



EVOLUTION OF THE TRANSIT ECOSYSTEM

Transport networks enable people to access all of the employment, education and recreational opportunities, and other essential services, that a city has to offer. As part of our 'Metros: Helping to reimagine Sydney' series, transportation specialist **Roger Jeffries** discusses how Transport for New South Wales used a brand new metro system as a catalyst to reimagine the entire transport ecosystem in Sydney.

A city's mobility ecosystem comprises multiple transport modes, covering various services, infrastructure, ownership and delivery models; and these differ in every city. These modes are intertwined in a complex mobility ecosystem focused on services and customers. The transport modes — for example, cars, buses, trains, trams, bicycles and walking — together contribute to the mobility ecosystem through connected networks —

essentially covering everything that people use to move around a city.

Road and rail corridors form the backbone of the transport network in Australia's most-populous cities. While car travel remains high, representing 89.6 per cent of motorized travel nationally, it has been decreasing per capita in Sydney and Melbourne since 2004. The trunk travel task is increasingly being delivered by public transit across road and rail infrastructure. Aggregate public transport patronage has increased, climbing nationally by about 2.5 per

89.6%

per cent of motorized travel nationally, is car travel, but has been decreasing in Sydney and Melbourne since 2004.

cent per annum between 2002 and 2013.¹ More recently, public transport patronage has grown rapidly, with Sydney experiencing an increase in rail patronage of 28 per cent from 2015–2018 and an increase in bus patronage of 49 per cent in the same period.

Network optimisation is key to Australian cities' future

Three globally significant metro projects are underway in Australia: Brisbane's Cross River Rail; Melbourne Metro; and Sydney Metro. ➔

These will deliver fast, high-capacity, ‘turn-up-and-go’ services to support our growing capital cities via a reimagined, efficient, reliable and modern transport ecosystem.

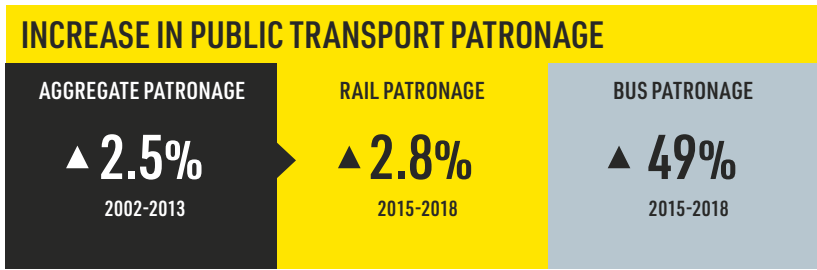
If, like me, you live in Sydney, you are probably all too aware of the visible signs of a transport system that is creaking at the seams and failing to meet the city’s needs, and where congestion is negatively impacting both the city’s productivity and liveability.

Many cities, including the Australian capital cities, already have measures in place to manage this ecosystem to try to maintain its healthy function for a viable, vital city. ‘Network optimization’ through a variety of measures, such as technology, operational management, policy and pricing, are used to manage supply and demand to make existing transport assets work more efficiently. Other ways of optimizing the network include removing on-street parking and introducing a bus rapid transit lane to an existing road corridor, or actively managing traffic signal controls to address congestion or delays caused by disruptions in real time.

Elsewhere in the mobility ecosystem, cities’ urban rail networks are being enhanced. Track-side signalling is making way for in-cab signalling and systems that allow more trains to run closer together on existing tracks. This enhances the utilization of infrastructure, increasing frequency, reliability and capacity.



UNLIKE A TYPICAL SUBURBAN BUS STOP, A NEW METRO STATION CAN TRANSFORM AN ENTIRE PRECINCT, AS THE FOCUS OF A NEW MULTI-MODAL HUB BRINGING TOGETHER MULTIPLE TRANSPORT MODES AND SERVICES, WITH ASSOCIATED EFFICIENT URBAN DEVELOPMENT OPPORTUNITIES TO PROVIDE HOUSING, EMPLOYMENT, SCHOOLS AND OTHER NECESSARY URBAN SERVICES.



Increase in public transport patronage

Metros’ transformational impact

Changes like these help to increase the passenger capacity, efficiency and reliability of the networks within the ecosystem. However, there comes a point, especially in cities experiencing population growth rates at the level of Sydney and Melbourne, when the network reaches capacity. Investment is then needed to support continued urban growth and development, to balance customers’ travel demands for increasingly complex patterns of journeys, and to support a healthy, vibrant city.

That’s when transport planners and government agencies look to make fundamental changes that introduce more efficient transport modes to the network, such as automated turn-up-and-go metro services. At the core of any transport investment is the need to achieve an efficiency enhancement beyond what was already in place.

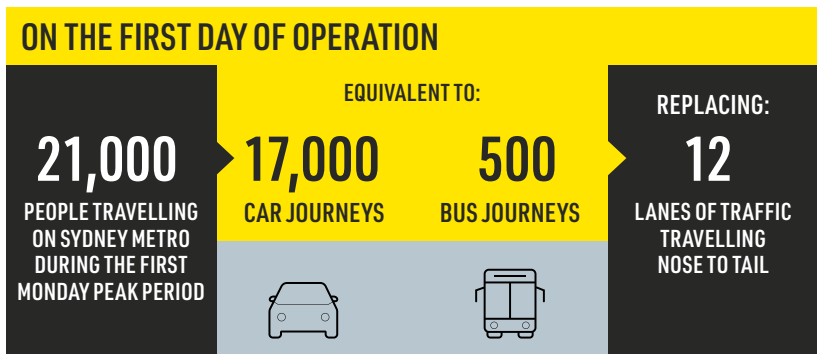
Unlike a typical suburban bus stop, a new metro station can transform an entire precinct, as the focus of a new multi-modal hub bringing together multiple transport modes and services, with associated efficient urban development opportunities to provide housing, employment, schools and other necessary urban services.

Sydney Metro is Australia’s largest public transport program. Sydney

Metro Northwest, the first of three stages, opened in May 2019, delivering Australia’s first automated metro line. It runs for 36 kilometres (km) above and below Sydney from Rouse Hill in Sydney’s rapidly growing Northwest Growth Area, (40 km from Sydney’s Central Business District (CBD)) to the strategic center of Chatswood in North Sydney, with easy connections to the nearby CBD. The Sydney Metro Northwest line can currently move up to 15,600 passengers an hour in each direction, with the potential to move as many as 40,000 passengers an hour in each direction when service frequency is gradually increased from five minutes to two minutes in the future.

The newly opened station precincts on Sydney Metro Northwest have created new spaces for employers and service providers to thrive, supported by increased footfall as thousands of people move between the metro and buses, bicycles, ride-sharing services and walking to surrounding residential suburbs.

Due to the high rates of car ownership and usage in the region, Sydney Metro Northwest was designed specifically to enable current car commuters to instead adopt a comfortable, convenient, safe and more reliable metro service.



On the first day of operation

Reshaping the transit network for better mobility

In preparing and planning for the new metro, Transport for New South Wales (TfNSW) sought to reshape the rest of the transport network to support the metro's efficient operation, with the aim of ensuring that Sydney Metro Northwest was set up for success from day one.

This involved re-routing bus services to increase their efficiency as measured by 'bus operating kilometres' to feed into the metro system. This expanded the metro's catchment area with regular, reliable feeder services and enabled TfNSW to introduce 'headway services' that are based on a maximum waiting time, as opposed to a specific time of day service.

If Sydney Metro Northwest had opened and some city-bound buses had not been re-routed, some people might still choose to stick with the bus rather than switching to the more efficient metro service.

These changes have freed up more buses to run orbital north/south services, connecting even more communities to the new metro line and better connecting strategic and local centers to each other.

Another important TfNSW consideration was accessibility. Modern metro services are accessible to all people and are fully inclusive in their design to facilitate ease of access for people with prams, in wheelchairs or carrying luggage, and this imperative was central to the design of the new metro line.

The NSW government's investment in Sydney Metro Northwest has also facilitated the creation of safer and higher quality public realm that integrates local community and businesses in a way that enhances both customers' door-to-door journeys and the role

of local precincts as destinations in themselves. There has also been a noticeable change in urban planning and design to ensure that people take priority over all vehicular transport, especially in the transitional zones closest to metro stations.

Infrastructure with a strong return on investment

Sydney Metro represents a significant step up in the capacity to move people across the network. It has allowed the city to re-imagine its mobility ecosystem to better focus the city on the needs of its people, while delivering faster, more reliable travel, enhancing the urban character of local neighborhoods and creating vibrant places where people want to work, live and play. It has created a more sustainable and equitable alternative to building more roads to

funnel even more cars onto already busy urban streets. Although the initial capital cost may appear to be high, the fully-automated trains have important benefits for both passengers and transit authorities, such as flexibility, reliability, safety, and security of operation as well as a reduction in dwell time, which makes the investment particularly attractive. For example, the return on investment for the automation of the Paris Metro Line 1 should be reached in 2027, only 15 years after its commissioning. A similar outcome in Sydney would produce an excellent return on investment for something that will benefit us for 50 years or more.

This article first appeared on AECOM's Sydney Metro microsite. [Visit the site](#) to read more about Sydney Metro. 

