

**Allison Waddington**

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**From:** John Pauley [REDACTED]  
**Sent:** Monday, 30 September 2019 3:16 PM  
**To:** GHT  
**Cc:** Rob Valentine  
**Subject:** Greater Hobart Traffic Congestion Submission  
**Attachments:** Submission to the RACT Greater Hobart Mobility Vision.docx; Trackless Trams.docx

Good morning,

Please accept my apologies for this late submission into your Select Committee Inquiry into Traffic Congestion Within Greater Hobart. Below I will briefly address each of the inquiry's Terms of Reference. I will also attach a submission I prepared earlier and presented to the RACT as part of its project looking at traffic issues within Greater Hobart.

In making this submission I am basing my views on the following experience. Firstly, while employed by the Tasmanian State Government I held the positions of Manager Land Transport Planning and General Manager Passenger Transport. In holding these two positions it gives me a unique perspective on Hobart's traffic issues as I have held senior roles within Government with direct responsibility for planning Tasmania's road network and providing passenger transport services to Tasmanian communities. Prior to retirement, one of the last initiatives I had a direct hand in implementing was the short section of bus priority lane on the Southern Outlet which I understand saves around 5 minutes of travel time for each of the buses coming into Hobart from the south each morning even though that lane is only around 500 metres long. It is disappointing that the extension of this bus lane both north and south from its present location has not been undertaken in the last decade.

Since retirement, I have maintained a keen interest in traffic issues and have worked closely with the Tasmanian Bus Association and a number of major bus operators on a number of strategic studies for improving passenger transport within Tasmania.

(1) The scope of Greater Hobart's traffic congestion and its impact on the community and economy;

Traffic congestion has increased markedly in the last decade within Greater Hobart and there are a number of key locations on the network that regularly come to a standstill. In my view, the network across Greater Hobart is very fragile and any single incident has the potential to cause the network to come to a virtual standstill. As time goes by the likelihood of an incident on any given day is increasing due to greater pressures from increased traffic. As a result of both the fragility of the network to an incident, and the increased likelihood of an incident, there will be increasing social and economic impacts on Greater Hobart as time goes by.

(2) Causes of congestion, including physical and topographical barriers;

In my view three factors impact on congestion within Greater Hobart.

First is we are a car dependent society and the private motor car is the principal means of transport within Greater Hobart. The development of our passenger transport network and the provision of facilities for active transport modes have not kept up with travel demand.

Second, Hobart's road network is significantly constrained and opportunities to expand the network are virtually non-existent. There is the potential for a small number of, what I consider to be, cost effective improvements for the road network, but each of these will be limited in scope if the dominance of the private motor vehicle is

maintained. Critical in this regard is the importance of the couplet through the city and the lack of any real options to by-pass it. While there have been suggestions to use tunnels and/or elevated roadways these offer limited scope given the transport patterns of users.

Finally, the topography of Hobart places further constraints on what can be achieved. Hobart is of necessity an elongated city stretching along the river and constrained on both sides by the topography of the mountain and the hills on the eastern shore.

These three factors drive congestion within Hobart.

(3) Strategic planning processes between Commonwealth, State and Local governments;

I will not make major comment on this other than to say that any strategic planning process within Greater Hobart must acknowledge the role that active transport (cycling and walking), passenger transport and motor cycles have in reducing the impact of congestion. Planning that seeks to maintain the dominance of the private motor car within Hobart will not deliver a sustainable outcome.

In particular recognition that Hobart is a bus city is required. In this regard I note recent comments made by Professor Peter Newman (which are referenced in my attached RACT submission) relating to the development of trackless trams as opposed to light rail. In this regard I consider that Hobart should be seeking to become an exemplar for new technology, rather than one of the last places to invest heavily in the outdated and constrained technology of light rail. This is particularly important if we seek to address traffic issues across Greater Hobart. Light rail dresses just one small aspect of the overall problem and does nothing to impact on the major traffic flows into the city from the east and south.

Coupled with this must be an approach which includes integrated land use and transport planning and carefully considers the impact of current and proposed settlement patterns on transport demand.

The current focus on a few large scale infrastructure projects (Bridgewater Bridge, Northern Suburbs Light Rail and the Airport Round-a-bout) have taken our eye of the broader issue of transport within Greater Hobart. My submission to the RACT specifically addresses this point.

(4) Future initiatives to address traffic congestion in the Greater Hobart area; and

These initiatives are outlined in my RACT submission which is attached. However, here I will stress some recent views I have developed.

First, the couplet is and will continue to be a critical piece of transport infrastructure for Hobart. While it divides the city from the waterfront, by-passing it is virtually impossible. So we need to think laterally about how it is managed and developed. In my RACT submission I talk about taking the southern outlet under Davey St and making a few changes to the way traffic is managed along Macquarie St to improve traffic flow.

Further to this Sandy Bay Rd could be taken under Macquarie St to improve traffic flow into North and West Hobart. In undertaking such a development consideration would need to be given to directing traffic up Byron St that wishes to access Macquarie St.

Furthermore, the two main pedestrian crossing of Macquarie St and Davey St are at Murray St and Elizabeth St. In these two locations a short section of tunnel could be developed to provide vastly improved at grade pedestrian links between the city and the water front.

These potential initiatives would maintain the efficiency of the couplet and also improve pedestrian flow at key locations.

Second, there is a need to improve traffic flow around the city. To this end we already have the Brooker Hwy. Added to this I would propose that the Campbell/Argle and Murray/Harrington couplets be prioritised for traffic, while Elizabeth St is prioritised for active transport and passenger transport between the waterfront and the northern end of the North Hobart strip.

Under such an arrangement private vehicle use in Elizabeth St would be discouraged by a range of traffic calming measures, encouraging motorists to use the alternative links. As part of an approach incorporating integrated land use and transport planning the spine along Elizabeth St should be developed for medium density housing based on 3, 4 and/or 5 story developments which maintain the existing street scape. As part of this I would also propose a single lane (with direction controlled by appropriate technology) bus way through Elizabeth Mall to remove the need for buses to circulate the city heart in getting too and from suburbs north of the city. In Melbourne I note there are two tram tracks running through their Bourke St mall and this seems to mix well with pedestrians.

(5) Any other matters incidental thereto.

As I have stated I have attached a copy of my submission to the RACT which covers a range of issues relevant to your inquiry. Further to this I would welcome any opportunity to meet with your Committee to further explore the ideas I have proposed.

As a final point, I consider that we need to rethink the priority given to the private car and introduce strategies across the city that encourage the use of other travel modes. In particular I think that apart from consideration being given to walking, cycling and bus travel, transport planners must take very seriously the opportunities offered by powered two-wheeled vehicles - motor cycles, scooters and also electric bicycles. Within an urban environment these modes do not have the terrible crash statistics that they have outside the urban area and they should not be dismissed given the opportunity they offer. This was a significant weakness of the RACT report which dismissed these modes out of hand without giving due consideration to their safety within a low speed urban environment.

I thank you for the opportunity to make a submission and again apologise for the lateness of my input.

Regards

John Pauley

## Submission to the RACT Greater Hobart Mobility Vision

By  
John Pauley

### Background

The situation facing Hobart and its current transport issues is the result of a long history associated with both settlement and infrastructure provision. Past decisions have created many constraints for the future provision of infrastructure and services.

### Over-Arching Issues

As background to my submission I think it is critical to consider three over-arching issues relating to transport in Hobart when looking at a vision for the future.

#### *1. 1968 Wilbur-Smith Report*

While dated now, the 1968 Wilbur-Smith report has been the guiding document in relation to road provision in Hobart for the last 50 years. Interestingly there have been no reports of this magnitude since, and there have been no significant deviations from the Wilbur-Smith proposals in the development of the Hobart road network.

There have, however, been some significant elements of the report that were not constructed, namely the North City bypass and the continued expansion of capacity on the Brooker and the Bridge.

Even as recently as today (1 October 2018) the Evers group has resurrected one of the missing pieces of the Wilbur-Smith report. However, instead of proposing an elevated roadway linking the Southern Outlet with the Brooker and the Bridge, they propose a tunnel.

The report also did not address the impact of significant population expansion to the east, north and south of Hobart that has been a characteristic of Hobart's development since the 70s and has contributed to the current problems.

Nor did the report consider the significant changes to transport habits that have occurred over the last 50 years such as multi-car households, changing patterns of school attendance, demands for childcare, changes to shopping patterns and more diversified travel to work patterns.

#### *2. The Couplet*

The Macquarie/Davey St couplet forms a critical element of Hobart's transport system.

Travel north/south or east/west within Hobart must interact with the couplet.

In addition, travel into the city centre from the south (Sandy Bay, Battery Point, Taroona and the Kingborough and Huon municipalities) requires use of/or interaction with these two roads.

Whatever happens in Hobart will involve these two roads and must reflect their critical role.

### *3. Hobart's Topography*

The nature of Hobart's topography, with the city centre lying alongside the river and suburbs hemmed in along the river's western and eastern sides by hills, significantly limits the opportunity to implement infrastructure solutions to transport problems within the city.

The city's topography also limits the role that active transport solutions such as walking and cycling can provide due the steepness of access to many suburbs on both the western and eastern shores.

The end result of our topography is city with low population density and extreme linearity.

#### **The way forward?**

In my considered view, there are two critical elements at the heart of improving mobility outcomes for Hobart:

- developing a strategic settlement plan; and
- considering how the available road network can more effectively and efficiently meet the transport task of Hobart.

#### *1. A Strategic Settlement Plan*

The pattern of settlement in Hobart, its location and density, drive the demand for transport services and mobility. With the current physical size of the city and its low population density transport options other than the private motor vehicle have become expensive alternatives.

In order to improve mobility outcomes consideration must be given to the nature of settlement within greater Hobart. The current practice of developing more land on the fringes will simply exacerbate Hobart's access and mobility problems and add increasingly to the cost of delivering effective access and mobility within greater Hobart.

As an idea, 4 sites within the city stand out where increased living density would potentially deliver significant benefits. These sites are already situated close to a wide range of services and could be serviced by high quality, high frequency, low cost transit services. The development of such sites would minimise the need for private car use and the vast majority of journeys undertaken by the residents of these locations could be achieved using transit, walking or bicycle (both human powered and electric).

So where could we be thinking about transit orientated developments within greater Hobart.

The first location is along Elizabeth St from the northern end of the mall through to the North Hobart strip. Along this corridor there are already a wide range of services and excellent transit. By maintaining the existing shop fronts, in order to maintain the feel of the city, medium density low rise residential building could be built in the blocks either side of Elizabeth St. This would bring a vibrancy into the inner city that is currently lacking and could include a proportion of low cost housing so that workers in the service sector have the option of living close to their place of employment.

The second location is east of Main Rd between Moonah and Glenorchy. This would cover the region between New Town Boys High School and the Showgrounds. Across this area low and medium cost housing should be developed. A mix of housing types from low rise blocks to single story family dwellings could be accommodated.

The development of a strong population centre within this area would provide a sustainable population base for whatever form of transport eventuates along the existing rail corridor. It is interesting to note the Prof Peter Newman has recently stated that light rail is no longer a cost effective option and he is now talking of trackless trams, a rubber tyred transit vehicle that is similar in concept to Bus Rapid Transit. A copy of a recent article from the Conversation is attached for your information.

Third cab off the rank for strategic development within greater Hobart is on the eastern shore between Rosny and Bellerive. This area is again well serviced with a wide variety of infrastructure and services and developing this area would provide a sustainable passenger load for ferry transport within easy walking or cycling distance from the Bellerive waterfront.

The final location where strategic development can be focussed could be Kingston. Such development could be then linked to the city by high frequency transit services.

In each of these 4 locations the development of higher density living and greater population around existing services would become a driver for better transport solutions that are not dependent upon the private car. The provision of these better solutions will assist those who live in the surrounding suburbs and create opportunities for park and ride and other transport modes to reduce pressure on a strained transport network and improve overall mobility within Hobart.

Irrespective of where such development may occur, and the above are but four options, stronger integrated land use and transport planning is required within greater Hobart if better and more sustainable mobility outcomes are to be achieved. This requires a strong strategic approach which is currently lacking within the city and the moderation of broad acre subdivision on the fringes.

## *2. Better Bus Services and Related Infrastructure - Hobart's Transit Future*

There is considerable talk about how light rail and ferries on the Derwent are the way forward for Hobart. Even the member for Denison, Andrew Wilkie, has engaged the PM on

the above topics. However, what is largely unsaid in the discussions about these two modes is that the best business case will, most likely, be dependent upon a feeder bus network to deliver passengers to stops and ferry terminals.

The best business case for light rail already highlights this with it assuming passengers are collected by Metro and delivered to just two stops - one at Glenorchy and one at Moonah.

Light rail has an upfront cost in the region of \$100m and will likely require an on-going subsidy of around \$3 to \$5m per annum. What the investment and subsidy costs are for ferries is uncouncted to my knowledge.

This investment will only directly service the northern suburbs beyond Risdon Rd and within 300 to 400m of the corridor. Similarly, ferries will only service a small potential of the Hobart catchment.

Light rail will not service the inner norther suburbs inside of Risdon Rd, nor does it offer any respite to the Eastern Shore or the Southern suburbs. Ferries may offer some benefit to the eastern share and southern suburbs, but at an unknown cost and travel time impact.

A new conversation is needed in greater Hobart around transit services.

As indicated above Peter Newman, one of Australia's greatest advocates for light rail, is now proposing the adoption of new technology which negates the need for the capital infrastructure spend associated with light rail and would facilitate the development of infrastructure suited to both trackless trams and buses.

Central to this conversation is improving what we currently have and using the existing road network to more effectively and efficiently provide for the city's transport task. Central to this view is the fact that the infrastructure and services which are already in place and can be vastly improved at very low additional cost.

Greater Hobart has the following 8 major transit corridors:

- East Derwent Hwy;
- Oceania Drv and Clarence St;
- the Tasman and Bowen Bridges;
- Sandy Bay Rd;
- Southern Outlet;
- Macquarie/Davey St;
- Elizabeth St and Main Rd; and
- the Brooker Hwy to Brighton.

Minor and supplementary transit corridors linking to these major transit corridors include:

- Tranmere Rd;
- Old Beach Rd from the Bowen Bridge to Bridgewater;
- Augusta Rd;
- Barossa Rd, Lenah Valley Rd and Augusta Rd;
- Regent St;

- Nelson Rd;
- Forest Rd, West Hobart and Mt Stuart;
- Goodwood Rd;
- Talossa St;
- Mary's Hope Rd; and
- Gordon's Hill Rd.

There may be a few more, but these will be less important relative to the corridors identified above.

Beyond the urban edge the:

- Midland Hwy;
- Tasman Hwy;
- Richmond Road;
- Acton Rd;
- South Arm Rd;
- Channel Hwy;
- Huon Hwy; and
- Lyell Hwy

provide important links to outlying growth centres in Margate, Huonville, New Norfolk, Brighton, Richmond, Midway Point, Sorell, Dodges Ferry and Lauderdale.

So what may the future look like?

Adopting an approach which begins to prioritise transit services over private car use will deliver better outcomes for both motorists and the users of transit services. Motorists benefit through lower levels of congestion for those journeys that cannot be readily undertaken by transit and transit users get high quality and frequent services that deliver reliable and rapid journey times.

This approach recognises that seeking to overcome congestion by undertaking massive infrastructure projects is not only extraordinarily expensive within an urban environment, but also of limited value due to the impact of the induced traffic that better infrastructure universally creates.

Implementing such an approach will require the following to be considered:

- more frequent bus services running along the major corridors providing continuous N-S, E-W journeys with fewer lay-overs within the city centre;
- the introduction of a circular network using the Bowen and Tasman Bridges with strategic interchange points in the CDB, Rosny, Glenorchy, Moonah and North Hobart;
- high frequency turn up and go services along each of the 8 transit corridors, with lesser frequency elsewhere;
- rail/tram like vehicle amenity along the major transit corridors, trackless trams would be a suitable option and deliver a city wide transport solution. In one fell swoop Hobart could become one of the most innovative cities in the world for transit;



- high quality stops that provide a secure site for passengers, secure parking for bicycles and deliver real time passenger information;
- dedicated transit laneways along each route (perhaps shared with high occupancy cars and monitored by smart technology and tolled);
- tidal flow clearways;
- loss of the left side parking corridor in Davey and Macquarie Streets to provide a continuous through lane for transit;
- use of the middle lane on the Tasman Bridge as a tidal flow transit and high occupancy vehicle lane;
- a dedicated transit lane on the north bound lane of the Southern outlet (which requires about 500 m of roadworks at Cats Eye Corner to deliver required road width along the full length);
- implement a “never stop at lights” philosophy for transit services across the greater Hobart area via provision of smart signalling and bus specific lanes at all traffic lights;
- supporting the main transit corridors with feeder services using perhaps smaller vehicles from minor routes that deliver passengers to strategic interchanges giving everyone improved journey times;
- focus on direct routes and frequency across the city. No waiting within the CBD on through routes from N/S and E/W

The implementation of this approach will minimise walking distances for vast bulk of city’s population and by encouraging greater transit use free up road space for those journeys that are better undertaken by private car.

By giving careful consideration to how this approach is implemented, consideration can be given to feeder services that have a tidal flow element to them so that they provide downhill walking in morning and afternoon for hillside suburbs to avoid need for excessive route kilometres.

### **How can this be Funded?**

Lets assume \$100m is on the table for the development of the norther suburbs light rail, plus \$5m pa in on-going annual subsidies. This amount of funding is equivalent to having \$150m available as a lump sum or around \$15m pa on-going to support services.

So let's cut the pie differently.

Instead of a high capital cost which would serve but a small proportion of the greater Hobart population, lets provide say \$30 or \$40m up front for vehicles, infrastructure and passenger information and facilities. If we were to adopt trackless trams, as part of a city wide plan, we may be able to attract even more capital funding as an international demonstration project.

The reduction in up front capital would leave an additional \$11 to \$12m pa in on-going funding for Metro to support increased service frequency across the network.

### **The Next Steps**

First up we need to start a new conversation about mobility for greater Hobart.

This conversation needs to tackle the issue of mobility across the whole city and not be confined to one or two narrow corridors.

This conversation needs to recognise that infrastructure solutions alone will not deliver any significant or long-term solutions to Hobart's congestion and declining mobility. It hasn't happened anywhere else in the world and there is nothing to suggest Hobart will be any different.

This conversation needs to recognise that for many reasons Hobart is a city that is best suited to transit services based around rubber tyred trackless vehicles using dedicated facilities located on the existing road network. Such vehicles can deliver effective services along each of the 8 transit corridors I have identified.

### **Conclusion**

Better transit services, not infrastructure will deliver better outcomes for both car users and transit users in Hobart.

The city's future will be based on transit services delivered by rubber tyred vehicles – trackless trams and buses – which share a defined and upgraded transit network.

The current urban form and the city's topography can only be satisfied by trackless trams and buses, with other potential modes restricted to narrow corridors which have an extremely confined catchment without feeder services.

So lets look very closely at how buses, and bus related technology (trackless trams, bus rapid transit) can be re-configured across the whole of greater Hobart building upon what we already have.

Such an approach will deliver a better bang for the limited buck that is available and provide benefits over the whole Hobart basin, as opposed a narrow corridors that have low population densities.

### **But if You Want Some Infrastructure Solutions Then . . . .**

While I have dedicated this submission to rethinking how mobility can be better delivered across greater Hobart, there are perhaps a number of infrastructure projects that will improve the way the city operates.

First up I think the southern outlet should be taken under Davey St linking 3 lanes (one transit lane and two vehicle lanes) directly with Macquarie St and avoiding two sets of lights. The southern outlet transit lane would be configured to run directly down the left hand side of Macquarie St while the traffic lanes would run down the right hand side. The existing traffic from upper Macquarie St would be brought over the top of the transit lane, merging

into the southern outlet traffic between the existing lights and Antill St to provide a total of four lanes along the length of Macquarie St (one transit lane, 3 traffic lanes).

Secondly I think Sandy Bay Rd/Harrington St should be taken under Macquarie St and traffic from Sandy Bay seeking access to Macquarie St using Byron St. Byron St in turn would be taken under Davey St.

These three bridges/short tunnels would remove a number of intersections along Davey and Macquarie Streets and potentially improve traffic flows by concentrating turning movements at a lesser number of locations.

Thirdly, some existing projects such as the Southern outlet transit lane should be given increased priority as these projects assist in improving transit services. Coupled with this investment would be creating a busway/trackless tram corridor along the old northern suburbs rail corridor and dedicating the existing parking lane on the Brooker Hwy to a continuous transit lane and creating limited parking on the existing verge which is wide enough in most places to accommodate such development.

The final area where infrastructure investment can be made is:

- providing smarter traffic light technology which, irrespective of where the city heads in meeting future mobility needs, provides transit services with priority across the network;
- delivering better passenger facilities for transit users including secure stops, parking for bicycles and better passenger information.

### **One Last Point**

Do not forget the role that bicycles and powered two wheeled vehicles (electric bikes, scooters and motor cycles) can provide in delivering better mobility outcomes for greater Hobart. These modes need better facilities. Obvious candidates for development include better cycling facilities along the eastern shore, perhaps in tandem with dedicated facilities for transit services and also the construction of the Battery Point walkway to provide better access to the city from Tarooma and Sandy Bay.

Added to the provision of facilities for these modes would be the provision of one parking spot in each city block on each side of the road for motor cycle parking. The revenue effects of such a model for the city would be minimal as the remaining on street parking spots and spaces in high rise car parks would be better utilised. The provision of such spaces for motor cycles and scooters would greatly encourage their use and provide a significant impact on motor vehicle use.

# Trackless Trams

PETER NEWMAN | 26 SEPTEMBER 2018

## Why trackless trams are ready to replace light rail: Peter Newman



GUEST OBSERVATION

I began my life as an activist academic in 1979 when the Western Australian government closed the Fremantle railway, saying buses would be better. Patronage immediately fell by 30% and I ran a four-year campaign to save the railway. We won. I have been writing books and running campaigns ever since on why trains and trams are better than buses. But I have changed my mind. The technology has changed, and I think it will end the need for new light rail.

“Trackless trams” are based on technology created in [Europe](#) and [China](#) by taking innovations from high-speed rail and putting them in a bus.

I went to China to check out the CRRC trackless tram (they call it autonomous rail transit, or ART). I came back convinced it’s a transformative transit technology.

Light rail is a connecting service. It joins up corridors or links heavy rail stations to surrounding areas and sometimes completes shorter corridors that lack rail lines. Buses were filling these functions in most cities but failing on two fronts:

- buses were not competing with cars so cities were filling with traffic
- buses did not enable denser development to be viable so cities were sprawling rather than redeveloping.

Light rail had many success stories of competing with cars and attracting denser development, so commentators like me did our best to make them policy-relevant (see, for example, [here](#), [here](#) and [here](#)).





*The battery-powered trackless tram, or ART, in operation in Zhuzhou, showing the trackless autonomous guidance system. CRRC Zhuzhou Institute, Author provided*

**SO WHAT CAN THE NEW TECHNOLOGY DO?**

Trackless trams are neither a tram nor a bus, though they have rubber wheels and run on streets. The high-speed rail innovations have transformed a bus into something with all the best features of light rail and none of its worst features.

It replaces the noise and emissions of buses with electric traction from batteries recharged at stations in 30 seconds or at the end of the line in 10 minutes. That could just be an electric bus, but the ART is much more than that. It has all the speed (70kph), capacity and ride quality of light rail with its autonomous optical guidance system, train-like bogies with double axles and special hydraulics and tyres.

*The first trackless tram rolled out for a road test in Zhuzhou, south China's Hunan Province, on October 23 2017.*

It can slide into the station with millimetre accuracy and enable smooth disability access. It passed the ride quality test when I saw kids running up and down while it was going at 70kph – you never see this on a bus due to the sway.



*A child runs along the trackless tram with the author looking on. Author provided*

The autonomous features mean it is programmed, optically guided with **GPS** and **LIDAR** technologies, into moving very precisely along an invisible track. If an accident happens in the right of way a “driver” can override the steering and go around. It can also be driven to a normal bus depot for overnight storage and deep battery recharge.

The standard ART system is three carriages that can carry 300 people, but it can take five carriages and 500 people if needed. In three years of trials no impact on road surfaces has been found.



*The author discusses his conclusions after visiting China to assess the operation of trackless trams.*

## **HOW DO TRACKLESS TRAMS IMPROVE ON LIGHT RAIL?**

Trackless trams can avoid the worst features of light rail – disruption and cost. It can take years to lay rail tracks, causing major disruption to local economies, as is happening in Sydney.

Similar disruption has happened in the Gold Coast, Canberra and elsewhere, but ultimately light rail systems have been highly successful in attracting patronage and land development. This will happen in Sydney too when the project is complete.

However, the cost has been far beyond original expectations. Sydney is costing over \$120 million per kilometre. The Gold Coast was similar. Canberra and Newcastle are over \$80 million per kilometre, as was the cancelled light rail in Perth.

The trackless tram costs around \$6-\$8 million per kilometre. And it can be put into a road system over a weekend.

The big test is whether the trackless tram can attract development around its stations as light rail can. That is the missing link in our cities. How can we unlock urban regeneration and prevent our cities sprawling ever outwards with poorer and poorer suburbs while the well-placed inner and middle suburbs become more and more expensive?

The divided city needs something that can unlock affordable medium- and high-density housing in new urban centres across the city. Following many discussions with the urban development industry, I think the trackless tram can do this. The cost can be afforded as a contribution to any new development and will bring the uplift in land value that unlocks investment.

*Trackless trams could be transformative for a city.*

We have developed a [model](#) that means governments do **not need to find all or even any of the capital costs**. This is how trams were [first built as real estate projects](#).

But governments are needed to manage the process and create the land assembly and other urban regeneration processes as well as community engagement. This will help show where best to route such a system and how to manage it as a transit system operating

for the public good. Governments can help with risk management on the financing, as in [City Deals](#). We have produced a [guide and manual](#) for how to do this.

## **AUSTRALIAN CITIES ARE LINING UP**

Cities across the world are lining up to trial these trackless tram systems. So far, Australian cities moving to use them are Townsville, Hobart, Melbourne (in Fishermans Bend and other sites), Sydney (in Liverpool and perhaps Parramatta Road where the first studies were done) and Perth – where five separate corridors are competing to run the first ART trial.

The table below summarises the main characteristics of buses, light rail and trackless trams, showing the improvements the new technology provides on key criteria.

## Characteristics of transit systems

The table summarises the key characteristics of Bus Rapid Transit (BRT), Light Rail Transit (LRT) and Autonomous Rail Transit (ART, or trackless tram) systems.

Characteristic	BRT	LRT	ART
Speed and capacity	✓	✓✓	✓✓
Ride quality	✗	✓✓	✓✓
Land development potential	✗	✓✓	✓✓
Cost	✓	✗	✓
Disruption to services and local economy in construction period	✓	✗	✓✓
Implementation time	✓	✗	✓
<b>Overall</b>	✓	✓✓	✓✓✓

Others would rate some characteristics higher or lower, but for me the trackless tram looks a winner due to its ride quality, land development potential and cost.

Time will tell if the early demand for ART translates into a real transformative change – a disruptive innovation. It reminds me of the early days of solar and batteries, which are now completely disrupting coal power systems.

***PETER NEWMAN**, Professor of Sustainability, Curtin University*

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