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Sydney 2070: Visions of a Future City



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Abstract

Sydney's population is predicted to increase from 4.6 million to nearly nine million by 2061. Even without this growth, the city has already surpassed the limits of its 20th century urban model—characterized by a car-based, monocentric city core surrounded by low density suburban sprawl. Congestion, long commutes, adverse effects of climate change, inaccessibility of public transport and decreasing housing affordability are the by-products of a city model under strain. Sydney needs a vision for growth that will transform it into a sustainable and equitable Global City. Design visions for the city that adapt to a 21st century urban model—underpinned by sustainability, equality and a low carbon future—include creating a new rapid transport system; removing aging infrastructure at Circular Quay to create a public realm; relocating Allianz Stadium over Central Station; revitalize the 19th century rail infrastructure; and creating a pedestrian spine in the CBD that represents post-automobile urbanization. These visions demonstrate the need to work on city vision and planning unrestrained by institutional boundaries.

Keywords: Economics, Density, Supertall, Sustainability, Transportation, Urban Habitat

Cities are increasingly critical to both our future economic growth, and our ability to ameliorate climate change. The greatest challenges facing 21st century cities are rapid urbanization, climate change and urban inequality.

These challenges are especially acute in Australia, which is one of the most urbanized nations on earth, with over 85 percent of the population living in cities (United Nations 2014). The population is predicted to increase from 25 million to 42 million by 2056 (Buckmaster and Simon-Davies 2010). The majority of this growth will occur in our urban centers, including in Sydney, where the population is predicted to increase from 4.6 million to nearly nine million by 2061 (SGS Economics & Planning 2016).

Even without this growth, Sydney has surpassed the limits of its 20th century urban model characterized by a monocentric city core surrounded by car-based, low-density suburban sprawl. Congestion, long commutes, the adverse effects of climate change, inaccessibility of public transport and decreasing housing affordability are all the byproducts of a city model under strain.

To overcome these challenges, Sydney needs to consider and implement visions for future growth that will transform it into a sustainable and equitable global city.

The Challenges of 21st Century Cities

Rapid Urbanization

We are living in a period of rapid urbanization, the likes of which has never been experienced in human history. In 1900 only 10 percent of the global population lived in cities. In 2007, over 50 percent of the global population lived in cities; and that is predicted to exceed 75 percent by 2050 (United Nations 2014). As a result of increasing global population and urban centralization, cities are experiencing growth at unprecedented rates, presenting one of the 21st century's greatest challenges: how to accommodate growth, reduce carbon footprint and create humane places to live.

Climate Change

By far the greatest challenge of the 21st century is climate change. Cities produce 75 percent of global CO₂ emissions; and therefore, have the greatest potential to ameliorate its impact. As the CEO of Zappos Tony Hsieh said, "If you fix cities, you kind of fix the world!"

The low emissions alternative to the car-based suburban sprawl of the late 20th century is to create a polycentric model: a series of compact high-density clusters that support walkable, mixed-use communities connected to a citywide rapid transport network. This urban model will produce a city that is cleaner, quieter, safer, socially inclusive and more economically productive for all people.

Urban Inequality

It is unacceptable that 33 percent of urban dwellers still live in slums. Rapid urbanization, shortsighted political ideologies and "trickle-down" economic frameworks have outweighed efforts to combat urban poverty and cost of living inflation. Two of the greatest challenges global cities face are inequality and the provision of social and affordable housing. For them to remain humane places defined by social cohesion and economic success, they must contain affordable housing located near city centers.

Sydney 2070 Visions

Any future city vision must contemplate how to mitigate the adverse impacts of these global challenges. Cities occupy just 0.5 percent of the earth's land surface but generate 80 percent of global economic output. Thus, cities have the potential to address the challenges of the 21st century.

A series of visions for Sydney propose how to tackle these challenges by adapting its current 20th century car-based city model for the 21st century to create a sustainable, equitable and low carbon future.

Investigations explore six solutions implementable at the regional, city and human scales. These visions demonstrate the need for architects to work on city visions that rethink traditional built environment and institutional boundaries to arrive at solutions that make our cities more livable, sustainable and productive. This kind of big picture thinking, when undertaken with the precision inherent in architectural thinking, is applicable beyond Sydney and could help make cities viable places where people want to live for many future decades.

The Regional Scale

Sydney as a Polycentric Megacity

The Greater Sydney Commission (GSC) has released its vision of Sydney as three great cities: Eastern, Central, and Western,

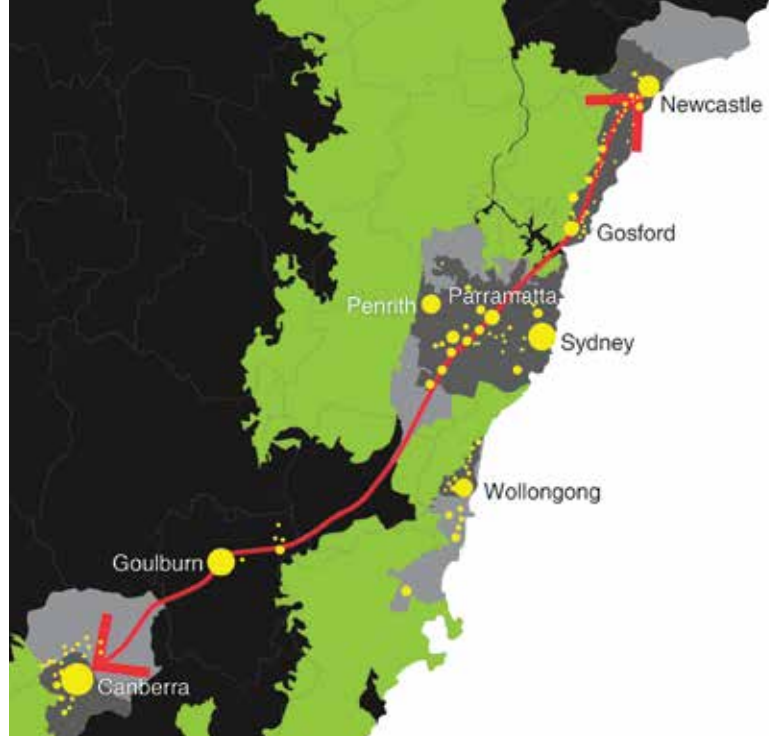


Figure 1. Sydney as a Polycentric Megacity—low carbon mobility increases connection to employment opportunities, affordable housing and lifestyle choices. The connected megacity maximizes resources, sharing critical infrastructure such as airports, hospitals, and universities. © Bates Smart Pty Ltd.

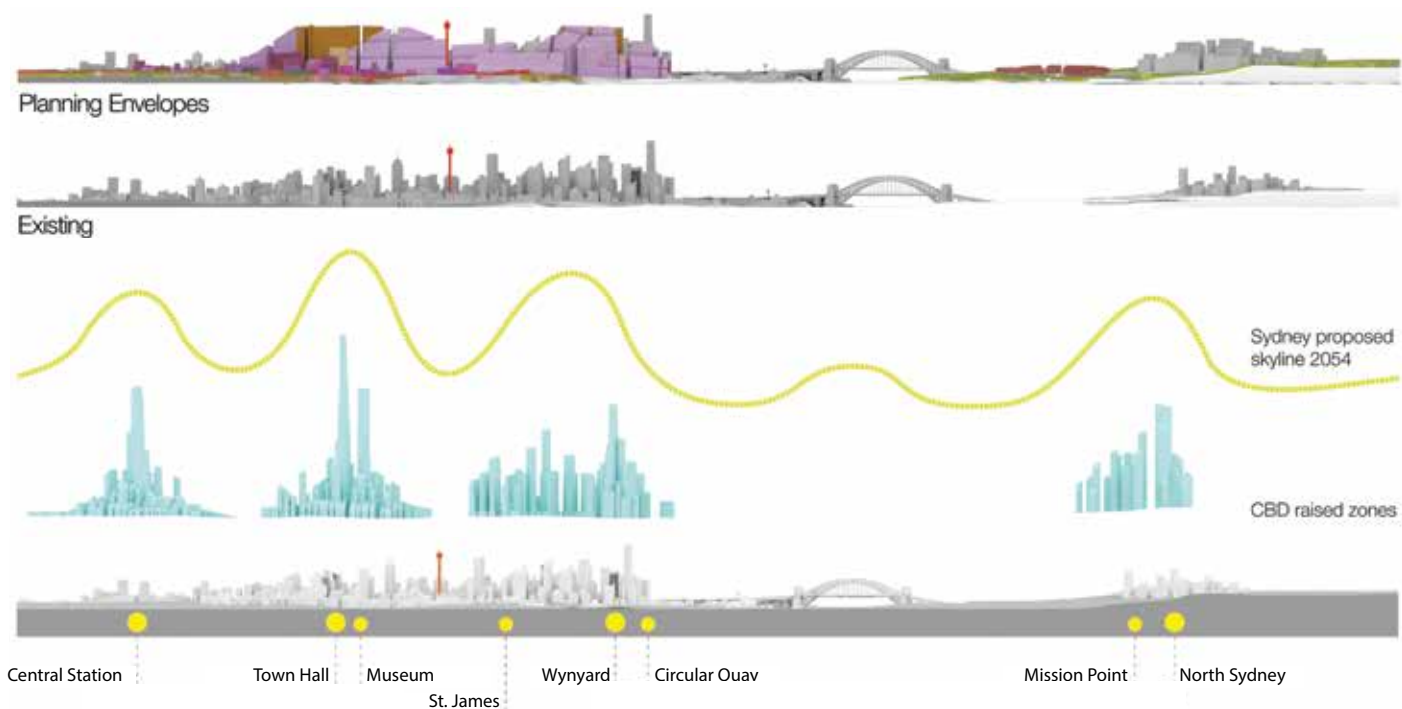
with the aim that everyone in Sydney is within a 30-minute commute from employment (2018). This vision restructures Sydney's strategic growth, however it doesn't allow for the anticipated expansion past mid-century. By 2050, Sydney will approach the size of a megacity. To make it a truly sustainable and equitable global city that can reasonably accommodate this population growth, Sydney's planning needs to be expanded to a regional scale and encompass Canberra and Newcastle.

In 2070, Sydney/Canberra/Newcastle could constitute Australia's first Polycentric-Megacity, connected by Australia's first high speed rail link. Green belts could protect the natural landscape and parklands around each city, while helping to focus density inside the city limits. Increased mobility between these cities will increase connection to employment opportunities, while generating greater housing affordability and lifestyle choices. This low carbon connected megacity will also share critical infrastructure such as airports, hospitals, and universities, avoiding duplication and maximizing resources (see Figure 1).

The City Scale

Dense and Tall Clusters Underpinned by Metro Transit

The height of the Sydney CBD skyline has been restricted to under 305 meters, which is approximately the underside height of Centre Point Tower, built in the 1970s and considered a Sydney landmark. This restriction has caused the city skyline to develop horizontally instead of vertically (see Figure 2). But if Sydney is to maintain its status as a global city, then it must push heights beyond a 1970s' landmark. It is simply not sustainable to continue the outward sprawl of the city, thus we must increase density, thereby increasing height.



Supertall Clusters Related to Metro Transport

Figure 2. Sydney CBD Elevations. © Bates Smart Pty Ltd.

A vision for Sydney 2050 was developed around the idea of linking the city's economic development and growth to the public benefit of a sustainable transport network. To sustainably increase density, Sydney needs a fully functioning rapid transit system, providing transport throughout the inner ring suburbs.

Under this model, supertall building development links directly to Metro stations in the city center; the ideal distance between the towers and stations is under 200 meters. This would create a city form of "hills and valleys" that is diverse and celebrates its transit system. Private purchase of the additional supertall height from the Government would finance the rapid transit system and help retire outstanding Government infrastructure debt.

These principles were quantified in a parametric model of the city to create a future vision of Sydney. The vision created a potential 12.5 million square meters of additional floor space (see Figure 3). Using the current value of Heritage Floor Space as a benchmark and compounding its value to 2050, this would realize an estimated AU\$7.1 Billion to fund the rapid transit transport network.

Urban Infrastructure Housing

The City of Sydney and state and federal Governments need to start thinking more creatively about the utilization of public land if we are going to effectively provide more affordable housing.

In Sydney, different development metrics agree that the land value of housing is approximately 35 percent of its cost. At the same time, a large proportion of Sydney's public land is underutilized space; only two percent of the City of Sydney

LGA is utilized for urban infrastructure. The majority of this two percent is located within a five-minute walk (400 meters) of a train station and is thus ideal for higher density residential development (see Figures 4 and 5).

Developing housing within air-rights over some of this urban infrastructure would eliminate the land cost. By eliminating this component, we could create considerable savings and deliver much needed affordable housing that would be located near rapid public transport.

Our solution considers development, unit capacity, and design and construction models that would make the delivery of this affordable housing possible. In addition, it would enhance the city by introducing needed public amenity.

Leveraging a public/private partnership (PPP) delivery, ownership and management model would utilize the efficiency of the private sector while maintaining public ownership of public assets. Under a PPP agreement, the government would be able to contribute the air rights over existing infrastructure (i.e., land at approximately 35 percent value) in return for a minimum of 35 percent of affordable housing to be owned by the City of Sydney. A long-term air rights lease would be co-owned by both parties to preserve public ownership of the infrastructure while simultaneously generating private gain. A build-to-rent model would allow the developer to manage both market rent apartments and the city's affordable housing units.

Returning to the infrastructure land, 105,600 square meters of sites would be available for development. Taking into consideration current FSR bonuses, planning allowances, and development trends, an estimated 6,000 units could be



Figure 3. A vision for Sydney 2050 was developed around the idea of linking the city's economic development and growth to the public benefit of a sustainable transport network.
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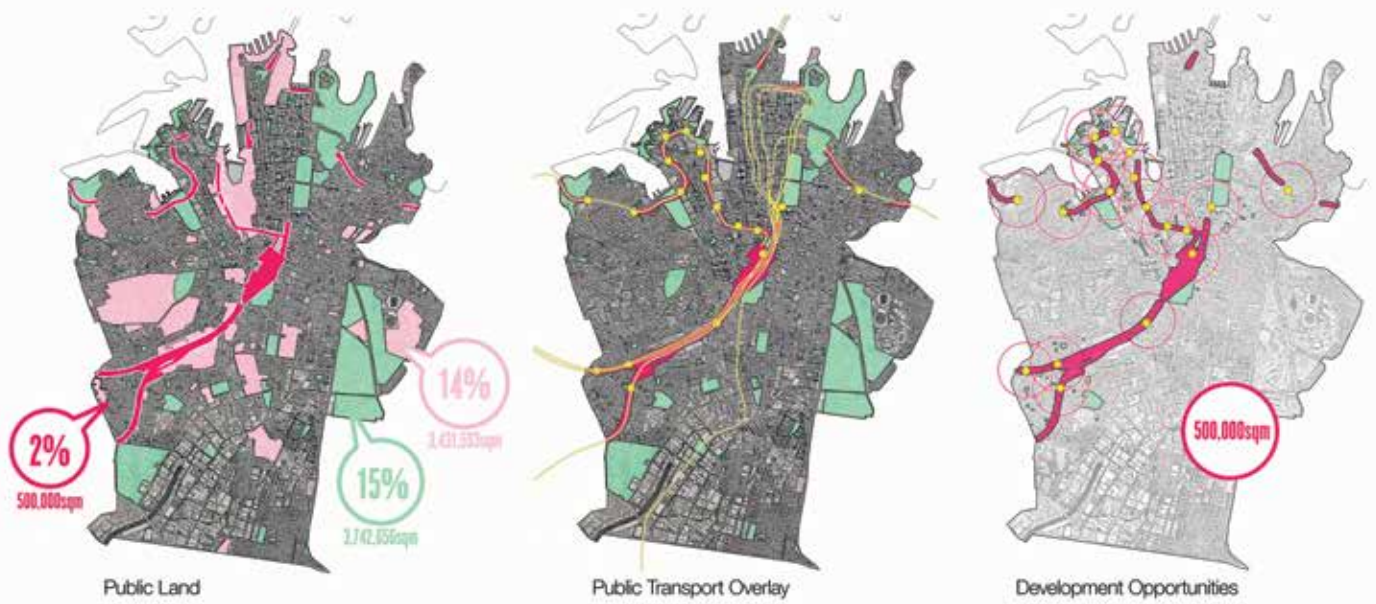


Figure 4. Urban infrastructure housing analysis. © Bates Smart Pty Ltd.

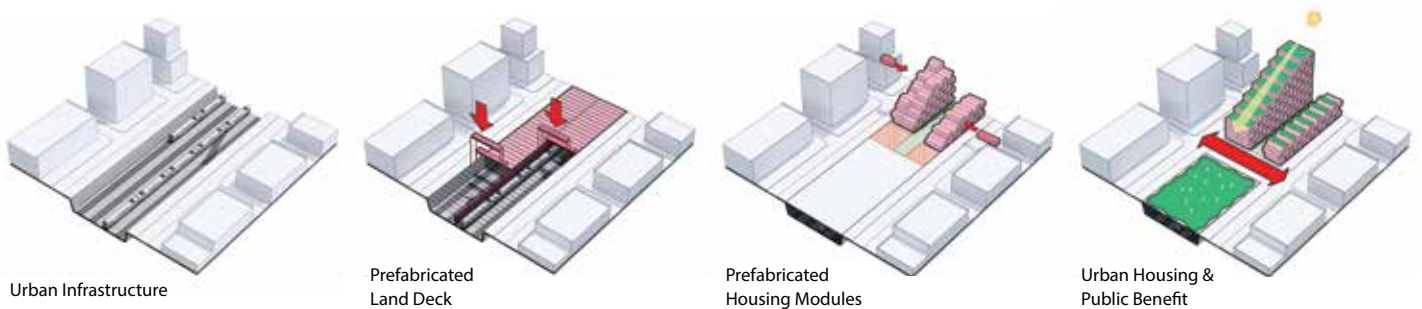


Figure 5. Urban infrastructure housing concept. © Bates Smart Pty Ltd.

delivered on this land, with a minimum of 2,000 units (33 percent) earmarked as affordable housing. This concept is replicable across any public infrastructure land and is scalable to the size of the site.

In terms of design and construction, this solution introduces prefabricated units and modular construction techniques so as to minimize disruption to the infrastructure and to allow for future disassembly and relocation. In addition, units can be configured so that public benefits could be easily integrated; these could include communal greens, shared social spaces and direct, safe connections to transit and the surrounding neighborhoods, and can be easily integrated. Much of our modern urban infrastructure has severed community connections in the city, thus using the housing neighborhoods to remake them would help generate public benefit for all people (see Figure 6).

Sydney Stadium: A Transport Oriented Development

The Coliseum in Rome established the concept of the stadium as a public space embedded in the fabric of the city; a monumental piece of infrastructure for public spectacle. In modern cities, however, with the advent of cars and suburbs, stadiums became mono-functional objects, isolated on the periphery of the city and surrounded by parking.

We envisioned a new stadium that could be built over Central Station's railyards, Sydney's most accessible transport node. This proposal challenged the State Governments proposal to demolish an existing stadium and rebuild it within an existing parkland, disconnected from public transport and urban amenity.

This positioning over Central Station maximizes the benefits of public transport accessibility, while anchoring a vibrant new

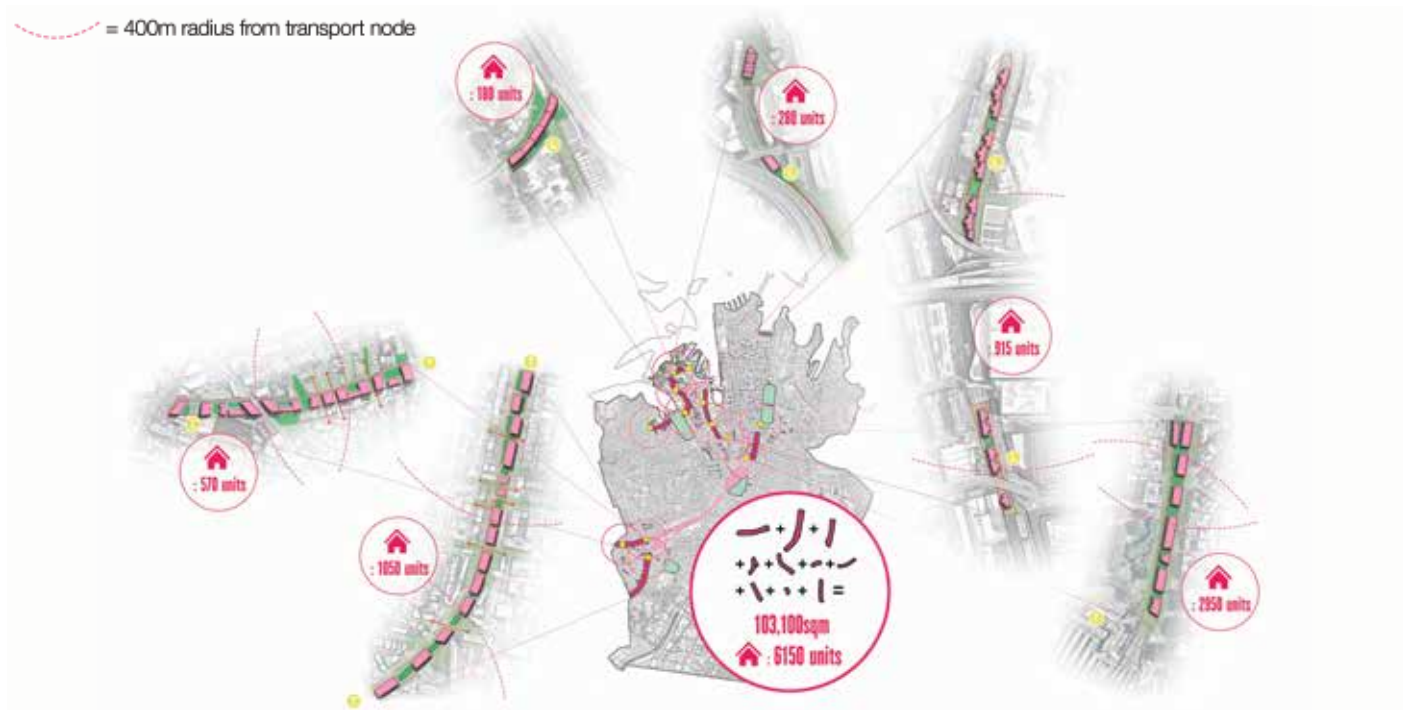


Figure 6. The majority of urban infrastructure is located within a five-minute walk of a train station and is thus ideal for higher density residential development. © Bates Smart Pty Ltd.

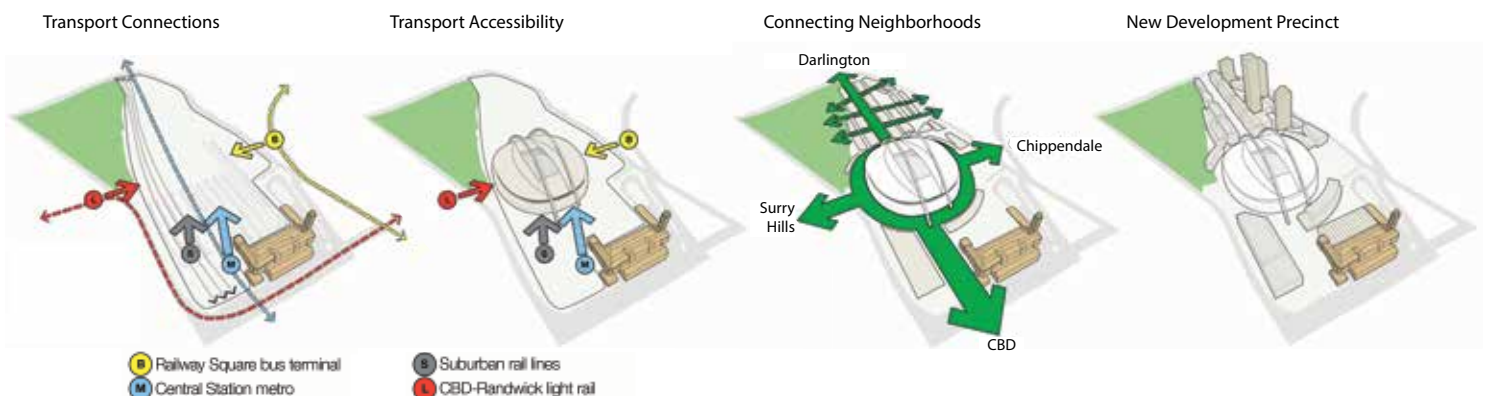


Figure 7. Positioning Sydney Stadium over Central Station maximizes the benefits of public transport accessibility. © Bates Smart Pty Ltd.



Figure 8. Sydney Stadium, before and after—embedding a stadium in the fabric of the city creates an urban spectacle, enhancing the experience of attending events.
© Bates Smart Pty Ltd.

mixed-use precinct that catalyzes the development of the railyards to connect to the adjacent, vibrant neighborhoods of Surry Hills to Chippendale (see Figure 7).

Embedding a stadium in the fabric of the city creates an urban spectacle, enhancing the experience of attending events. The spill over benefit is that the broadcasting of major events will promote Sydney as a destination to broader audiences. Crowds from major events will have a multiplier effect on the economy as people access surrounding entertainment and hospitality venues in the city (see Figure 8).

The Human Scale

The Post Automobile City

Cities are on the cusp of a mobility revolution that will see the end of car domination of our cities and public space. This is being spurred on by the effects of the combustion engine on climate change, post peak oil production, global population growth and rapid urbanization.

If we contemplate the scenarios for a low carbon post-automobile future, there are opposing visions. The pessimistic view is a futuristic dystopia, as envisioned in movies such as *Mad Max* and *Blade Runner*. The more optimistic view is of a future urban utopia, a quieter, pollution free world, where cities flourish as human centric places.

Visioning critical places in the city as car free, such as Park Street and Circular Quay, would help to promote the benefits of reclaiming space from cars and repurposing it for positive public use.

Park Street without Cars

Sydney is planned along a linear peninsula running north-south, with George Street as the historic main route through the city that connects Circular Quay on Sydney Harbour to Central Station on the CBD fringe. George Street is currently under construction to incorporate a new light rail line and pedestrianize this primary artery through the city. This is the beginning of creating a city that prioritizes low carbon transport and pedestrians over cars.

Park Street connects Darling Harbour, just west of the CBD, to Hyde Park, which is located on the CBD's southeast corner and acts as district's central park. When it was originally constructed, Park Street was given a special 40-meter width so that it would act as a boulevard that visually connects to and celebrates Hyde Park. Instead, it has acted as a vehicle clogged thru-CBD link that connects Sydney's eastern and western suburbs.

The vision for Park Street is a tree lined pedestrian boulevard that embodies the benefits of a future where the car is less important. The boulevard would be green, free of cars and a central destination in the CBD. It would also link important transit nodes and public spaces at its western end, including Town Hall and the new city square at the corner of George and Park Streets Town Hall, to its eastern termination at Hyde Park.



Figure 9. The vision for Park Street Axon is a tree lined pedestrian boulevard that embodies the benefits of a future where the car is less important. © Bates Smart Pty Ltd.

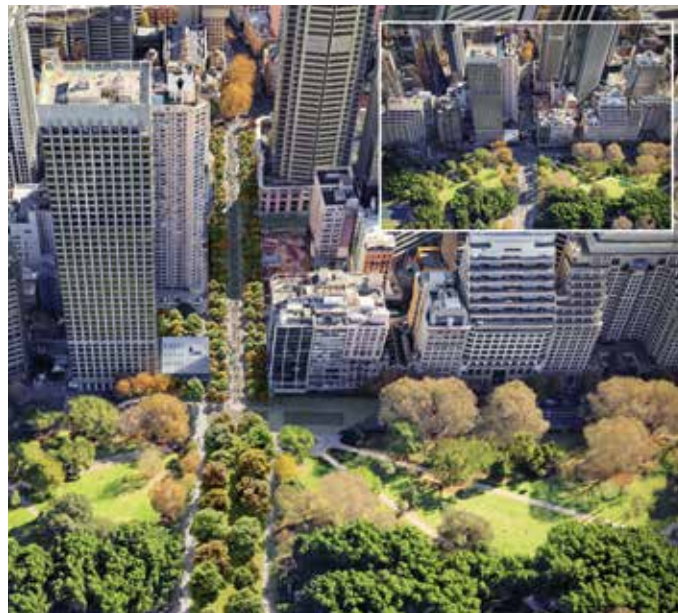


Figure 10. Park Street aerial view, before and after. © Bates Smart Pty Ltd.

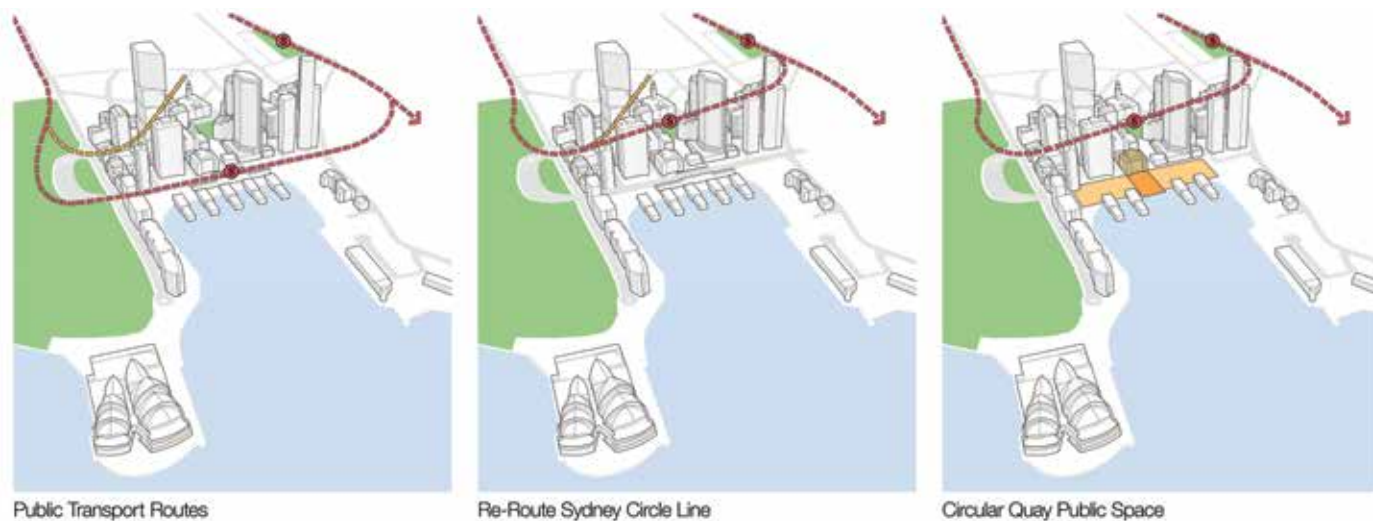


Figure 11. Circular Quay diagrams. © Bates Smart Pty Ltd.

Vehicular traffic would be rerouted to the existing Cross City Tunnel, which runs underneath the CBD (see Figures 9 and 10).

These moves would reduce the number of cars traveling through the CBD and reclaim and upgrade space for pedestrians, thereby repositioning Park Street—one of our city’s most central streets—from its current position as a thoroughfare to an elevated position as a destination.

Circular Quay without Cars

Sydney is a harbor city, and Circular Quay is not only where the city meets the harbor, but it is also the site of the first landing, and thus the birthplace of Australia. It should be a place of national significance—a people place for gathering around significant events. But because of its function as a

transportation node and a lack of vision, the Quay has become dominated by infrastructure.

The removal of the Cahill Expressway presents the opportunity to transform Circular Quay into a grand urban room. It would be the gateway to Sydney that reconnects the city with the harbor and creates a people place. The narrow, dense foreshore around the ferries would be replaced with a generous public realm connecting to the new light rail. Busses and taxis are removed, creating more space. Under this vision, Customs House, the original government trade building, would once again reclaim its historic significance as the Quay’s centerpiece.

If Sydney is to be a Global City, it must celebrate its location on the harbor and create great places for people. This is a visionary



Figure 12. Circular Quay, before and after—removal of the Cahill Expressway presents the opportunity to transform Circular Quay into a grand urban room. © Bates Smart Pty Ltd.

infrastructure project that focuses on creating cities for people and the future (see Figures 11 and 12)

Conclusion

Sydney 2070 is a composite of pro-bono projects for the city. These projects shift Sydney from a disparate, monocentric

city that's reliant on the car and transform it into a fluid, interconnected network of walkable precincts anchored by rapid transport nodes. They tackle problems at the human, city and regional scale so that future progress isn't socially, environmentally or economically unjust. It is our hope that Sydney will adapt some of these ideas as we continue to grow into the future, setting the way for positive urbanization across the globe in the 21st century.

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