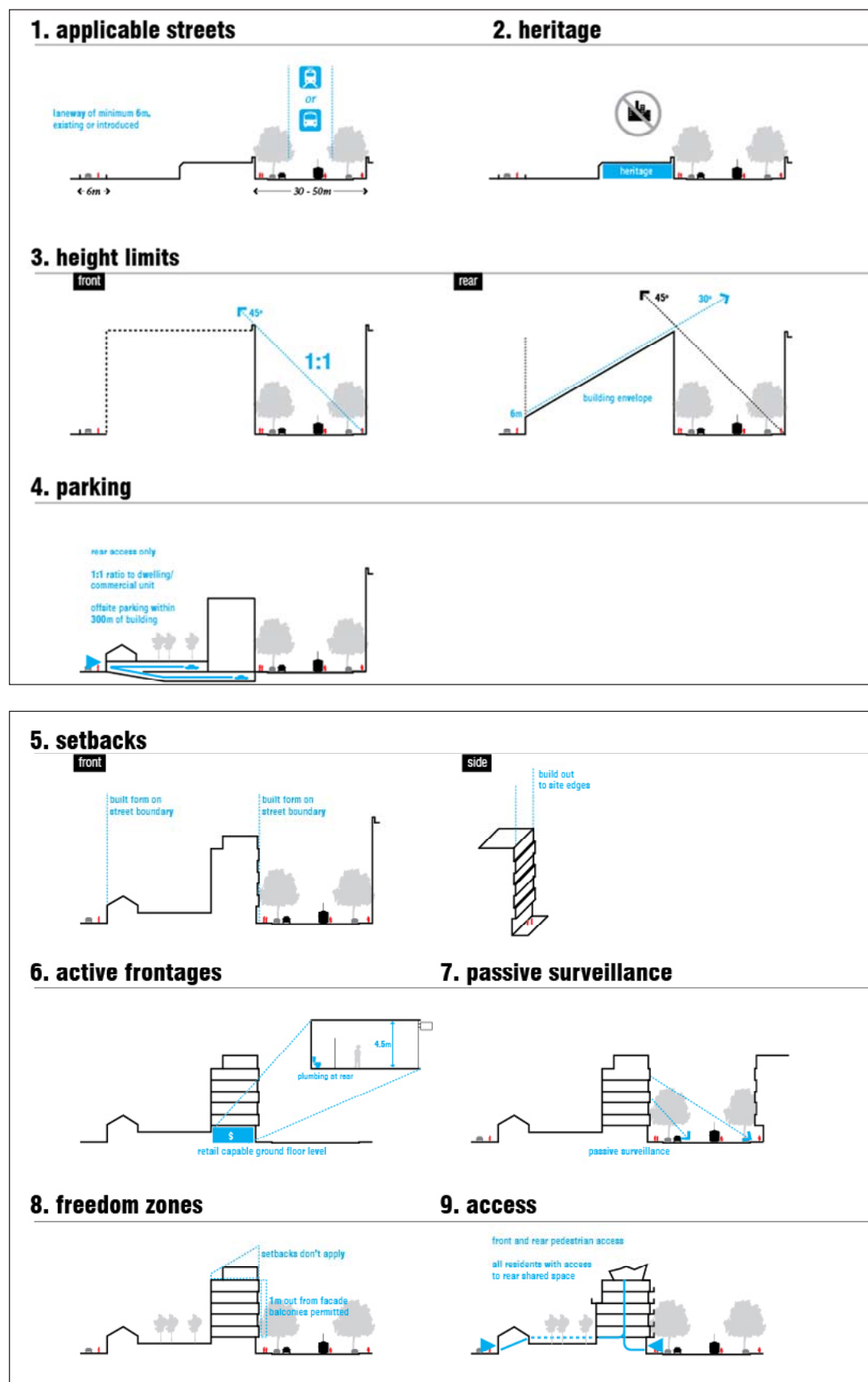
Arguably the most effective way of facilitating new development in the most appropriate areas is to amend Planning Schemes so as to direct development towards key development areas and away from areas of stability. These are the principles currently being developed by the City of Melbourne in its Municipal Strategic Statement.

*Draft City of  
Melbourne Municipal  
Strategic Statement*



Established areas   Ongoing change   Key development areas   Footscray central activities district

## Design development overlay



Source: Department of Planning and Community Development



## Concluding remarks

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This study has looked in detail at the potential capacity for new residential development along the road based public transport corridors in Melbourne and has shown that there is with the right implementation strategies room for up to 2,400,000 new people accommodated in medium density development of between 4 – 8 storeys. It has also identified the potential for a further 1,400,000 people to be accommodated within existing activity centers and known redevelopment sites giving an additional metropolitan capacity of 3,800,000 people. It has also identified that these three interventions would require only 7.5% of the land within the Metropolitan area to be transformed potentially leaving the remaining 92.5% in its current form.

On this basis Melbourne could double its residential population without impacting on the current suburban residential character and life style that Australians have come to enjoy. Not only could it do this within the next 40 years but could do it in a way that would support the current infrastructure of the city, particularly the public transport infrastructure that is so vital to a livable and sustainable future for the city.

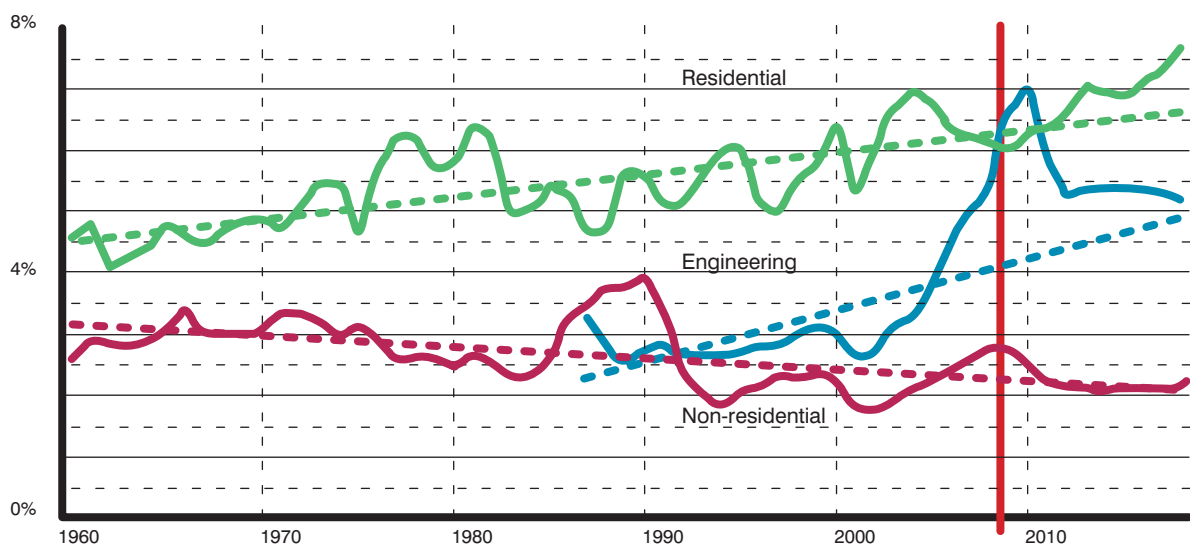
Australia requires a shift in the way it visualises its cities and infrastructure. We need to break the myth that higher densities mean high rise development. More importantly, we need to quantify all the hidden costs (external costs and underpriced infrastructure) of continuing to build at low density on the periphery of our cities, and reinvest these hidden costs in making targeted higher density Urban Corridors, Activity Centres and redevelopment sites viable. We also need to better understand the cost to the community and the Nation of adopting poor and inefficient models of development. Residential development makes up 8% of GDP while Coal provides 2%. To locate future residential development poorly at this crucial stage of our national development would make future adjustments even more difficult and costly.

A related shift in thinking is to recognise that much of our cities existing infrastructure is under utilized, future capacity building is not necessarily best served by large scale infrastructure. Current thinking that power generation and water supply can only succeed through the provision of large centralised infrastructure limits our options and ability to not only climate proof our cities, but also defend them against the extreme weather events. Smaller distributed solutions are not only increasingly more efficient and economical in their requirement and use of existing distribution networks, but are also, as a result of their distributed nature, less vulnerable to extreme circumstances.

Lateral thinking that looks to build on existing infrastructure through greater efficiencies have the potential to produce quick relatively low cost solutions far superior in many instances to new build solutions. Of particular importance are the efficiencies that can be achieved off existing transport infrastructure. Better utilization of road space for buses and trams is a well documented solution. Similarly the recent success of the Victorian Department of Transport in providing free travel to work prior to 7am resulted in a net saving of \$85 million over the alternative of buying 5 new trains. The art of retime-tabling our existing cities is capable of producing cost efficient solutions quickly and providing the breathing space we need to switch to new low carbon solutions.

A primary purpose of this study has been to open up debate about alternative ways of looking at the future of our cities, a future that does not repeat the patterns of the past and lock our cities into the limitations of continued expansion and consumption of productive farm land while stretching our infrastructure so thin as to create both social and environmental problems. While it is accepted that the case put by this study will require a change in both attitude and policy by all levels of government as well as some sectors of the community, initial feed back to the principles which have already been publically debated have been positive with the preliminary document receiving Awards and recognition from the design, planning and development sectors.

*Annual building activity spending as a percentage of GDP*



*Coal production and sale is equal to 2% of GDP and 1% employment*

The evidence presented clearly makes the case that the combined development capacity within the existing Activity Centres, road based public transport corridors and redevelopment sites could accommodate a doubling of Melbourne's population to 8 million people. Equally this could occur in a low rise high density format with development outside of the CBD contained to less than 7.5% of the Metropolitan area and built to 4-8 stories maximum.

This is not to say that existing land already set aside within the growth boundaries should not be utilized. This study has never argued for an either or scenario. There is however a clear case not to further extend the growth boundaries.

Putting aside all else, a strong argument for this recommended approach to future development is the need to reinforce the future viability of all and existing infrastructures and in particular the public transport infrastructure with its already significant investment. Melbourne's overall distribution of transport infrastructure when seen as an integrated system is excellent. Better use of buses, greater priority for trams and an expansion of the rail services could see Melbourne overcome its current moderate congestion problems while producing an efficient and ultimately environmentally sustainable transport system. To achieve this, it is a prerequisite that greater densities are located strategically adjacent to the public transport infrastructure. This is a trend that is already apparent from recent development activity that has seen a slow down in single detached house approvals and an acceleration of apartment approvals, many of which are in the areas discussed in this study. *(The Age, September 27, 2009)*

A simplification of the existing Planning Controls to facilitate this development model will be one of the key steps in ensuring a speedy implementation. Future Planning schemes need to clearly direct development to the key development areas outlined in this study while protecting the existing suburban areas. This is a simple principle and is worthy of trial before being dismissed as 'simplistic.'

*'We can't solve problems by using the same kind of thinking we used when we created them.'*

– Albert Einstein



Investment in conventional infrastructure will give us conventional outcomes. Investment in 'new age' technologies could see us become a world leader. The proposal to transform our cities is one that relies on targeted investments at all levels of Local, State and Federal Government, with complementary private investment encouraged by government policy direction. It has the potential to deliver huge long term benefits in terms of more sustainable and resilient urban systems, agglomeration benefits in both production and consumption, and more engaged citizens. The end result will be a transformation of our cities, and nothing less will resolve the current problems confronting us.

If our cities are to double their populations over the next 40 years it is not credible to expect a doubling in our current infrastructure. For example, a doubling of our existing road infrastructure would only lengthen travel times, increase emissions and build in social isolation. The only credible strategy is to make our cities more compact and achieve greater efficiencies out of our existing infrastructure. While this study has concentrated on road based public transport and land use, the principles are equally applicable to water, energy, waste and food production. This is not simply a study in urban morphology but rather a look at a new approach to the future infrastructure and land use of our cities in order to meet the dual pressures of climate change and the projected rapid urban growth.

This is a once in a generation opportunity to transform our cities while preserving their intrinsic qualities that should not be missed.

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## Acknowledgements

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# TRANSFORMING AUSTRALIAN CITIES

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## APPENDIX 1 URBAN GROWTH CORRIDORS METHOD AND RESULTS



CITY OF MELBOURNE



# URBAN GROWTH CORRIDORS

## DRAFT METHOD AND RESULTS

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This section of the report outlines the method used to identify the capacity of sites along the tram and bus network.

## 1. Aim

---

This study aims to estimate the potential population capacity, of sites located along the tram and bus network within metropolitan Melbourne, if residential intensification was to be encouraged according to best practice urban design principles.

## 2. This report

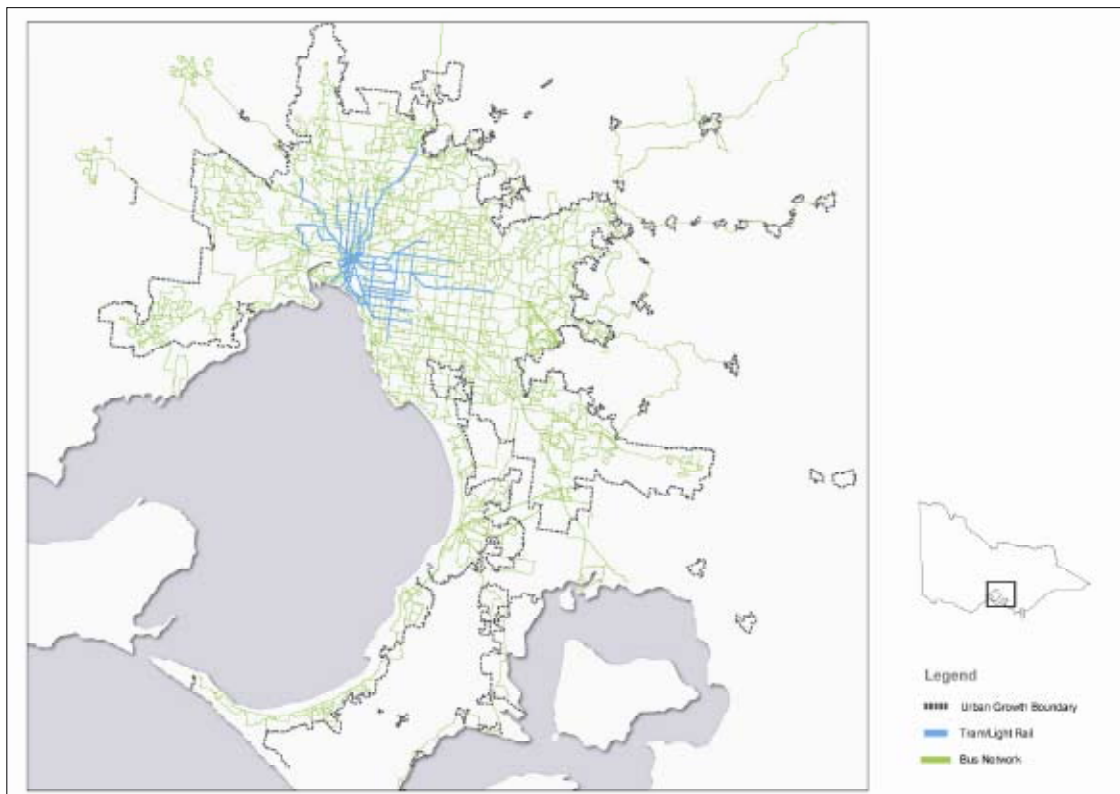
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This report focuses on the rationale for undertaking the analysis, along with the method and results.

## 3. Study area

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The study area is the bus and tram network across Metropolitan Melbourne (Figure 1).



*Figure 1: Tram and Bus Network across Metropolitan Melbourne.*



## 4. Approach

---

To achieve the aim the work program was divided into the following three stages

1. Develop a model to assess if sites along the tram and target bus network are appropriate for redevelopment.
2. Calculate the current population density along tram and bus corridors
3. Develop density scenarios for the sites identified based on international city comparisons.

### Stage 1: Model development - method

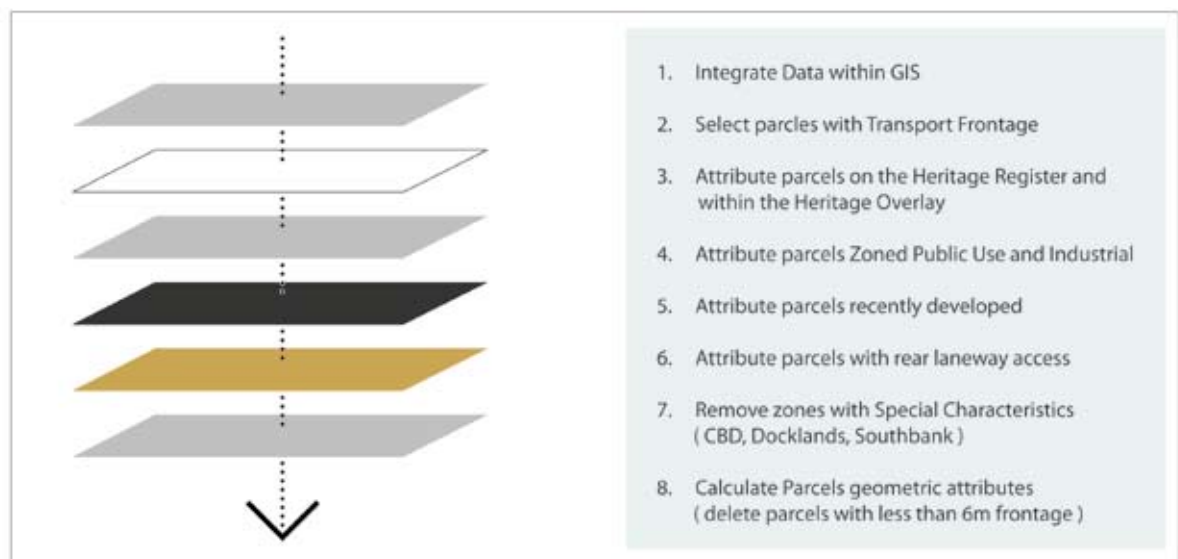
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To begin, seven datasets were identified and sourced from the following organisations:

- (1) Cadastral Parcels  
(Source: DSE, Date: 2008)
- (2) Tram and Bus Network  
(Source: DoT, Date: 2007)
- (3) Heritage Register  
(Source: DPCD, Date: 2008)
- (4) Heritage Overlay  
(Source: DPCD, Date: 2008)
- (5) Public Use, Mixed Use and Industrial Zones  
(Source: DPCD: 2008)
- (6) Recently Developed sites and sites Currently in the planning process  
(Source: DPCD: Date 2007)
- (7) Rear laneways  
(Derived based on the Cadastre)
- (8) Target Bus Routes\*  
(Source: Bus Association of Victoria 2008)

*\*Target Bus Routes are bus routes identified by Bus Association of Victoria as having priority for transport connections and opportunity for densification.*

These eight data sets formed layers which have been incorporated into a Geographical Information System (GIS) for visualisation, analysis and interrogation of the data. Figure 2 is a conceptual model of the integration of data within the GIS. Each of the eight steps and assumptions made throughout the model development are described below.



*Figure 2 Method of data integration and capacity scenario development*

### **Step 1 – Integrate data within GIS**

To begin, the datasets were formatted into ESRI shape file format (.shp). It should be noted that although these are the latest available datasets they have been collected from a range of data sources and have been collected to various levels of currency, accuracy and completeness.

It is important to note that at this stage data processing has taken place to remove duplicate records. This process removes the potential problem of double counting.

### **Step 2 – Select parcels with transport frontage**

Cadastral parcels with frontage to tram lines and target bus routes were selected and extracted. This process required buffering the tram lines and target bus routes and selecting parcels within the buffer, manual editing was then used to delete parcels which did not have a frontage to the tram network.

### **Step 3, 4 & 5 – Attribute parcels based on spatial location**

From the potential parcels layer created in Step 2 spatial selection was used to identify parcels which have their centroid within parcels which are on the heritage register, Heritage Overlay, Planning Zones (Public Use and Industrial), Public Parks and Recreation Zones and/or recently developed sites. A field was added to the potential sites data layer to identify each of these parcel characteristics.

### **Step 6 – Attribute parcels with rear laneway access**

Calculating the rear laneway access involved merging adjacent property parcels, the spaces between parcels were assumed to be road access. This dataset was then split at the vertices and lines with frontage to the tramways were deleted. The remaining lines were assumed to be laneway or rear access points. The potential sites were then selected based on an intersection with the laneway of rear access points. The selected sites were attributed as 1 for laneway access or 0 for no rear access.

### **Step 7 - Remove Zones with Special Characteristics**

This step involved the deletion of sites within the CBD, Southbank and Docklands. These sites have very high density potential with defined high density height limits already in place.

### **Step 8 - Calculate parcels geometric attributes (Frontage, Depth and Area)**

First the area was calculated using the standard function within ArcGIS. Second each parcel has been simplified and split into lines at the major vertices, lines with frontage to the road were selected using a buffer and their length calculated, these have been joined spatially to the land parcels and constitute the parcel frontage. Parcels with a frontage of less than six meters have been deleted; this is because of the assumed access restrictions to the sites and the limited redevelopment potential. Third, the depth for each parcel was calculated using the formula  $\text{Depth} = \text{Area} / \text{Frontage}$ . This assumes that each parcel is approximately rectangular.

## **Stage 2: Current population density**

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The current population density has been calculated based on the selecting Mesh Blocks along tram corridors (excluding “special zones” CBD, Southbank and Docklands). The density of these Mesh Blocks is then calculated.

### Stage 3: Density scenario

---

Once the data has been prepared, scenarios can be applied to ascertain the potential capacity of identified sites. In this instance the density scenario chosen is in accordance with the following criteria:

1. No change to Public Use, Industrial or Public Park and Recreation Zones (PPRZ)
2. No residential development on land zoned for industrial use
3. No change to buildings listed on the heritage register
4. Only land parcels with rear or side road access have the potential for development
5. 50% of buildings in the Heritage Overlay have the potential to be developed
6. To avoid situations where sites are located on both tram and target bus routes, the tram routes have been given priority and these sites were removed from the bus routes.
7. A population density factor has been applied. This factor was ascertained by analysing developments along transport corridors from overseas (see figure 3) and ongoing research into developments currently under construction and recently completed within Melbourne.

Once the model has been implemented potential sites remain and density ratios applied to ascertain the potential capacity of these sites. The results and assumptions are discussed further in section 5.

### Stage 4: Application to local government areas

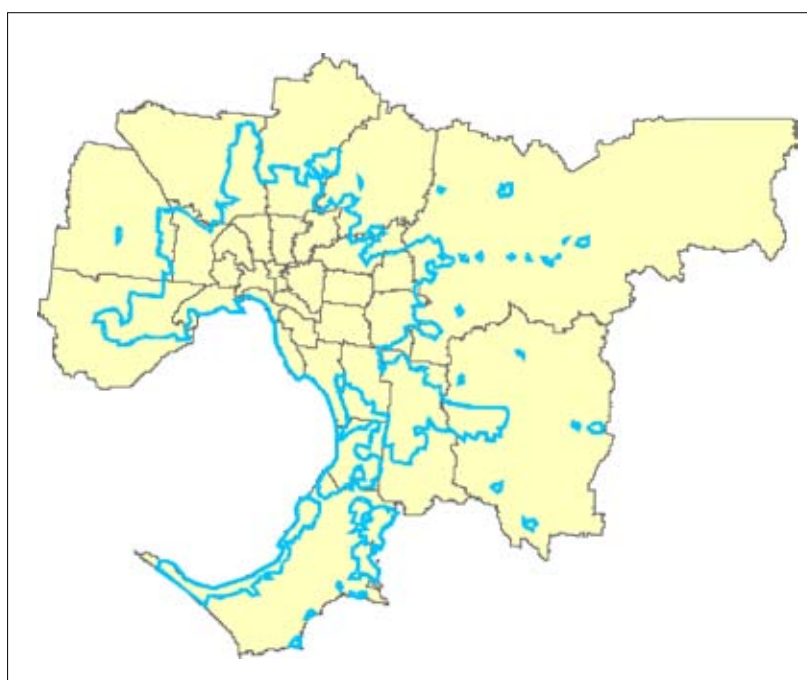
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#### Method

To establish the area for each LGA within the UGB the following steps have been undertaken:

Step 1 Intersect the LGA boundaries with the UGB so that the areas of the LGAs are clipped by the UGB.

Step 2 Calculate the Area of the LGA and compare with the original LGA area to establish the proportion of the LGA which falls within the UGB.



*Intersection between LGAs and the Urban Growth Boundary across Metropolitan Melbourne*

— UGB



### Tallinn, Estonia



Population density per ha  
237

### Mexico City, Mexico



Population density per ha  
449

### Vancouver, Canada



Population density per ha  
553

### Vienna, Austria



Population density per ha  
903

## 5. Results

The summary of results is outlined in Table 1 below. In calculating the results the following assumptions have been made.

- > Household size = 2 persons (refer to Note 1 which outlines the household size by House Type for Metropolitan Melbourne).
- > Current Density = 30 people per ha (This has been calculated based on the selection of Mesh Blocks along the tram and target bus routes).
- > Future Population Density = between 180 and 400 people per hectare (This assumption is based on a selection of developments overseas, figure 3, and internal research into local examples of developments currently taking place).

Using the land area calculated based on the density scenario and subtracting the current population provides an estimate of the potential population along the tram and target bus routes.

	Tram	Priority Bus Lines
Sites available for densification	13,439	21,038
Total area	1,418	5,275
Current Density	30	30
Current Population	42,540	158,250

### Proposed density range 180 – 400

	Low	High
Net Population Increase	1,003,950	2,476,410
Net Dwelling Increase	501,975	1,238,205

*Table 1: Summary of results*

### Total net population increase

In total there were 34,477 sites identified adjacent to tram and target bus routes within the Melbourne Inner Growth Boundary which meet the criteria for development. The potential population capacity of these sites is between 1,003,950 (501,975 dwellings) and 2,476,410 (1,238,205 dwellings) (based on a density factor of 180 to 400 respectively).

## 6. Advantages of the model

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It should be noted that the approach used in this study is flexible and additional data can be added and a range of scenarios tested. For example changes to the transport network, or changes to the development criteria can be added and the results retested.

## 7. Limitations

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### 1. Site compactness

The assumption that sites are rectangular may not apply. One potential solution to this is to apply a compactness measure to test the degree of compactness. The compactness measure is based on a circularity ratio, which compares the ratio of the area and perimeter to that of a circle having the same perimeter.

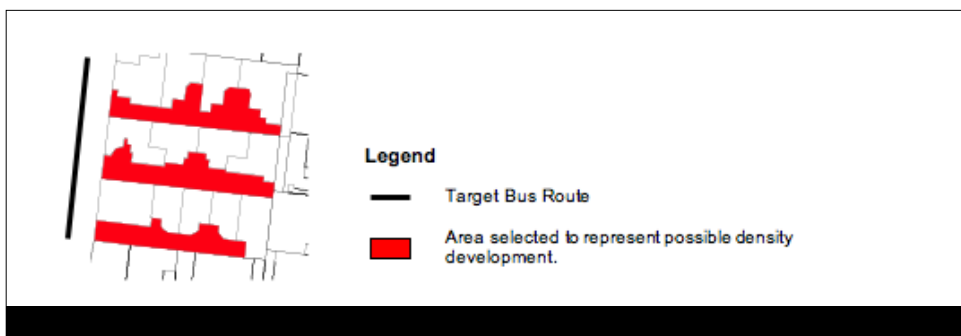
The formula for the ratio is  $M = 4\pi (\text{area})/(\text{perimeter})^2$

As M approaches 0, the shape approaches a long or irregular shape;

As M approaches 1, the shape approaches a compact shape, time permitting further investigation into the shape and density yields would be undertaken.

### 2. Subdivided blocks

In some situations small subdivisions have taken place and due to the structure of the land parcels the centre or side road area has also been selected for possible development. These cases were randomly assessed and because the area is relatively small (ie. Approximately 1/3 of the total site) we have opted to retain these parcels within the model.



*Figure 3: Example of subdivided parcels included in the analysis*

### 3. Verges/Barriers

Some parcels are adjacent to the tram bus routes however they are separated by small slivers of land (See Figure 6) – in some cases these are road barriers and in other cases they are separating verges which could incorporate a substantial level of change. Further work would be required to analyse the impact of these verges/barriers on the results.

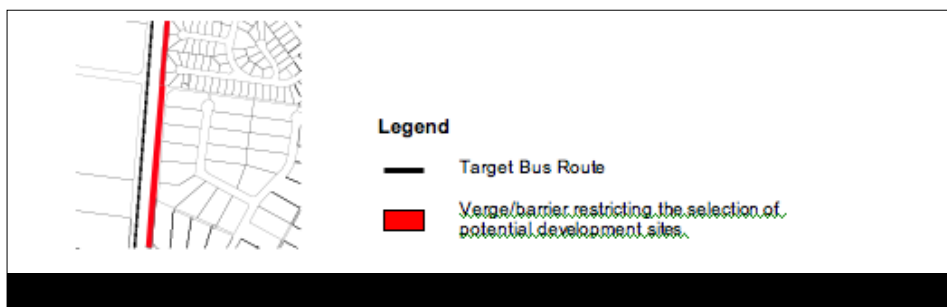


Figure 4: Example of verge or barriers which buffer the selection of potential sites

### 4. Data accuracy

Although the latest datasets have been obtained each data custodian has provided a disclaimer outlining that errors maybe present within the data.

## 8. Conclusion

This study uses spatial analysis to identify sites along tram and bus corridors across Metropolitan Melbourne. It has been conducted inline with the Metro 2030 vision in where sites for development are located within the Urban Growth Boundary whilst maximising access to transport.

In total the capacity of the sites identified through this study have the potential to yield a net population increase of between 1 million and 2.5 million depending on a high or low density ratio applied.

## 9. References

State Government of Victoria (2008) Urban Development Program MapsOnline Available Online: <http://services.land.vic.gov.au/maps/content/udpintroduction> (Date of Access 15/12/2008)

Department of Sustainability and Environment (2006) Know You're Area Available Online: <http://services.land.vic.gov.au/knowyourarea/homepage.html> Date of Access (18/02/09)



**Note 1 - Household size**

	Average household size	Average household size
House Type	2001 (a)	2006 (b)
Separate house	2.89	2.87
Semi-detached, row/terrace, etc	2.03	2.13
Flat, unit or apartment	1.74	1.76
Other - Average household size	1.94	1.94
Total - Average household size	2.63	2.61

Source: (a) Department of Sustainability and Environment (2006)

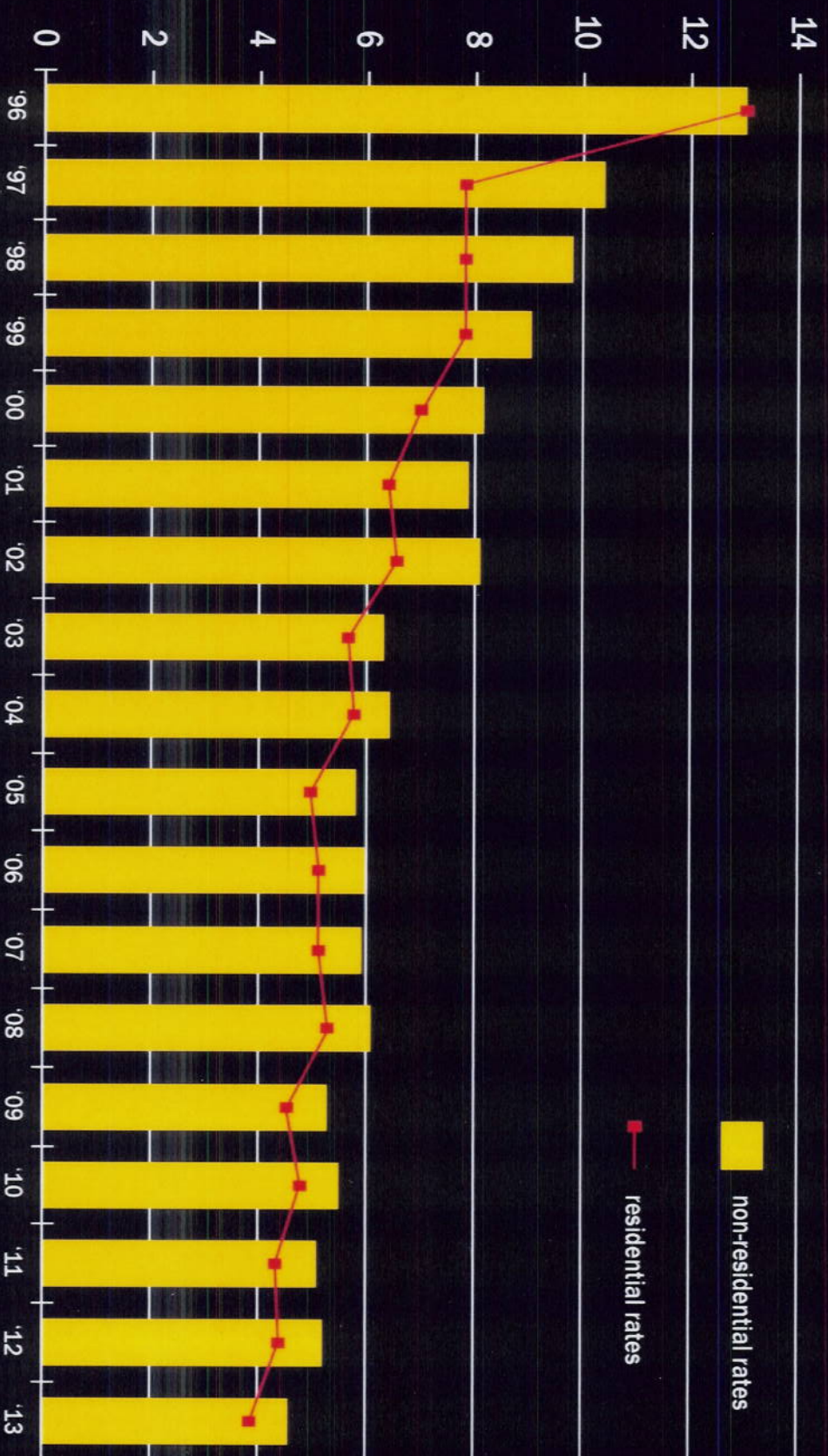
(b) Data derived from ABS Census 2006

**Disclaimer**

To undertake this model and subsequent analysis data has been collected from a variety of sources including: VicRoads, Department of Planning and Community Development (DPCD) Department of Transport and Bus Victoria. Where data is not available it has been derived. For example rear laneways have been derived based on gaps between cadastral parcels. As a result each dataset has various levels of accuracy, completeness and currency. The accuracy of data collection/derivation will inevitably impact on the overall accuracy of the model.

# rates history

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# Making the Future a Success

**City Strategies in an Age of Austerity –  
Recent UK Reforms**

**AHURI National Urban Policy Conference, Sydney  
17<sup>th</sup> May 2013**

# The UK City Region Reform Story

- How it all started
- The key components of the reform:
  - Funding baselines
  - From the “New Transport Economics” to “Single Assessment Frameworks”
  - Self help and the infrastructure fund approach
- The Greater Manchester Transport Fund Case Study
  - Decision making, prioritisation and the programme view
  - Tax Increment Finance Partnerships and “Earn Back”
- City Deals
- Where next



# The Fiscal Penny Drops



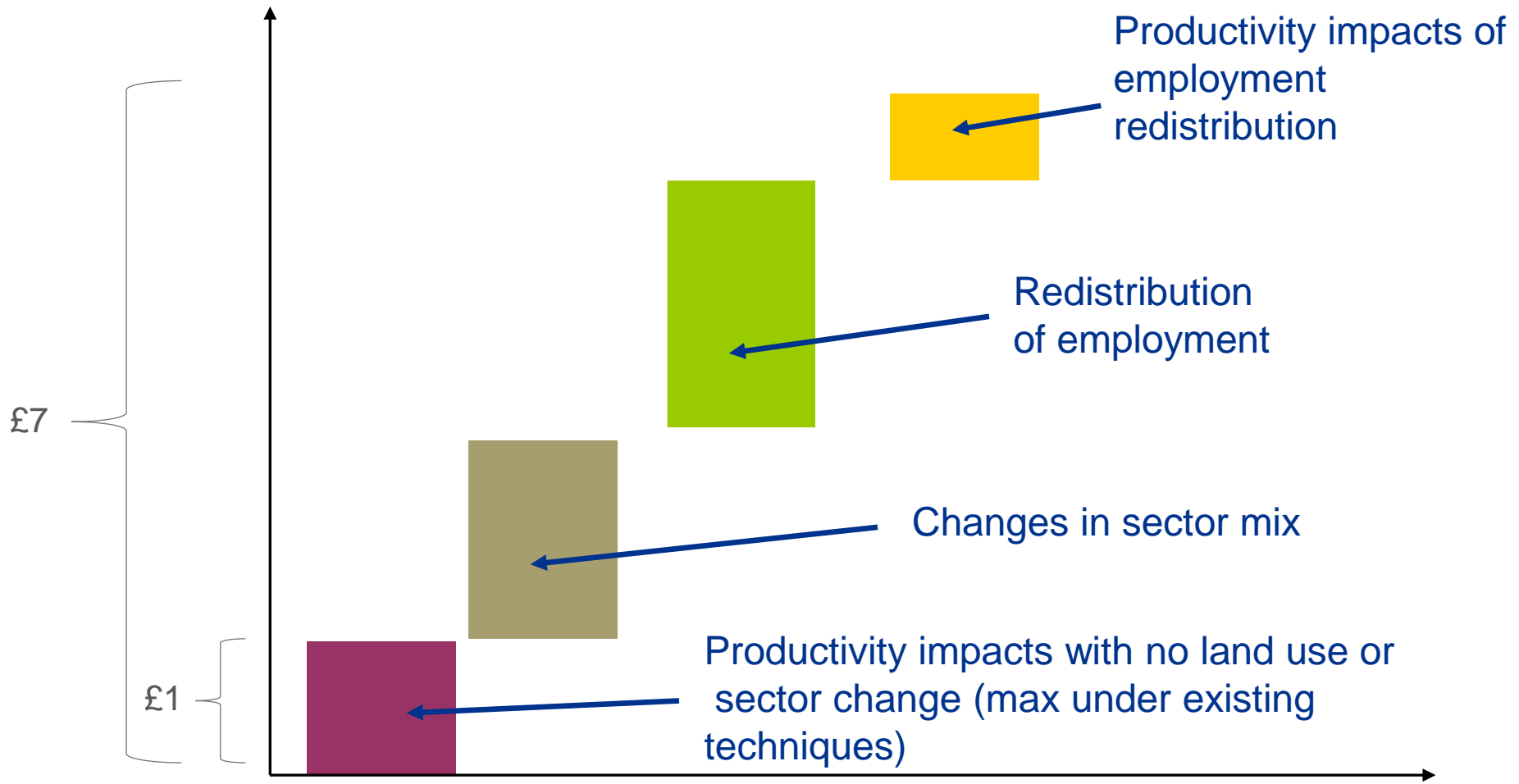
- Increasing clarity around likely city region funding levels, even pre-austerity
- Only London adequately funded (7x other English cities per £ of output)
- Post 2010 budget cuts “protected” infrastructure, but non-London city transport capital spend still reduced by 75%
- London/other ratio now closer to 30x - what Greater Manchester (GM) gets to spend on transport in a year London gets every 48hrs
- All the large cities English cities now have a 10 year transport funding line
- The “do-nothing” funding line is now transparent
- Thanks to GM it is also clear what “do something” means



# The New Transport Economics

- Traditional transport appraisal assumes the real economy (jobs and productivity) is fixed – its really all about the time savings
- This risks a “so what” attitude to the implications of reduced transport funding
- Some recent moves to “wider economic benefits” (WEBS) have helped, but the focus is very narrow and impacts are essentially multipliers on the time savings
- The “NTE” approaches are radically different:
  - The focus is solely on the wider impacts (time savings etc discarded)
  - Jobs, productivity (and thus tax revenues) are modelled explicitly
  - Issue is net impacts at a large geography – eg net impact on GVA (local GDP) at the level of the whole of Greater Manchester
  - Principally a prioritisation tool: “if I want to maximise the growth potential of my city which mix of schemes should I buy?”
- Today in the UK you will be hard pressed to find a large city that uses anything else

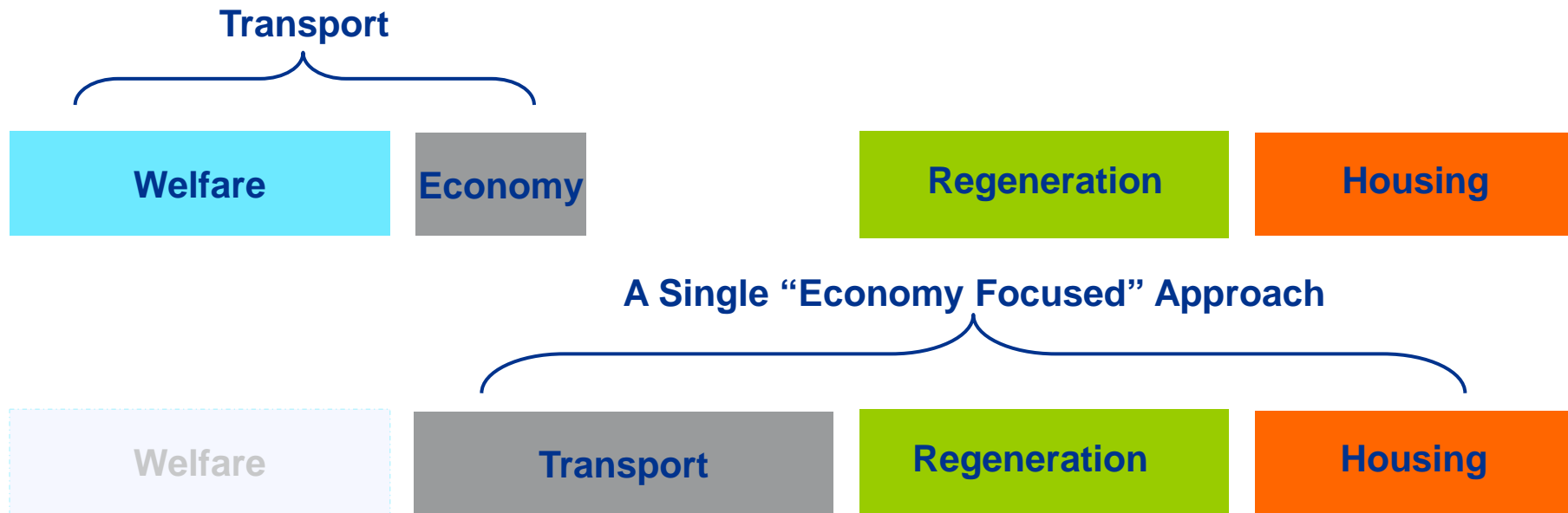
## City Region GVA Impacts, NTE versus standard approach



Source: 2010 KPMG rail study for northern English cities

# Single Assessment Frameworks

- Logical extension of the NTE approach
- Supply side impacts are not unique to transport
- What is required is a level playing field focused on net GVA impacts – means changes for regeneration and housing appraisal as well as transport
- Allows for capital budgets to be allocated in a way best calculated to promote growth
- Adopted by GM, now the emerging standard for other large cities



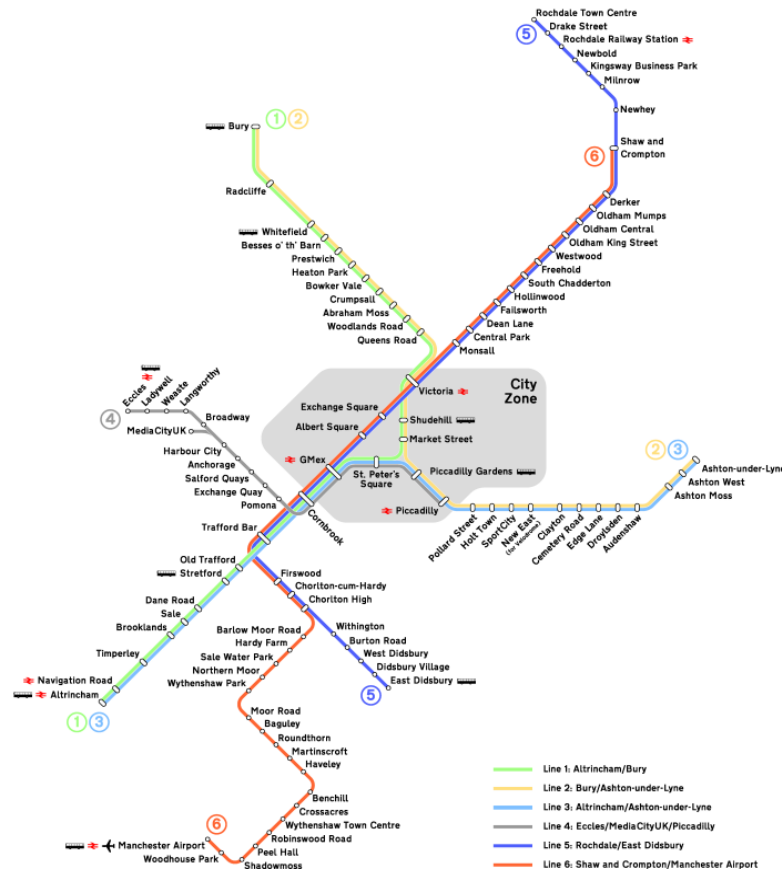


# Self Help and the Fund Approach

- Understanding the implications of baseline funding for growth is only the start
- Additional funding is also required
- This has resulted in the establishment of “self help” city region infrastructure funds
- These top-up the devolved baseline budget with local revenue streams, including significant top-slices of existing current programmes, developer and other contributions which are then allocated to a fund
- The fund then secures finance to translate the revenue streams into capital buying power which is then allocated on a prioritised basis focusing on a whole 10 year plus programme
- Local decision makers decide:
  - the rules of the game – eg the basis for the prioritisation
  - How much local funding to put in – ie how far down the prioritised list to go through self help
- They do not decide the scheme rankings – this is done independently

# Greater Manchester Transport Fund

## 2017/18 Metrolink Network



- Self help on a massive scale (10x base case 10 year budget)
- Some £2.0bn rather than £0.2bn
- Programme strictly prioritised on a net GVA (jobs and productivity) at the GM level per £ of net cost
- But with “programme minima” (eg better than average improvements in employment opportunities for bottom 25%) to ensure balance at programme level
- Rules agreed by the 10 leaders of the 10 GM local authorities in advance
- Money committed in the end game (pro rata to population) by unanimous vote
- New delivery structure (Combined Authority) put in place to deliver – accountable to a cabinet of the 10

# Tax Increment Finance and Earn Back

- GM Story does not end with initial decisions on their self-help fund
- They have negotiated a ground breaking deal with the UK Treasury which is really a new form of Tax Increment Finance
- Focused on the tax GM creates through its self help
- This is not about actual tax devolution (and it is outside all the standard grant formulae etc) but a revenue formula which reflects the extra tax the Exchequer will get as and when GM's self help delivers results
- The formula is based on net growth at the GM level (ie the same basis as GM's prioritisation) because this means a high proportion of it will be net national, and against benchmarks (ie growth that would happen anyway)
- GM can only get back what it has put in, and has committed to reinvest every penny it earns back in additional GVA prioritised investment
- Means GM's fund is genuinely rolling one, with the step up in annual investment a function of: (a) the degree of initial local self-help; and (b) additional growth delivered
- GM's first 10 year programme now likely to be £2.6bn rather than £2.0bn

# City Deals

- The GM approach has proved the catalyst for a whole new dialogue between UK cities and central Government, built around a City Deals process
- Eight initial deals for the largest English cities were concluded last year, of which GM's was the most radical
- Now 20 more due this year, with the first 8 widening and deepening
- Special Central Government Unit established to sponsor each deal, and a Treasury Minister put in charge of the process
- All the deals are bespoke but with one central theme – a self-help city “offer” focused on growth, and a central government “ask” reflecting the additional national value created
- Critically, this is not about the better off cities capturing the surpluses they already create, but any city sharing in value it creates by going the extra mile
- Versions of the GM “Earn Back” deal feature strongly

# Where Next

- Yesterday London broke cover and announced it wants its variant of the GM deal
- The process is expanding into Scotland, where the partnership will be three way: city; Scottish Government; UK Government, at least until the independence referendum next autumn
- The City Deal process is evolving into one about additional budget devolution, with the Single Assessment Framework approach to prioritising across traditional silos being seen by the Treasury as the principal prize
- The lead cities are beginning to ask where “payment by results” might go next – eg into reduced welfare payments delivered through local action

## Raising the capital

*The report of the London Finance Commission*

MAY 2013



## Some key themes

- Long term funding baselines are a critical part of any grown up conversation between a city and higher tiers of government
- Think 10 year (fully funded) programme, not one project at a time
- Ideally, leaders should tie themselves to the outcome, not the project
- The growth focused level playing field approach is critical to maximising returns and generating buy-in
- Independent prioritisation helps
- Self-help, additionality and a focus on net impacts at a large geography can help unlock a tax increment partnership with upper tiers of government
- The business community can help, but self-help is not just a public sector issue
- No getting away from the need for local leadership on the one hand and vision on the part of higher tiers of government on the other
- Never waste a crisis, especially a fiscal one

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The Network Rail logo, featuring the text "Network Rail" in a blue sans-serif font, with a red and white stylized graphic element to the right.

Network Rail

The background of the slide is a blurred image of train tracks receding into the distance, creating a sense of speed and forward motion. The tracks are rendered in warm, golden-brown tones.

# *Prioritising investment to support our economy*

A new approach to appraisal methodology

# Foreword

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**Paul Plummer**  
Director,  
Planning & Development



Investment in infrastructure is vital to the UK economy, and will continue to be so as the Government seeks to deliver sustainable economic growth. For example, investment in the transport network helps companies trade with other businesses, reach new markets and gives them access to the labour they need.

However, at a time when the funding available for such investment is limited, it is crucial important decisions are taken that focus on delivering the best economic return, as well as delivering that investment as affordably as possible.

This paper seeks to address the issue that, at present, investment decisions in the transport, housing and regeneration sectors are not made on the basis of the economic value they add, but on other factors. In transport, this is through an approach based on welfare economics which focuses primarily on the value of any investment to transport users - most commonly through the time saved on their journeys or other benefits.

Though this welfare economics based approach is perfectly sound, it fundamentally fails to ask how we best generate economic growth and it is not clear that this can be addressed by including wider-economic benefits in the appraisal. This paper argues that a new methodology is needed to help prioritise investment decisions and that this approach should focus on assessing the impact of investment on the economy. It does not advocate doing away with welfare based appraisal altogether, but instead that the current approach should be run in parallel to one that focuses exclusively on the real economy and that facilitates level playing field assessments across closely related strategies such as regeneration and housing.

This approach would differ from one which makes a purely commercial assessment of what should be delivered. Instead, it would make an assessment of how best to identify and target investment to maximise the impact on economic growth. It acknowledges that climate change and other environmental considerations would still need to be given appropriate priority in the decision making process.

With limited money available for investment, it is expected that there would need to be trade offs between the transport, housing and regeneration sectors in order to get the best mix to maximise the economic benefits and secure the best value for money through a genuinely integrated approach.

With the need to reduce the deficit and support economic growth of paramount importance to the Government, we believe an approach which prioritises the maximisation of economic growth could be the primary consideration in decisions on investment for the foreseeable future.

This is very much a discussion paper, and the ideas it contains would require more detailed work, but we would welcome the thoughts of those interested in this area. I would also like to thank colleagues from KPMG for their help in preparing this paper.





**Neil Bentley**  
CBI Director,  
Business Environment



In its first months in office, the new Coalition Government has rightly focused on addressing the fiscal deficit, by far the most pressing issue we face today.

In the June Budget, the Chancellor made clear that the Government's plan for the economy will rely on whether increasing private sector demand can offset the impact of public sector cuts.

In that context, it is vitally important for the nation that we ask how we can most effectively generate private sector growth. Investment in our nation's infrastructure – in whatever sector – is absolutely key for business, and the Government has recognised this.

However, when money is scarce, we need to prioritise investment projects that are most likely to support economic growth. In the current climate, we must do everything that can realistically be done to meet that goal.

The problem with the current appraisal system for transport investment projects is that there is no thorough assessment of the impact of those investments on the real economy; what it would mean for jobs, the construction supply chain or for overall economic productivity. These are not questions the current system seeks to address in a wholesale manner, despite the fact that they are crucial in determining the economic value of investment decisions.

With constrained public finances, the taxpayer needs – and deserves – a system that gets the best value for any public money that is spent, and one that helps to deliver the highest possible levels of economic return from transport investment. Businesses need a system that, in simple terms, helps them grow, create jobs and drive further growth.

Therefore, the time is now right to examine whether changes could be made to the appraisal system that help support the overriding objective of encouraging economic growth. The proposals Network Rail has set out in this paper contain a way forward that could support that objective, and the CBI believes these proposals are worthy of further detailed debate. We look forward to the discussions that will follow.

## *Executive summary*

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### *The urgent need to repair the UK's fiscal position and restore economic growth presents a major challenge to the rail industry, the wider transport sector and the public sector as a whole.*

There are a number of dimensions to this challenge. First and foremost it is about reducing the costs to the taxpayer of the things the public sector buys. Efficiency, however, is not just about how much things cost, it is about what is bought in the first place. A complete response to the efficiency challenge, therefore, also means understanding whether the things we buy are those that generate the greatest economic value. This Network Rail paper aims to stimulate a debate about how this second dimension to efficiency is addressed.

Within rail, the value for money study being led on behalf of Department for Transport and Office of Rail Regulation by Sir Roy McNulty is assessing whether areas such as asset management, supply chain management and the industry's overall incentive structure can be improved so the railway can deliver better value for money to the taxpayer. This involves both of the dimensions of efficiency identified above, and this paper has been prepared as an input to the study as well as to the wider debate.

In the transport sector, the need to generate economic value has generally been addressed using transport appraisal methodology. This puts a value on improvements to transport, based largely on what users would be prepared pay for the benefits – typically time savings – that they enjoy as a result. The methodology in effect asks the question: 'How do we best spend the tax proceeds of economic growth to increase total economic welfare, trading what taxpayers give up for the value that users receive?'

This approach has underpinned the substantial improvements in rail services over the last 15 years. Whilst taxpayer support for rail has increased significantly, what rail delivers to its users has also markedly improved: there are more services, on newer trains, at record levels of punctuality.

These improved outputs have real value to users, and this has been reflected in increased demand: between 1995/6 and 2008/9 the number of passenger journeys grew by 67%, and there has been a 59% increase in the volume of freight that is moved by rail. This in turn has reduced congestion on the roads, giving benefits to road users as well as rail users.

However, it is clear that we now need to answer a very different question, namely: 'How do we prioritise spending in a way that best supports economic growth?' We believe that a new approach to decision making is required in order to answer this question, both in transport and more broadly.

This is not to say that the improvements in rail services of the last 15 years have not benefited the economy. Far from it. They have delivered substantial benefits through larger and more efficient labour markets, lower congestion, improved business to business connectivity for people and goods, and by enabling the most productive parts of the UK economy to grow faster than they would otherwise have done. The increased expenditure on the railway has therefore delivered economic growth as well as improved transport outputs.

Neither is it to say that the importance of transport to the economy not been recognised before. Traditional transport appraisal puts a value on time saved by business travellers. More recently, methodologies have been developed to estimate some aspects of the "wider economic benefits" of transport improvements. However, these do not capture all of the benefits to the economy; and they are in effect bolted on to an appraisal framework that is still centred on valuing welfare benefits to users.

This paper therefore proposes that strategic spending decisions in transport and closely related sectors should focus more strongly on the maximisation of what we might call "real economic returns" per £ of net cost to the taxpayer.

We suggest that the traditional welfare based approach to transport appraisal should be supported by a separate assessment of the impact on the “real economy”. These two approaches to the returns on transport spend could be run in parallel. The case studies drawn on in the main body of this paper suggest that the “real economy” approach would prioritise different kinds of transport spend, and we would anticipate that the challenges facing the Government mean that the real economic dimension would need to dominate in strategic decision making for some time. But the welfare question will remain relevant and should have a continuing role even in the near term.

The approach to addressing the “real economy” impacts needs to be comprehensive. For transport this means it needs to address the impact of transport on land use and business mix. The case studies drawn on in the main body of this paper suggest these impacts will account for the majority of the long term impacts of transport on the real economy, particularly at the regional and sub-regional level. It is recognised that this means a wider confidence level to transport appraisal impacts than has been the case in the past, but we believe this is a price worth paying in order to provide a comprehensive answer to the key “real economy” question.

This would be quite different both to a purely commercial approach (based on transport services that are commercially viable in terms of fares revenue generated), and to a Keynesian approach (relying on the “multiplier effect” of government spending).

This is not just about rail or transport. It has implications for the way we think about the economic value generated by spending in other closely related areas such as regeneration and housing. It has long been acknowledged that regeneration, housing and transport interventions should be planned together in order to get the best possible economic returns, but this has not always proved easy to do in practice. One reason has been the lack of a common framework for assessing the economic return from the different types of intervention.

However, a new approach of the type suggested in this paper can change this. Regeneration and housing deliver economic outcomes principally through land use change. Extending transport economic impact assessments into land use change, together with a focus on a common currency based on the real economy, therefore opens up the way to the optimisation of combined regeneration, housing and transport programmes designed to deliver the maximum real economic return for a given level of total spend.

A further advantage of this kind of approach is that it gives the ability to make explicit allowance in decision making for the impact of those decisions on the distribution of economic activity. This requires distributional objectives to be defined against which the value of these impacts can be assessed. Although the proposed new approach is principally about providing for better, more economically focused decision making at all levels of government, we believe that in doing so it would facilitate localisation of decision making. Indeed, much of the thinking drawn on for this paper has emerged bottom up as a result of local authorities and others seeking to understand the economic implications of public sector infrastructure spending decisions.

The Government has clearly stated that the priorities for transport investment will be to support both economic growth and the decarbonisation of the economy. We share these priorities, and we support the Government’s intention to ensure that the benefits of low carbon proposals are fully recognised in decision-making. However, for the avoidance of doubt, the focus of this discussion paper is on economic growth.

As explained in the main body of the paper, there are techniques and tools available, or in development, that can help support the steps outlined above, and a key part of delivering the proposed approach would be rapid steps to take these techniques into the mainstream. But this cannot be a lengthy process that seeks perfection. There are decisions that cannot be delayed and others that cannot wait for long. Decisions need to be based on the best available evidence that addresses the wider economic question the country faces. The approach therefore has to be pragmatic, whilst also seeking to ensure that the economic evidence base is enhanced over time.

This, however, needs to be combined with a genuinely integrated approach to efficiency. While the question of how to reduce the cost to the taxpayer of the things the public sector buys is the right place to start the efficiency debate, a genuinely integrated approach is required that addresses the economic impacts of all spending decisions if we are genuinely to deliver better economic outcomes for less spend.



# Context

## *The Chancellor's Budget statement in June 2010 set the tone for a radical re-think of the way that public investment decisions are assessed and prioritised.*

Specifically in rail, the value for money study being undertaken by Sir Roy McNulty is examining ways in which the rail industry as a whole could deliver better value for money.

Meanwhile, many of the questions this paper seeks to help address are also issues – at least in terms of transport – which will be the subject of an inquiry recently launched by the House of Commons Transport Select Committee<sup>1</sup>.

Government departments with budgets that have not been ring-fenced face real terms cuts in the Comprehensive Spending Review of an average of 25 % in current expenditure, and potentially somewhere in the region of 30-40 % in capital expenditure. In order to deliver more for less and continue to make that investment which promotes economic growth, the UK needs to get at least 33-60 % more 'bang for our buck' from public spending. This will have a fundamental impact upon both rail and the wider transport sector. While a key part of this challenge is to make efficiencies, the Budget also identified that spending plans would need to be reviewed to ensure that the spending which continues is focused in those areas that deliver the greatest economic return.

The logical question which follows is how we can change the way we make taxpayer funded investment decisions to drive economic returns.

This should be seen in the context of a broader set of challenges that the Government has set the public sector as part of the Spending Review<sup>2</sup>:

- **Does the activity provide substantial economic value?**

If activities are to be prioritised on the basis of their economic value, we need to be clear about how we define economic value. Given today's challenges, economic value should be principally about jobs and productivity. This is, however, not the economic value question that has traditionally been asked when appraising transport investment.

- **Can the activity be targeted to those most in need?**

We should be giving greater weight to investment that both addresses worklessness and provides better accessibility to jobs in deprived areas. This is not to say that we should not meet the transport needs of areas that are already relatively productive, where this supports further economic growth. But if economic growth can be delivered in more than one area then, even leaving aside social or other objectives, it is better from a fiscal point of view that it should be delivered in more deprived areas, as this reduces the cost to government of worklessness.

- **How can the activity be provided more effectively and/or at a lower cost?**

This is partly about straightforward efficiency – doing the same activities for less money. But the question can also be phrased in terms of outcomes: how can we provide the same outcomes more effectively and/or for lower cost. This is particularly relevant where outcomes can most effectively be provided via a combination of interventions across traditional public spending boundaries. We believe this is the case for transport, regeneration and housing as we discuss further within this paper.

- **Does the Government need to fund this activity?**

Understanding who benefits from a particular scheme or activity, how these benefits manifest themselves and their potential financial value can help to leverage alternative funding sources and thereby reduce or even eliminate costs to the taxpayer. In practice part of the rationale for an economically focused approach to programme selection is that it is more likely to generate the kind of benefits that can unlock this kind of financial contribution. The funding approach to Crossrail is a prime example of an economically driven project that is part funded from the benefits it delivers to the London business community – in this case through a bespoke supplementary business rate regime.

<sup>1</sup> <http://www.parliament.uk/business/committees/committees-a-z/commons-select/transport-committee/news/transport-and-economy>

<sup>2</sup> Sources: The Spending Review Framework, HMT, June 2010; Chancellor's Budget speech, House of Commons, June 2010.



In the longer term, economically focused programmes that generate significant additional economic activity will, over time, start to pay for themselves through increased tax take both at a local and national level. We believe that understanding and valuing this potential should become an increasingly important part of decision making.

- **Does the activity help us to move away from a situation where growth is focused not just in one corner of the country, nor in just one sector?**

If growth is focused in one area of the country or within one sector, this places a substantial constraint on the UK's overall growth potential. The reality is that jobs are more mobile than people, which means that geographically concentrated growth risks reducing economic potential, and concentrated growth risks accelerating the point at which inflationary pressures act as a constraint on growth. An economically focused approach needs to reflect this.

In addition, as the case studies within this paper illustrate, prioritising the economy in decision making also means defining the geography within which decision makers are seeking to maximise economic benefits. There will be important differences between the net economic impact of a given scheme depending on whether the view is local, regional or national. An approach to decision making that prioritises the economy and seeks balanced growth needs to reflect this reality. Ultimately this is not just about the tools decision makers use; it also begs questions about how budgets are allocated and to which level of government.

- **Does the activity make a positive contribution towards meeting our environmental targets?**

Whilst the focus for this paper is decision making that focuses on the real economy, this approach is entirely compatible with giving due weight to environmental targets. At the simplest level this can mean working within an environmental budget as well as a financial one. This, for example, was the approach adopted by Greater Manchester in developing its economically driven transport strategy (see Greater Manchester Transport Fund case study on page 16). Under this approach economic outcomes were prioritised but subject to a minimum level of total environmental gain.

It is also possible to deploy a “shadow economic price” to reflect the benefit to the economy of delivering reduced environmental impacts. In the context of a given environmental target (e.g. an annual target for reducing carbon emissions) this shadow price will be the most economically expensive intervention necessary to meet the target. The benefit to the economy from saving carbon emissions then becomes the value of avoiding this cost.

Both approaches have the advantage that they involve working backwards from the target – they do not involve posing the question about the value of environmental outcomes which risks second guessing the target.

The remainder of this paper:

- Considers these challenges in the context of the existing framework for assessing the case for investment in rail and other transport schemes;
- Outlines a new approach designed to meet those challenges; and
- Provides some case studies that show how this kind of approach has already been used in practice.

# Why we need a new approach

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*Government assesses investments in rail, transport, housing, regeneration projects, hospitals, waste, schools and other areas in a range of different ways. The approach in different sectors has been developed in response to the targets and particular challenges faced for that sector.*

The Treasury sets the overall framework for how projects are assessed across different departments through the 'Green Book'. This sets the benchmark for project appraisal and evaluation across government.

The Green Book essentially asks: 'How should the tax proceeds of economic growth be used to buy the things people like?'

We believe that Government's desire to target funding at projects that best support economic growth requires a different question: 'How can our investments be targeted to support economic growth and thereby generate the tax proceeds of economic growth?'

The tools and practices currently used by different sectors to appraise schemes are still important. But they are not set up to answer this question, and they differ so substantially that a level playing field does not exist for prioritising investment on the basis of economic impacts across or indeed within sectors.

Inevitably our starting point for thinking about the approach to decision making is the current way in which transport schemes are assessed. This largely focuses on the welfare benefits to existing travellers (i.e. how much they would be willing to pay for the time savings and other benefits resulting from a given scheme) rather than the contribution to economic activity. Our proposition is that this traditional approach, used in isolation, does not make it easy for decision makers to identify and target investment on those projects that deliver the greatest economic return.

We then look at the approach to decision-making in the regeneration and housing sectors. Investment in these areas is closely related and needs to be planned together in order to complement each other and deliver the greatest possible economic gain. Improving a transport link may increase a city's labour market catchment – a key connectivity change that influences business behaviour and affects productivity. Similarly, increasing the supply of housing near to employment opportunities, or close to existing transport links with available capacity, also provides businesses with access to a wider pool of labour and residents with a larger pool of job opportunities, driving up specialisation and productivity.

In practice this means that different mixes of transport, regeneration and housing investment within an overall combined programme can produce the same overall result on the headline performance of a region's economy. The question therefore, with limited money available, is which mix gives the best result. This means trading between the regeneration, housing and transport sectors to make best use of existing infrastructure as well as optimising within them. Ultimately there is no substitute for genuinely integrated approaches that seek to maximise outcomes for the available budget.

In addition, we show that while the existing method of assessment of regeneration schemes provides some of what an economically driven approach requires, the approach is too narrow, and does not capture the net economic benefits of schemes other than at a very local level.

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## Different approaches and measures of success for different sectors

The following diagram summarises how we see these differences across transport, regeneration and housing.

### Transport



*Dominated by Welfare economics – ie user benefits versus costs to taxpayers*

*Limited focus on the real economy as a result of a fixed land use and fixed sector assumptions and high standard of proof presumption looking at transport in isolation*

### Regeneration



*All about economic impacts through land use change and sectoral impacts but at a very localised level*

### Housing



*Delivers economic impacts through land use change but appraisal tends to be output based*

#### Rail and the wider transport sector

The UK's transport network allows businesses to trade. It enables businesses to access labour, to trade with other businesses and to reach retail markets. Improving transport links by enabling faster and more frequent journeys can:

- Benefit existing economic activity by saving time or cost; and
- Change the way the economy works by influencing what people do, where they do it and how productive they are.

The traditional focus of transport appraisal on welfare benefits to existing and marginal users rather than the overall impact on economic activity (although some of the benefits to existing users will feed through to economic activity). This has, to some extent, been recognised and the Department for Transport has worked to better understand the links between investment in transport and the economy.

The Department for Transport issued a discussion paper in 2005 which examined the impacts of transport on productivity and economic output. Many aspects of this have now been brought into the mainstream of how projects and programmes are assessed. In particular, the draft 'Wider Economic Benefits' (WEBs) guidance now captures:

- How bringing businesses closer together by improving journey times can provide larger effective clusters of economic activity and boost productivity; and
- How changes in the cost of commuting can make a difference to the jobs people take and indeed whether they enter the labour market.

The way these wider economic benefits are applied in transport appraisal effectively treats them as a bolt on to the traditional welfare benefits. The recent history of the transport appraisal process is one of incremental change

by widening the welfare analysis, where this could be done without widening confidence intervals, rather than starting from scratch and considering the potential economic impacts of transport schemes in the broadest sense.

The changes that have been introduced essentially focus on the benefits to existing economic activity rather than assessing how this activity is likely to change. Changes to the way businesses operate, where they locate and how many jobs they create are not captured. In addition, the impact of a transport investment on jobs, other investment, economic output or future national tax revenues is not directly addressed.

The fundamental questions of how transport affects the real economy posed by the Budget and the Comprehensive Spending Review are therefore left broadly unanswered by current techniques. Such questions include:

- How do projects or programmes help support economic growth?
- How and where does this economic growth come from, who benefits, and therefore what contribution is made to balancing growth?
- Do projects or programmes reduce worklessness and support those wanting to work?

#### Regeneration and housing

Regeneration investments are public funds provided to projects such as new city centre developments, or science and business parks.

The purpose of regeneration schemes is to bring about real economic change in local areas that are in need of a boost in economic prosperity. Public funds may also be committed because the development is considered strategically important to support the growth of particular business sectors or places.

Guidance on measuring the impacts of this investment is set by the Department for Communities and Local Government. Some of the building blocks of regeneration analysis under the DCLG guidance are:

- Understanding the gross number of jobs created at the new site;
- Deadweight – understanding what the private sector would have done anyway in the absence of public intervention;
- Displacement and substitution – understanding whether benefits are displacing other things happening in the target area;
- Leakage – accounting for impacts that benefit those elsewhere; and
- Crowding out – understanding whether public investment is crowding out private investment elsewhere (e.g. by pushing up wages or interest rates).

The appraisal of regeneration projects has developed to capture the impacts that a scheme can have on jobs and development in local areas. Regeneration guidance sheds light on how public investment can increase employment in areas of high unemployment. This could have important consequences for both economic growth and the fiscal impacts of the reducing the welfare burden that results from high levels of worklessness. Techniques for assessing the impact on different groups, particularly the workless, help answer the question the Government is posing about increasing employment and supporting greater economic prosperity.

Therefore, at face value, current tools and practice for the regeneration sector appear to be much better at providing evidence of the impact that regeneration schemes have on the real economy. However, there are two important ways in which this is not the case.

Regeneration is often about the redistribution of economic activity to areas that are deemed by policy to require it. The analysis is designed to be spatial and therefore related to policy considerations in a particular area. This means it is not designed to capture the net impacts of an intervention at sub-regional, regional or national level. As it does not capture the impacts of the scheme on productivity and the supply side of the economy, it is possible that crowding out, displacement, substitution and leakage effects could combine to mean that, for example, the net gain nationally is considerably lower than the gross impacts at a particular site.

In many cases economic impact assessments of regeneration initiatives are confined to impacts on outputs such as floor space, retail units delivered or affordable housing delivered, without attempts being made to assess

the impacts on outcomes such as employment or economic growth. Approaches have been developed to convert these outputs into outcomes, but these tend to rely on a standard set of parameter values. The resulting measures of local job creation may only be associated with a particular geography but can be misinterpreted as impacts on regional or net national employment.

In conclusion, the tools of regeneration analysis inherited by the government are designed to answer questions of local spatial policy. This means that, like transport (but for different reasons), they have not been designed to assess how investments can really contribute to economic growth.

*“It is important to recognise that the analytical framework... does have a number of limitations, in particular in accounting for macro-economic adjustments, which may reduce (or increase) the additionality of an intervention at wider spatial scales.”<sup>3</sup>*

The tools of regeneration analysis must therefore be treated carefully when being used to assess the impact of a scheme on regional or national economic growth, and are certainly not comparable with the analysis undertaken to assess transport schemes.

Housing schemes often form part of regeneration schemes and in these cases are assessed in a similar way. A key focus here is the cost efficiency of the scheme in terms of the outputs delivered rather than capturing the explicit economic benefits the delivery of those outputs brings about.

## Conclusions

Consideration of the factors set out above leads us to the following conclusions:

- Existing transport appraisal is focused mainly on the benefits to users; benefits to the “real economy” are treated as a bolt on, and treated incompletely;
- Appraisal of regeneration schemes is focused much more on the economy but only at a local level. How much of the effect is simply re-distribution of existing economic activity is not generally evaluated;
- Appraisal of housing schemes is often focused on cost-efficiency of delivering outputs, rather than the ultimate effect on the economy; and
- In short, none of the existing approaches properly address the critical questions that now need to be answered.

However, we do not currently have an approach which allows consistent comparison across these closely related policy areas, or that allows either integrated or sector specific strategies to be optimised in terms of the economic returns they deliver per £ spent.

<sup>3</sup> *Additionality Guide: A standard approach to assessing the additional impact of interventions, English Partnerships*

# What a new approach would look like

An approach which successfully captures the economic returns from investment would need to:

- Address how investments affect the supply side of the economy and make the UK a more attractive location for business;
- Capture how investments can change the size, location and type of economic activity;
- Consider how an investment attracts unemployed people into the workforce; and
- Provide a level playing field for closely related sectors in the pursuit of economic objectives, so that transport, regeneration and housing can be compared against each other and combined to maximise economic returns.

In this section, we outline the framework of an approach that could deliver on the above, allowing decision makers to address how investment can affect the national, regional and local priorities of employment and economic growth. The case studies we present in the

following section demonstrate how elements of this kind of approach have already begun to be used.

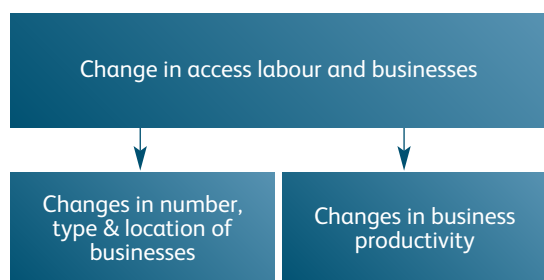
We also discuss how this approach could provide a more complete approach to the immediate efficiency question, recognising that the challenges facing the public sector are not solely about delivering more from a lower overall capital budget but also about reducing current spend in a way that does not undermine the prospects for private sector-led growth.

This framework could apply equally to scheme assessment within the rail sector, the wider transport sector, and in making comparisons between transport and sectors such as regeneration and housing. Overall economic returns can be improved both by action within sectors and across them.

This approach would not alter the need to consider the environmental impacts of schemes, nor does it consider directly the methodology for doing so. The proposed approach is, however, entirely compatible with giving due weight in decision making to environmental targets.

## Outline approach to measuring economic impact of transport investment

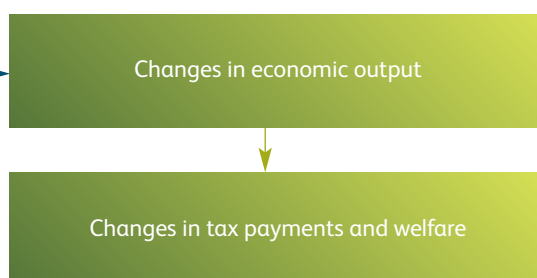
### Businesses



### Household



### Economy & government





From the business perspective, rail and wider transport investments can grow access to labour and to other businesses, growing addressable markets and increasing efficiency. This can influence how businesses operate and where they locate, supporting clustering and specialisation of business activity and feeding through into job creation and economic growth. Using information on where businesses choose to locate and the kind of business they do, the key relationships between transport changes and economic changes can be addressed. This can then be used to capture changes in the competitiveness of different areas and the business response to this through relocation, growth and sectoral change. This kind of analysis is of increasing interest at the local and city region level, but is not part of the investment analysis carried out by central government.

Transport improvements can also reduce direct costs, for example from fuel and staff time, which lead to increased efficiency and economic output.

Similarly, from households' point of view, better access to job opportunities can improve employment search prospects, help attract people into work and reduce unemployment. This both increases economic output and eases the long term welfare burden of worklessness. The spatial pattern of unemployment is linked to the pattern of access to job opportunities. This evidence can be used to capture the impacts of an investment on the pattern of worklessness. In practice, this means a new approach would need to capture how investments expand access to employment opportunities, and the knock-on impacts for economic output and benefits payments. Precisely quantifying these impacts is difficult, but the evidence is sufficient to begin addressing the first order challenge of targeting rail and other transport investment to support economic growth and reducing the fiscal drag of worklessness. It can also help address the longer term fiscal prize of faster national economic growth which ultimately translates into a higher national tax take.

The foundations needed for the analysis of wider economic impacts in transport have been laid. For example, Department for Transport research has shown with statistical confidence that increasing 'effective economic density' by 10 % (for example by improving transport connections between businesses) tends to lead to an increase in productivity of 0.83 % in the producer services sector. Building on this work, other studies have shown significant links between rail connectivity and the location decisions made by businesses. Work on the Northern Hub suggests, for example, that a 10 % change in rail connectivity to other businesses can increase the number of jobs within an area by 14 %. This is because businesses

are attracted to better connected areas, though it should be noted that a large proportion of this effect would be through redistribution and not a net national increase. The statistical analysis this result is based on is statistically significant at the 99 % confidence level.

How investments affect catchment areas can therefore tell us a lot about how businesses' productivity and location are likely to respond to transport investments.

Other work has established links between the connectivity provided by the transport system and the intensity and sectoral mix of local economic activity. Work to assess the impacts of investment in the Northern Hub found that the density of employment in an area tends to increase by 13 % for every 10 % increase in rail connectivity to jobs or other businesses. The same study found that the effect was strongest in the business services and finance sectors and weakest in the agriculture, manufacturing and construction sectors. Similar evidence can underpin how transport can encourage changes in businesses' location, sectoral mix and the number of jobs businesses are capable of creating.

An approach based on these principles must be transparent about how changes take place in different areas. This is not just about understanding the implications of investment for local or regional economic policy. It is also critical to understanding net national impacts, such as the extent to which businesses are attracted to more productive areas or to form denser clusters of business activity in our cities. For some time it has been recognised that transport can boost national productivity by bringing businesses virtually closer together. What has been less well understood is the potential multiplier effect of bringing them physically closer together as a result of what infrastructure can do to make more productive places even more attractive to businesses.

Regeneration and housing investment contribute to net economic growth in the same way through improving the supply side of the economy – better matching employment demand with employment supply by providing job opportunities, sometimes in areas with high levels of worklessness. How schemes contribute to connectivity through the existing transport network determines a large part of their net economic impact, from attracting the unemployed into the labour market or making business locations that deliver agglomeration benefits more attractive. By allowing a comparison between different investments, this approach has no a priori bias as to whether a transport, regeneration or housing investment, or indeed a combined scheme, would provide better value for money when pursuing the objective of economic growth. This is because value for money is a function of both the scale of benefits and the costs of delivery.

### So would the new approach replace traditional transport appraisal, add to it or sit alongside it?

The approach advocated here must not be seen as another bolt on to existing approaches, as has been the case with the Wider Economic Benefits (WEBs) that are currently used in some transport scheme appraisals. It is a different approach which focuses entirely on the impact of investments on the real economy. The two approaches are not additive; they are measuring different things and should be kept separate.

In addition, although the key question facing the public sector today is the economic one, the traditional welfare element of transport appraisal is an appropriate way of considering how transport can benefit individuals and, to some extent, businesses. It certainly addresses issues of well-being in that it starts from the premise that people see transport as a means to an end, not the end itself, and they therefore want to get as quickly, as comfortably and as reliably from A to B as possible. The need to focus on the economy does not change this.

In addition, the tools and techniques we have inherited have become well developed as they have been scrutinised and refined over many years. Indeed, many of the techniques and models that already exist to support the traditional welfare approach will also be fundamental in establishing the new framework proposed.

We would therefore suggest that the new 'real economy' approach advocated here works separately and alongside the traditional methods of transport appraisal.

Whilst the details would require significantly more discussion, we would envisage the contribution to the real economy would be the primary criterion for strategic decision making and prioritisation for some time. Clearly the benefit side of the equation means little without reference to costs, and preferably costs should be addressed with reference to whole life costs, which would provide consistency with the long term economic focus. Ideally, the approach would provide space to address long term fiscal returns, and the important differences between local, regional and national economic impacts.

The welfare approach would become a secondary criterion, in order to provide both a better understanding of the potential impacts of schemes on existing travellers; and an additional criterion in assessing schemes, for example where the economic trade-offs were close. There is an open question as to whether the 'wider economic benefits' currently bolted on to the traditional welfare approach would be required within this arrangement, given that they would be covered within the overall calculation of real economic impact of a given scheme.

It is also possible to see the welfare dimension to scheme decision making acting as a minimum threshold which schemes have to pass to be part of a programme. One of the great strengths of the welfare approach is that schemes that deliver benefit cost ratios of greater than 1 can be said with confidence to deliver benefits to users at least as great as the costs imposed on the taxpayer.

Using a welfare BCR as a minimum threshold within an approach that seeks to maximise economic returns would in effect act as a backstop; a minimum guarantee that, even if the economic gains being targeted by a project or programme were not fully delivered, society as a whole was, in a welfare sense, better off as a result.

The environmental criteria would flow through any method of appraisal. One way of doing this would be to set an overall environmental budget to work within – whereby the economic impact is maximised subject to minimum performance against other criteria capturing environmental impacts. This, for example, was the approach used by Greater Manchester in developing its transport fund programme where the approach was the maximisation of GVA (Gross Value Added – essentially, jobs and productivity), subject to also delivering net reductions in transport CO<sub>2</sub> emissions at the programme level. It would also be possible to deploy a "shadow economic price" in economically driven decision making to reflect the benefit to the real economy of delivering reduced environmental impacts.

The above process shows how the approach could work when looking at incremental capital spending decisions. The reality, of course, is that the challenge the public sector faces also means delivering savings in on-going resource spending.

Clearly, the best way to make savings is through pure efficiency that has limited impact on economic and welfare outcomes. The reality, however, is that the challenges are sufficiently large that pure efficiency alone may well be insufficient. To the extent that it is not, the above framework could work in reverse – to answer the question of how to minimise any negative economic impacts of necessary reductions in spend.

Whether considering reductions in spend or enhancements in infrastructure or services, this approach would allow for comparison across closely related sectors on the basis of a common currency (i.e. the GVA impact of the given schemes), giving us the level playing field that fully maximising the economic returns to the affordable level of total spend requires.

## Outline of the single economy focused approach across sectors

### Transport



*Welfare benefits side of transport appraisal treated as separate criteria within transport*

### Regeneration



*Regeneration appraisal widened to include redistribution impacts - to allow the additionality question to be addressed*

### Housing



*Housing addressed in terms of economic contribution - e.g. as a potentially more cost-effective way of improving labour markets*

A SINGLE 'ECONOMY FOCUSED' REGIME



*Transport economic appraisal becomes 'connectivity impacts' appraisal with land use and sector change part of the mix*





# *Where the new approach has worked in practice*

*The new kind of approach to assessing and prioritising infrastructure expenditure this paper advocates is already being applied.*

This section highlights some examples and, in particular, demonstrates that it has proved possible to consider the real economic impacts of schemes in the following ways:

- Prioritising schemes on the basis of their impact on jobs, productivity and therefore economic output;
- Distinguishing between the national, regional and local benefits of strategic infrastructure;
- Considering the impact of interventions on worklessness; and
- Considering the economic impact of non-passenger transport infrastructure.

## **Using a new approach to prioritise schemes on the basis of their impact upon jobs, productivity and therefore economic output**

### **Greater Manchester Transport Fund, GMPTE**

In May 2009, the ten districts of Greater Manchester voted unanimously to establish the Greater Manchester Transport Fund (GMTF). The GMTF draws upon a mixture of local, national and regional funding to deliver a £1.5bn programme of transport investment over a ten year period.

Using new techniques similar to those described in this paper, the programme to be delivered reflected a local prioritisation exercise that focused principally on economic impacts. Potential transport interventions were modelled to understand their potential impact on output – measured in terms of Gross Value Added (GVA) – through changes in employment and productivity. The prioritisation approach was to

- Maximise the medium term impact on the size of Greater Manchester's GVA for the available funding, subject also to:
  - delivering a net reduction in total carbon emissions at the programme level; and

- securing at the programme level a better than average improvement in accessibility to employment for the most vulnerable 25 % of wards, measured in terms of an index of multiple deprivation.

A prioritisation metric was established by comparing the GVA impact of each potential intervention to its net cost. Costs to the GMTF were assessed on a whole life basis. A 'scheme efficiency' metric was then expressed in terms of the GVA impact per pound deployed. This was then used to rank the list of potential schemes. The resulting programme was multi-modal, including light rail, road, bus interventions, park and ride and a heavy rail stations programme.

This approach produced a very different ranking of schemes to that which would have resulted from a traditional welfare based approach. The most obvious example of this was that the scheme which ranked first under the real economy approach came only ninth under the welfare approach.

It also demonstrated that similar types of schemes could see quite different results in terms of their cost-effectiveness in delivering real economy outcomes. Of the schemes that were affordable within the context of local funding decisions, the top-ranked and bottom-ranked schemes were remarkably alike. Both were light rail schemes. Both had capital costs of approximately £85 million. However, in terms of the GVA impact per £ deployed the scheme at the top of the list performed around 15 times better than the one at the bottom.

The work undertaken in Manchester is possibly the most complete demonstration of how, by adopting a new approach to assessing the economic impact of transport schemes, a clear and coherent economic case for prioritising infrastructure expenditure can be developed. The evidence gathered to establish the economic case for each scheme was also powerful enough to convince local decision makers to allocate a very substantial element of local funding to the programme. Overall more than half of the whole life costs of the £1.5bn programme are being met locally.



### Jubilee Line Extension Impact Study

The work done towards understanding the wider impact of the Jubilee Line Extension (JLE) shows that the type of thinking highlighted in this paper is not wholly new.

It was believed the JLE would have significantly wider benefits than those considered in the conventional social cost benefit assessment of the time, which included only the financial and transportation effects.

The Jubilee Line Extension Impact Study Unit (JLEISU), based in the Transport Studies Group at the University of Westminster, was set up in 1997 to help coordinate and provide an independent focus for the Impact Study.

An early paper<sup>4</sup> by the study team identified a range of wider impacts of the extension that would not necessarily be picked up within conventional transport appraisal. These included:

- Economic and labour market activity;
- Land use;
- Development activity;
- Property market activity; and
- Environment and sustainability.

In particular, the paper highlighted the importance of impacts upon the London labour market, and on changes in land use that would result from the new scheme, neither of which would have been considered within existing transport appraisal techniques.

A series of surveys monitored the impacts of the scheme. These helped to shed light on some of the impacts highlighted above. However, as they focused on activity along the JLE corridor, they cannot provide evidence at a more macro level.

However, we believe the scope was much wider than any preceding transport appraisal work, and it would be worth capturing the lessons learned here when considering a new approach going forward.

This also highlights the extent to which transport, regeneration and housing schemes can complement each other. The JLE was fundamental to the successful development of the Docklands, whilst the success of the JLE in delivering economic growth has been reliant upon developments such as Canary Wharf. The dramatic land use changes that have resulted from the improved transport infrastructure have multiplied the benefits of the scheme many times over.

### Using a new approach to consider the national, regional and local benefits of strategic investments

#### Northern Hub

The 'Northern Hub' study resulted in a proposal for a £530m investment package to improve rail travel in the north of England through quicker, more frequent and more direct rail services.

Phase 1 of the study was led by the Northern Way. Stakeholders in the north of England identified improvements to rail services that would drive and facilitate economic growth, which were then documented by the Northern Way.

Phase 2 of the study was led by Network Rail. Working with the rail industry and PTEs, value for money improvements to rail services were identified that would bridge the gap between currently committed rail improvements and those identified by the Northern Way. The appraisal methodology adopted included Wider Economic Benefits (agglomeration, labour market efficiency and addressing imperfect competition). The evidence base is referenced in chapter 4 of the Northern Hub Rail Study Report<sup>5</sup>.

Businesses and stakeholders from across the north have welcomed the improvements proposed by the Northern Hub, suggesting the appraisal methodology was able to successfully identify improvements that would be supported by those who will make use of them. In particular, direct services between northern cities, without having to change trains in Manchester, were strongly supported both by the methodology and by stakeholders.

The approach adopted differed to some extent from more traditional approaches to transport scheme development, in that it started from a consideration of the potential economic benefits of rail interventions. This focus informed the value engineering of services and infrastructure, rather than simply starting with a list of schemes and applying traditional appraisal methodologies to pick the best performing projects from a welfare perspective.

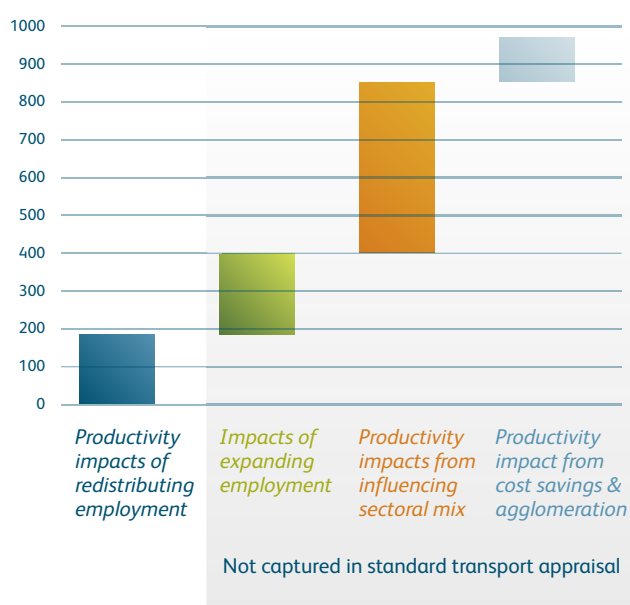
Whilst the assessment methodology did not go as far as the new approach outlined in this paper, it did utilise traditional welfare-based appraisal techniques plus Wider Economic Benefits. Even using this approach, it was clear that some train service improvements were far more significant in terms of their impact on the economy than the welfare benefits alone would suggest.

<sup>4</sup>Jubilee Line Extension Impact Study Unit Working Paper 15, University of Westminster, 1998  
[http://home.wmin.ac.uk/transport/jle/wp/WP15\\_Economic\\_Activity\\_and\\_Labour\\_Market\\_SR.pdf](http://home.wmin.ac.uk/transport/jle/wp/WP15_Economic_Activity_and_Labour_Market_SR.pdf)

<sup>5</sup>The Northern Hub Phase 2 Report, Network Rail, February 2010

Once this work was completed, KPMG was asked by GMPTE to investigate the potential economic impact to the Northern Way area of the proposed Northern Hub scheme, using a development of the methodology used for the Greater Manchester Transport Fund. The chart below sets out the different components of GVA that were valued.

#### GVA impact of the Northern Rail Hub in the Northern Way area (£millions)



Only the productivity impact from cost savings and agglomeration would have been fully captured in a standard transport appraisal which includes welfare benefits and the currently measured Wider Economic Benefits.

The remaining three impacts require the relaxation of the assumption that land use and sectoral mix are fixed. As the chart shows, relaxing this assumption can have a substantial impact on the overall economic impact of a scheme. In this example capturing these impacts increases annual GVA impacts from around £200 million to almost £1 billion, a factor of five increase.

It should be noted, however, that these impacts are to the Northern Way area only, and a significant proportion of the impacts on sectoral mix and expanding employment will be as a result of abstraction from other areas of the UK. This highlights the importance of defining economic objectives geographically.

After allowing for abstraction, it is likely that total impacts at the national level will be double those that emerge from standard Wider Economic Benefits assessments – since a proportion of the wider regional (sectoral and employment) impacts will ‘stick’ at the national level and the productivity impacts of redistribution (in this case the economic impacts of physically bringing businesses closer together) will be genuinely national.

The above example also highlights the importance of co-ordinating transport, regeneration and housing interventions. The largest wider regional impacts, and a significant proportion of the national impact, depend on sectoral and land use change. It is therefore possible that even better returns could be delivered if regeneration and housing interventions are co-ordinated with transport changes. Conversely, impacts of the above scale could be frustrated if planning or other constraints create barriers to changes in business location or land use.

### Using a new approach to consider the impact of interventions on worklessness

#### Manchester Buses, GMPTE

As part of a joint study undertaken by consultants including KPMG for DfT and GMPTE into the opportunities for delivering enhanced efficiencies in the Greater Manchester bus network, an investigation was undertaken into the potential impact of changes to the coverage and pricing of the bus network on worklessness within the city region.

This showed that for those at the margins of the workforce who face the trade-off between work and benefits:

- Access to employment opportunities through the public transport network could represent a barrier to entering the labour market; and
- That these barriers could be lowered through targeted improvements to the network and/or fares interventions.

The work also derived statistical relationships which could be used to inform Greater Manchester's bus strategy. Importantly the work focused not only on worklessness impacts in a local area, but net impacts at the city region level. The aim was to identify strategies that would produce net reductions in worklessness, increasing both local participation rates and total employment. Clearly such net impacts will have national as well as local benefits, notably the reduction in the cost to the taxpayer of supporting worklessness.

This case study highlights how, by combining some of the more traditional transport economic techniques (which consider how individuals trade off their travel costs and time with other activities), with a consideration of how this might affect individuals' marginal decision to work, it is possible to capture the social outcomes of infrastructure schemes and service improvements in terms of reducing worklessness and additional employment generated, along with the fiscal implications.

### Using a new approach to consider the economic impact of freight transport infrastructure

#### The hidden economic benefits of rail freight

The case studies above focus on the real economic impacts of passenger transport. In practice, real economic as well as environmental gains can also be delivered by rail freight.

It has been recognised for some time that rail freight has the potential to provide benefits to the real economy (through reduced congestion) as well as to the environment through modal shift. Indeed, these benefits have been reflected in the value for money assessments for taxpayer support for rail freight infrastructure and operations.

What has been less well understood is the direct value rail freight can deliver to the economy by lowering the costs of UK distribution for UK businesses in a position to use rail freight. As with benefits to road hauliers from new road construction, or business time savings from passenger rail services, these benefits translate directly into real economic benefits to the country as a whole. They are precisely the kind of real economic returns we believe the new approach should focus on.

These kinds of benefits have been valued in previous studies. In 2006, Network Rail commissioned KPMG to analyse the productivity benefits of intermodal services to and from the major deepsea ports. The work was conducted jointly with Freightliner and was based on a large survey of actual container movements and comparisons between the prices paid by users of intermodal services and the costs of their road alternative.

The results pointed to significant variations in the level of saving between markets (spot, retail and wholesale) and the region from or to which the containers were being moved, with the benefits being greater for regions located further away from the South East's major deepsea ports. It also showed that, in aggregate, these real economic impacts were of comparable size to the external (largely welfare) benefits traditionally used to justify taxpayer support for the intermodal sector. In aggregate, these real economic benefits to users are calculated to significantly exceed the total level of annual support provided

This work helped support Network Rail's bid for substantial funding from the Transport Innovation Fund to upgrade key freight rail routes, including a programme of gauge clearance projects on the West Coast Main Line for freight being transported from Southampton to the West Midlands and beyond.

The work demonstrates that an alternative approach which focuses on the real economic returns can work for non-passenger transport as well as passenger transport.





# Conclusions

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- 1 Reducing the deficit and supporting economic growth are the highest priorities for the Government. As a result, affordability and real economic impact are likely to be key considerations for decision makers considering investment in transport (and other areas of government activity) for some time.
- 2 This means asking the question: 'How do we best generate the private sector economic growth that will generate tax proceeds?' This differs from traditional transport appraisal, which focuses upon the welfare benefits to individual users of transport services, and sets out to answer a different question: 'How do we best spend the tax proceeds of economic growth to increase total welfare?' It also differs from a purely commercial approach which would ask: 'What services are commercially viable and what does this mean for investment?'
- 3 The Wider Economics Benefits bolt-on to traditional transport appraisal only partially resolves this issue. As it does not address economic impacts directly, there is evidence that the approach understates economic impacts significantly, particularly at a local and regional level. Critically, it does not provide the kind of level playing field that would allow optimised strategies to be developed that recognise that sectors like transport, regeneration and housing work best in combination and that different mixes of these interventions will deliver different economic returns per £ spent.
- 4 There are techniques and tools available, or in development, that can help answer these questions, but they are not yet part of mainstream decision making. If decision makers are to be able to deliver optimised cross sector strategies, these approaches need to be brought into the mainstream and developed further. This would mean an approach with less certainty than we are used to, though this is a price worth paying to allow the first order economic question to be properly addressed.
- 5 Addressing the big questions is about more than appraisal tools; it is about the way they are used. Any approach needs to provide for transparent comparisons. For transport this means parallel running of a purely "real economy" approach with the traditional welfare assessments being kept separate; they are not additive and should not be mixed. Climate change and other environmental criteria would continue to be given due weight in of decision making.
- 6 A focus on economic outcomes means defining objectives in a way that recognises that economic impacts differ depending on the geography being addressed. Economic impacts are always likely to be greater at lower levels of geography, but at the same time the Government has balanced growth objectives.
- 7 Further detailed work is essential, but we believe consideration should be given to using these kinds of methodologies to assess the impact on the economy of potential investments as the primary assessment criteria, alongside the traditional welfare approach as a secondary criterion.
- 8 Furthermore, it is acknowledged that greater efficiency may be insufficient to fully address the Government's priorities to reduce the deficit. This real economy approach could help to determine the most appropriate reductions in public spending by providing an assessment as to which reductions would have the smallest negative economic impact.
- 9 Network Rail is currently working with its industry partners to develop its plans for Control Period 5 (2014-19). The intention is to prioritise schemes which enhance national or regional economic growth, and we will be looking to see whether this new approach can help the rail industry in assessing which schemes would best deliver against this objective.
- 10 For some time, it has been recognised that to get best value for money regeneration, housing and transport interventions need to be planned together. The new appraisal approach this paper proposes can also be used to assess the impact on the economy of regeneration and housing interventions, and can therefore help determine which schemes provide the best value for money.

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# Moving Melbourne

A TRANSPORT  
FUNDING AND  
FINANCING  
DISCUSSION  
PAPER

COMMITTEE  
FOR  
MELBOURNE





#### ABOUT THE COMMITTEE FOR MELBOURNE

The Committee for Melbourne is an apolitical, not-for-profit member network that unites a cross-section of Melbourne's leaders and organisations to work together and enhance Melbourne's economic, social and environmental future.

The Committee aims to ensure Melbourne's challenges and opportunities are tackled and grasped in ways that keep our city vital, inclusive, progressive and sustainable long-term.

## Imagery

Inside Cover: North Melbourne Station  
Image courtesy of Metro Trains Melbourne  
Page 4: Flinders Street Station  
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Page 9: Nunawading Station  
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Page 11: South Morang Project  
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Page 13: Commuters  
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Page 14: Rail Transit  
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## FOREWORD

*Moving Melbourne* is a discussion paper that examines alternative funding and financing options that could be used to advance Melbourne's future transport needs.

This work is a culmination of a 12 month long series of workshops between the Committee's Grade Separation Taskforce and its Infrastructure Funding and Financing Taskforce.

The Committee would like to thank all members, in particular those listed, who have generously contributed their time, knowledge and expertise, to help drive positive discussion on Victoria's long-term infrastructure investment strategies.

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**“We must start to explore innovative mechanisms to unlock new funding streams, and bring forward our infrastructure investment to generate an uplift in productivity and urban value.”**

# introduction

**Victoria faces a range of economic challenges – a high Australian dollar, weaker global and national economic conditions, declining productivity and a substantial reduction in revenues, all of which constrain budget capacity. As the state’s population increases and our city’s economic contribution to the national economy becomes more widely recognised, the need to invest in critical productivity-enhancing transport networks continues to build.**

Victoria plays a central role in the Australian economy. It is home to approximately one quarter of the nation’s people and represents one quarter of the nation’s gross domestic product. The quality of Victoria’s transport infrastructure, which was planned with the foresight of previous generations, continues to support our population and economic position today. However, the existing network is under stress and this creates a risk for Victoria’s future liveability and competitiveness. Over the last few decades, a lack of strategically focused planning and appropriate investment in transport infrastructure to meet growing social, economic and environmental needs, has diminished Victoria’s competitive position and created a significant infrastructure backlog.

At 30 June 2011, Victoria’s population was 5.6 million, and based on current forecasts, is projected to increase to 8.7 million over the next 40 years. Melbourne, which is home to approximately 75 per cent of Victoria’s population, is expected to experience a similar growth rate, moving from 4.1 million to 6.5 million over the same 40 year period.<sup>i</sup>

Considering our constrained economic conditions and rate of growth, **we must start to explore innovative mechanisms to unlock new funding streams, and bring forward our infrastructure investment to generate an uplift in productivity and urban value.**

In June 2012, the Committee for Melbourne published *Discussion Paper on Funding and Financing Infrastructure in Victoria*, which concluded the solution to infrastructure funding and financing issues was a change in the mindset of government and the community.<sup>ii</sup> Less than a fortnight later, Infrastructure Australia’s (IA) Infrastructure Finance Working Group (IFWG), published its report on *Infrastructure Finance and Funding Reform*. The reform report made a number of high-level recommendations, including the following:

***Governments should utilise appropriate models to drive revenue from the broader benefits delivered by major infrastructure projects, such as value capture for transport infrastructure...***<sup>iii</sup>

Many voices are recognising the fiscal challenge of an increasing funding gap facing all levels of government and the community.

*Moving Melbourne* aims to create a conversation for Victoria by examining value capture techniques and other funding options, that could be utilised to increase the pool of funds available to invest in critical transport infrastructure projects.

The Committee for Melbourne recognises that a large proportion of the community is yet to reach a level of understanding and acceptance around many of these concepts. However, given Victoria’s aspirations to improve its liveability and competitiveness, this is a conversation that needs to occur.

Victoria’s infrastructure requirements are well-documented. This paper does not seek to cover this ground, nor does it intend to prioritise one project over another. In that context, examples should be considered exactly as they are: examples, not priorities.





**"There is no magic pudding. We can't have it all and some things do have to change and nor is it an overnight wonder."**

VICTORIAN PREMIER,  
TED BAILLIEU<sup>VI</sup>

# focusing on transport investment – the need for innovation

**A city's mobility is vitally important. Connecting people and places helps drive economic activity, sustains relationships and has been shown to improve well-being. An efficient and effective transport system is therefore critical to the success and functionality of Melbourne and Victoria.**

The foresight of previous generations to plan and build quality transport infrastructure underpins Melbourne's highly-prized liveability and consistent rate of growth. Arguably, if it was not for the vision and ambition of those before us to deliver city-shaping projects like the Melbourne Underground Rail Loop and CityLink, Melbourne would be a very different place.

Nevertheless, Melbourne and Victoria are now at a crossroads. Investment in transport infrastructure has stalled while population growth continues alongside a disproportionate increase in public transport patronage, and a growing freight task. Declining productivity is a risk for all Victorians.

Although the benefits of investing in transport infrastructure are widely recognised (improved mobility, local economic stimulation and job creation), the negative impact of under-investment to economic, environmental and social contexts is equally as important, and very real given the tight fiscal environment.

**There is impetus for change as the cost of 'do-nothing' is significant. One of the major challenges facing governments of all persuasions is how to cost-effectively respond to the future demands on Melbourne's transport network.**

The current Victorian Government recognises these challenges and has responded by implementing a series of important reforms for the approval and management of high-value and high-risk projects; however, more must be done. Traditional sources of funding are dwindling as various changes play out in the macro-economic environment, and this is impacting the investment capacity of State Governments. Victoria is at risk of being left behind as other jurisdictions think creatively about how to fund their city's future mobility.

An example of an innovative funding strategy was demonstrated in the United States (US) city of Los Angeles (LA). The LA 30/10 initiative was a funding proposal voted in by more than two-thirds of LA County voters in November 2008 to assist the delivery of 12 new transport projects over a 10 year period.<sup>IV</sup>

The proposal featured a one-half cent sales tax called Measure-R that was applied across the entire county and used to fund targeted transportation improvements. By adopting a plan that was backed by an innovative and strong local funding commitment, the city was able to secure the rest of the investment required to fill the funding gap from state and federal partners.

The LA 30/10 initiative proves that strong political leadership and community support for the benefits of an identified program

of city-building transport projects can achieve a significant acceleration in the delivery of an ambitious project pipeline.

## FUNDING AND FINANCING

There is a clear distinction between funding and financing, however there is constant confusion between these concepts. To clarify, these can be described as follows:

- **Funding** is the source of funds which ultimately pays for the infrastructure, and can be sourced:
  - indirectly from community members via the application of state or local government funds;
  - indirectly from infrastructure beneficiaries (for example value capture via specific levies); or
  - directly from infrastructure users (for example user pays via tolls on toll-roads, fares on public transport).
- **Financing** is money raised upfront and can be:
  - monies raised from banks and other investors to pay for infrastructure, which ultimately must be repaid by one of the funding sources; or
  - not raised at all, if infrastructure is paid for directly from federal, state or local government funds.



## LA 30/10

The LA 30/10 initiative is accelerating the construction of 12 new transport projects that were scheduled to be built over a 30 year period – but will complete them in 10 years.

The concept uses funding from a 30 year sales tax, called Measure-R, as collateral to pay off long-term bonds and a federal loan.

Two-thirds of LA County voters voted in the Measure-R sales tax in 2008, which will commit a projected US\$40 billion towards transportation upgrades. After subtracting 1.5% for administrative costs, the remaining money must be spent as follows:

- 35% for transit capital projects (new rail and bus rapid transit lines)
- 3% for transit capital on the Metrolink commuter rail system
- 2% for transit capital on rail cars and rail yards
- 20% for highway capital projects
  - 5% for operations on new rail lines
  - 20% for bus operation improvements
  - 15% for local return (transportation money that individual cities decide how to spend).

Source: LA Metro, 30/10 Initiative,  
<http://www.metro.net/projects/30-10/>, May 2011

In essence, funding must be available to repay finance. This is a critical conceptual point, as the availability of capital or financial products does not remove the need to identify a funding source. While there are specific issues – and opportunities – with funding and finance, they are not the same.<sup>v</sup>

**It is the willingness of government or users to commit funding, which ultimately determines the level and pace of infrastructure development.** Unless the funding source for a piece of infrastructure is determined, it is counterproductive to discuss financing. Throughout this discussion paper, we focus on funding rather than finance, as we believe the questions around funding solutions must be answered before we turn a focus to financing.

### GOVERNMENT FUNDING

Direct government funding of infrastructure can be derived from three main sources:

1. Applying current tax revenues to build infrastructure;
2. Applying future tax revenues, by borrowing today to invest in infrastructure (thereby generating greater economic activity and thus tax revenue in the future); or
3. Sales of public assets, providing capital to reinvest in infrastructure.

Over the last two decades, federal and state governments have relied on surplus recurrent revenues to fund their expenditure on infrastructure, and as a result, have actively minimised the use of debt. This approach has reflected a short-term focus on generating cyclical budget surpluses and maintaining credit ratings. Political imperatives have also largely driven this strategy, rather than sound economics; resulting in short-term financial considerations being prioritised over long-term economic outcomes. This form of decision making has deferred projects which offer net economic benefits and could expand long-run economic capacity.<sup>vii</sup>

The Committee for Melbourne believes the fiscal balance is wrong. The increasing entrenched aversion to even modest levels of debt means much-needed investment in productivity-enhancing infrastructure is constantly deferred. Debt funding equitably spreads the cost of long-life infrastructure across generations. One politically palatable solution to encourage governments to invest in transport infrastructure may be to tie government debt raisings to specific projects, so the community can clearly identify the reason why debt levels may be increasing.

In regards to the sale of public assets to release funds which can be reinvested

into infrastructure projects, this discussion is beyond the scope of this paper. However, recent reports from IA and the IFWG have discussed the validity of such concepts.

### PRIVATE FINANCING

Private financing is often seen as the solution to our infrastructure problems, with discussion to date focusing primarily on why our superannuation funds do not invest more in infrastructure. Private financing alone is not the solution to our infrastructure problems. The question of where the funding source necessary to repay the finance will come from, must first be answered.

All private sector financing raised from banks and other investors (including superannuation funds) to pay for infrastructure, ultimately must be repaid via a funding source (for example, user pays, value capture or government funding). Therefore, if there is an increase in the number of infrastructure projects financed by the private sector, funding for that infrastructure will need to derive entirely from, or through a combination of, the three funding sources mentioned.

## CROSSRAIL

Crossrail is a major railway link under Central London, with an estimated cost of £15.9 billion.

A Crossrail Business Rates Supplement (BRS) allows the Greater London Authority (GLA) to collect financial contributions to fund this cost.

Under powers enacted in the Business Rates Supplements Act 2009, the GLA applies a levy of 2 pence per pound on non-residential properties with a rateable value of £55,000 or more in London (over 80% of businesses in London are exempt from the BRS, as their rateable value is below this threshold).

The BRS is collected on the GLA's behalf by 32 London boroughs and the City of London Corporation, in conjunction with rates collections. The supplement is expected to run for 24–30 years, or until the GLA's initial upfront borrowing is repaid.

The GLA financed 26% of the project cost (£4.1 billion worth of borrowing) via the application of the BRS, and the outstanding repayment of this debt is set to begin upon completion of the Crossrail construction works.

Crossrail farepayers will also contribute towards the debt raised during construction.



**Source:** Greater London Authority, Intention to Levy a Business Rate Supplement to Finance the Greater London Authority's Contribution to the Crossrail Project: Final Prospectus, January 2010

### The Committee for Melbourne strongly believes exploring the full range of funding sources will help generate the answers to some of our infrastructure challenges.

An example of how a range of funding sources may be used to address a current transport priority is in the topical area of grade separations – that is, removing rail level crossings from the road network. Melbourne has over 170 intersections where train tracks intersect with road; more than any other city in Australia, which significantly impedes traffic flow and creates public safety risks.

Eliminating these intersections by separating train infrastructure from the road network can yield significant benefits for public transport, road networks, and the broader community. When upgrading these locations, there are often opportunities to capture uplifts in property values throughout surrounding areas, and/or increase the possibility of raising funds from those that benefit directly from the upgraded infrastructure.

There are also wider benefits for the community, including increased productivity, safety, and urban renewal, which create a compelling case for governments to contribute significantly to these projects.

No single source of funding (other than the short supply of government funding) can support these projects. With a combination of funding sources applied however, the Committee believes the funding gap can be reduced and infrastructure investment can be brought forward.

This discussion paper explores a range of funding options, with the realisation that many of these concepts are difficult and unpopular to discuss. Nevertheless, the Committee is committed to driving an informed debate on how some of the complex infrastructure challenges we face might be solved.

## DALLAS AREA RAPID TRANSIT

Dallas Area Rapid Transit (DART) is a TIF arrangement exclusively for Transit-Orientated Development (TOD) projects and was approved in 2008 as a result of collaboration between DART and the City of Dallas. Key features include a 226 ha assessment district and a project lifespan of 30 years. DART is expected to deliver US\$328 million in incremental tax revenue, and stimulate around \$1 billion of development, based on property value prices increasing from US\$320 million (2008) to US\$3.52 billion (2038). Between 1999 and 2007, approximately US\$4.26 billion of development projects undertaken adjacent to railway lines were attributed to DART. Studies have determined that residential and commercial properties near DART stations command 12.6% and 13.2% premiums respectively, as opposed to properties located elsewhere.

**Sources:** City of Dallas, Office of Economic Development, TOD Tax Increment Financing District Project Plan and Reinvestment Zone Financing Plan, 10 November 2010; see also Clower, T.L. and Weinstein, B.L., 'The Impact of Dallas (Texas) Area Rapid Transit Light Rail Stations on Taxable Property Valuations' 8(3) Australasian Journal of Regional Studies 389.





**“When introducing a new levy or charge, the governing body must prove a clear and demonstrable link between the levy that beneficiaries (businesses and/or residents) pay, and the improvements they receive in return.”**

# why capture value?

**There is a growing body of international and domestic empirical evidence which demonstrates the benefits of transport infrastructure investment to real estate values and the wider economy. In an environment where there is increasing pressure on governments to deliver sustained and significant transport infrastructure investment programs, relying on traditional funding sources, such as user pays and direct government funding contributions, can only form part of the funding solution.**

By providing a framework to monetise the wider benefits of improved transport accessibility and efficiency, value capture mechanisms provide government with additional sources of funding that can be targeted directly at the beneficiaries of the particular transport infrastructure project being invested in.

There is growing momentum overseas towards the use of value capture to support the funding of infrastructure projects, and the use of property development as a funding source for transport investment is well-documented. For example, property development has been a major contributor to funding rail infrastructure investment in countries such as Japan and Hong Kong, where land values are high and public transport mode share is significant.<sup>viii</sup>

There is also a long list of projects that have applied value capture levies on key beneficiary groups. London's Crossrail project is a recent example (see page 8). This project involves 21 kilometres of new rail tunnel with 37 rail station connections (including eight new sub-surface stations). Project funding is drawn from a range of sources, including a business rates supplement, (an additional levy on

non-domestic property rates in certain London boroughs, also known as a Benefitted Area Levy), that aims to raise £4.1 billion (25%) of the forecast £15.9 billion project capital cost. Sale of surplus land and developer contributions will also provide additional funding for the project.<sup>ix</sup>

Throughout the US, the use of value capture techniques has a long history, having supported delivery of numerous transport projects including, among others, the Dallas Area Rapid Transit, the Los Angeles Metro and San Francisco's Bay Area Rapid Transit development, which introduced Benefitted Area Levies as far back as 1966.

The introduction of value capture techniques can generate a range of new benefits beyond pure funding. If implemented well, they can provide an effective and efficient source of finance, in addition to more traditional sources of finance. They are also equitable, in that they target the investment's beneficiaries, and can encourage improved transparency and accountability in the infrastructure investment decision, with an onus on proving the connection of the project's benefits to the value capture charge.

If we take for example, the case of improved grade separation across Melbourne's road and rail network, the range of beneficiaries include:

- **Public transport passengers**
  - due to improved frequency and service quality;
- **Rail and road freight users**
  - due to improved operational efficiency generated from reduced congestion and travel times;
- **Business owners**
  - due to improved accessibility for their customers and/or employees;
- **Private transport passengers**
  - due to reduced congestion;
- **Land owners**
  - due to the increase in underlying land values and the potential increase in developed real estate values; and
- **Government**
  - due to improvements in property-based revenue streams, such as rates and land taxes from increased land values.

A variety of techniques have been employed domestically and internationally to capture the benefits generated by transport investment, and to use them as a funding source for the infrastructure which creates the benefit. These range from targeted levies linked to a defined area or group of beneficiaries (such as a Benefitted Area Levy), broad-based levies targeted at the broader public or potential beneficiaries (such as a Broad-Based





## MELBOURNE PARKING LEVY

In 2006, the Victorian Government implemented a parking levy for all specialised parking buildings within the Melbourne CBD and adjacent areas including the Southbank, Docklands and St Kilda Road precincts. The levy is paid by the owners of both public and private (excluding residential) car parks within the defined area.

The Melbourne parking levy is an annual rate, applied to each parking bay. In 2006, rates began at \$400 a year per bay, rising to \$800 in 2007 and \$910 in 2012. The levy is expected to generate revenue of more than \$46 million in 2012, with this revenue to be directed towards public transport initiatives and other infrastructure investments.

Transport Improvement Levy), through to levies which alter behaviour to encourage greater use of the public transport investment (such as a congestion charge or parking levy). An overview of these options is outlined on the following pages.

In the Australian context, value capture is still an emerging funding mechanism, and is yet to be widely adopted beyond the use of developer contributions to fund public infrastructure. However, local government has introduced a range of rates-based levies to support investment in community and local business area infrastructure, as well as community-wide charges to support investment in public transport.

Generally, Australian governments have been slow to adopt alternative approaches to funding infrastructure, beyond the relative ease of selling surplus land and/or development rights for cash and works in kind (of which Barangaroo in Sydney is a great example), and developer contributions towards the provision of civil and transport infrastructure.

Depending on the number of stakeholders involved, the catchment area size, and the implementation approach, value capture mechanisms may involve a high-level of complexity in implementing and administering the regime which could offset the financial benefit.

There are also numerous legislative, public interest and implementation issues to consider before introducing a value capture mechanism (for example conceptualising the regime, defining beneficiaries, quantifying benefits, considering planning and land use impacts, setting the charge, legislative and public interest considerations, governance and administration).

Despite the technical detail that must be considered as part of the discussion of these funding concepts, public support is crucial to their implementation.

**When introducing a new levy or charge, the governing body must prove a clear and demonstrable link between the levy that beneficiaries (businesses and/or residents) pay, and the improvements they receive in return.** The case studies discussed in this paper have often involved high-levels of public consultations, support for the value capture levy, and a co-commitment to invest in proposed infrastructure projects, the latter being a crucial element to public support.

**Source:** Hamer, P., Currie, G. and Young, W., *Australasian Transport Research Forum 2011 (Adelaide)*, Parking Price Policies – A Review of the Melbourne Congestion Levy, 28 September 2011; see also: State Revenue Office of Victoria, Congestion Levy: Overview [www.sro.vic.gov.au](http://www.sro.vic.gov.au)



# alternative funding and financing mechanisms

**Funding and financing innovation is the key to unlocking continuous investment in Victoria's transport infrastructure.**

**The following concepts are not new and have been successfully applied in many jurisdictions internationally, and in some cases, within Victoria or elsewhere in Australia.**

While each mechanism has distinct characteristics suited to different contexts, it is likely that a blend of alternative funding sources will need to be used in addition to federal, state and even local government contributions, to accelerate infrastructure investment. It is estimated that combining multiple innovative mechanisms which hypothecate revenue raised towards transport infrastructure investment, could help reduce demand on consolidated revenue to around 50%–60% of the project cost; thereby enabling governments to initiate a broader pipeline of investment. An overview of these mechanisms is provided in the following pages.

## FUNDING & FINANCING MECHANISMS

- **Benefitted Area Levy**
- **Broad-Based Transport Improvement Levy**
- **Incremental Rates Growth**
- **Paid Parking Levy**
- **Developer charges and development rights**
- **Road tolling**
- **User Infrastructure Levy**
- **Congestion charging**

## BENEFITTED AREA LEVY

Benefitted Area Levies (BAL) – also known as betterment levies, special assessment districts, or value capture levies – aim to recover some of the benefits that specific areas and businesses receive from an efficient public transport system. BALs involve the application of a special levy to the properties and/or businesses within a defined area, using the collected revenue to fund new public transport infrastructure or contribute to public transport operating costs. BALs are widely accepted and utilised by local councils throughout Australia. They can be implemented in a number of ways (such as via supplements on rates on property owners or payroll taxes on business owners); and require a clear nexus between the public transport investment's benefit, and an identifiable catchment of associated beneficiaries.

One of the most recent and successful use of a BAL to assist project funding is London's Crossrail.<sup>x</sup>

### Potential Application to Victoria

Melbourne has previous experience with the use of a BAL to fund the Melbourne Underground Rail Loop (MURL) – more commonly known as the Melbourne City Loop.<sup>xi</sup> In the case of the MURL, the Victorian Government provided 50%<sup>xii</sup> of the funds through a public transport ticket levy,

City of Melbourne provided 25%<sup>xiii</sup> of the funds through a BAL, and the Melbourne Metropolitan Board of Works provided 25%<sup>xiv</sup> of the funds. To support the MURL, the BAL commenced in 1963 and was lifted in 1995.<sup>xv</sup>

In the context of Melbourne Metro (a current Victorian Government transport priority project), applying a BAL to businesses in the Melbourne CBD could have merit, as there are likely to be substantial benefits for CBD-based businesses. The project will provide increased capacity and accessibility for morning and evening peak travellers, while also increasing the efficiency of the entire metropolitan rail network.

A contribution from CBD-based businesses could be levied in the form of either a:

- **Rates supplement**
  - on CBD-based properties applied as either a flat or sliding scale rates supplement; or
- **Payroll tax supplement**
  - an additional premium on CBD-based business payroll tax calculated as a sliding scale rate based on payroll value.

Another method could involve applying a BAL to residential and business owners of properties located in proximity to significant public transport improvements, recognising that these owners may receive a value premium relative to properties with limited access to public transport. A levy



## GOLD COAST RAPID TRANSIT

**Stage 1 of the Gold Coast Rapid Transit project is an 18 year, \$1 billion Private Public Partnership (PPP) contract. Stage 1 includes design, build, finance and operation of the light rail project.**

**It is 13km long and includes 16 stations. Future stages are expected to deliver a total corridor length of 40km.**

**Gold Coast Rapid Transit secured total funding commitments of \$949 million from all three levels of government. In addition, a long-term partnership has been developed with private sector consortia for finance, build and operation of the light rail system.**

**The Commonwealth provided a \$365 million capital grant on an unconditional basis.**

**The Gold Coast City Council is contributing \$120 million via a BBTIL on Gold Coast ratepayers. The Queensland State Government is providing \$464 million.**



*Source: Gold Coast City Council, Revenue Statement and Resolution of Rates and Charges, 2012–13, 22 June 2012; see also Department of Transport and Main Roads, Gold Coast Rapid Transit: Lessons learned from Planning to Procurement, 2011*

on property owners could be applied, on the basis that access to public transport has added value to their holdings at no additional charge. This levy could be calculated as a flat rate on the basis of the unimproved capital value of each property. Grade separations that can support urban renewal in the immediate surrounds of properties and drive growth in local property values, may warrant the use of the BAL and/or hypothecation of an increase in local government rates.

### BROAD-BASED TRANSPORT IMPROVEMENT LEVY

An efficient public transport system benefits all members of the community. A Broad-Based Transport Improvement Levy (BBTIL) imposes a city-wide levy, typically on ratepayers, which is then used to fund public transport improvements. BBTILs typically provide a significant pool of funds, and in turn, an ability to accelerate a program of public transport investment. BBTILs can also provide a recurring revenue stream for the state.

The Gold Coast City Council levies an annual transport improvement charge (a BBTIL) on ratepayers (currently \$111 per annum FY2012).<sup>xvi</sup>

These funds support investment in public roads and public transport and were

used to help fund the Gold Coast Rapid Transit project.<sup>xvii</sup>

### Potential Application to Victoria

In order to accelerate the delivery of Melbourne's current transport infrastructure priorities, a BBTIL could be implemented in the form of an additional charge to ratepayers in the Melbourne metropolitan region. Councils could collect the levy on behalf of the Victorian Government, with revenues used to directly fund a program of critical transport projects that support metropolitan-wide benefits. This could include many of the projects on the current Victorian Government Infrastructure Australia priority list.

BBTILs could be applied under two main structures:

- **A flat levy** – potentially involving a flat levy per rateable property; or
- **A variable levy** – based on the rateable value of properties, similar to the approach used when determining rates and land tax.

Given that the infrastructure and systems to collect rates and land tax are already in place, this option would be relatively efficient to deploy. Combining the BBTIL with a hypothecation regime that directs the levy to ongoing investment in public transport infrastructure, would distinguish the levy from ordinary government revenue mechanisms.

BBTILs raise significant funds over time. As a new source of funding to support public transport investment, BBTILs could enable governments to accelerate investment, and bring forward the productivity and social benefits this infrastructure generates.

### INCREMENTAL RATES GROWTH

Good infrastructure undoubtedly has a beneficial effect on property values across the area serviced by the infrastructure. This increase in property values translates to a funding source, because there is an incremental increase in rates (and land taxes) which are calculated based on the unimproved value of property.

This funding is only realised over time, so there is no immediate revenue stream. However, the future revenue stream can support financing, commonly known as Tax Increment Finance (TIF), as the future incremental revenue can be dedicated to repay financing. Indeed, both BAL and BBTIL referred to above can be converted from a future funding source into cash for infrastructure via a TIF arrangement.

A key argument in favour of TIF arrangements is that they are equitable, efficient (linked to wealth gains by property owners),



## CITY OF SURREY

The City of Surrey (the City) is located in British Columbia, Canada. It has an approximate population of 450,000 people spread across six town centres.

In 2006, after a number of funding shortfalls (including Provincial Government funding cuts, an ongoing 0% property tax increase and increasing maintenance costs), the City identified a significant funding gap in its 10-Year Transport Servicing Plan.

The City currently has a number of property taxes associated with the construction or redevelopment of developments within the metropolitan boundary. Recognising the funding gap, the City decided to use these redevelopment related property taxes to fund the public transit system.

In 2010, these taxes generated \$163.6 million in property taxation revenue. Legislation required the City to spend \$16.5 million (approximately 10%) toward funding public transport improvements.

**Source:** Fillion, S. *Transportation Funding Strategy: A Review of Alternative Funding Strategies to Deliver Transportation Services*, November 2006



and effective (do not have upfront price impacts or create a disincentive to the redevelopment of land). Additionally, in a large number of US cases, stakeholder support for TIF arrangements is a necessary pre-condition to their implementation, providing a direct link between the decision to invest and the investment beneficiaries.

Utilising this incremental rates growth via TIF has been widely used throughout the US to finance urban renewal and transport projects and is often used as a tool to encourage economic development. The Dallas Area Rapid Transit project collaboration with the City of Dallas is a notable example of how TIF can be used to support the financing of infrastructure that generates localised benefits (see page 8).<sup>xviii</sup>

### Potential Application to Victoria

While having great appeal overseas, the use of TIF in a Victorian context requires further consideration of a range of jurisdictional, legislative and structural factors to ensure acceptability to the different tiers of government. Structuring the bonds to obtain sufficient appetite from capital markets also demands attention, given the connection to incremental property value growth.

## PAID PARKING LEVY

Paid Parking Levies (PPL) are fee-based mechanisms charged against the use of parking bays within a defined area. PPLs can be implemented either as a levy, or as an annual fee, for a car park licence tied to a cap on car parks in a region. PPLs are commonly implemented in high congestion areas including CBDs and other key activity nodes.

Many cities around Australia (including Melbourne) employ PPL schemes as a means to modify behaviour of private vehicle users and to provide a funding source for public transport investment.<sup>xix</sup>

Due to existing infrastructure around parking bays, a PPL provides a robust revenue system with a secure and easy-to-implement collection method.

PPLs also assist in shifting the behaviour of the community towards increased public transport usage, and are most effective when there is spare capacity in the relevant transit modes which private vehicle users migrate towards.

### Potential Application to Victoria

Given PPLs are already successfully used within the Melbourne CBD and surrounding areas, one option may be to widen the boundaries to which the PPL is applied.

This could involve expanding the PPL boundary by one kilometre, or targeting the PPL to congested areas where access to public transport is ample.

As is currently the case, the additional funds generated by increasing the PPL boundary would be targeted towards public transport investments.

## DEVELOPMENT CHARGES AND DEVELOPMENT RIGHTS

Existing public transport infrastructure is often situated in central locations and can present attractive property development opportunities. This is particularly the case where land is scarce, rents and/or sale prices are high, and demand for developed outcomes (residential or commercial uses) is strong.

The acquisition of land above and/or adjacent to key public transport stations provides an opportunity to contribute funding for the construction of transport infrastructure through the sale of development rights. Combined with amendments to land use planning that support appropriate uses and increased density around key transport nodes, there is potential to deliver urban renewal to the Victorian Government's infill development targets.<sup>xx</sup>

**Source:** VicRoads, CityLink Project Overview, last updated December 2011, available at: <http://www.vicroads.vic.gov.au/Home/Moreinfoandservices/RoadManagementAndDesign/TypesOfRoads/CityLink/ProjectOverview.htm>



## EXHIBITION STREET EXTENSION

The Exhibition Street Extension project was announced by the Victorian Government in April 1998 and opened in October 1999.

It included a four lane divided road over the Jolimont Rail Yards which connects Melbourne's CBD with CityLink.

The project delivered improved traffic outcomes for CityLink and Swan Street road users. Given the majority of benefits were accrued by road users, the use of new toll points was considered the most effective solution to fund the project.

Tolls for operating the project are integrated with CityLink and collected from road users by Transurban.

Developer charges and contributions vary from development rights and are generally well understood. There may be opportunities to capture value through increases in developer charges, connected with density bonuses and planning gain bonuses, given land use planning may support land value improvements through, for example, increased density or changes in allowable uses.

The City of Surrey in British Columbia, Canada, has used redevelopment-related property taxes to fund its public transit system (see opposite).<sup>xxi</sup>

### Potential Application to Victoria

Given there are a number of drivers influencing people's decision to live and work in areas well serviced by public transport, such as cost of living pressures, traffic congestion and concerns about climate change, there can be strong demand for Transit-Orientated Development (TOD) outcomes. In addition, from the Victorian Government's perspective, there are a range of social and financial benefits to government from promoting infill development over development on the urban fringe.<sup>xxii</sup>

In the case of application to grade separations, there may be opportunities to sell development rights to allow TOD

above and/or adjacent to the grade separation. Upon completion, surplus land could then also be sold for development.

Whilst there are many challenges with development above and/or adjacent to public transport infrastructure (such as construction and operation interface and construction cost considerations), the value derived from the sale of development rights ultimately accounts for these impacts. In pursuing TOD outcomes around priority transport nodes, the key for the Victorian Government will be to ensure that infrastructure designs account for TOD outcomes and that planning frameworks support an appropriate mix and scale of development.

### ROAD TOLLING

Road tolling is a fixed charge or fee imposed on the direct beneficiary of a particular road asset. It is often linked with the provision of significant capacity or efficiency-enhancing infrastructure, and thus provides a privilege (for example, improved travel times) for its users.

Tolling, which is common practice around the globe, provides an opportunity to fund investment in new transport infrastructure

in the locality the toll is collected. Melbourne has a number of successful toll roads that provide significant benefit to the functionality of the city, in many cases helping to shape major economic improvement.

One example of how road tolling was successfully used to contribute to the funding of transport infrastructure that improved localised traffic outcomes for the city was the Exhibition Street Extension for CityLink.

### Potential Application to Victoria

In the context of road/rail grade separations, there are numerous localities within Melbourne where level crossings are closely located to freeway entries and/or exit points, negatively impacting multiple transport nodes. These specific areas also create safety and congestion points beyond the immediate intersection as traffic backs up onto the freeway proper, thereby impeding traffic flow. By removing the intersection of road and rail at these locations, there would be significant capacity and efficiency improvements, which could be partly funded by installing new toll points.

## SINGAPORE NORTH-EAST LINE

A S\$4.6 billion 20km 16 station fully underground automated and driverless rapid transit line operational from 2003.

The Land Transport Authority gained approval to construct the line in 1996.

The construction was fully government funded, with the aim to foster development along the north-east corridor of the island.

The North-East Line operates under a 30 year operating licence, by SBS Transit; one of Singapore's two vertically integrated competing land transport operators.

The private sector operator, SBST, retains the revenue generated from fares, as well as third party/commercial usage of the stations, and pays the Land Transport Authority a licensing fee.

While the rolling stock is initially provided to the private sector operator at no charge, it is expected that the private sector operator subsequently acquires the rolling stock from the Land Transport Authority at a pre-agreed price. The private sector operator is responsible for maintenance as well as ongoing asset renewal.



Source: KPMG International, *Success and Failure in Urban Transport Infrastructure Projects*, 2010

### USER INFRASTRUCTURE LEVY

A User Infrastructure Levy (UIL) provides an opportunity to invest in new infrastructure and apply a charge to those road and/or public transit users who directly benefit from this new infrastructure through reduced congestion and improved travel times.

One example of how a UIL has been used to help bring forward the investment in a major piece of city-building transport infrastructure is the North-East Line in Singapore.

#### Potential Application to Victoria

In the context of Victoria, a railway-user infrastructure levy could be used to fund the construction of new rail infrastructure by adding a levy to the fare charged for its use. As noted in the discussion of BALs, Melbourne has previous experience with the use of a railway-user infrastructure levy to fund the MURL via the public transport ticket levy.

Melbourne Metro – a Victorian Government project involving the construction of a nine kilometre rail tunnel through the heart of Melbourne, linking the Sydenham (soon to be Sunbury) and Dandenong rail lines;

can be used to provide an example of how a railway-user infrastructure levy could help fund a current transport priority.

The current project proposal includes five new underground stations at North Melbourne, Parkville, CBD North, CBD South and Domain.<sup>xxiii</sup> As the project is expected to provide improved access to part of the inner city and enhance service reliability and capacity, users of the new Melbourne Metro could have a surcharge applied to fares for use of the new line and associated stations.

### CONGESTION CHARGE

A congestion charge is a fee-based mechanism aimed at limiting the number of private vehicles on the road by imposing a direct cost on the externalities that contribute to road congestion.

Two main congestion charge structures are utilised globally:

- Distance-based – users are charged for distance travelled through electronic tagging of vehicles; and
- Cordon-based – users are charged for entering a defined area (such as the CBD).<sup>xxiv</sup>

Distance-based and cordon-based congestion charges are capable of generating significant revenue. As an added benefit, congestion charges also help drive operational efficiency through higher utilisation of the public transport network, and reduce or defer capital expenditure on road networks in favour of public transport investment.

The most well-known congestion charge is the London Congestion Charge (see opposite), which was introduced in 2003.<sup>xxv</sup>

#### Potential Application to Victoria

In the context of Victoria, this mechanism could provide an opportunity to influence the behaviour of private road users by implementing either a cordon-based charge, which could be levied on vehicles entering a given area (such as the Melbourne CBD), or a distance-based charge levied on mileage.

This would generate a significant amount of revenue which could be specifically targeted towards a defined program of public transport investments.

# summary

**In an environment where there is increasing pressure on governments to deliver sustained and significant transport infrastructure investment programs, broadening the range of options that can support the funding and financing of key projects is paramount.**

The quality of Melbourne's liveability and competitiveness is connected to the quality of its transport infrastructure. In the past, our transport plan met our transport needs, and it was a key factor in delivering our success. Recently however, our lack of vision in appropriately planning for increasing demand has placed the transport system under stress; thereby impacting our liveability and competitiveness.

The need to plan for the long-term is not a new concept. The current Victorian Government has articulated its priorities in its current submission to Infrastructure Australia. At the same time, the government is considering the next 30–40 years as they develop the Metropolitan Planning Strategy. This will no doubt be supported by a long-term plan for Melbourne's transport networks. The challenge is how to fund these priorities.

Infrastructure is a long-term game. It is expensive and does not become cheaper over time. As this paper highlights, there are a number of ways to pay for our transport requirements, some of which are more controversial than others. While many of the user pay options discussed in this

paper may seem unpalatable in the short-term, a visionary approach to funding priority projects now will drive a range of important, long-term benefits (economic, environmental and social) in the future.

This paper has identified a range of ways various jurisdictions responded to the transport challenges they faced. In many instances, advancement for the future has required difficult and occasionally unpopular decision-making to transform the city.

The funding options outlined are by no means an exhaustive list of possible opportunities, and the Committee for Melbourne recognises that many are at times both difficult to understand and unpopular to discuss. Nevertheless, the Committee is committed to driving forward an informed debate on how all Melburnians can work together to solve some of our complex infrastructure challenges.

## LONDON CONGESTION CHARGE

The London Congestion Charge was introduced in 2003 in response to increasing public concern over the level of traffic congestion across central London.

The scheme imposes a £10 daily charge for driving or parking a private vehicle within the charging zone between the hours of 07:00 and 18:00 from Monday to Friday.

All net revenue raised through the London Congestion Charge must, by law, be invested to improve transport in London.

In FY 2009–10, the scheme produced a net revenue of £148 million.

The 18 month period of public consultation prior to the scheme's introduction was instrumental in making the congestion charge publicly acceptable.



**Source:**  
Transport for London,  
[www.tfl.gov.uk/roadusers/  
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# case study: Burke Road level crossing – questions for the community

**Melburnians have identified the safety and mobility issues associated with level crossings for many years. They impact directly on road and rail operations, while generating broader implications including safety concerns, the economic cost of congestion and lost productivity that can be attributed to operational delays. The problem has increased in recent years due to the strong growth in public transport patronage and the ever-increasing number of vehicles on Melbourne roads.**

While the current Victorian Government is acutely aware of this problem and has made a greater commitment to remove level crossings than any other government in recent decades, project costs are prohibitive, and the planned rate of removal is outpaced by demand. Unless new initiatives can be implemented to increase the pool of funds available to invest in transport upgrades like level crossing removal, Melburnians will need to accept the present rate of delivery.

The following case study presents an existing scenario at a current priority site for the Victorian Government. The Committee for Melbourne's objective is to identify the issues currently experienced at this location and others like it, and to create a dialogue about the options to help accelerate their removal.

## Location

Burke Road in Glen Iris, immediately south of the Monash Freeway (CityLink) interchange and north of the Burke Road and Malvern Road intersection. The level crossing is located on a section of the Glen Waverley Line immediately adjacent to Gardiner Railway Station and on the Route 72 tram line.

## Current issues

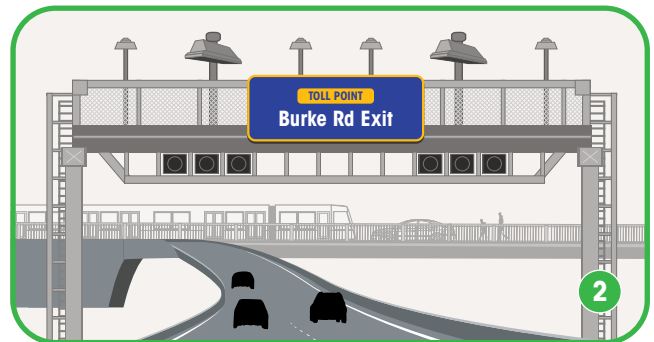
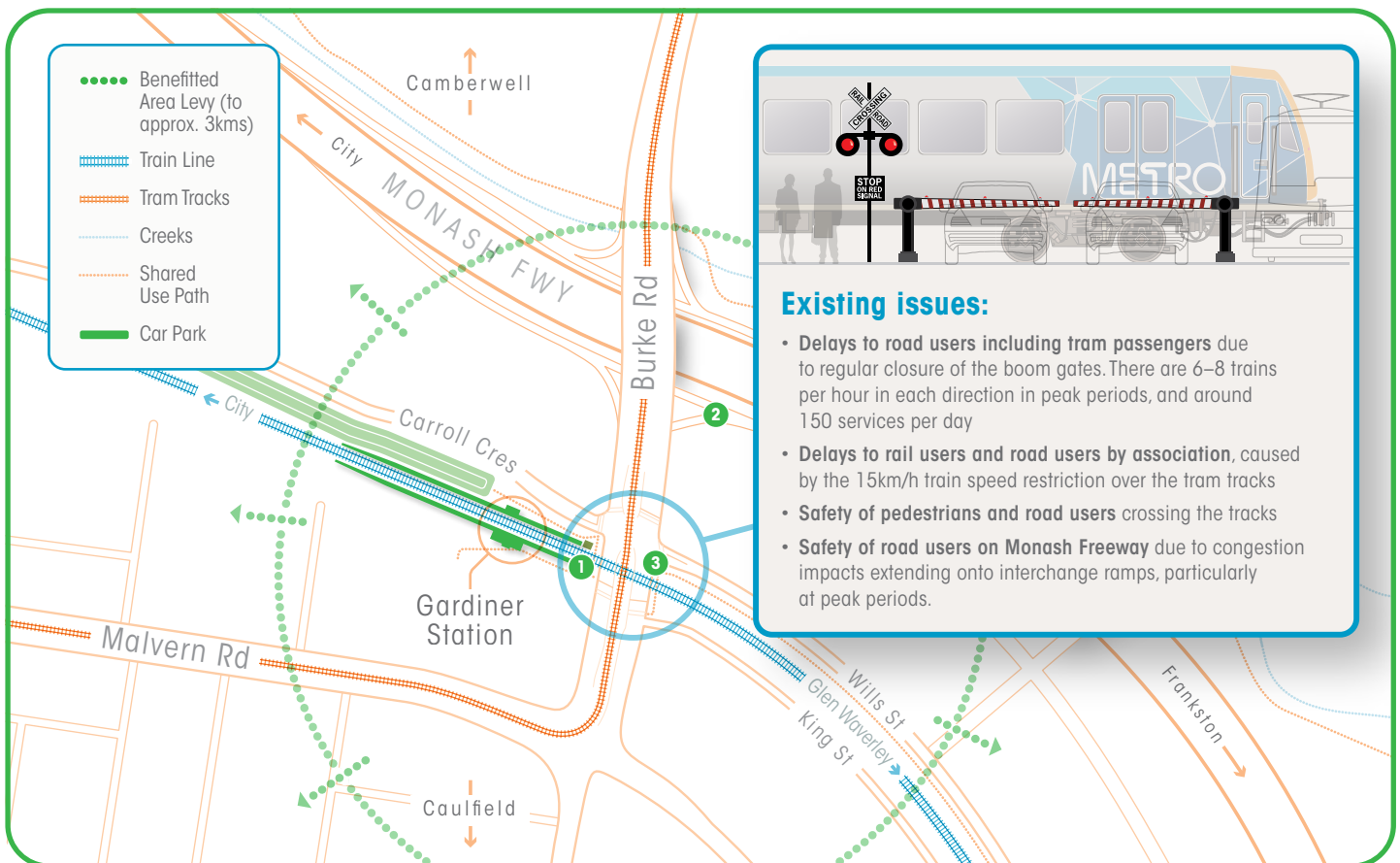
- Delays to road users including tram passengers due to regular closure of the boom gates. There are 6–8 trains per

hour in each direction in peak periods, and around 150 services per day

- Delays to rail users and road users by association, caused by the 15km/h train speed restriction over the tram tracks
- Safety of pedestrians and road users crossing the tracks
- Safety of road users on Monash Freeway due to congestion impacts extending onto interchange ramps, particularly at peak periods
- The cost of staffing the crossing and maintenance of the track work
- Strategic importance of Burke Road as a main traffic route.

## Potential benefits of removal

- Community – Reduce noise level, mitigate congestion, improve land use and local amenity, improve safety
- Road – Mitigate congestion, improve safety
- Train – Improve travel times, improve station access and facilities, reduce operating and maintenance costs
- Tram – Improve travel times, improve station access, remove track interface problems.



### Possible solutions to level crossing removal:

- 1 Potential development of station and adjacent land to fund works
- 2 Potential toll gantry at Monash Freeway off ramp to fund new works
- 3 Potential application of a Benefitted Area Levy



## Questions

1. Do we as a community agree there is a problem at this location and other locations like it?
2. How could we accelerate the improvements at this location or other locations like it?
3. Would we be prepared to do so by making a contribution to the funding? Which mechanism, or combination of mechanisms, would we be prepared to contemplate:
  - a) specific levy on surrounding ratepayers to fund the level crossing works?
  - b) toll on the level crossing payable by each vehicle which crosses it?
  - c) toll on the level crossing payable by each vehicle which uses it to access the M1?
  - d) greater redevelopment (with relaxed height limits) in the area surrounding the level crossing with development rights used to help fund the infrastructure?
  - e) increases in property rates (due to increased property values) being dedicated to repay financing for the level crossing?
4. If not, then would we be prepared to allow the redevelopment of sites above and/or adjacent to transport stations to help fund improvements?
5. If not, then are we prepared to tolerate this potentially worsening situation?





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COMMITTEE  
MELBOURNE FOR



# Yarra Campaign for Action on Transport

## Introductory Comments on The role of public transport in delivering productivity outcomes

12:15 Yarra Room

- a. the need for an integrated approach across road and rail in addressing congestion in cities, including Sydney, Melbourne, Brisbane, Adelaide and Perth;
- b. the social and environmental benefits of public transport projects compared to road infrastructure projects such as Westconnex and the East - West Link;
- c. the national significance of public transport;
- d. the relationship between public transport and building well-functioning cities;
- e. the decision of the Federal Government to refuse to fund public transport projects;
- f. the impact on user charges arising from requiring states to fund public transport projects; and
- g. any related matter.

### Presenters:

Chris Goodman:

President of the 3068 Group,

Committee member of YCAT,

Participant in The Northern Central City Corridor Study Community Reference Group and the Hoddle Street Study Advisory Group.

Chris Star:

Committee member of YCAT,

Sustainable Transport consultant

Jill Koppel:

Member of YCAT, and Committee member of Collingwood and Abbotsford Residents Association

### YCAT role

- ❖ a non-partisan community group originating in the City of Yarra but now encompassing a broad catchment of individuals and community groups from many suburbs of Melbourne
- ❖ promotes community awareness of the potential benefits to Melbourne of having a well-planned and adequately funded public transport system
- ❖ opposes the proposed EWLlink as an ineffective and wasteful road-based response to traffic congestion
- ❖ provides a clearinghouse function for published mainstream and alternative media news items on transport alternatives for Melbourne
- ❖ calendar of community campaign events and activities



- ❖ interacts with the public on transport issues via social media
- ❖ supports community-based campaigns to oppose EWLink and promotes effective PT solutions

## YCAT - history

YCAT started in 2008 as a community reaction to the East-West Road tunnel proposed in Rod Eddington's Investing in Transport report.

YCAT is totally opposed to the East-West Link road tunnel and the massive impacts its construction will have on our local communities, which include:

- Compulsory acquisition of residents homes,
- Destruction of public space and park amenities,
- Heritage destruction
- Air pollution and noise
- Doing nothing to alleviate long term road congestion and related issues,
- The estimated \$9-10 billion projected to fund the road tunnel would be better utilised to fund massive improvements to Melbourne's public transport requirements.

YCAT has linked up with the other community groups with the Coalition of Transport Action Groups, who are also lighting recommendations proposed in the EWLNA in Melbourne's west and inner west.

- a. the need for an integrated approach across road and rail in addressing congestion in cities, including Sydney, Melbourne, Brisbane, Adelaide and Perth;

When we invest in transport, we should consider:

- Who does it help?
- Who does it fail to help?
- Who does it harm?

### Network Effects

Dr John Stone: a public transport solution to traffic congestion is both essential AND possible

The current situation is the result of a 100 years of underinvestment in public transport.

Network efficiencies can be gained by improving the connections between the **radial** Train and tram network and the **circumferential** bus (and tram) network (east/west)

Current barriers to effective public transport planning: separate management bodies, lack of coordination, lack of pedestrian planning around stations.

Immediate efficiencies can be gained by investing relatively modest amounts of money on:

- Route alignment of bus routes and
- upgraded signalling on train network (improve the IT).
- extensions of existing train lines, eg the South Morang line to Mernda and beyond (to service the growth corridor to the North)
- Lack of Capacity is no excuse for underinvesting in the train network.

The currently proposed EWLink will not ease traffic congestion for the majority of Melbourne commuters.

Density is not destiny.

Public Transport Victoria Doncaster Rail study lacks network awareness – proposed South Morang Tunnel diverts at Clifton Hill so misses connection to proposed Doncaster Line. Also the East-West Link will make the rail tunnel from Clifton Hill to Southern Cross impossible.

## b) the social and environmental benefits of public transport projects compared to road infrastructure projects such as Westconnex and the East-West Link;

When dealing with the level of **traffic congestion** currently faced in Melbourne or Sydney, ANY mass transit is going to provide far greater gains (and fewer social and environmental impacts) than roads.

### Social Equity

Historic legacy needs to be reversed and won't be easy. Cultural resistance to using PT is ingrained in the outer suburbs:

#### Poverty = Lack of Options

##### Lack of car alternatives - especially in the poorest suburbs

The right to drive a car on an uncongested road and park it - is **treated as an entitlement**, like wearing a gun in the US. Cars were marketed as symbols of freedom.

Inequality near Freeways. Proximity to trains and PT is desirable and appreciates land values. Proximity to freeways depresses land values.

**For equity bus network must be upgraded to a train access network.** The bus network is run mainly for the benefit of the bus companies and the bus driver union.

The Victorian government is **not coordinating bus routes** and timetables and service level agreements under the Public Transport Department.

If we build only road options we are **locking people into a carbon intensive lifestyle**. We are forcing them into a situation where you really need to have a car for each adult, because - car- is the only transport option you have. Council Area of Wyndham has a car ownership is an average of three per house.

## Health impacts of road transport and the East-West Link

Transport Projects must not disadvantage an already disadvantaged group.

The east west tunnel, for example, funnels the air pollution into areas that have high levels of public housing. This population is more susceptible to air-pollution related health issues.

People who can't afford a car, so they won't use a toll road.

Health impacts of air pollution on lung cancer are well known.

Diesel exhaust is a class one carcinogen - up there with tobacco and asbestos.

More recent research shows diesel exposure leads to significant cardiovascular deterioration.



Health disbenefits are not in the business case for road transport. There is no health section for the East West Link CIS.

In contrast, there are obvious and immediate health benefits of good connectivity of PT, particularly when combined with improved cycling and pedestrian access to services.

**The Federal government should help fund a zero-emission bus fleet.**

## Environment

Our carbon footprint is too big. Scientists are estimating a **95% chance of a biosphere emergency**.

Major roads projects are locking future generations into a carbon intensive lifestyle

Energy required to produce and import cars is higher than for other forms of transport.

## c) National Significance of PT

### Productivity

Public transport must be **cost-effective and time-effective** compared to other modes for people to choose it.

It also needs to be safe and reliable. Clean and attractive is desirable, but not worth spending hundreds of millions beautifying stations if the basics are not funded.

Mobile Broadband ubiquity – means passengers can be productive while riding to work. Almost all train passengers now have smart phones.

The opportunity is available (as never before) to connect with one's work and with work colleagues/ contacts. Even when not using one's mobile data service directly for work, PT commuters can maximise their journey time to do whatever they want - leaving more time at work and at home to do other things.

This major **boost to national productivity is not available to drivers** who must concentrate fully on road and traffic conditions and avoid distractions.

The increase is also less on busses as the ride is less smooth.

The changing nature of work (flexible hours: mornings, evenings and weekends) demands immediate improvements in frequency of services - **buses are critical to the solution** (except where heavy rail infrastructure is a feasible and preferable option).

### Financial Considerations

Federal Government's refusal to fund public transport - No justification

Estimate \$18,000 to buy and run a car in Melbourne at the moment. That is a significant proportion of an average family's income, and unattainable for others. Most of this money will go to overseas companies.

**Corporate and tax incentives** to drive must be reviewed in the context of true (and unacknowledged environmental and health costs viz PT ( less accidents, less particulate



pollution).

Tax benefits for cars (Salary Packaging, parking entitlements). No advantage for cycling or PT to work.

Roads do not reduce congestion. Demand management does. It is politically difficult for the major parties to talk about road pricing, especially tolls.

Auditor can only investigate government department not private companies promoting major road projects

Investment in PT has stopped and gone backwards relative to population. Victorian industry is setup for road building and has less experience in rail. So risks are higher.

All the low hanging fruit in road projects have been completed so the cost benefits ratio of remaining project are low. The opposite case with PT where some very simple projects, have huge benefits, example Monash bus extension.

Does the CIS amount to deceptive and misleading conduct ?

#### d) the relationship between public transport and building well-functioning cities;

Roads and car parks currently take up 30% of the usable land in Melbourne. [not sure how this compares with worst case Detroit with a predominance of land use devoted to the motor car.]

Inner urban land is far too valuable to the economy to be given up to road projects - given the growth rate of Melbourne, we will NEVER have enough land to devote to roads and carparks without an efficient and connected PT network.

eg. traffic on Alexandra Parade won't decrease if EWLlink is built because MORE vehicles will use it for short trips in the expectation that congestion has been resolved.

Trend towards centralisation of jobs means lots of people want to get to the same place at the same time. Only PT can meet this logistic challenge.

#### e) the decision of the Federal Government to refuse to fund public transport projects

This decision is baseless and unjustified.

The federal government's professed scorn for PT projects originates in the assumption that **only those who can't afford a car** will need to and choose to, use PT.

Now, the ability to access the train network is a status symbol - driving a car signifies living in a less affluent location. We must make public transport accessible to all.

Melbourne is already completely dependent on the train network.

Those advocating for outer-suburban PT are often residents of inner suburbs.



Metropolitan Transport Forum



GAMUT

AUSTRALASIAN CENTRE FOR  
THE GOVERNANCE AND MANAGEMENT  
OF URBAN TRANSPORT

For full  
monograph visit  
[www.mtf.org.au](http://www.mtf.org.au)

Contributions by: Professors Ross  
Garnaut, John Stanley and Graham  
Currie; Deloitte's Henry Ergas;  
Dr Michael Keating; transport  
consultant Eric Keys and others

# THE ECONOMICS OF TRANSPORT

## *Smarter Transport – Better Cities*





# Preface



**Professor Ross Garnaut**

*VC Professorial Fellow, Faculty  
of Economics and Commerce,  
University of Melbourne*

Distinguished economist, Ross Garnaut was for 20 years, Professor of Economics in the Research School of Pacific and Asian Studies at the ANU. He was also Australian ambassador to China from 1985-88.

He led the Government's Climate Change Review 2007-2008, and authored "The Great Crash of 2008".

Australia's prosperity in the early 21st century flows from the benefits of productivity-raising economic reforms of the 1980s and 1990s. There is now evidence of a great complacency by policy makers who are failing in the hard thinking and hard decisions that are important sources of this prosperity.

It shows. Australian productivity growth has fallen from exceptionally high levels in the 1990s, to exceptionally low levels in the 2000s.

Nowhere is this effect revealed more clearly than in the infrastructure of our cities, and first of all, in public transport. Failure to provide adequately for public infrastructure has given rise to increases in costs of many kinds. The poor quality of urban infrastructure has been a major factor in a confused debate about whether Australia can remain open to high rates of immigration.

This collection on *The Economics of Transport: Smarter Transport – Better Cities* makes a large contribution to thought about Australia's urban infrastructure, and especially its public transport problem. The collection seeks to challenge lazy thinking that for too long has accepted uncritically, such established beliefs as "public transport is heavily subsidised compared with roads".

One straightforward point from mainstream economics is that public choice on urban infrastructure requires rigorous comparison of the social costs and social benefits of a decision. This requires assessments of good and bad "externalities" – effects of a decision that are enjoyed by or imposed on people, other than those who make the decisions.

One major externality considered in Professor John Stanley's *Chapter 2*, is greenhouse gas emissions,

which contribute to climate change. Lower emissions are one key benefit of shifting from private cars to public transport. They are not the main reason, but add to the other good reasons for improving public transport.

Good cost benefit analysis, as proposed in this publication, needs to take account of all of the externalities that are not compensated by a suitable price.

Social cost benefit analysis requires choice of an appropriate discount rate. Eric Keys in *Chapter 6*, notes the discount rates typically used for these purposes – he mentions 6.5% in real terms for Victoria, while Dr Michael Keating in *Chapter 7*, refers to 7.7% for CityRail in Sydney. Benefits that are ten years into the future have only modest effects on decisions now, and benefits that are 40 years away, virtually none.

But such are the time horizons for investments that can make large differences to the quality of a city's transport infrastructure, that these discount rates exclude changes that could transform city economic and social life. When businesses and citizens are prepared to lend to the Government on a long-term basis for a bit over 2% in real terms, we have strong reasons for asking whether the State's high discount rates are appropriate for durable decision making.

Good questions and answers lead to other good questions. The Metropolitan Transport Forum starts with good questions and answers that should be taken further by transport policy makers and their advisors, as we prepare to replace the great Australian complacency of the early 21st century with a new era of productivity-raising reform, based on rigorous analysis of policy choices.



# The Economics of Transport

## Smarter Transport – Better Cities

*Why is it so difficult to have policy based on evidence rather than belief?*

Norman Swann  
ABC Health Report

## Forum overview



**Cr Jackie Fristacky**

*Chair, Metropolitan Transport Forum (MTF);  
Councillor, City of Yarra*



**Professor Bill Russell**

*Centre for the Governance and Management of Urban Transport (GAMUT),  
University of Melbourne*

The Metropolitan Transport Forum (MTF) hosted this forum with Melbourne University's Centre for the Governance and Management of Urban Transport (GAMUT) to examine the economics of transport. The aim was to explore economic issues underlying transport infrastructure investment and pricing.

MTF submissions on the Victorian 2010/11 budget<sup>2</sup>, asked the State government to undertake a proper cost benefit analysis of transport modes to examine key myths held about transport costs.

### Transport myths

The MTF/GAMUT forum raised the need to address key myths in transport economics:

**Myth 1:** that public transport is heavily subsidised compared with car use and thus it is cheaper for governments to promote car based transport; and

**Myth 2:** that truck based freight is more efficient than rail freight.

These views have pervaded the public service and political debate for the past 60 years.

<sup>1</sup> Papers included in the monograph were presented in stages: 22 June 2010, Infrastructure Investment at the Melbourne Town Hall held jointly with MTF/GAMUT; 22 July 2010, Fare Pricing at the Department of Transport Theatre; and 23 September 2010, Agglomeration Economies at the Municipal Association of Victoria

<sup>2</sup> MTF 27 October 2009 [www.mtf.org.au](http://www.mtf.org.au)



The pressures of climate change, city congestion and costly fringe development, have all combined to make it imperative to re-assess the underlying assumptions and flawed economic bases of these views.

Professor Ross Garnaut in his recent Hamer Oration highlighted productivity challenges facing Australia linked to the failure of government to address infrastructure challenges and climate change mitigation. Professor Garnaut pointed out that the capacity of transport infrastructure has grown less rapidly than the demand for it. He alerted an attentive audience at the University of Melbourne that this had major economic consequences in that weaknesses in the provision of transport and other infrastructure are major drags on Australian economic performance. While tariff reform had delivered high productivity growth, he warned that Australian productivity was now stagnating. He linked this to the failure of leadership to act in the wider public interest on key economic reforms including on transport infrastructure in the face of the power of special interests seeking sectoral benefits.

MTF/GAMUT views the economic burden of poor investment choices in relation to public transport infrastructure as comparable to the burdens imposed on the economy by tariff protection.

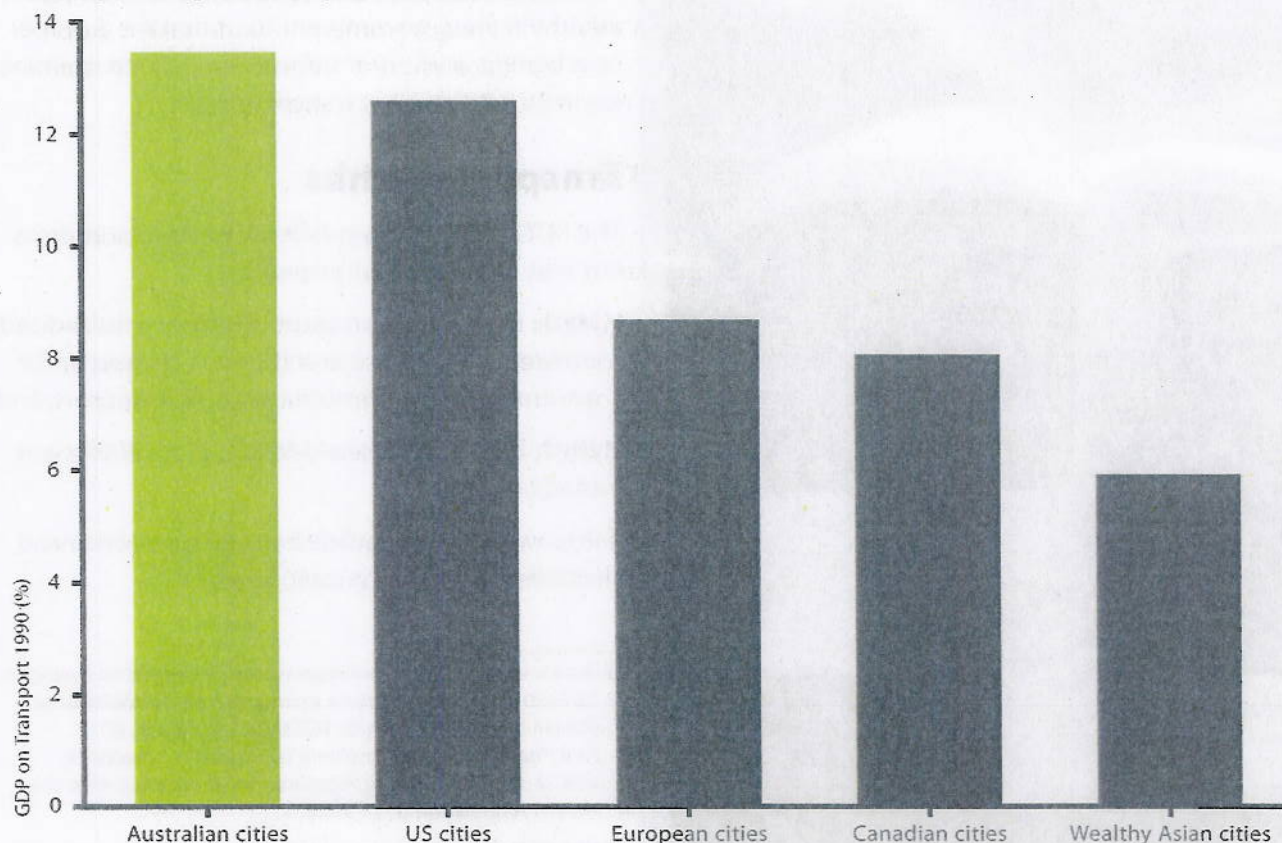
The belief that it was cheaper to build roads for cars and trucks rather than railways was not the prevailing view in earlier times. Up to the 1930s, it was seen as far more costly to build roads than to build rail lines.

In terms of operating costs, the view that these are lower for road transport compared with running public transport, also fails to take into account the full costs of operating the road system in terms of externalities – congestion, health, fuel, land use and accident costs.

Melbourne's rail system was largely built in the 1870s to the 1890s – the network constructed for a population of some 300,000. Now with a population of 4 million, heading to 7 million by 2050, and a far larger revenue base, there is still a prevailing government belief that the State cannot afford new rail lines for passenger and freight movements. The MTF/GAMUT forum was held to challenge these views.

Australia spends more of its wealth on transport than any other developed nation – near 14% of GDP on transport compared with 8.5% for European cities and 6% for wealthy Asian cities. See *Chapter 9, Professor Graham Currie*.

#### Total spending on transport as a share of GDP



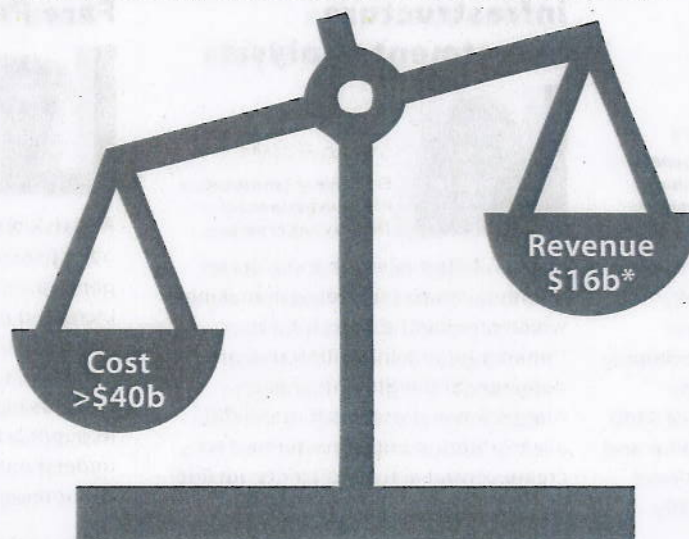
From presentation by Professor Graham Currie, MTF Mongraph, Chapter 9.

Data source: Newman and Kenworthy (2000) *Sustainability and Cities*



The annual deficit for road costs including externalities (infrastructure, congestion, emissions, noise and air pollution, and road accident costs) is summarised by Professor John Stanley (*Chapter 2*) as follows:

### Annual deficit in road costs including externalities versus road revenue



Courtesy of Professor John Stanley, *MTF Monograph, Chapter 2*.

\*Bureau of Infrastructure, Transport and Regional Economics

## Conclusion overview

In summary, the forum on the economics of transport highlighted five broad areas of conclusion:

### 1. The importance of assessing transport externalities in full

Henry Ergas pointed to major deficiencies in project appraisal, whereas John Stanley, Susan Gillett and Eric Keys all pointed to the need for holistic analysis. Particularly important were the points made by John Stanley in relation to agglomeration economies, also examined by Graham Currie, and the need to assess social exclusion issues. Michael Keating also discussed the need for externalities to be included in considering the rate of cost recovery for public transport through fares and infrastructure investment.

### 2. The need to redress the continuing structural bias toward road transport and especially road freight

John Stanley provided data showing the negative benefits of road investment compared with the positive return from investments in the bus system. Rose Elphick pointed to the inequitable access charges imposed on rail compared with road, and John Stanley emphasised the importance of transport pricing reform.

### 3. The need for proper cost-benefit analysis

Henry Ergas pointed to the shortcomings of many project appraisals. Rose Elphick also argued for

better project appraisal and the need to archive such analyses for later review. Both Susan Gillett and Eric Keys referred to their use of Triple Bottom Line criteria in assessing projects. Graham Currie argued that project assessments needed to look at aggregation economies and dis-economies.

### 4. The need for better disclosure and transparency re external costs

Henry Ergas and Rose Elphick both emphasised the need for greater transparency in relation to project appraisals and their full costs. Michael Keating highlighted the need to identify key externalities for both fares and the assessment of new infrastructure.

### 5. Policy issues

Many policy issues concerning transport economics arose, but in particular:

- The need to reform transport pricing for road use, fare setting and infrastructure;
- The need for improved project appraisal through evaluation tools including improved cost benefit analysis;
- The need for externalities, including social exclusion and agglomeration economies to be built into assessments; and again,
- The need for better disclosure and transparency in costings and project planning.



# Monograph contributors

## Chapter 2. Costing transport modes for externalities



**Professor John Stanley**

*Adjunct Prof in Sustainable Land Transport, Institute of Transport and Logistic Studies, University of Sydney*

Stanley calculates total road transport costs nationally at \$40b annually (comprising \$14b infrastructure; \$10b congestion; \$10b road accidents; \$5b emissions; \$4b noise and air pollution). Offsetting revenue of \$16b through petrol excise, registration and other vehicle charges, leaves a road transport deficit of \$24b annually.

## Chapter 3. Evidence based policy for infrastructure investment



**Henry Ergas**

*Senior Economic Adviser, Deloitte Australia*

Ergas states that "systematic cost benefit analysis is fundamental for government projects". He warns that "when poor public projects are selected, the community loses twice": firstly scarce capital is misapplied; and secondly, taxes funding projects, involve distortions which themselves have a significant cost.

## Chapter 4. Rethinking the economic appraisal of rail freight



**Rose Elphick**

*Chief Executive Officer, Victorian Freight Logistics Council*

Elphick highlights research findings "that taking into account the full externalities of road versus rail use (congestion, accident costs, road maintenance, GHG emissions, pollution, noise, water, nature and landscape, and urban separation), a shift to rail would produce an average saving to the economy of \$27 per container."

## Chapter 5. Transport infrastructure investment analysis



**Susan Gillett**

*Executive, Infrastructure Policy, Department of Treasury and Finance*

Susan Gillett deals with the State's broader contexts for decision making which provide the basis for better thinking for dealing with transport demands. She highlights that to reduce travel pressures to the CBD, a key "option being considered is to create central activity districts outside central Melbourne along existing transport corridors".

## Chapter 6. Cost benefit analysis of transport projects



**Eric Keys**

*Project Leader Melbourne Metro 1, Department of Transport*

Eric Keys states: "public transport is more efficient than car travel on environmental measures. The significant benefit of public transport is setting the foundation for a form of society where walking, cycling and public transport go together with urban development to impact beneficially on lifestyle and city function. It is about more efficient land use."

## Chapter 7. Pricing fares in Sydney



**Dr Michael Keating**

*Former Chairman, IPART*

IPART's estimate of external benefits from rail led it to conclude that passengers should fund only around 30% of rail revenue requirements through rail fares. IPART also put the view that Government should consider this broad 70:30 cost sharing ratio, and the associated impact on fare levels, when evaluating new infrastructure investments.

## Chapter 8. Victorian Fare Policy



**Adrian Webb**

*Fare Policy Manager, Department of Transport*

Adrian Webb sets out the broad objectives of public transport fare policy as: simplicity, supporting increased patronage, providing customer benefits, supporting social inclusion, operational efficiency, maximising utility of investment in public transport, customer understanding, revenue generation, and integrated ticketing.



**Dean Purkis**

*Manager, Policy and Stakeholder Information, Transport Ticketing Authority*

Dean Purkis states that despite the enormous resources expended in developing the Myki system over five years, "we have persevered despite its problems, because it provides a more efficient, integrated smartcard ticketing system, and the enormous advantages it brings to customers, operators and the government".

## Chapter 9. Agglomeration economies: understanding benefits in mass transit project evaluation



**Professor Graham Currie**

*Professor of Public Transport, Institute of Transport Studies, Monash University*

Professor Currie shows that congestion costs are high in Australia at 2.6% of GDP compared with 1.5% in the USA and 2% for the OECD average. Professor Currie also highlights that Australia spends more of its wealth on transport than any other developed nation. He warns that productivity is at risk because of constraints in rail capacity serving CBD employment.



# Annual costs to run a car in the Melbourne CBD

Annual cost			
Vehicles per household	2	1	1 to CBD; 1 not
Annual km's per household	30,000	15,000	30,000
Fixed vehicle expenses (per RACV)*	\$17,680	\$8,840	\$17,680
Operating costs **	\$6,000	\$3,000	\$6,000
Parking costs (\$16 per day)***	\$7,680	\$3,840	\$3,840
Total annual expenses	\$31,360	\$15,680	\$27,520
Annual public transport (full fare, 2 zones, myki pass) (PTV website fares as of 1 Jan 2014)	\$4,420	\$2,210	\$4,420

\* standing costs avg \$170 per week (RACV 2013 data) for 52 weeks (I looked at medium, large and SUV costs)

\*\* operating costs avg 20c/km (RACV 2013 data) for 52 weeks (I looked at medium, large and SUV costs)

\*\*\* Early bird parking rates in CBD vary between \$11 and 21/day, depending on location, 5 days a week, 48 weeks/year.



# Capital cities - potential

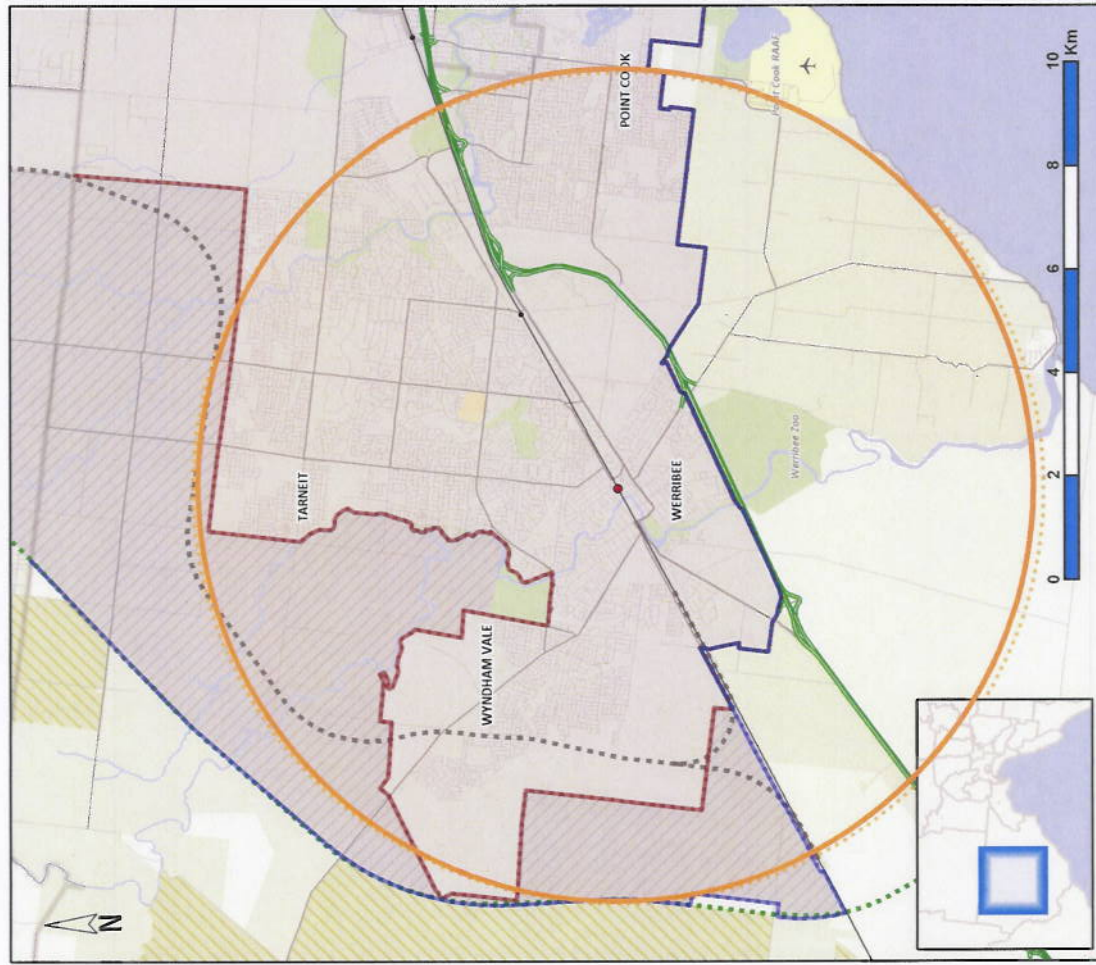
Released in December last year, this national review identified that Australian commuters could save more than \$5,400 per year by leaving their car at home and commuting to the CBD with public transport. The ARA commissioned report also identified that CBD commuters could average a saving of \$9,425 by not owning a car at all or deciding not to purchase a second household car. Cases were also broken down to a state-by-state basis, which further reflected the significant savings that can be made by switching to public transport in each Australian capital city.

- “If Australia commuters do not own a car or choose not to purchase a second car and instead commute by public transport to work in the CBD, the annual commute costs drops to an indicative average of **\$1,607**.”
- This figure excludes travel costs to and from a bus or train station and the potential parking costs at park and ride facilities but can result in an indicative saving of **\$9,425 (85%)** compared to owning and using a car to commute to work.”

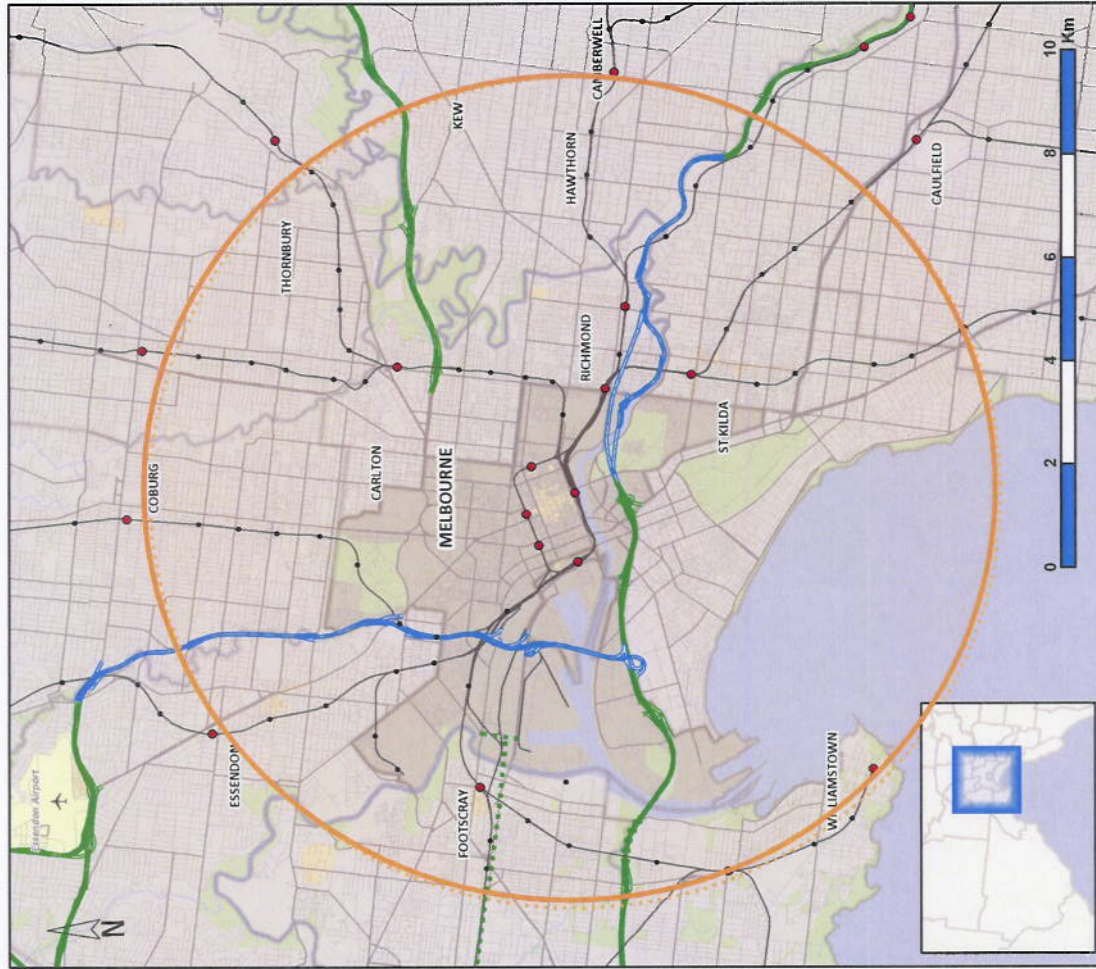
Source: -Dr Jian Wang; CRC for Rail Innovations for the Australasian Rail Association November 2013; Commuter Costs Potential Savings Report



# Map comparison transport infrastructure Wyndham/ 8kms Flinders Street



8km Catchment Analysis - Werribee Station vs Flinders St. Station





## National General Assembly of Local Government, 16-19 June 2013, Canberra

**Motion on federal fiscal arrangements, seeking re-evaluation, including at COAG, of federal state, local government funding arrangements.**

**Equivalent motion at Municipal Association of Victoria (MAV) State Council on 16 May 2013, passed 97%.**

### **Motion: 2. Foundations for the Future – Twenty 13: Infrastructure and Service Funding**

That this National General Assembly call for the Federal Government:

- (a) to note:
  - (i) successive ALGA motions in previous years highlighting problems in funding urban and regional public transport infrastructure, social housing, education, and health services by the States and Local Government infrastructure and services to meet population growth; and
  - (ii) fiscal imbalances between Commonwealth, State and Local Governments in meeting their responsibilities for the above; and
- (b) to raise through the COAG Agenda, the need for re-alignment of federal funding arrangements so that levels of Government in Australia have a more efficient match between their responsibilities and their finances.

### **Background: (max 250 words)**

There is a significant imbalance between Federal, State, and Local Government responsibilities to deliver infrastructure and services and their funding capacity as set out in the table below.

Given these disparities there is diminishing capacity to pay for infrastructure at State and Local Government levels. This has resulted in core infrastructure needs, such as public transport, health, education and community facilities not being adequately provided. State and local government funding shortfalls have reached critical levels.

The lack of financial capacity for State and Local Governments to deliver the infrastructure and services for which they are responsible, creates inefficiencies in our federal system of government. Considerable resources are applied by local government in applying for non-recurrent grants and government grants for basic ongoing community needs. Similarly, other tiers of government expend resources in assessing grant applications. There is also considerable duplication of administrative arrangements to oversight funding arrangements and grants.

It is considered that ALGA should raise at COAG, the need for a more effective federal system with re-alignment of federal funding arrangements so that levels of Government in Australia have a more efficient match of their responsibilities with their finances

Extract - Local Government in Australia  
Table 1.4: Share of Taxation revenue, by sphere of Government and source of revenue 2009-10

Revenue Source	Federal %	State %	Local %	Total %
Tax on income	56.2	-	-	56.2
Employers payroll taxes	0.2	5	-	5.2
Property taxes	-	6.1	3.5	9.6
Taxes on Property	23.7	3	-	26.7
Taxes on provision of goods and services	-	-	-	-
Taxes on use of goods and performance activities	0.2	2.3	-	2.5
Total	80.3	16.4	3.5	100.00

Notes: Figures may not add to totals due to inclusion of external territories and rounding:  
- nil or rounded to zero

Source: ABS, Taxation Revenue, Australia, 2009-10, cat. No. 5506.0