

Restitching the city by rethinking motorways

Benjamin Driver



Photo: Taras Vyshnyja – stock.adobe.com

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So much of Sydney’s urban dialogue is dominated by just a few contested topics – population growth, building heights and density, and transport. As our population continues an upward trajectory to over eight million by 2050, they’ll no doubt remain hot topics.

Retrofitting our cities with higher-density living and associated services for this rate of change is a significant task; and the funds, time and political enthusiasm to do so are all limited – but we can’t afford not to do it well.

If funds are limited, we must prioritise benefits for the maximum number of users at the most efficient rate. This is not only economically prudent but underpins cities as reflections of our democracy – open to all, which flows on to social and environmental savings. This democracy or openness of cities is at risk if we continue to squeeze and hence limit the movement of its citizens.

For decades now we have been sold the idea that private vehicles are a right for all, and government policy has underpinned this by disproportionately funding the development of motorways and endless widening of roads to accommodate them – often at the expense of pedestrians, cyclists, landscape, public transport and often our

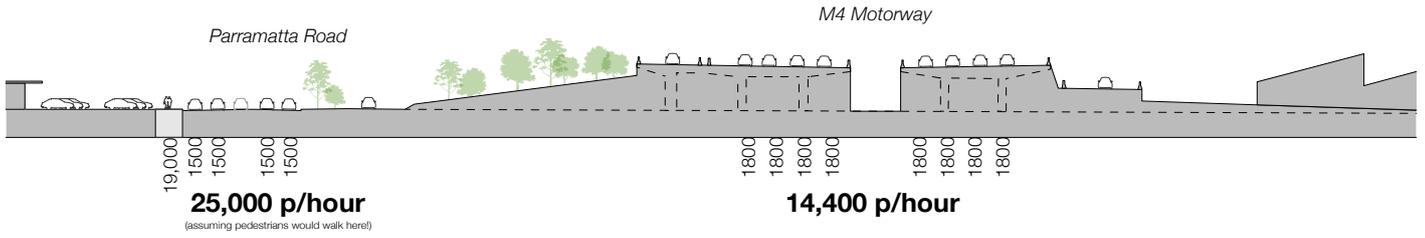
quality of life. Motorways have cut great divisive valleys through our cities, greatly restricting how we use them.

Current state government policy across the country is very much the status quo – investing heavily in motorways promising congestion-busting relief. But as has been proven in cities around the world, no motorway project has even provided congestion relief for more than a year or two (if lucky). In fact, new motorways or widened roads create congestion. This is known as induced demand. On top of this many are privatised, requiring a fee for the privilege of being stuck in said congestion.

Now, this is in no way an anti-car ideal, rather a pro-city agenda – understanding the spatial needs and limitation of cities, and aiming to use them in a way that benefits the most, allowing us to live healthy and successful lives in cities. For this we search for balance.

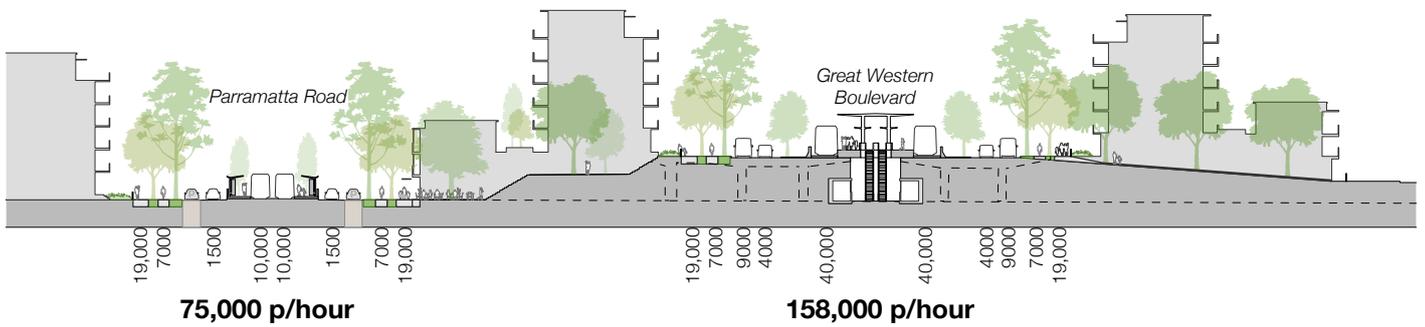
So, the question reads ‘Are we using our urban movement corridors in the most efficient way?’

If we look at a 3.5 metre car lane, we can typically move 1500 vehicles an hour (not including accidents and congestion). With mostly one person per vehicle, this use of space is majorly inefficient. If we’re generous we’d say



Existing Condition

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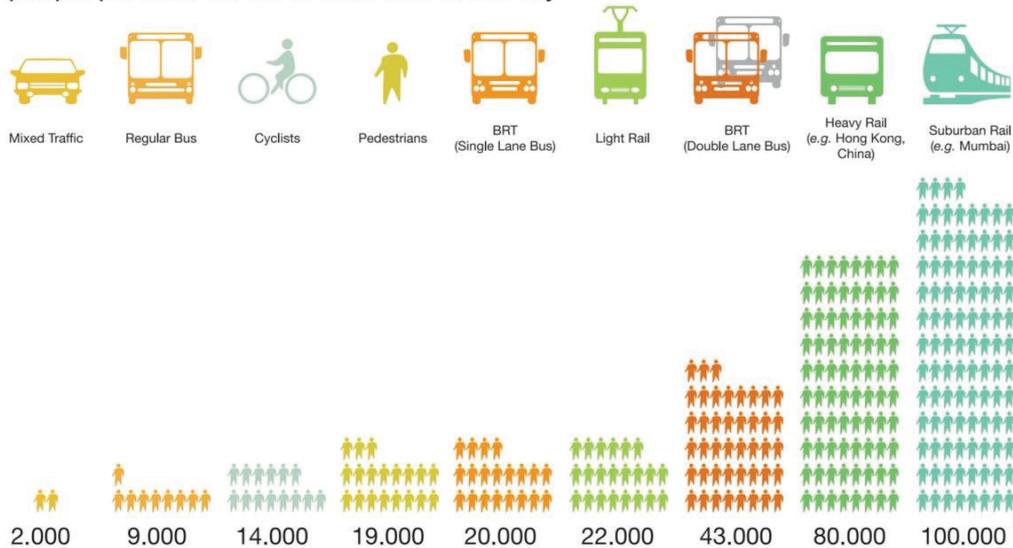


Potential Condition

Source: Hill Thalix

If we were to give a 3.5 metre lane to buses, it could move 9000 people an hour, per lane. For light rail make it 10,000+. But when we get serious and dedicate such corridors to heavy rail or metro, the waste of motorways is glaringly obvious. Instead of 1800 people in cars we could move 40,000 an hour, in each direction. We must re-balance.

Corridor Capacity
people per hour on 3.5 m wide lane in the city



BRT = bus rapid transit, m = meters

Sources: H. Botma and H. Papendrecht. 1991. Traffic Operation of Bicycle Traffic. In *Transportation Research Record 1320*. TRB. Washington, D. C.: National Research Council, and based on GTZ calculations (2009).

‘Repurpose the inside lane of the M4 for metro/ heavy rail now. As car use is reduced, take the outside lane for buses or light rail and we can add a proper footpath with shade trees and a cycleway. This then releases huge quantities of currently alienated urban land to build housing and employment adjacent to this now quieter, greener and healthier corridor.’

we can optimally move 1800 people per lane, per hour. On the new widened M4 (at huge cost) we can boast a measly capacity of four lanes in either direction, or 7200 people an hour. In a city of 5,500,000 our single largest movement corridor is given over to just 7200 people in peak hour.

This is hardly what we might call accessible or democratic. On the numbers alone, this gross misuse of public land is shamefully exclusionary. So if we agree that we have a limited number of mass-movement corridors set aside in our cities, and that our public funds are limited, it’s obvious we need to be using this limited space in the most efficient way possible.

When we dedicate the same 3.5 metre lane of space to alternate uses the justification for motorways falls apart. From a starting point of 1800 people in cars, the very same lane as a footpath has a capacity of 19,000 pedestrians an hour. As a cycleway we could fit 7000 cyclists an hour, per lane.

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Take the attached section of the widened M4 near Hill Road in Homebush. A vast, open hardscape. Over the 150 metre section depicted there is one footpath – an urban wasteland by any measure. The sheer number of car lanes is unsettling – and the capacity laughable. An immediate redress is needed.

Rather than spending billions on slow and expensive tunnelling for a West Metro, use this movement corridor for a combination of high capacity modes – take just one lane of the M4/WestConnex and install rail. In the same 3.5 metre lane we could transport more than 22 times the number of people an hour. With overpasses and underpasses located at regular intervals, stations are easily integrated at points ripe for interchange from feeder buses or light rail and soon, automated pooling.

This rebalance also aligns well to the advancement in automation. The potential of automated vehicles to transform the way we move in Sydney is vast – but risks making our congestion problems infinitely worse. If electric automated cars are allowed to dominate our cities as the combustion engine has until now, then the appeal will surely only induce more driving. Cleaner or not, we still don’t have the additional space or funds to make the room for more private cars. Every bit of city we demolish for wider motorways is less actual city to live in.

We must be ahead of the surge and harness automation to our advantage. As suggested above, repurpose the inside lane of the M4 for metro/heavy rail now. As car use is reduced, take the outside lane for buses or light rail and we can add a proper footpath with shade trees and a cycleway. This then releases huge quantities of currently alienated urban land to build housing and employment adjacent to this now quieter, greener and healthier corridor.

Finally, as single use private vehicle use reduces further over time, quarantine the last lane as a point-to point, on-demand automated vehicle corridor. With all these measures combined we have a true, high capacity urban movement corridor that’s efficient and liveable. We can deliver multiple metro lines years early and at a fraction of the cost. The corridor which once only moved 7200 people in each direction per hour now moves more than 10 times as many.

Single use private vehicles would still be free to use the hundreds of thousands of kilometres of streets across the city – but for these high-capacity corridors we can no longer lend them to such an inefficient single use. The numbers speak for themselves.

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