

CANTERBURY-BANKSTOWN

LSPS SUBMISSION – TECHNICAL REPORT

PREPARED BY KINESIS FOR THE CITY OF CANTERBURY-BANKSTOWN

SEPTEMBER 2019





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Note: This report is provided subject to some important assumptions and qualifications:

The results presented in this report are modelled estimates using mathematical calculations. The data, information and scenarios presented in this report have not been separately confirmed or verified. Accordingly, the results should be considered to be preliminary in nature and subject to such confirmation and verification.

Energy, water and greenhouse consumption estimates are based on local climate and utility data available to the consultant at the time of the report. These consumption demands are, where necessary, quantified in terms of primary energy and water consumptions using manufacturer's data and scientific principles.

Generic precinct-level cost estimates provided in this report are indicative only based on Kinesis's project experience and available data from published economic assessments. These have not been informed by specific building design or construction plans and should not be used for design and construct cost estimates.

The Kinesis software tool and results generated by it are not intended to be used as the sole or primary basis for making investment or financial decisions (including carbon credit trading decisions). Accordingly, the results set out in this report should not be relied on as the sole or primary source of information applicable to such decisions.

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OUR VISION FOR CANTERBURY-BANKSTOWN

Canterbury-Bankstown will see significant growth and development in the near future. By 2036, population in the city is expected to grow by nearly 40% to over 500,000 people. Correspondingly, dwellings will grow by nearly 40% to 190,000 dwellings and jobs are set to grow by over 20% to 135,000 jobs. The expected population growth and urban development will put increasing pressure on the city’s natural environment. There is a need to ease this pressure by managing the city’s resource consumption, greenhouse gas emissions and air quality.

The City has developed a vision where both the community and the natural environment strengthen each other. This can be achieved by embedding the natural environment into the City’s urban systems so it can materially contribute to the sustainability of new and existing urban places. This approach will go beyond nature conservation and deliver significant social and economic outcomes that benefit the community. For example, increasing canopy cover and urban greening can reduce urban heat island, increase walkability and improve public health. Urban greening can also reduce the energy use of a building and lower resident’s cost of living. However, the corresponding increase in water demand will need to be managed correctly.

This vision and approach recognises the interaction between environmental outcomes, the built environment and our local economy. These interactions are key to deliver a more liveable and resilient community.

The development and growth strategy for Canterbury-Bankstown should respond to and build on the unique patterns and demographics of the area. Based on our discussions with council, there are 4 key priorities for the city.

- 1. **Support a Net Zero Emissions City**
- 2. **Address Urban Heat Island**
- 3. **Build Resilient Suburbs**
- 4. **Deliver Outstanding Urban Renewal Projects**

To contextualise these priorities for the City of Canterbury-Bankstown and identify impactful interventions, Kinesis has investigated the following six key trends:

- 1. **GHG Emissions in Canterbury-Bankstown**
- 2. **Cost of housing and living**
- 3. **Car ownership rates**
- 4. **Travel patterns and containment**
- 5. **Urban heat island**
- 6. **Building performance and renewable energy**

These trends are explored and discussed in the proceeding pages.



SIX KEY TRENDS FOR CANTERBURY-BANKSTOWN

1. GHG EMISSIONS IN CANTERBURY-BANKSTOWN

In FY 2016-17, the City of Canterbury-Bankstown recorded **2,913 thousand tonnes of emissions** across the LGA. The contributions from the residential and the non-residential sectors towards these emissions were similar. However, the source of emissions differed in the residential and non-residential sectors (see Figure 1).

Due to current BASIX policy favouring gas hot water systems, 34% of emissions in the residential sector was from gas consumption. The Australian Electricity Market Operator predicts a greener electricity grid in the future with the emissions intensity of the electricity grid reducing by 90% (AEMO Integrated System Plan, 2018). As such, in the future, switching from gas to electric hot water systems will be a key driver for emissions savings.

Contextualising these emissions spatially, it can be observed that residential and non-residential buildings in suburbs at the edge of the LGA (Regents Park, Sefton, Chester Hill, Lansdowne, Villawood, Milperra, Padstow, Revesby) are significantly higher than those at the centre (Bankstown, Lakemba, Wiley Park, etc.). This could be due to two reasons; first, the homes and buildings on the fringe suburbs are likely bigger, older and constructed prior to the implementation of the BASIX policy. Second, policies that encourage higher efficiency standards in the Bankstown CBD such as the FSR bonus scheme are having an impact (see Figure 2 and Figure 3).

LGA WIDE EMISSIONS BY SECTOR AND SOURCE

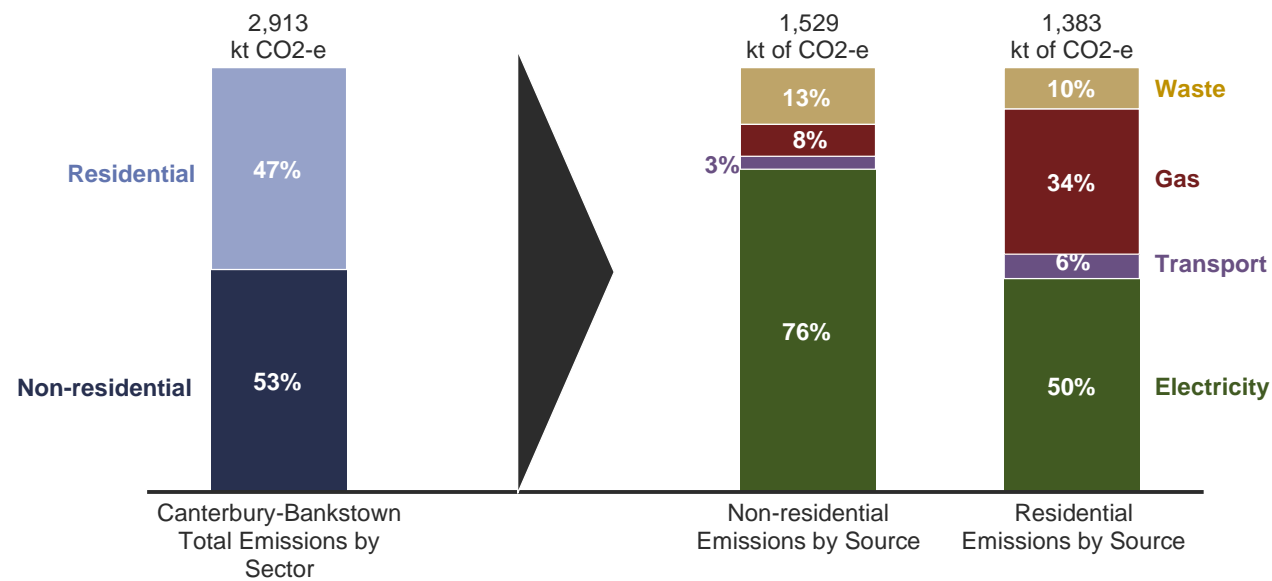


Figure 1: Canterbury-Bankstown LGA-wide emissions by sector and source

RESIDENTIAL STATIONARY EMISSIONS PER DWELLING

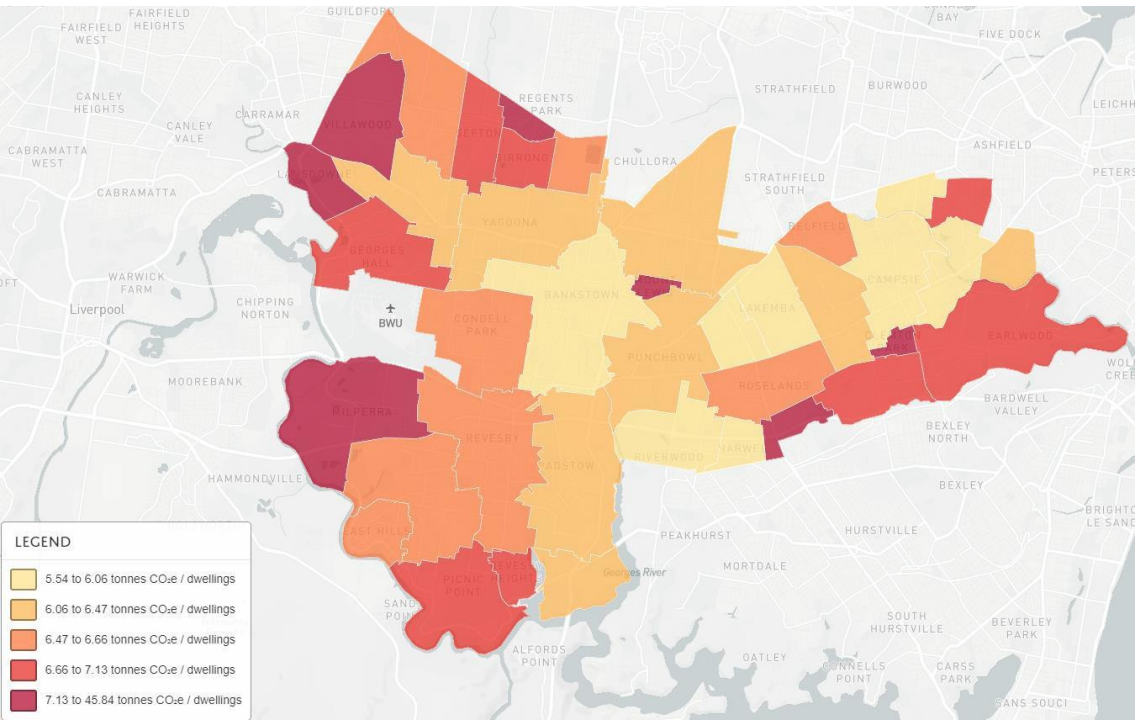


Figure 2: Normalised residential stationary emissions (tonnes of emissions per dwelling per year)

NON-RESIDENTIAL STATIONARY EMISSIONS PER JOB

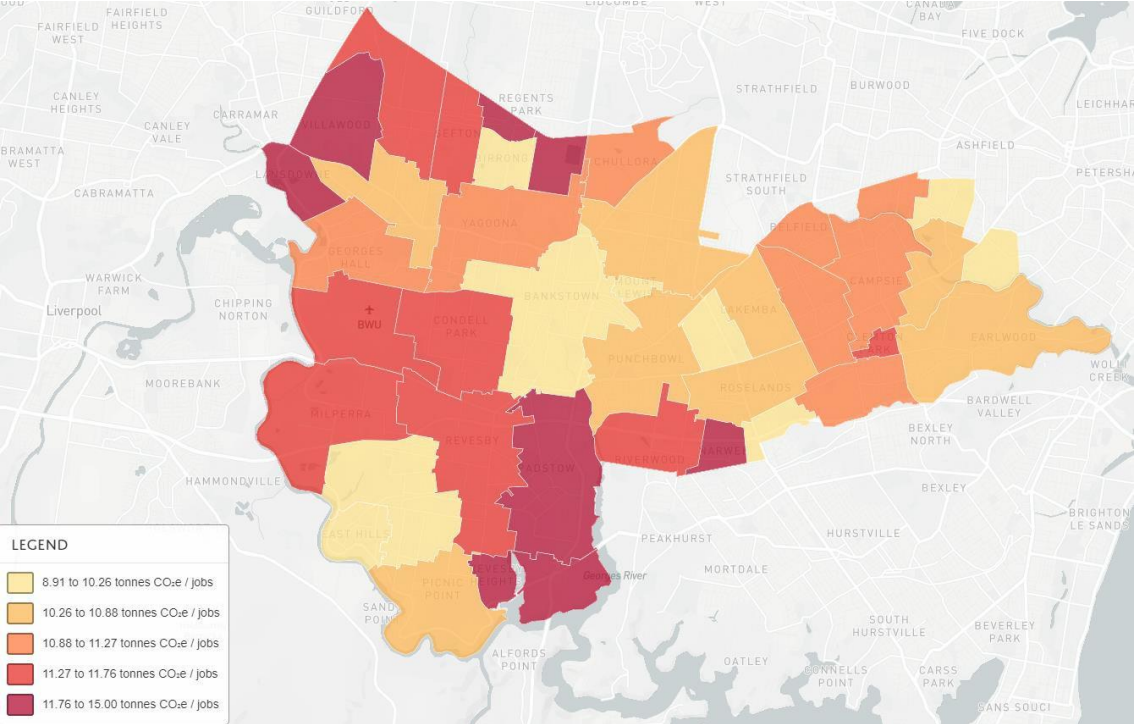


Figure 3: Normalised non-residential stationary (tonnes of emissions per job per year)



2. AFFORDABLE COST OF LIVING FOR CAPTURING GROWTH

Canterbury-Bankstown's residents spend on average \$400 per week on transport and utilities. Interventions in these areas can deliver significant affordability benefits for the community.

- Affordability is often considered only in the context of the cost of housing. However, when looking at average household expenditure, transport costs associated with car ownership and fuel consumption can be significant (see Figure 4). Like housing, expenditure on transport is highly context specific.
- It is also important to understand how planning for new development, particularly along the renewal of Chapel Road Spine, Eastern Lifestyle Precinct and the CBD cultural ribbon can affect household expenditure. Building design and the ability for residents to leverage access to public and active transport will affect household costs related to housing, transport and utilities (energy and water).
- To better understand this variable for Canterbury-Bankstown, housing, transport and utility expenditure analysis was undertaken across the LGA and incorporated the following:
 - Housing costs were calculated based on the purchase of a home at the median house and unit sales price in the LGA for the last 12 months, assuming a 5% deposit, a 30-year loan and a 5% interest rate.
 - Transport costs were calculated based on existing car ownership and travel patterns (car use and public transport use) in the LGA.
 - Utility costs were calculated based on existing average energy and water consumption for the average household in the LGA, assuming current retail tariffs.
 - For the purpose of this analysis, all other household expenditure including food, clothing, household items, medical and recreation was based on the average expenditure reported in the ABS Household Expenditure Survey.
- The results of this analysis are shown in Figure 5 and highlight the following:
 - The costs associated with the purchase of a home in the LGA are significant.
 - After housing, transport is the highest household cost and the ability to affect transport costs can drive significant affordability outcomes.
 - Utility costs are low when compared to housing and transport costs. However, significant household savings can still be achieved through more efficient housing design.
- Studies have identified a strong link between household income, expenditure and resilience or adaptive capacity. Affecting transport, energy and water costs will deliver significant affordability outcomes and provide key resilience and adaptive capacity outcomes for residents. This will be vital to create a liveable and resilient community.

AVERAGE HOUSEHOLD EXPENDITURE, METROPOLITAN SYDNEY

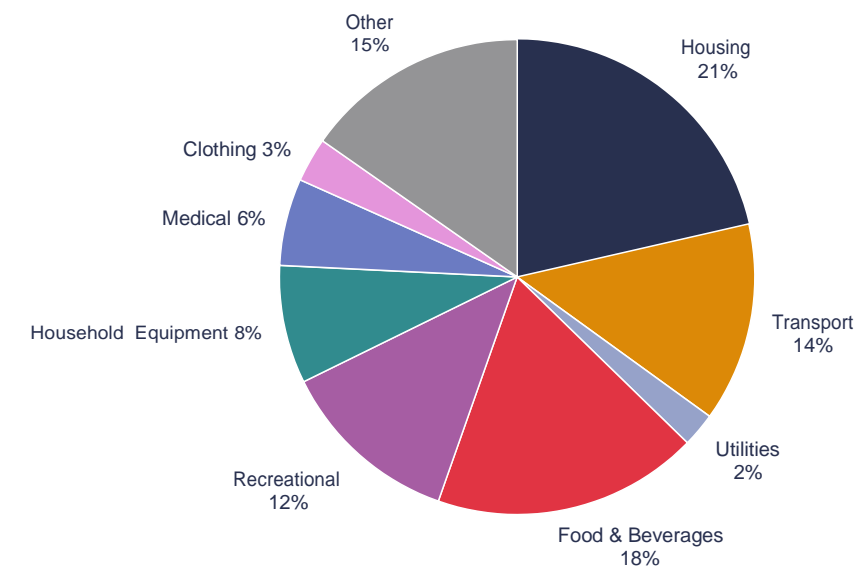


Figure 4: Average household expenditure in Metropolitan Sydney (ABS Household Expenditure Survey 2015-16).

EST. AVERAGE HOUSEHOLD EXPENDITURE, CANTERBURY-BANKSTOWN

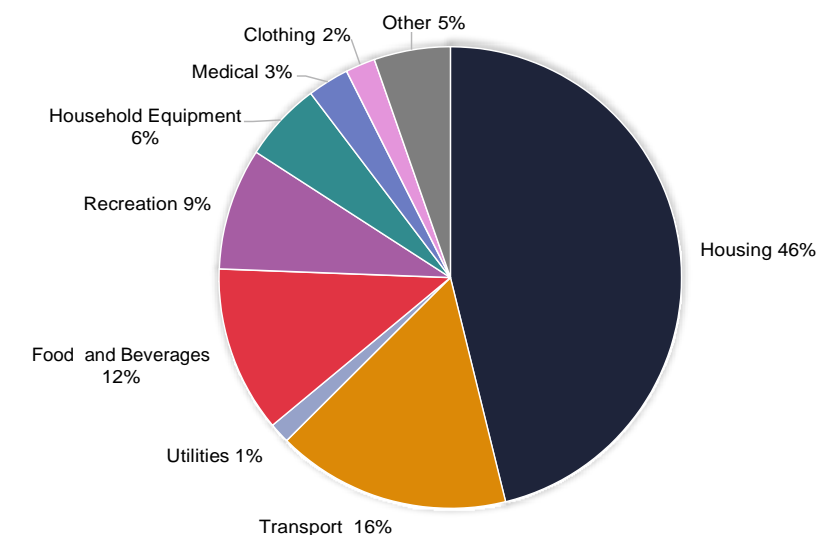


Figure 5: Estimated Canterbury-Bankstown LGA average household expenditure assuming the purchase of a new home (ABS Household Expenditure Survey 2015-16 and analysis by Kinesis of transport and property data).



3. CAR OWNERSHIP – A TREND THAT CAN BE PLANNED FOR

Current parking controls are not responsive to the variation in accessibility and car ownership across different areas of the City.

- Average household car ownership rates in the Canterbury-Bankstown LGA is 1.5 vehicles per household but varies across the LGA largely due to variability in access to public transport and household type (Figure 7).
- Car ownership rates in centres such as Bankstown, Lakemba and Campsie are much lower than in the outer suburbs of the LGA. This is correlated with access to public transport, and access to amenities and services indicated by the walk score (Figure 8).
- As apartments will drive much of the future growth in the LGAs centres, it is important to understand parking requirements in this sector. Across the Canterbury-Bankstown local government area, car ownership in dwellings has remained unchanged between 2011 to 2017 at around 1.5 vehicle per household. However, averages hide insight. Figure 6 shows the variation in car ownership by suburb. Despite being on the rail line, car ownership in suburbs such as Lidcombe - Regents Park has grown by 11%. At the same time, car ownership in Revesby has decreased by 2%. It is important to understand why this may have occurred.
- Decreasing car ownership in Revesby is supported by similar trends at the metropolitan level:
 - Vehicle license rates for younger demographic are falling. Across the Sydney Metropolitan Area, 1 in 4 people aged 20 to 34 do not have a license or own a car. This has increased from 1 in 5 in 2011.
 - Over the last 10 years, car share has grown at an average rate of over 35% per year. Yet, there are only 5 GoGet car share pods in Canterbury-Bankstown.
 - Across Australia, the number of Uber rides has increased to 1.2 million trips per month.

As Canterbury-Bankstown grows, its access to high frequency public transport, active transport infrastructure, car share services, local employment and retail services gives it an opportunity to deliver parking and mobility solutions that respond to these trends. These will be especially important to consider in the City's priority precincts and urban renewal corridors.

CAR OWNERSHIP BY SUBURB, 2011 AND 2017

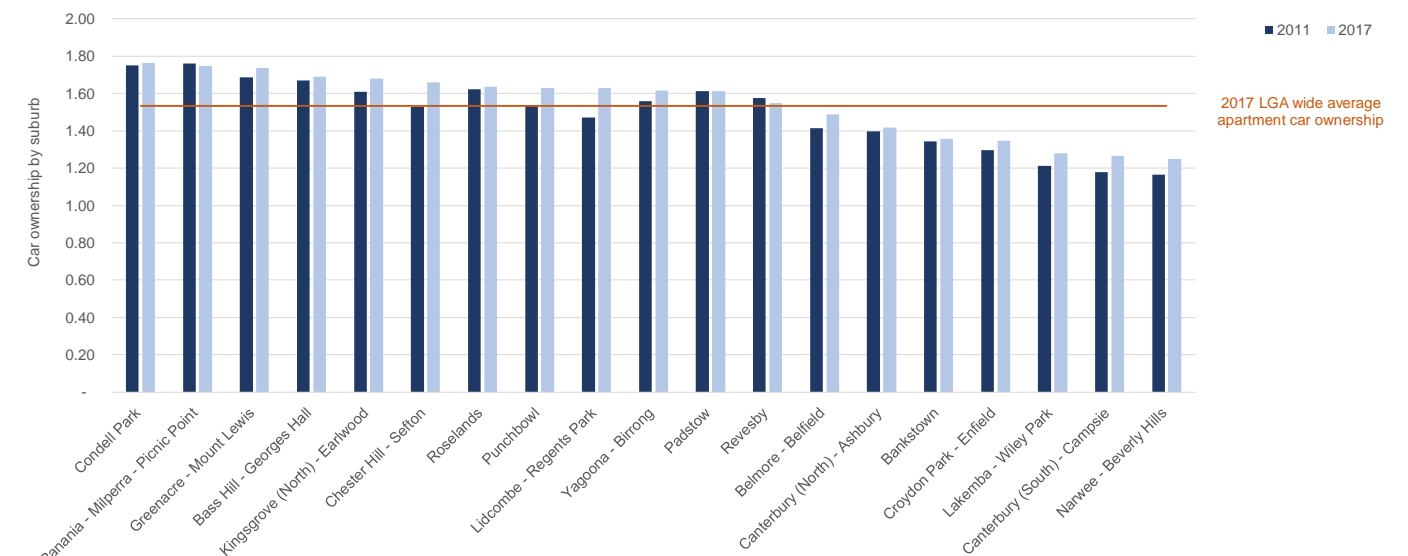


Figure 6: 2011 and 2017 car ownership by suburb



EXISTING CAR OWNERSHIP RATES ACROSS CANTERBURY-BANKSTOWN

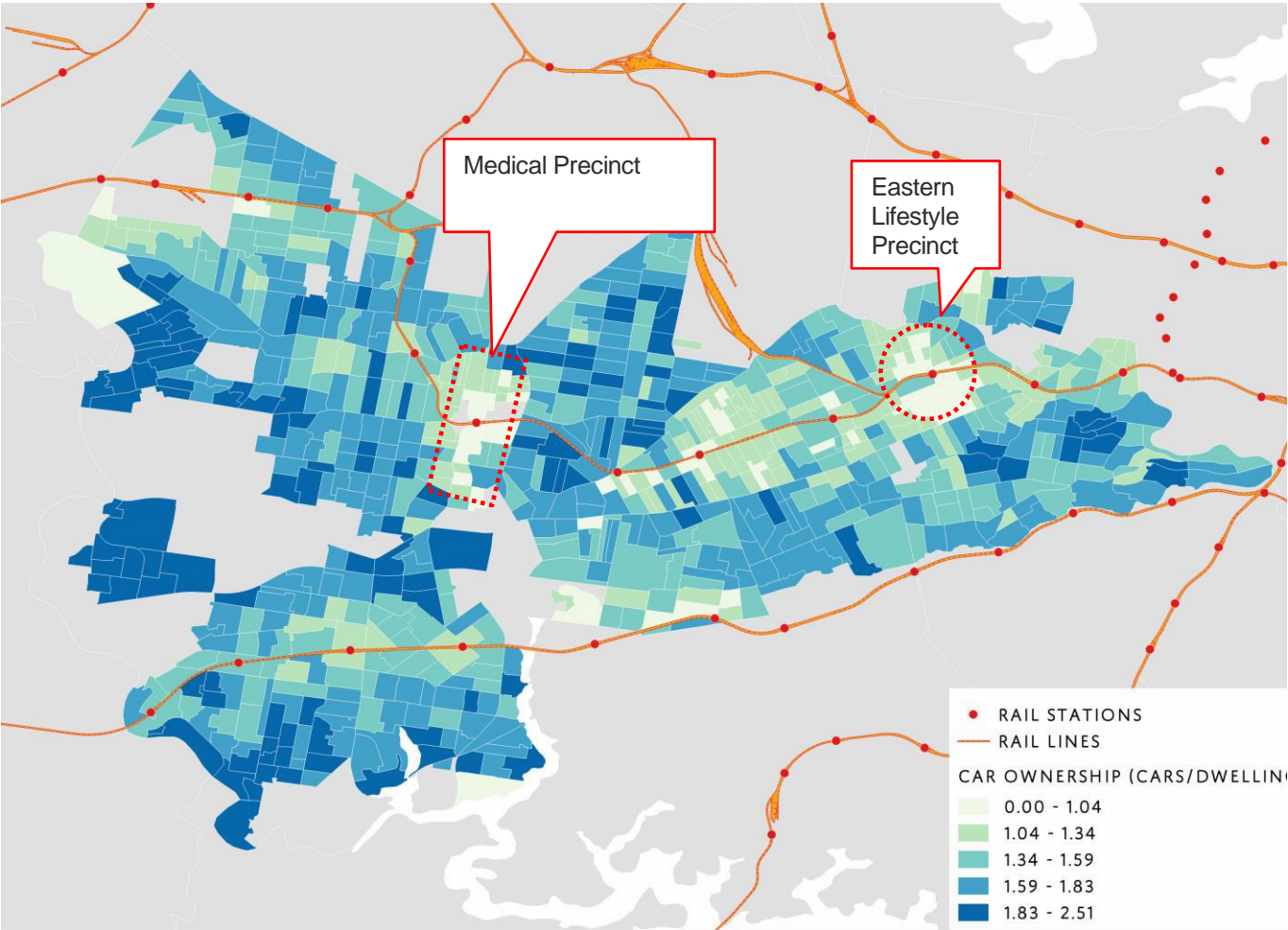


Figure 7: Car ownership rates across Canterbury-Bankstown (ABS 2011,2016 Census)

WALKSCORE – MEASURE OF ACCESSIBILITY IN CANTERBURY-BANKSTOWN

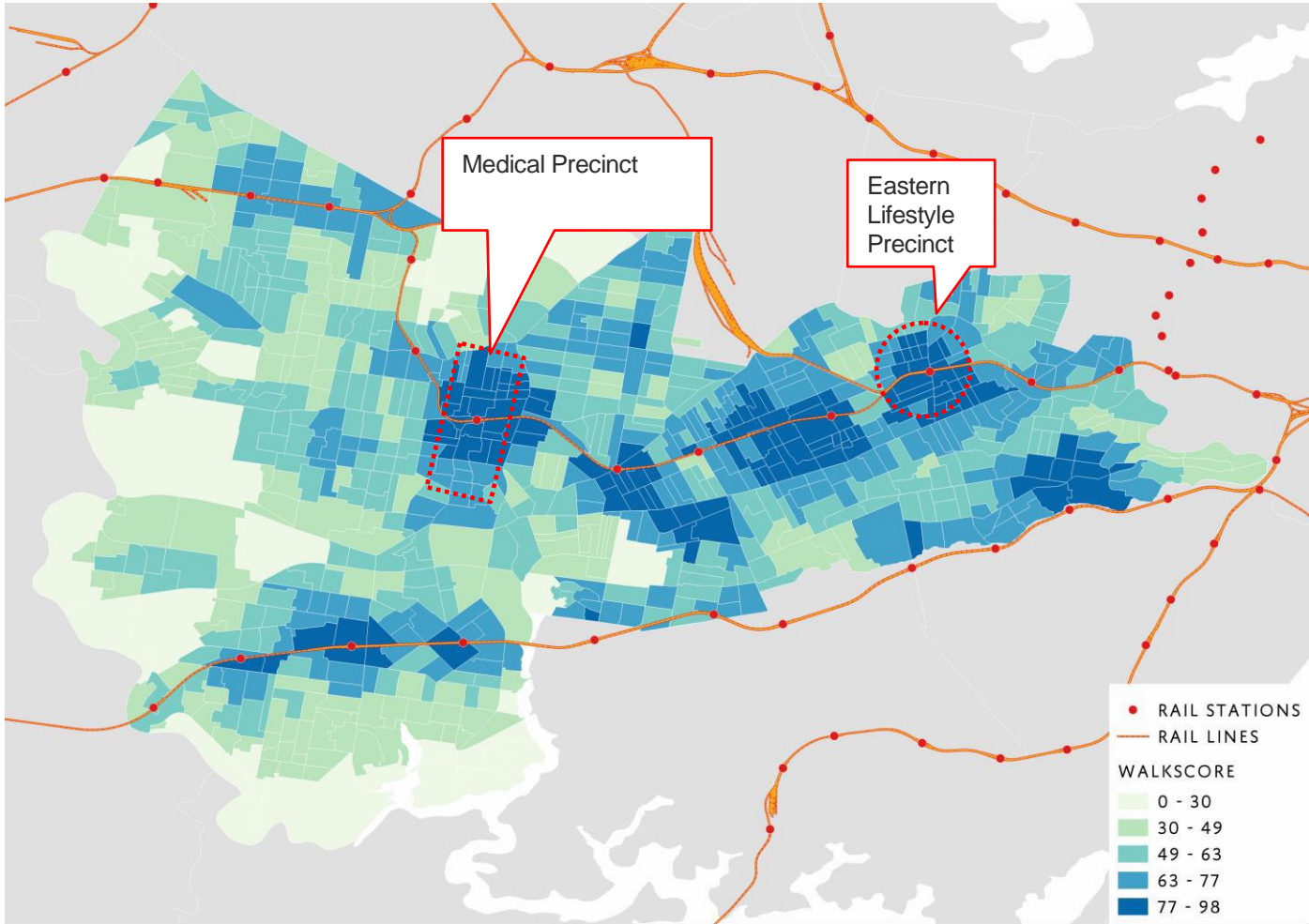


Figure 8: Walkscore in Canterbury-Bankstown (Walkscore 2019)



4. TRAVEL PATTERNS AND CONTAINMENT

There is a high level of worker containment with nearly 40,000 internal trips to work within Canterbury-Bankstown. However, 70% of these trips are made using a car.

Travel patterns were analysed to understand travel and containment patterns in the Canterbury-Bankstown LGA. This data was sourced from the ABS Census Journey to Work dataset (2016).

Council and Transport for NSW need to understand these travel patterns to implement measures to limit car use across the LGA.

- Over 40% of work trips to Canterbury-Bankstown are made from resident workers within the LGA. There are nearly 40,000 internal work trips made within the Canterbury-Bankstown LGA daily. Nearly 70% of these local trips are made using a car.
- From Canterbury-Bankstown,
 - 25,640 residents commute to the City of Sydney for work – 70% public transport, 27% car
 - 7,073 residents commute to the Inner West for work – 19% by public transport, 78% car
 - 5,753 residents commute to Parramatta – 20% by public transport, 78% by car
 - 4,635 residents commute to Cumberland – 8% by public transport, 89% by car

Over 65% of all journey to work trips made by Canterbury-Bankstown's residents are made using a car.

- Of people commuting to Canterbury-Bankstown for work,
 - Over 6,800 people commute from Liverpool – 93% by car
 - 5,000 from Georges River – 88% by car
 - 5,000 from Sutherland Shire – 96% by car
 - 5,000 from Fairfield – 91% by car
 - 4,500 from Cumberland – 85% by car
 - 2,100 people from Inner West – 78% by car
 - 913 people from Sydney – 68% by car

Future growth in Canterbury-Bankstown's centres should respond to this high car use of residents within the LGA and in neighbouring LGAs. Workers must be encouraged to use public and active transport networks for their commute.

JOURNEY TO WORK CAR TRIPS OUT OF CANTERBURY-BANKSTOWN

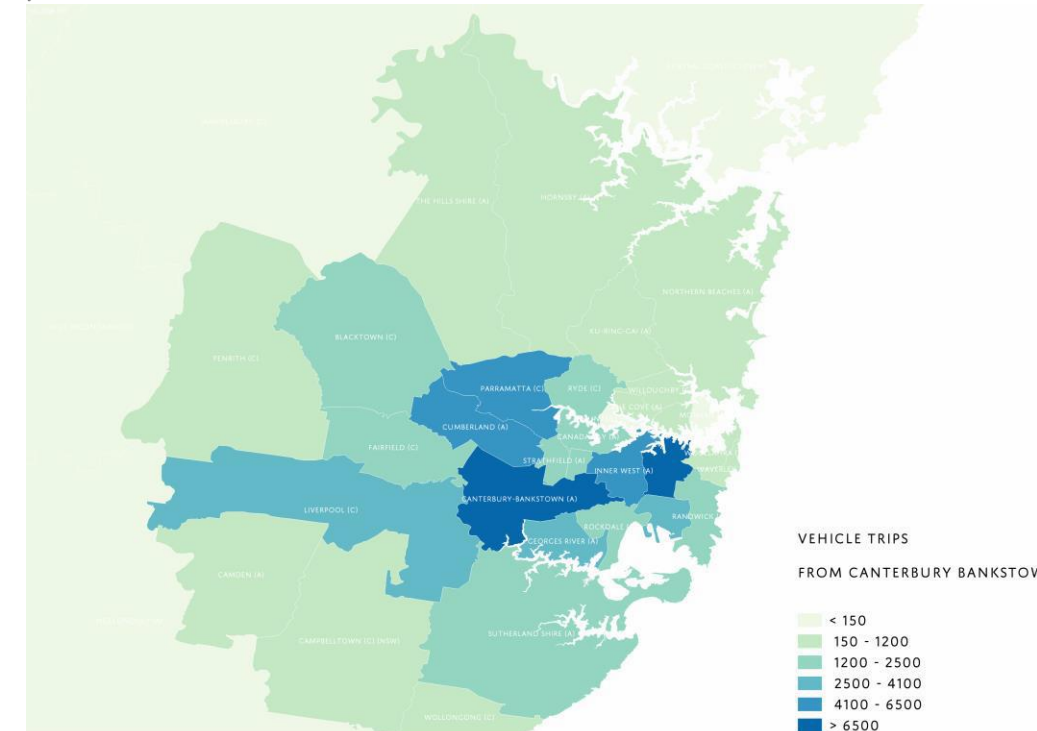


Figure 9: Heat map of vehicle trips out of Canterbury-Bankstown

JOURNEY TO WORK CAR TRIPS IN TO CANTERBURY-BANKSTOWN

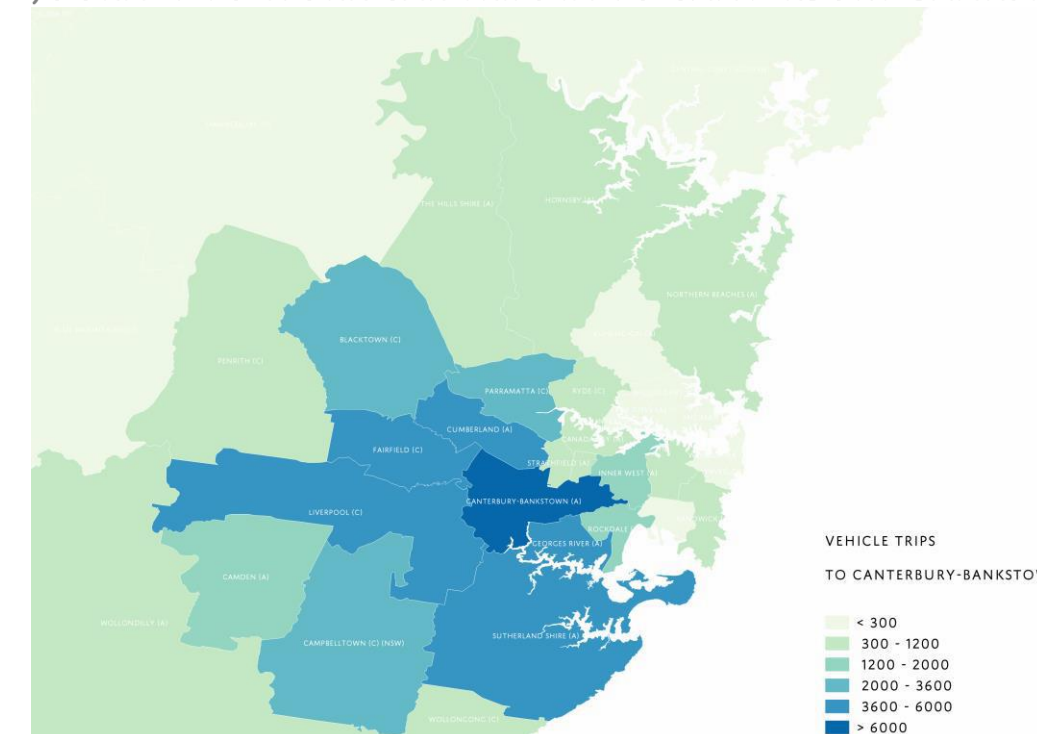


Figure 10: Heat map of vehicle trips in to Canterbury-Bankstown



5. URBAN HEAT

Low canopy cover in the centre is resulting in high land temperatures impacting accessibility and posing a risk to the vulnerable population in our community.

- The impact of local climate can be considered across three key areas: local existing climate, future climate projections and the urban heat island.
- Without the cooling sea breeze off the coast, Canterbury-Bankstown's residents feel the full effect of heatwave conditions and this gap is widening from climate change and a loss in canopy cover.
- Major heat waves are Australia's deadliest natural hazards. Major heat waves have caused more deaths since 1890 than bushfires, cyclones, earthquakes, floods and severe storms combined (Department of Infrastructure and Regional Development (2013) State of Australian Cities). People living in urban environments can be more susceptible than non-urban dwellers to the effects of heatwaves as a result of the urban heat island. The urban heat island is effectively the difference between the land surface temperature and the average air temperature. Higher land surface temperatures in urban environments are due of the prevalence of heat-absorbing materials in cities. These include dark coloured pavements and roofs and concrete. The effect of these materials is amplified by urban canyons trapping hot air and a lack of shade and green space in dense urban environments
- Several studies have indicated a strong correlation between surface types and vegetation with lower land surface temperatures. This is supported in Canterbury-Bankstown. Figure 13 and Figure 14 show the canopy cover and land surface temperature in the LGA, highlighting the temperature variation between the less vegetated environment at key centres compared to fringe suburbs with more street trees and vegetation. Current average canopy cover as a percent of total area in the LGA is only 15%.
- Canterbury-Bankstown's local climate is getting hotter and more extreme. The number of days per year over 35 degrees recorded by the Bankstown Airport weather station has increased from 5 days in 1970 to 18 days in 2019. In comparison, the Observatory Hill weather station in the City of Sydney recorded 2 days in 1970 and 7 days in 2019.
- In addition, the increase in local temperatures, heat island and extreme heat events has a direct impact on electricity demand for air conditioning which is expected to increase peak electricity demands and household electricity costs. The broader liveability and resilience outcomes of urban greening are outlined in Figure 12.

EXTREME HEAT EVENTS – NUMBER OF DAYS OVER 35° CELSIUS IN THE LGA

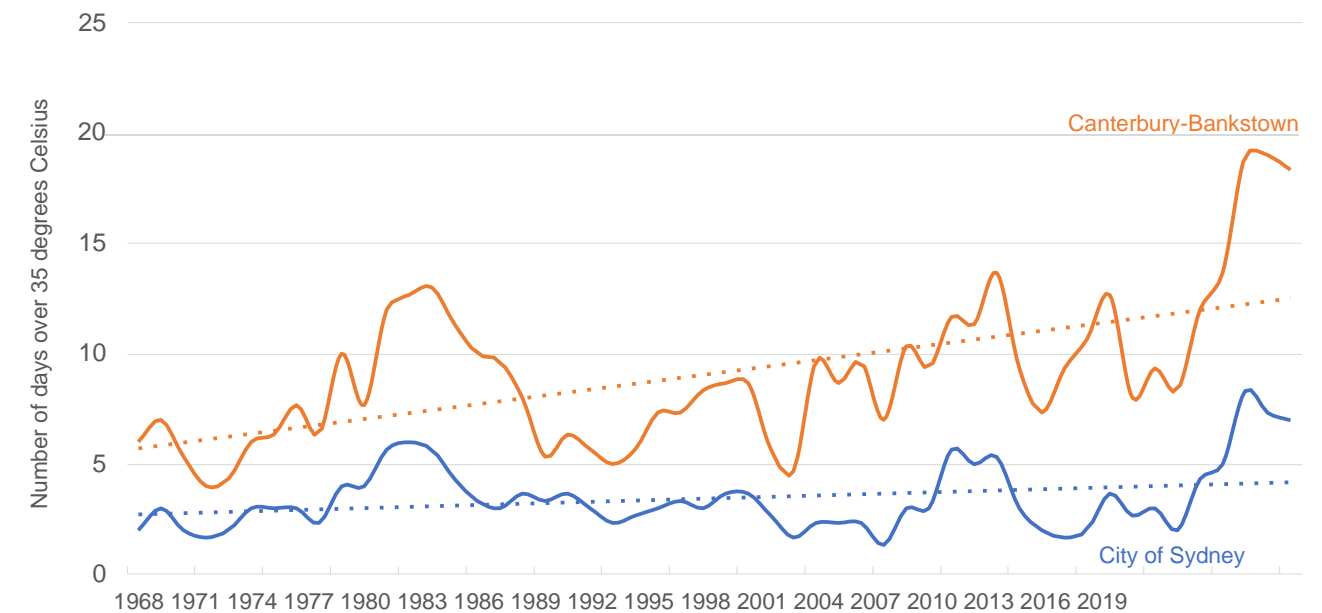


Figure 11: Number of days over 35 degrees Celsius - Canterbury Bankstown versus City of Sydney

LIVEABILITY + RESILIENCE OUTCOMES OF URBAN GREENING

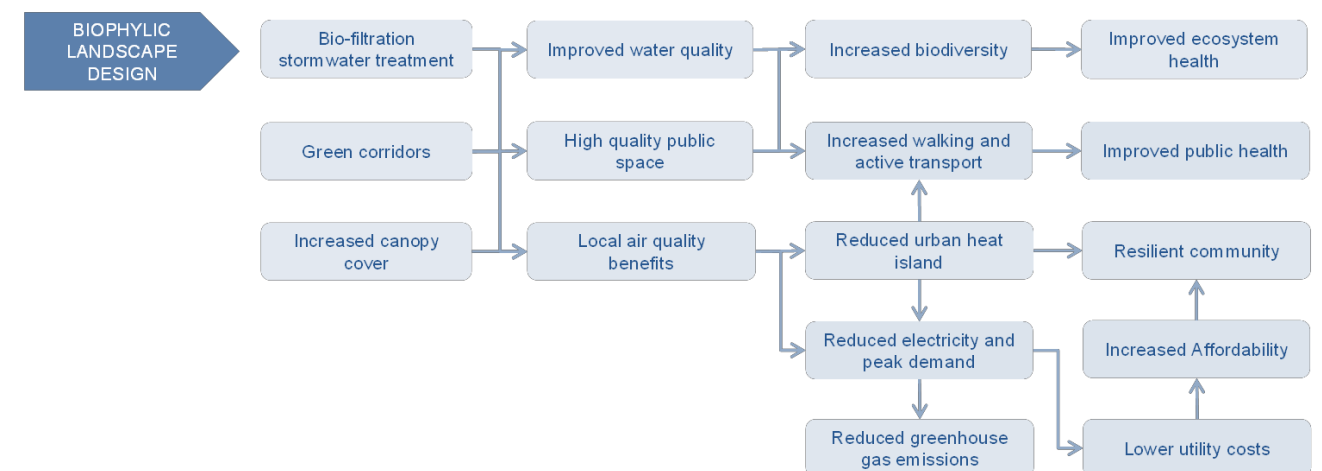


Figure 12: Impact of urban greening and biophysical landscape design on liveability and resilience of the community



CANOPY COVER

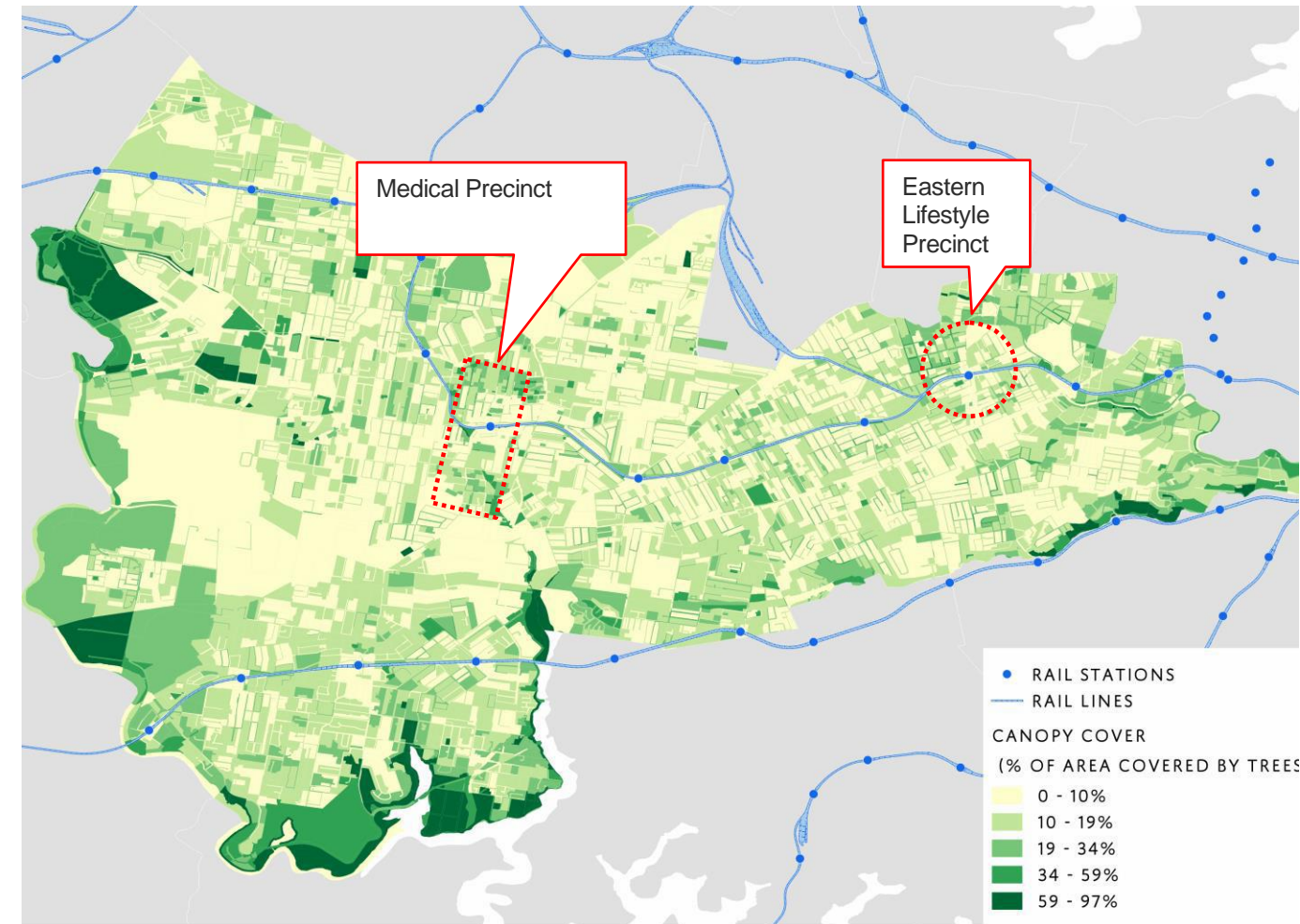


Figure 13: Canopy cover (NSW OEH Urban Heat and Green Cover Datasets, March 2019)

URBAN HEAT ISLAND

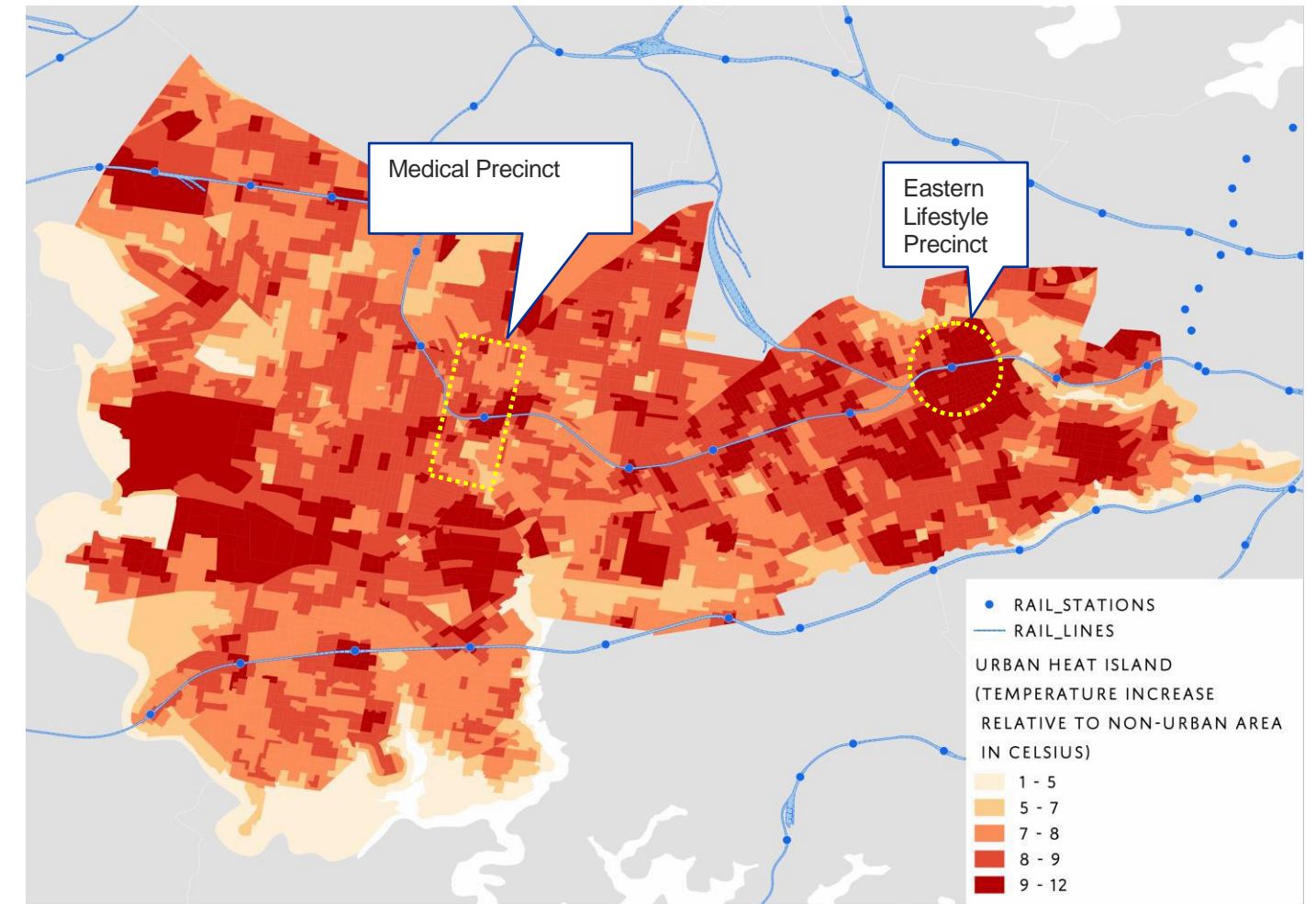


Figure 14: Urban Heat Island – temperature difference relative to a non-urban vegetated area (NSW OEH Urban Heat and Green Cover Datasets, March 2019)



6. LOCAL SOLAR PV + BUILDING PERFORMANCE TRENDS

There is potential for more solar PV installations in Canterbury-Bankstown.

- Data from the Australian Photovoltaic Institute shows that Canterbury-Bankstown ranks fifth amongst all the LGAs in Greater Sydney in terms of total installed solar PV capacity with 40 MW (Figure 16 and Figure 17). Over 70% of this capacity is contributed by small scale solar PV (under 10kW) installations – typically solar PV installations on single dwellings.
- Amongst all the LGAs in Greater Sydney, Canterbury-Bankstown has the largest number of dwellings (over 120,000 dwellings) and the second largest number of single dwellings (nearly 90,000 single dwellings). However, according to APVI, only 11% of Canterbury-Bankstown’s single dwellings install solar PV. As such, there is significant potential to increase solar PV penetration in Canterbury-Bankstown.
- Within the LGA, fringe suburbs such as Regents Park, Sefton, Chester Hill and Milperra have higher installed capacity per dwelling relative to the centres.

INSTALLED CAPACITY PER DWELLING BY SUBURB

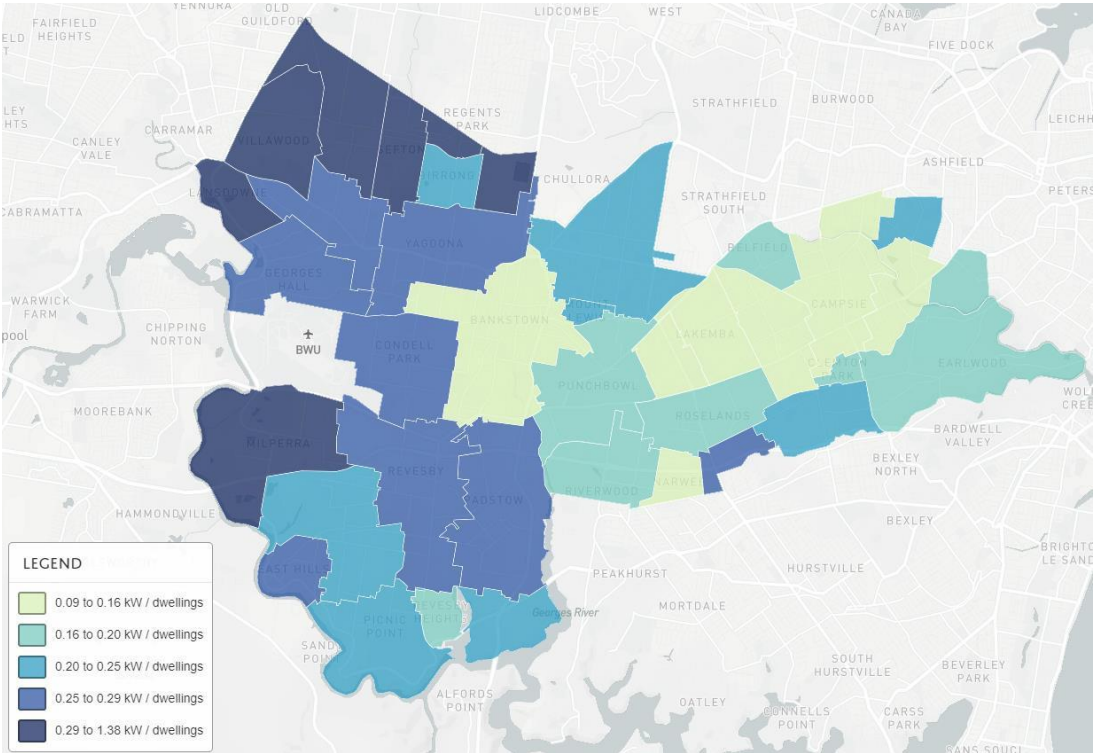


Figure 15: Installed capacity per dwelling by suburb - spatial heat map

COMPARISON OF TOTAL INSTALLED CAPACITY BY LGA

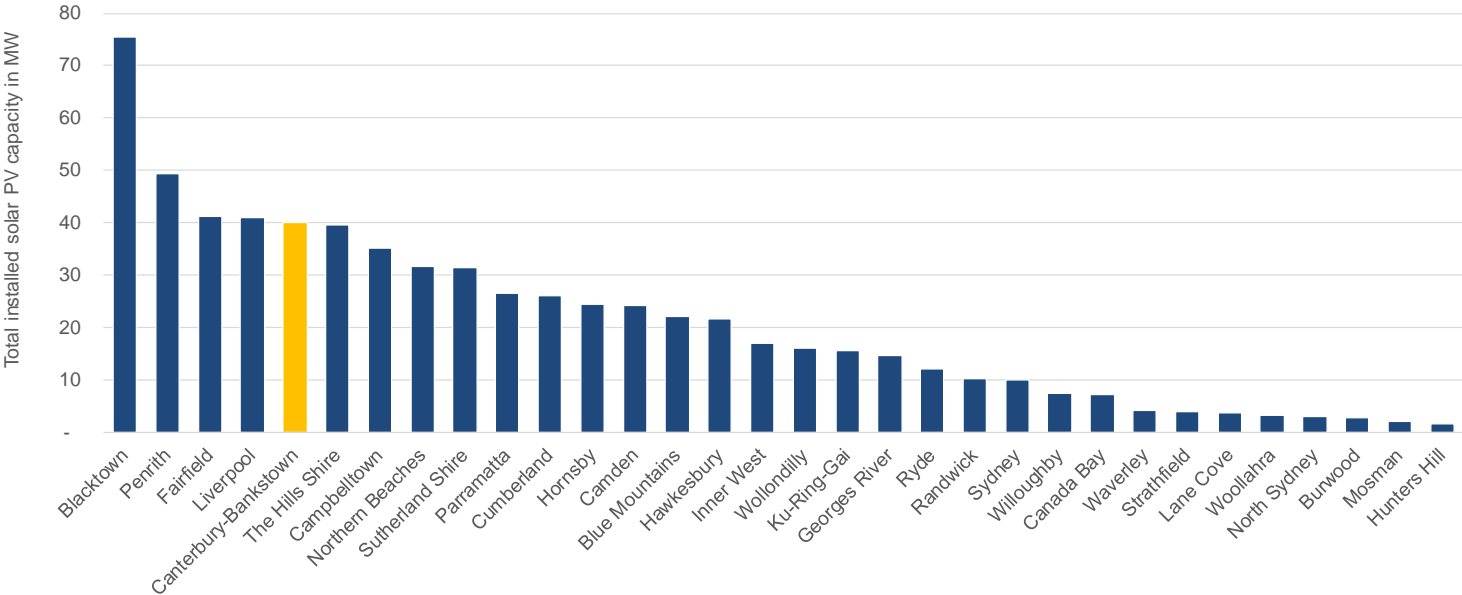


Figure 16: Total installed solar PV capacity by LGA in Greater Sydney

COMPARISON OF SOLAR PV INSTALLATIONS ON SINGLE DWELLINGS BY LGA

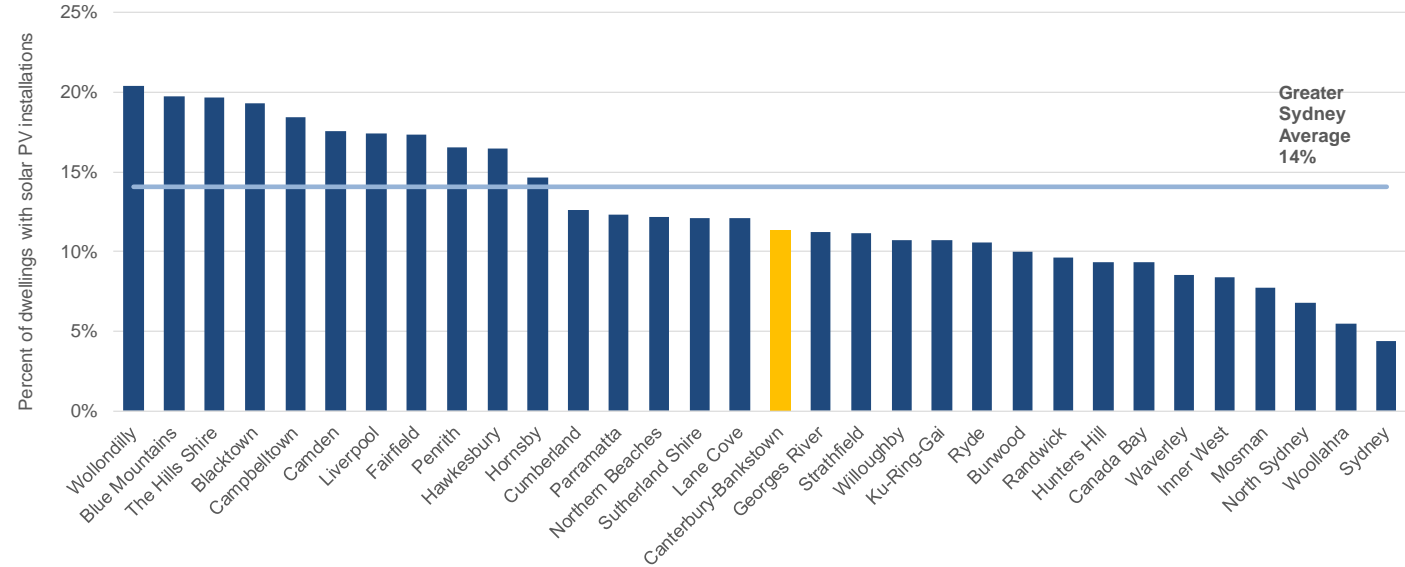


Figure 17: Comparison of solar PV installations on single dwellings by local government area, highlighting the Canterbury- Bankstown LGA



BASIX Energy overcompliance in single dwellings and apartments in Canterbury-Bankstown has always been relative to Greater Sydney. This trend indicates an industry appetite to deliver high efficiency buildings in the LGA.

- Department of Planning BASIX data highlights the outcomes of new developments. Since FY10, new single and multi-unit dwellings across Canterbury-Bankstown have shown increasing trends in over-compliance in Energy (Figure 18).
- Between FY17 to 18, BASIX Energy overcompliance in single dwellings in Canterbury-Bankstown fell lower than the Greater Sydney average (Figure 18). This demonstrates the need for government to intervene to continue delivering high performance buildings in the LGA.
- BASIX Energy overcompliance in apartments in particular is significantly higher in Canterbury-Bankstown relative to the Greater Sydney average (see Figure 19).

BASIX ENERGY OVER COMPLIANCE IN SINGLE DWELLINGS

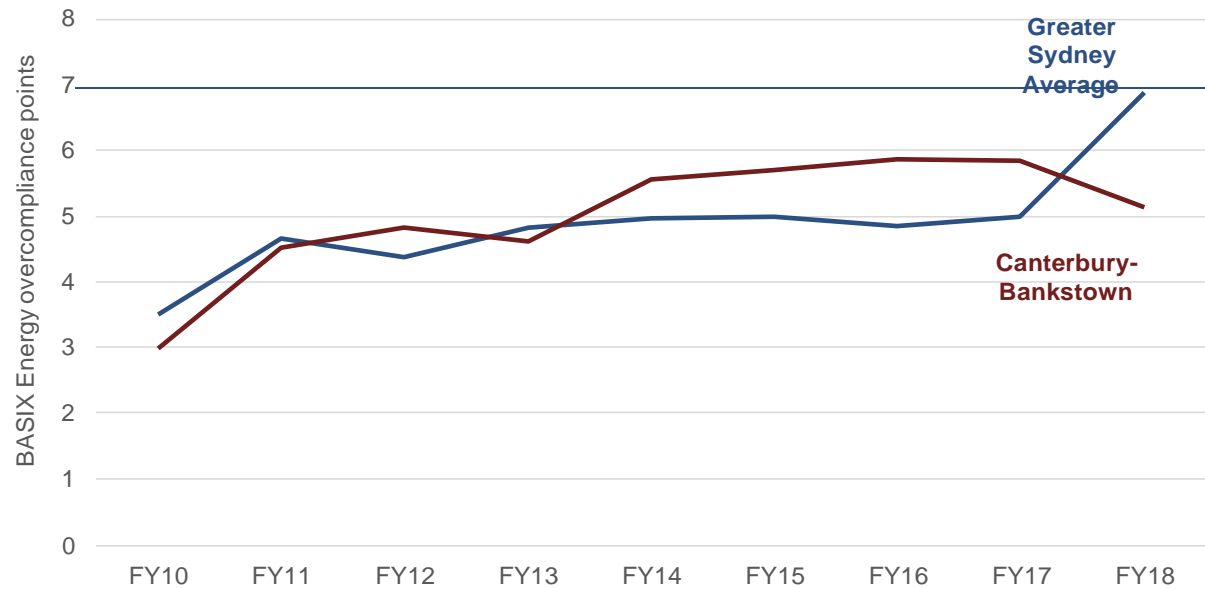


Figure 18: Annual Average Points above BASIX Energy Compliance for all new single dwellings – Greater Sydney vs. Canterbury-Bankstown LGA (Source: NSW Department of Planning BASIX data)

BASIX ENERGY OVER COMPLIANCE IN APARTMENTS

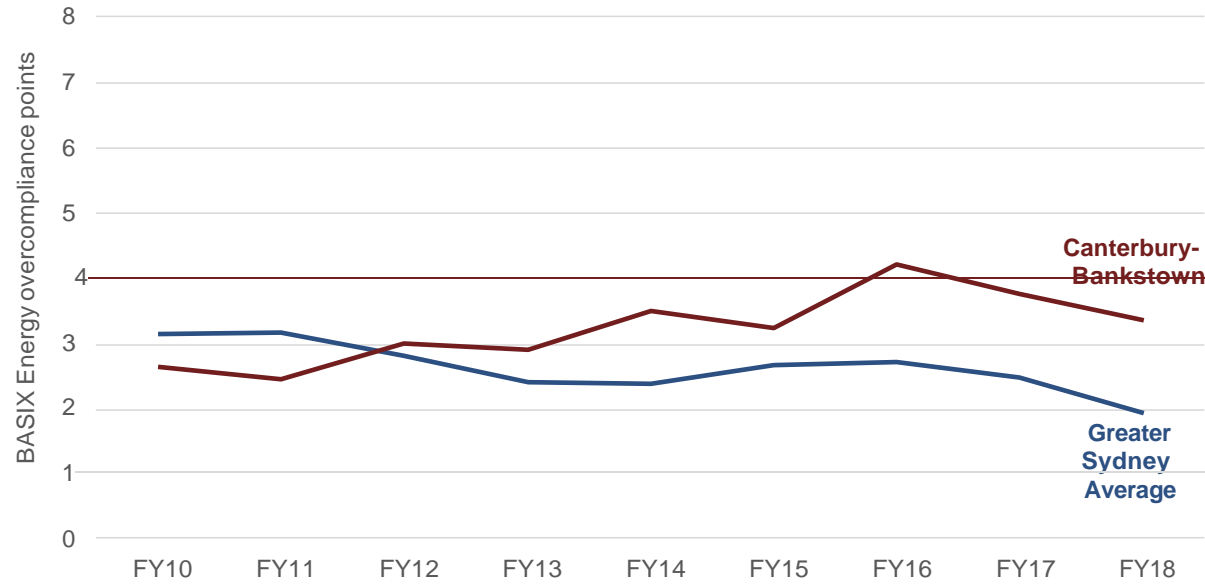


Figure 19: Annual Average Points above BASIX Energy Compliance for all new multi-unit dwellings – Greater Sydney vs. Canterbury-Bankstown LGA (Source: NSW Department of Planning BASIX data)



SUMMARY OF KEY TRENDS AND ISSUES

The analysis above has highlighted six key trends and issues that should be considered in the development and growth of Canterbury-Bankstown:

1. After housing, transport is the highest household cost. Utility costs are lower but are growing - Sydney residents have experienced significant utility price growth in recent years and this trend is expected to continue (Figure 20). Significant household savings can be realised by affecting transport and managing energy and water use. Achieving these affordability outcomes will increase the resilience of the community.
2. While average vehicle ownership across apartments in the LGA appears unchanged, vehicle ownership across apartments in suburbs such as Panania, Picnic Point and Condell Park have decreased by 60% since 2011. This decrease is in line with local and metropolitan trends displaying shifts in mobility preferences across centres with high access to public transport, amenities and services.
3. Reductions in car ownership are driven by changing consumer preferences and technology (including car share, combined with access to public transport). Adding the disruption posed by the emergence of the autonomous vehicle, it is clear that the City's planning strategy has to be agile and respond to a new approach to mobility and car ownership.
4. Shifts in energy generation and consumption (such as electric vehicles and battery storage) provide a significant opportunity for the way energy is delivered to cities allowing for more efficient and optimised peak demand profile and infrastructure delivery management (Figure 21).
5. Canterbury-Bankstown's centres currently experiences high temperature in summer due to low canopy cover. This is expected to worsen with climate change and the observed increasing severity of the urban heat island effect. The increase in local temperatures, heat island and extreme heat events has a direct impact on electricity demand for air conditioning which is expected to increase peak electricity demands and household electricity costs, as well as limit the ability for the city to be a walkable urban environment.
6. Given the trend in increasing BASIX Energy performance for dwellings across Canterbury-Bankstown and Metropolitan Sydney, there is an appetite to deliver new buildings that meet significantly higher performance standards in the LGA.

SYDNEY UTILITY PRICE GROWTH

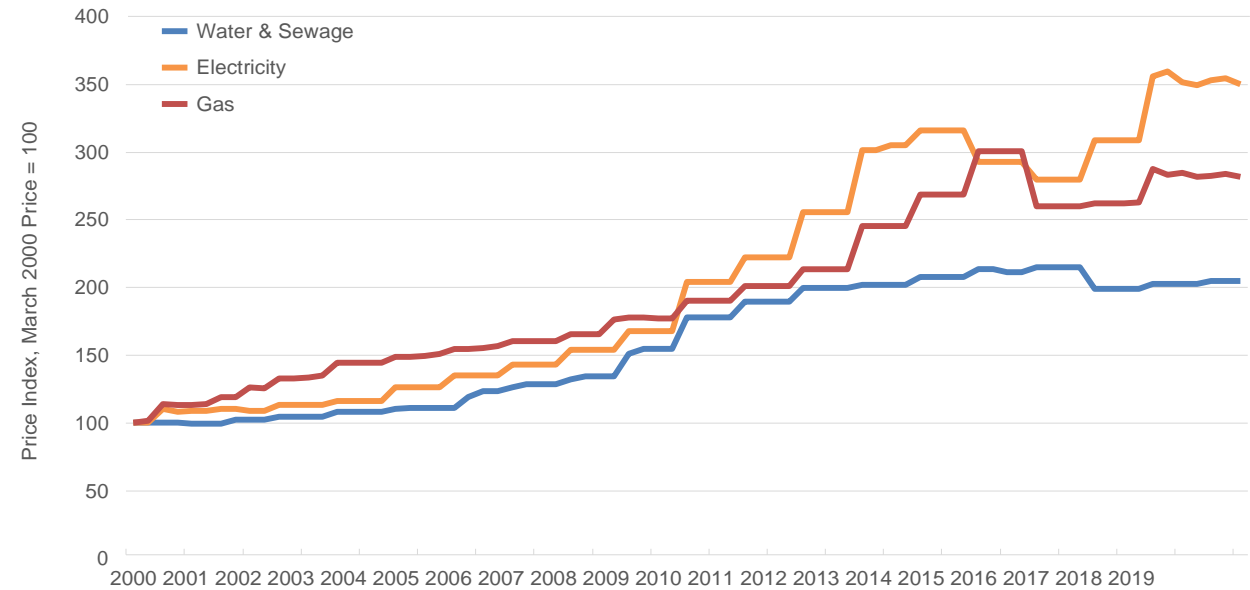


Figure 20: Sydney utilities price growth from a base value of 100 in March 2000. (ABS 6401, Table9 – Consumer Price Index)

ELECTRIC VEHICLES AND BATTERY STORAGE



Figure 21: The emergence of new technologies represents significant opportunities to the way energy is delivered to a city.



DELIVERING SUSTAINABLE GROWTH

Based on the key trends and issues for Canterbury-Bankstown and through discussions with key staff in the City, Kinesis has identified 4 key strategies to deliver the vision for a more liveable and resilient City.

1. **High Performance Buildings** - increase new building standards through higher BASIX and NABERS
2. **Urban Greening** – increase canopy cover and deliver green facades on buildings
3. **Planning for a new mobility future** – parking strategy that responds to emerging mobility trends
4. **Local waste solutions** – develop a circular economy solution for waste management

We have collaborated with key City staff to develop a set of actions, implementation mechanisms, stakeholders and indicators to implement and measure the effectiveness of each of the four strategies. These are outlined in Table 2.

Following implementation of these strategies, council is aiming for the following aspirational targets outlined in Table 1.

Key indicator	Now	2036
Tree Canopy Cover	15%	40% - Suburban 15% - Commercial 25% - Medium-High Density
Greenhouse Gas Emissions	2.5 million tonnes CO2-e per year	1.7 million tonnes CO2-e per year (based on contextualised results of Kinesis' <i>Exploring Net Zero Emissions for Greater Sydney</i>)
Water consumed per year	33 million kilolitres per year	No net increase in water consumption (similar to comparable urban Councils such as the City of Sydney)
Residential solar PV capacity	40 MW	135 MW to contribute its part to 2036 NSW rooftop solar PV capacity (projected by the Australian Energy Market Operator)
Council buildings with solar PV		Where practical council will install solar PV on council buildings.

Table 1: Aspirational targets for key indicators



Strategy	Actions	Implementation mechanism	Stakeholder	Indicators
High performance buildings	<p>Investigate the following BASIX Energy and Water targets for all new homes across the local government area to deliver efficient, resilient and affordable living:</p> <ul style="list-style-type: none">BASIX Water 50 for all dwellings (BASIX Water 60 where recycled water is available)BASIX Energy 40 for buildings of 6 storeys units or greaterBASIX Energy 50 for buildings of 4 to 5 storey unitsBASIX Energy 55 for buildings of 3 storey units or lessBASIX Energy 60 for detached and semi-detached dwellings	<ul style="list-style-type: none">BASIX SEPPNABERS Commitment agreements	Council and DPE	<ul style="list-style-type: none">Energy, Water, GHG DataBuilding Consumption DataInfrastructure Resilience
Addressing urban heat island	<p>Prepare an Urban Tree Canopy Plan with the goal of increasing canopy cover against the aspirational targets set out in Table 1.</p> <p>Identify areas of tree canopy deficiency across the local government area and ensure urban tree canopy is planned for in areas.</p> <p>Support higher canopy cover with reduce hard surfaces in public areas, including reed bed technology and passive irrigation to both address urban heat and improve stormwater quality.</p>	<ul style="list-style-type: none">Urban Tree Canopy Plan	Council	<ul style="list-style-type: none">Local Climate DataBiodiversity DataCanopy Cover %Air Quality DataWater Quality DataLand Use Mix
Planning for a new mobility future	<p>Develop a Strategic Parking Policy that responds to the emerging trends in mobility, including ensuring provisions for accessibility-based parking ratios that respond to access to public transport and local services, provisions for unbundled and decoupled parking, and developing a car share policy that enables mobility choice for all residents across the local government area.</p>	<ul style="list-style-type: none">LEP Parking ControlsCar Share PolicyEV charging points in all apartments	Council	<ul style="list-style-type: none">Traffic and Travel DataPedestrian ActivityParking Use + Car Share UseAccess to open spaceHousing Diversity
Local waste solutions	<p>Develop a Circular Economy solution for organic waste across the district, minimising greenhouse gas emissions as well as creating a valuable resource.</p>	<ul style="list-style-type: none">Council waste servicesSSROC	Council	<ul style="list-style-type: none">Waste recycling, organics reuse and landfill diversion rates

Table 2: Key strategies, actions, implementation mechanisms, stakeholders and indicators



KEY ASSSUMPTIONS

Metropolitan Sydney average benchmarks

Electricity	2,132 kWh per person/year
Gas	3,888 MJ per person/year
Water	237.8 L per person/day
Transport	19.98 km per person/day

Tariffs and rates

Household cost savings outlined in this report are based on current tariffs outlined below:

Residential Water	Rate	Unit
Mains tariff	2.232	\$/kL
Recycled water tariff	2.068	\$/kL
Service charge per dwelling	765	\$/yr
Recycled water service charge	0	\$/yr

Residential Grid Electricity	Rate	Unit
Applied tariff	0.2514	\$/kWh
Solar feed-in tariff	0.06	\$/kWh
Service charge per dwelling	289.16	\$/yr

Residential Gas	Rate	Unit
Gas (first 3,775 MJ per qtr/remaining)	0.041/0.023	\$/MJ
Service charge per dwelling	207	\$/yr

Residential Transport	Rate	Unit
Fuel	1.50	\$/L
Annual capital costs (devaluation)	6,642	\$/yr
Annual registration/insurance	2,172	\$/yr

KEY DATA SOURCES

- ACADS-BSG Australian Climatic Data (Reference Meteorological Year, RMY) for hourly temperature, insulation and humidity.
- Bureau of Meteorology local rainfall and evaporation data
 - Data is from the representative weather station for the local climate zone
 - The RMY (Representative Meteorological Year) is synthesized from a composite of 12 typical meteorological months that best represent the historic average of the specified location using post-1986 data in addition to the earlier weather data for each of the 69 climate zones in Australia.
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