

**APPENDIX A – HOUSING MONITORING AND REVIEW PROGRAM  
2016 ANNUAL REPORT**

**Knox Housing Monitoring  
and Review Program**



**Annual Report for 2016**

**Prepared August 2017**

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## How to Read this Document

**Sections 1 and 2** of this document set out the purpose of the Knox Policy Housing Monitoring and Review Program and how it fits with the other documents and reports that define housing policy at the State and local level.

**Section 3** provides a brief summary of the factors that define the current state of housing in Knox and the issues that are driving future changes.

**Section 4** gives an overview of the indicators that are used to assess the performance of housing policy in Knox and how they relate to the *Knox Community and Council Plan 2017-2021*, which sets out the overall vision, shared goals, and targets for measuring progress toward those goals.

**Section 5** steps through each of the housing indicators, providing a summary of the data used to measure progress and an interpretation of the findings for each.

**Section 6** provides future directions for the Knox Housing Monitoring Program, including a description of potential future indicators and the Knox Housing Scorecard currently under development.

## 1. The Housing Policy Monitoring and Review Program

This report provides information from the ninth annual Housing Policy Monitoring and Review Program. This Program was developed in 2007 to measure the effectiveness of the Knox Housing Policy in assisting in the delivery of the *Knox Housing Statement 2005*, Council’s initial strategic plan for housing and residential development in Knox. It has been updated for this calendar year to reflect the *Knox Housing Strategy 2015*, which was adopted by Council in January 2015. Subsequent changes to the Knox Planning Scheme were approved in March 2016 approved via Amendment C131.

## 2. Current Policy Framework

The *Knox Housing Strategy 2015* was supported by the Knox@50 community engagement program and developed within the State Government’s regional planning framework of *Plan Melbourne*. The underlying strategy for housing across Melbourne is to direct most new development toward Activity Centres, those areas near existing shopping centres and transportation. This has two key effects on housing in Knox. One is to deliver housing efficiently, where the infrastructure and services can best support it. The other is to protect existing neighbourhoods and areas with particular significance – like the Dandenong Foothills – from overdevelopment.

The *Knox Housing Strategy 2015* builds on that idea by setting out a scaled approach to housing in Knox. The *Housing Strategy* divides the city into four policy areas – Bush Suburban, Knox Neighbourhood, Local Living, and Activity Areas – and provides guidance on what types of dwellings are preferred and permissible in each area (see Figure 1). Parts of the city designated as Activity Areas and Local Living areas are expected to experience the most change, accommodating medium and higher density development over time. Bush Suburban and Knox Neighbourhood areas are expected to experience less change in order to preserve existing areas of environmental significance and neighbourhood character.

The previous regional planning framework, *Melbourne 2030*, set out a series of aspirational housing targets that each city would need to meet to cater to expected levels of population growth through the year 2030 (see Table 1). While the first version of *Plan Melbourne* did not include housing targets, the current state government is working to re-establish a new set of targets that will help guide growth across the metropolitan region. The previous targets have been used as a benchmark in every Housing Monitoring Program report since 2008, and still provide the most current guide for understanding how well Knox will be able to meet the need for future housing.

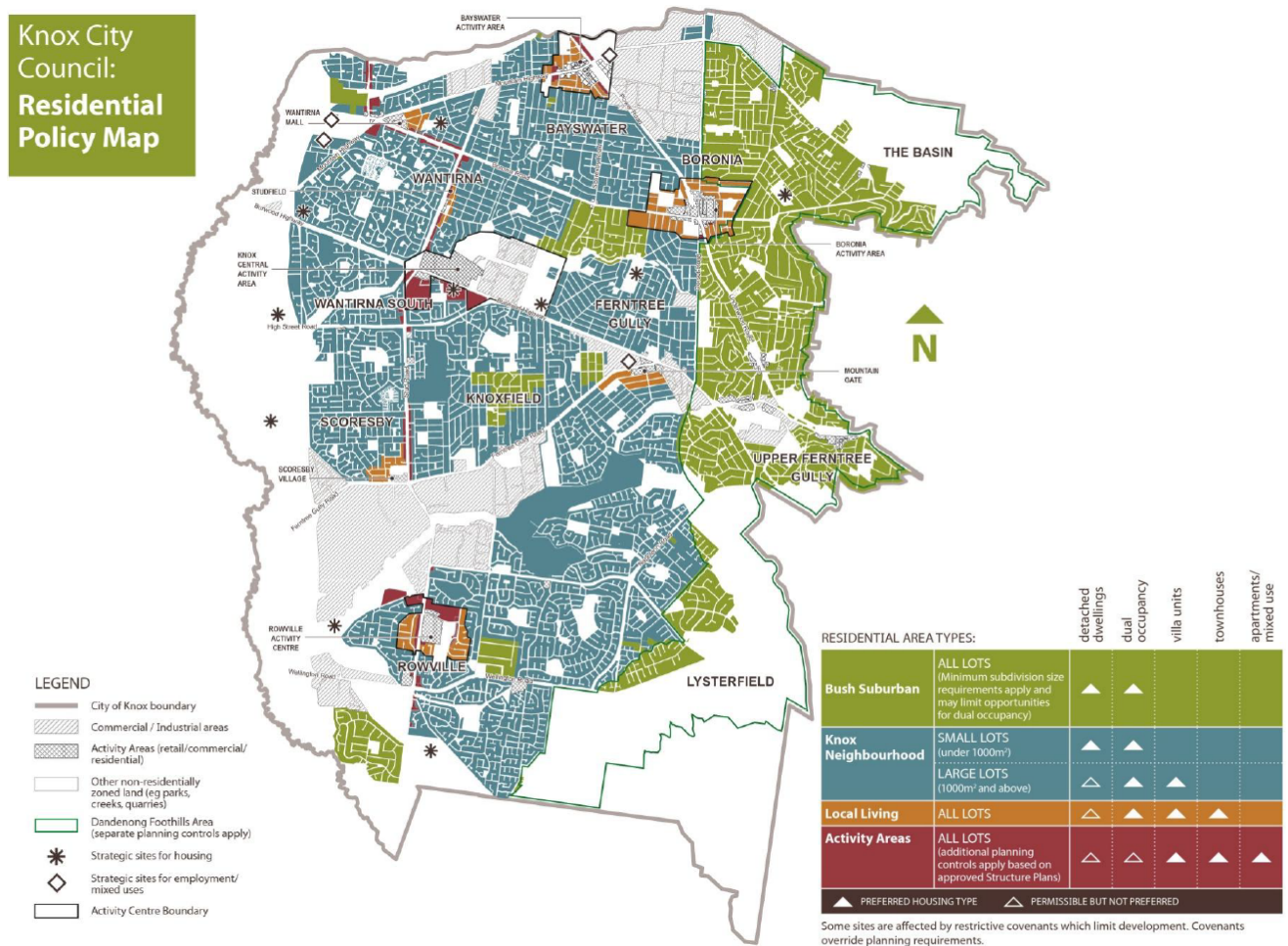
The Housing Policy Monitoring and Review Program also works in concert with the annual State of Knox report to provide guidance on the *Knox Community and Council Plan*, the city’s overarching strategic document that provides a vision statement for the Knox community, shared goals and strategies to achieve the vision, an outline of the role and focus of Council, and the targets and initiatives that Council has set to help achieve those shared goals. Section 4 of this report sets up how



housing indicators examined here relate to the overall goals of the latest *Community and Council Plan*.

**Table 1: Aspirational housing distribution for Knox, 2001-2030**

Potential number and percentage of new dwellings in Knox							
Location	2001-05	2006-10	2011-15	2016-20	2021-25	2026-30	TOTAL
Greenfield sites	2377 92%	200 8%	0 0%	0 0%	0 0%	0 0%	2,577 (17% of 2001-2030 total)
Activity Centres	30 0%	578 8%	910 12%	1895 25%	1895 25%	2269 30%	7,577 (50% of 2001-2030 total)
Strategic Redevelopment Sites and along the PPTN	88 5%	425 23%	500 28%	500 28%	175 10%	107 6%	1,795 (12% of 2001-2030 total)
Dispersed Development (including the Dandenong Foothills)	855 27%	700 22%	456 15%	380 12%	380 12%	380 12%	3,151 (21% of 2001-2030 total)
<b>TOTAL</b>	<b>3,350</b>	<b>1,903</b>	<b>1,866</b>	<b>2,775</b>	<b>2,450</b>	<b>2,756</b>	<b>15,100</b>



**Figure 1: Housing Policy Areas as defined in the Knox Housing Strategy 2015**

## 3. Key Challenges and Opportunities

### An Ageing Population

Knox's population is ageing in line with national trends. According to current projections, one in three people living in Knox will over 55 years old by 2036, which would result in almost as many people of retirement age (65 years or older) as young people under 18 years. This would mean an increasing demand for housing for older people, including retirement villages and aged care facilities as well as flexible, accessible dwellings located in places where people looking to downsize want to live.

### Declining Household Size

The average household size has been steadily declining over the last 20 years, from a peak of 3.17 people per household in 1991 to 2.70 people per household in 2016. This reflects broader regional trends towards greater numbers of couple-only and single-person households. By 2036, it is projected that there will be more one and two-person households in Knox (36,000) than families with children (31,400). These projections estimate this decline will continue to 2.58 people per household in Knox by 2036, which would likely mean further increases in the demand for smaller dwellings.

### Increasing Number of Vulnerable Households

The number of vulnerable households on a very low income<sup>1</sup> in Knox has increased from 1,668 households in 2006 (3.3%) to 2,146 households in 2011 (4.1%). Significant numbers of lower income households are experiencing housing stress<sup>2</sup> as mortgage payments consume an increasing share of household incomes as the availability of affordable private rentals is decreasing. One in ten lower income mortgage holders and one in four low-income renter households in Knox is under financial stress from mortgage or rent (2011 Census), though this varies across Knox. Directing a significant proportion of income towards a housing costs places pressure on meeting other household expenses such as transport, health, education and food, leaving people more vulnerable to changes in circumstances and further disadvantaging those already facing hardship including the unemployed and single parent families.

### Pressure on Climate and Resources

According to CSIRO, "the duration, frequency and intensity of heatwaves have increased across large parts of Australia since 1950. There has been an increase in extreme fire weather, and a longer fire season, across large parts of Australia since the 1970s."<sup>3</sup> Future rainfall events are predicted to be more frequent and more intense, even if average rainfall levels decrease overall. With energy and water prices increasing along with landfill fees, measures to address the efficient use of these resources will be needed to help mitigate pressures of everyday costs of living.

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<sup>1</sup> Lowest 10% of equivalised household incomes, nationally

<sup>2</sup> Households in the lowest 40% of incomes, nationally that are paying more than 30% of their usual gross weekly income on housing costs.

<sup>3</sup>CSIRO, <https://www.climatechangeinaustralia.gov.au/en/climate-campus/australian-climate-change/australian-trends/>, accessed July 2017.

## Declining Affordability

Knox is becoming a less affordable place to live. The Knox median house price passed the metropolitan Melbourne average for the first time in 2014 and remains higher. In Knox half of all houses in Knox cost \$653,000 or more, compared to level of \$527,450 across Melbourne overall. In fact, Knox experienced the fourth largest percentage increase in median house price of all metropolitan municipalities over the five years to 2014.<sup>4</sup>

However, the growth in median household income has failed to match the pace of rising house prices. The median house price in Knox increased by 52% from 2006-2011, but median household income only rose by 20% over the same period. Figure 2 shows that these figures represents the continuation of trend that has been accelerating over the last 20 years. The cost of a dwelling affordable for the 'typical' Knox household<sup>5</sup> was calculated at \$380,000 in 2014, compared with a median house price locally of \$540,000. This represents an 'affordability gap' of 30%. As is true across Melbourne generally, average household income is no longer high enough to comfortably service the mortgage on an average house in Knox.

The rent burden is also increasing. The median rent increase in Knox of 50% between 2006 and 2011 is more than double the increase in average wages in that time, while the amount of social housing and affordable private rentals is insufficient to meet the housing needs of the most vulnerable in the Knox community.

## An Identified Shortage of Social Housing

In 2011, social housing comprised 2.1% of the total housing stock in Knox, compared with a metropolitan average, 2.9%. Knox has an identified shortage of social housing relative to current and projected future demand. The shortfall was estimated at 460 dwellings in 2016 and is projected to increase to 860 dwellings by 2036 if no action is taken to increase supply. The percentage of affordable housing need that can be met by social housing and affordable private rental housing in Knox declined from 85% in 2011 to 83% by 2014, and is projected to decline further to 70% by 2036 if supply is not increased.<sup>6</sup> Knox City Council has estimated that between 35 and 95 new social housing dwellings would be needed each year in order to meet future demand.<sup>7</sup>

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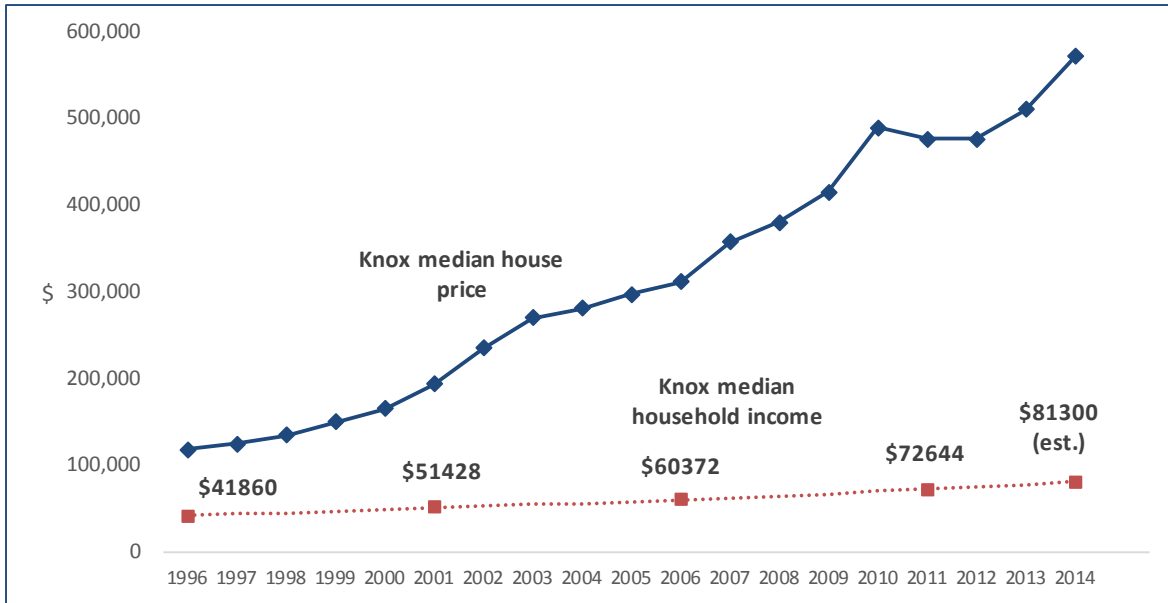
<sup>4</sup> These figures are currently being updated with data to 2016 and will be included in future versions of the Housing Monitoring Reports as they become available.

<sup>5</sup> Price that would allow a Knox household on the median income to service a new mortgage without falling into housing stress, benchmarked at not more than 30% of gross household income.

<sup>6</sup> Knox City Council, *Minimum Supply of Social Housing, Eastern Metropolitan Region (2014-2036)*.

<sup>7</sup> Knox City Council, *Defining Affordable Housing and a Minimum Supply of social Housing for Knox*, 2011.





**Figure 2: Increase in median house prices and median household income for Knox, 1996-2014<sup>8</sup>**

<sup>8</sup> These figures are currently being updated with data to 2016 and will be included in future versions of the Housing Monitoring Reports as they become available.

## 4. Housing Policy Directions, Tools, and Measures

### Housing that Provides Choice through Diversity

*For many of us our lifestyles and family structures are changing, and with this comes a change in housing needs.*

– Knox Community and Council Plan, 2017-2021

Overall, 85% of the dwellings in Knox are separate houses, most of which have three bedrooms or more.<sup>9</sup> Medium and higher density housing, which tends to also be smaller, only comprises 13% of Knox’s housing stock – less than half the Melbourne average of 28% in 2011. This limits housing choice and the ability to accommodate a wider variety of household types, or respond to the changes in household size and structure Knox is experiencing.

The mismatch between supply and demand of smaller housing is already evident: between 2006 and 2011, the increase in smaller households was three times as large as the increase in smaller dwellings. This may constrain the ability of younger locals to move out of their parents’ home and start their own household in Knox. It may also make it difficult for older residents wishing to downsize to a smaller dwelling within their neighbourhood.

While Knox with its supply of larger, family sized homes will continue to attract new families with children in the ongoing process of household lifecycle and regeneration, steady increase in smaller household formation will generate demand for smaller housing choices. As Knox becomes more age and household diverse, a wider choice of housing stock will be needed. This includes accessible housing that can accommodate the needs of aged residents.

### Council Policy Directions

Knox Community and Council Plan 2017:	Knox Housing Strategy 2015:
<b>Strategy 2.1:</b> <i>Plan for a diversity of housing in appropriate locations</i>	<b>Objective 1:</b> <i>A diversity of housing is provided in appropriate locations</i>

### Existing Policy Tools

- The Knox Planning Scheme (Residential Zones and Schedules)
- Knox Housing Strategy 2015
- Structure Plans and Local Area Strategic Plans

### 2016 Housing Monitoring Indicators

- Alignment with Housing Policy Areas
- Dwelling Typology
- Dwelling Size
- Rental Options

## Housing that Responds to Current and Future Needs

*When people have secure and affordable housing that is appropriate to their life circumstances, other needs can be met, such as employment, education and life opportunities.*

– Knox Community and Council Plan, 2017-2021

Knox will need more housing options for older people, in the future, as people’s health care needs increase. This includes smaller dwellings for those wishing to or needing to downsize for health or financial reasons. Much of the housing stock in Knox is large family homes with larger garden areas and higher utility and maintenance costs, which are often not preferred option for older residents. An aging population will also require also need more flexible housing, including single-story housing that can accommodate wheelchairs and other mobility aides, and dwellings that have or can be fitted with facilities to help those with specific health needs.

In addition, declining affordability of housing means reduced options and flexibility for people who need to change housing unexpectedly, including those who have lost or changed jobs, experienced a sudden medical condition, or have had a change in family circumstance. This may lead to additional difficulty for families who wish to keep kids in school or for those who wish to stay close to work. Young people, particularly young couples and families, may find that they need to leave Knox to find housing they can afford. This displacement can be into homelessness, into inadequate housing, or out of Knox altogether. When people need to leave Knox to find affordable housing, it can disrupt social networks and increase travel time required for jobs, education, and day-to-day needs.

### Council Policy Directions

Knox Community and Council Plan 2017:	Knox Housing Strategy 2015:
<b>Strategy 2.3:</b> <i>Support the delivery of a range of housing that addresses housing and living affordability needs</i>	<b>Objective 2:</b> <i>Residential development better responds to the community's current and future needs, and allows people to 'age-in-place.'</i>

### Existing Policy Tools

- Knox Planning Scheme (Residential Zones Schedules – Accessibility Triggers)
- Knox Housing Strategy 2015
- Rezoning Opportunities for Strategic Investigation Sites
- Use of Council Land and Assets

### 2016 Housing Monitoring Indicators

- Aspirational Housing Targets
- Housing Affordability
- Social Housing

### Future Indicators Under Development

- Residential Aged Care Facilities

## Housing that Delivers Environmentally Sustainable Design

*Knox residents recognise the importance of achieving sustainability and quality in building design that contributes positively to neighbourhoods. With energy and water prices increasing and the cost of landfill disposal increasing every year, measures to address the efficient use of these resources will help with cost of living pressures.”*

– Knox Community and Council Plan, 2017-2021

The Knox community recognises the close relationship between our built environment, our health, and our social wellbeing. Our homes are major contributors to the resources we consume and the impact we have on the wider environment. Prices for electricity and gas have risen in recent years, placing a strain on the ability of many to keep up. Knox households produce more garbage and divert more waste to recycling than the metropolitan average. Shifting weather patterns have produced extended heat waves and larger and more frequent rain events have altered the way we mitigate bushfire risk and approach water management.

Development that better responds to environmental issues can lead to more sustainable outcomes. Managing water, energy and gas in a more efficient way is an important goal for future housing development in Knox. Smaller dwellings generally require fewer resources to heat and cool, leading to lower operating costs and a smaller environmental footprint, and new development typologies are starting to provide greater choices for people interested in smaller homes. Water Sensitive Urban Design (WSUD) techniques can reduce demand for mains water by making better use of rainwater for uses inside and outside our homes. Finding ways to be more responsible about the amount of waste we produce and how we dispose of it is another key area of focus for the Knox community, and building houses that are more resource-efficient can help.

### Council Policy Directions

Knox Community and Council Plan 2017:	Knox Housing Strategy 2015:
<b>Strategy 2.2:</b> <i>Encourage high-quality sustainable design</i>	<b>Objective 3:</b> <i>Energy, water, and waste efficient design are increased in residential dwellings</i>

### Existing Policy Tools

- Knox Planning Scheme
  - Clause 22.04 – Environmentally Sustainable Design Policy (pending approval of C150)
  - Requirements Sustainable Design Assessments (SDA) for multi-dwelling developments in Residential Zone Schedules and some Design and Development Overlays (DDOs)

### Future Indicators Under Development

- Household Water Use
- Household Energy Use
- Household Waste Generation
- Household Carbon Emissions

## Housing that Contributes to a Strong Sense of Place

*Our physical environment contributes to our individual and collective sense of place and community. We identify and strongly value Knox being made up of a network of villages with good access to urban facilities and services.*

– Knox Community and Council Plan, 2017-2021

Knox is known for green and leafy neighbourhoods, quiet streets, and a mix of city and country feel. The low density pattern of residential development of Knox has provided the quiet streets and natural feel that have attracted people to the area for decades. However, this form of development has also led to a dependence on cars to get around, which in turn has resulted in increasing use of resources, air pollution and reduced amenity for Knox residents. As land values have increased over time, redevelopment has introduced new types and styles of housing into Knox’s neighbourhoods that are changing the look and feel of the city and placing additional strain on infrastructure networks.

Residents of Knox are concerned about the changes that occurring in their neighbourhoods when medium and higher-density development replaces existing single houses. Some neighbourhoods have lost trees and open space as single-house lots are redeveloped with dual occupancies, villa units, townhouses, and in some cases apartments. The resulting increase in residential density is placing additional strain on physical infrastructure that was designed for lower-density neighbourhoods, including stormwater pipes and drains, roads, and on-street parking.

### Council Policy Directions

Knox Community and Council Plan 2017:	Knox Housing Strategy 2015:
<b>Strategy 1.3:</b> <i>Ensure the Knox local character is protected and enhanced through the design and location of urban development and infrastructure</i>	<b>Objective 4:</b> <i>Quality housing design in Knox is improved to better respond to neighbourhood identity and create a stronger sense of place.</i>

### Existing Policy Tools

- Knox Planning Scheme
  - Residential Zone Schedules – Canopy Tree Controls
  - Design and Development Overlays (DDO)
  - Landscape Significance Overlays (LSO)
- Structure Plans and Local Area Strategic Plans

### 2016 Housing Monitoring Indicators

- Walkability

### Future Indicators Under Development

- Neighbourhood Character
- Urban Design

## Housing that Protects Areas of Natural Significance

*Trees and green spaces provide numerous economic, environmental, and social benefits, including habitat for flora and fauna, enhancing neighbourhood aesthetics, providing shade, and lowering ambient temperature, which can contribute to reducing the effects of heatwaves.*

– Knox Community and Council Plan, 2017-2021

The City of Knox enjoys a unique natural setting, located at the foot of the Dandenong Ranges. The City is crisscrossed by creeks and wetlands that provide a habitat for native animals and peaceful respite to local residents. These characteristics bring the feel of bushland and natural spaces into Knox’s neighbourhoods and key places.

The Dandenong Foothills enjoy particular significance in Knox, providing a unique bushland setting characterised by significant tree canopy and a rolling landscape. Council has well-established policy and planning controls that aim to protect and preserve the significant landscape and environmental values of the area through controls on vegetation and residential design. There are 118 ‘Sites of Biological Significance’ identified across the city that serve to protect areas of remnant and indigenous vegetation. These areas also have specific planning controls that restrict the removal of vegetation and residential design guidelines that include higher requirements for new canopy trees.

While Knox enjoys a spectacular natural setting, over half of the indigenous plant species found in Knox today are at risk of disappearing within 10-20 years. It will be increasingly important to ensure that new development does not erode Knox’s unique and significant sources of environmental value.

### Council Policy Directions

Knox Community and Council Plan 2017:	Knox Housing Strategy 2015:
<b>Strategy 1.2:</b> <i>Create a greener city with more large trees, indigenous flora and fauna</i>	<b>Objective 5:</b> <i>Protect and enhance landscape and environmental values of natural areas of significance within the municipality.</i>

### Existing Policy Tools

- Knox Planning Scheme
  - Residential Zone Schedules – Canopy Tree Controls
  - Clause 22.01 – Dandenong Foothills Policy
  - Environmental Significance Overlays (ESO)
  - Vegetation Protection Overlays (VPO)
  - Design and Development Overlays (DDO)
- Sites of Biological Significance

### Future Indicators Under Development

- Tree Canopy Cover
- Areas of Natural Significance

## Housing that is Delivered by Sound, Integrated Decision-Making

*We look to the leaders in our community to make informed, evidence-based decisions.  
This requires a level of trust in all levels of government and within the city.*

– Knox Community and Council Plan, 2017-2021

Planning for the future housing needs of the city is a complicated and important job that requires input from community members, policy experts, design professionals, and local landowners. When making decisions related to planning and development, Councillors must weigh up a wide range of competing priorities.

The *Knox Community and Council Plan* provides overarching guidance on what the needs of the city are and Council's role in addressing them. That document supports a whole range of Council policies and strategies on issues ranging from infrastructure and open space to social and environmental issues. The Knox Planning Scheme spells out Council's specific goals and policies for the planning and development of the city. It is the official reference for all decisions related to planning made by Council, planning officers, and VCAT.

Knox Council undertakes place-based planning initiatives in activity centres and other key places around the city. These include structure plans and other strategic plans developed through extensive consultation with the local to provide specific directions and guidance for future decisions.

### Council Policy Directions

Knox Community and Council Plan 2017:	Knox Housing Strategy 2015:
<b>Strategy 8.1:</b> <i>Build, strengthen and promote good governance practices across government and community organisations.</i>	<b>Objective 6:</b> <i>Development responds to neighbourhoods in an integrated and balanced manner.</i>

### Council Policy Tools

- Knox Planning Scheme
- Structure Plans and Local Area Strategic Plans

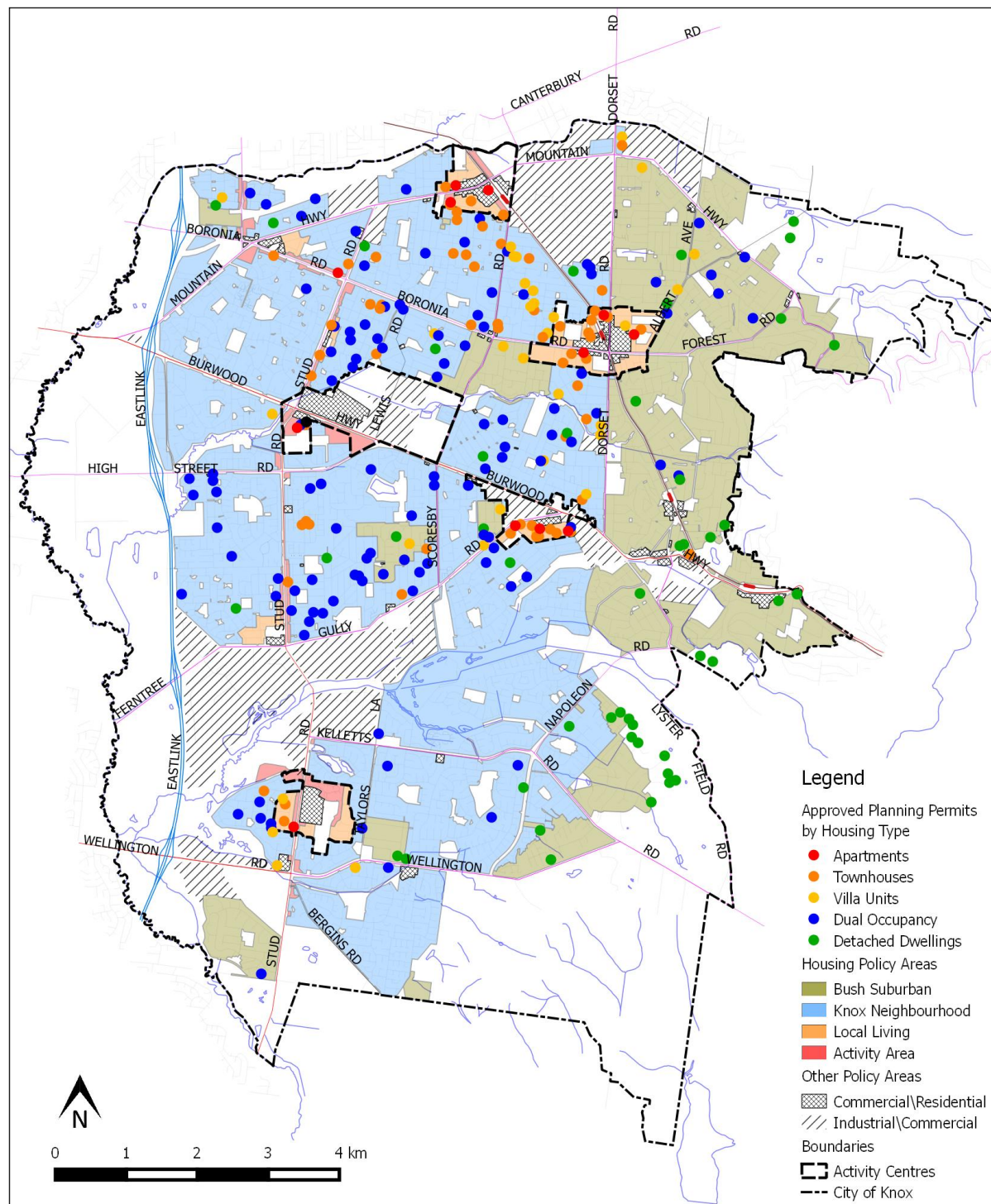
### 2016 Housing Monitoring Indicators

- Alignment with VCAT Decisions
- Integrated Place-Based Planning

## 5. Findings

### Summary of Planning Application Approvals

<b>Planning and Subdivision Permits Approved in 2016:</b>	<b>265</b>
<b>Total Number of New Dwellings Possible from Approved Permits:</b>	<b>867</b>
<b>Number of Proposed Demolitions Possible from Approved Permits:</b>	<b>163</b>
<b>Potential Net Increase in Dwellings Possible if All Approved Permits are Built:</b>	<b>704</b>
<b>Aspirational Dwellings Target for 2017 (from <i>Melbourne 2030</i>)</b>	<b>555</b>



**Figure 3: Approved Planning Applications by Dwelling Typology and Housing Policy Area, 2017**



## Aspirational Housing Targets

The number of new dwellings approved through the planning process each year are co in the context of a set of targets set in the Knox Housing Statement. The targets were set in five yearly periods from 2001 to 2030, and include figures for total numbers of new dwellings (Figure 4) and their locations across the city (Figure 5). The preferred locations described in the *Knox Housing Statement 2005* (Greenfield Sites, Activity Centres, Strategic Redevelopment Sites and along the PPTN, and Dispersed Development including the Dandenong Foothills) have been refined and replaced in the Knox Housing Strategy 2015 with the four housing policy areas (Activity Areas, Local Living, Knox Neighbourhood, and Bush Suburban). New dwelling approvals are compared against the current Housing Policy Areas in Table 2: Number of net new dwellings by typology and policy area as defined in the Knox Housing StrategyTable 2, but they are also compared against the previous location categories to show changes over time.

### Current Snapshot

Key Statistics
704 new dwellings possible from 2016 approvals is 126% of the aspirational target for Knox
317 new dwellings possible in Activity Areas is 84% of the estimated target for these areas
24 new dwellings possible in Strategic Sites and the PPTN is 24% of the estimated target
363 new dwellings possible in Dispersed Areas is 478% of the estimated target for these areas

### Analysis

The overall new dwelling target for 2016-2020 is higher than the previous five-year period, reflecting an expectation of greater demand for housing over the next five years. While the number of net new dwellings approved in 2017 is lower than in three of the past four years, it still is above the aspirational target needed to meet estimated demand (see Figure 4). This decline in dwelling approvals is a departure from recent trends, but it is not yet clear whether this change represents a new trend in development activity or a temporary change.

The most relevant assessment of where new dwellings are being approved is the comparison to current Housing Policy Areas as defined in the *Knox Housing Strategy 2015* (Table 2). However it is useful to consider distribution of new dwelling approvals by the previous location definitions as well. The 2016 data shows that the percentage of dwellings approved in Activity Centres remains high, which is consistent with past and current policy. But the 2016 data also reveals more dwelling approvals in dispersed areas than is desirable.

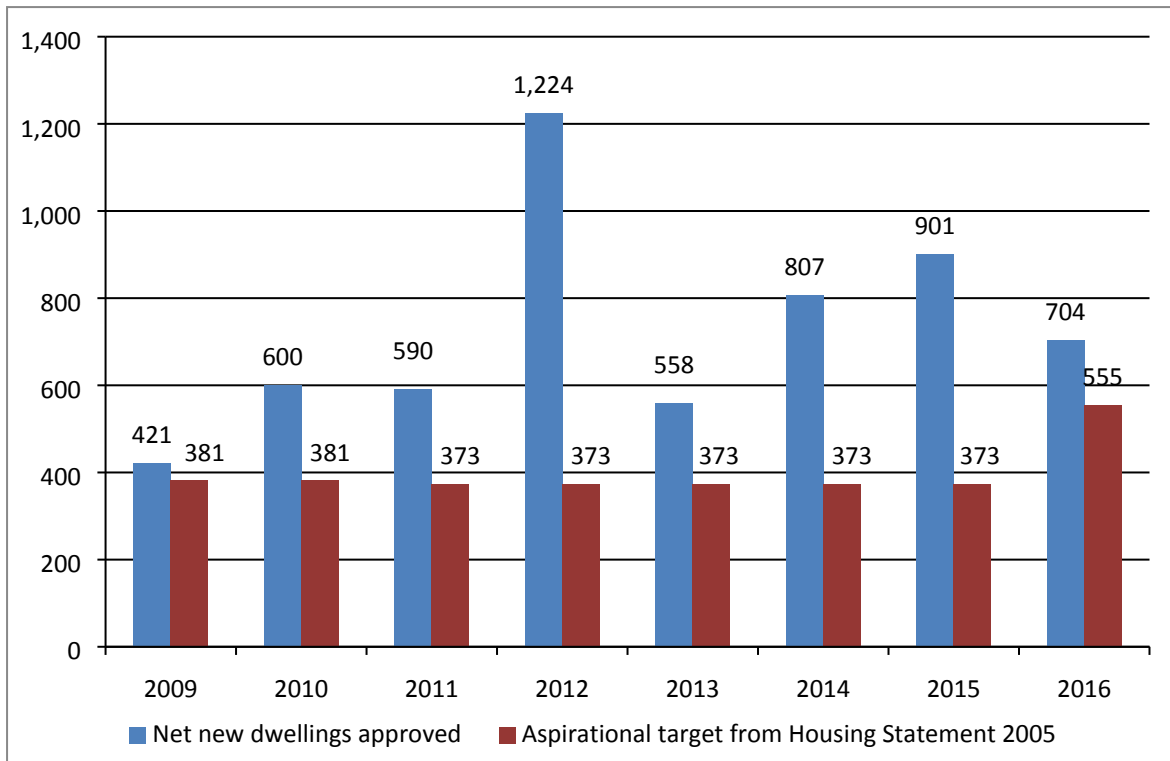


Figure 4: Number of net new dwellings from approvals and aspirational targets, 2009-2016

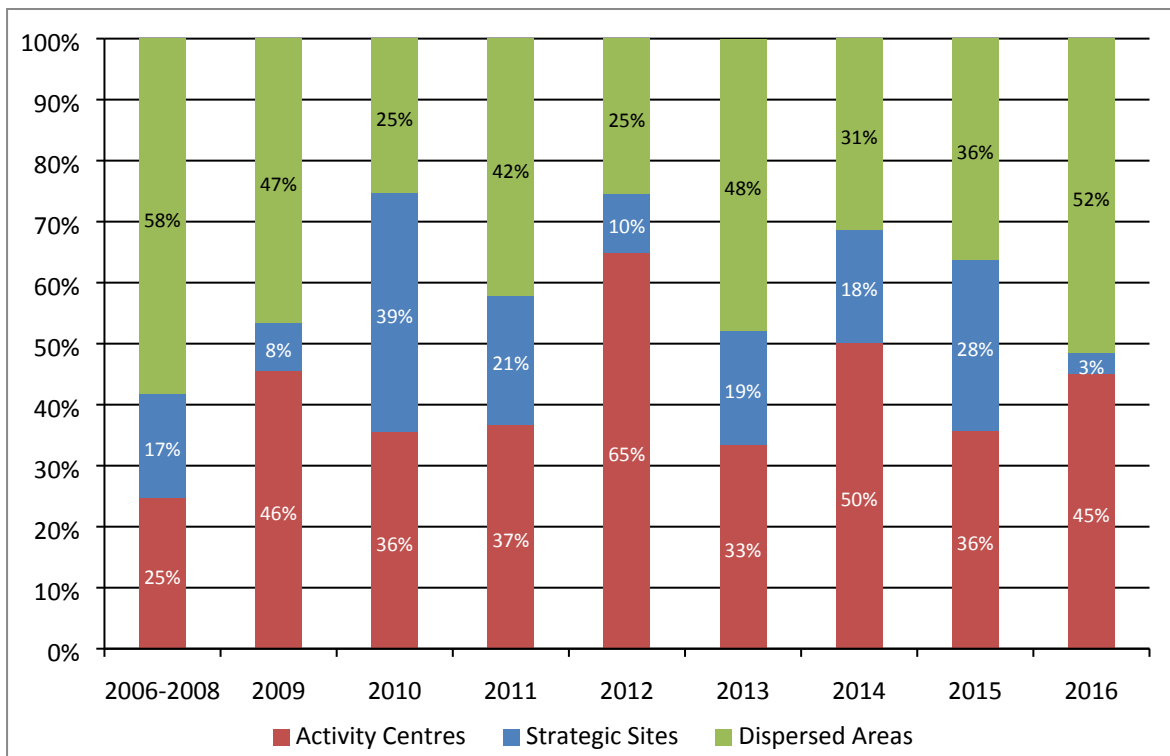


Figure 5: Percentage of net new dwellings approved by location category, 2006-2016

## Alignment with Housing Policy Areas

The map and table on Page 19 of the *Knox Housing Strategy 2015* defines a scaled approach to delivering future housing in Knox. The residential areas of the city are divided into four policy areas, each with its own set of preferred housing types. Approvals for denser development like apartments and townhouses should be concentrated in Local Living and Activity Areas, while those for single houses and dual occupancies should fall mainly in Knox Neighbourhood and Bush Suburban Areas.

It is worth noting here that these typology definitions and areas of preferred development are broad policy guides only. The true determination of whether or not a development is “appropriate” is made according to the detailed controls in the planning scheme. The comparison below illustrates how well the outcomes delivered by the specific planning controls match the policy intent of the Knox Housing Strategy.

### Current Snapshot

Key Statistics
68.2% of new approvals were for dwelling types consistent with their Housing Policy Area
29.4% of new approvals could be considered overdevelopment for their Housing Policy Area
2.4% of new approvals could be considered underdevelopment for their Housing Policy Area
50% of dwelling approvals were in higher-density areas: Local Living, Activity Areas, Commercial

### Analysis

The figures in Table 2 suggest that the Knox Housing Strategy is mostly succeeding in delivering appropriate development in the lowest-density areas (Outside the Urban Growth Boundary) and the highest-density areas (Activity Areas and Commercial Areas). However, there was some development classified as “not preferred,” based on the Housing Strategy, which is worth considering here.

Most of the approvals classified as “overdevelopment” in the table below are borderline cases, including villa unit developments in Bush Suburban Areas and townhouse developments on large lots in Knox Neighbourhood areas. Where these lots are large enough, they may still deliver outcomes related to open space and vegetation that these policy areas are set up to deliver. However, there were 18 townhouse developments approved on small lots in Knox Neighbourhood areas and seven apartment buildings approved in Local Living areas. These cases make up about 9% of applications and about 16% of approved dwellings overall.

Some of this activity may diminish over time, as the new Housing Strategy and Residential Zones become more engrained in the development and assessment process. However, these results suggest that there may also be improvements to the planning controls or assessment and decision-making process that could reduce these cases in the future.

**Table 2: Number of net new dwellings by typology and policy area as defined in the Knox Housing Strategy**

DWELLINGS		TOTAL	Detached Dwellings	Dual Occupancy	Villa Units	Townhouses	Apartments / Mixed Use
Outside UGB	ALL LOTS	15	15	0	0	0	0
Bush Suburban	ALL LOTS	54	24	13	17	0	0
Knox Neighbourhood	SMALL LOTS	172	7	60	43	62	0
Knox Neighbourhood	LARGE LOTS	111	6	42	26	37	0
Local Living	ALL LOTS	233	0	2	10	173	48
Activity Areas	ALL LOTS	65	0	1	0	20	44
Commercial Areas	ALL LOTS	54	0	0	0	10	44

**Table 3: Classification of planning approvals based on preferred typologies in the Knox Housing Strategy**

	Underdevelopment (Permissible)	Preferred Typology	Overdevelopment (Not Preferred)
Outside UGB	*	100%	0%
Bush Suburban	*	69%	31%
Knox Neighbourhood (Lots under 1,000 sqm)	*	61%	39%
Knox Neighbourhood (Lots over 1,000 sqm)	5%	61%	33%
Local Living	0%	79%	21%
Activity Areas	2%	98%	**
Commercial Areas	0%	100%	**
<b>Overall</b>	<b>2%</b>	<b>68%</b>	<b>29%</b>

\*Underdevelopment not possible in these areas as lower-density typologies are preferred

\*\*Overdevelopment not possible in these areas as higher-density typologies are preferred

## Dwelling Typology

One of the key aims of the Housing Strategy is to help address the growing imbalance between the type of dwellings available and the type of dwellings that are likely to be needed in the future. While the number and share of small households (two people or fewer) continues to increase, most of the housing stock across Knox remains large single-family homes.

There is a general trend toward denser housing types across metropolitan Melbourne, particularly in the inner suburbs but also near activity centres in the outer eastern region. Apartments and townhouses are increasingly attractive to younger and older residents in particular seeking out lower-cost and lower-maintenance housing options. For some this represents a conscious choice to lower their carbon footprint or trade time and money on maintaining a garden for spending in other areas. And for others it is a practical matter of affordability.

The Knox Housing Strategy seeks to encourage denser forms of development in appropriate areas, including townhouses in Local Living areas and new apartments in Activity Areas and Commercial Areas, in order to provide more choice for residents seeking alternatives to large houses.

### Current Snapshot

Key Statistic
62% of net new dwelling approved in 2016 were townhouses or apartment units

### Analysis

For the second year in a row, more townhouse dwellings were approved than any other type, and by almost a two-to-one margin. While most of these townhouse approvals were in the five activity centres, there were over 110 new townhouse units approved in dispersed areas. This continuing trend toward townhouses may represent continued demand for smaller products. Overall these figures represent a continuing diversification of the local housing market, albeit at very slow growth rates.

There were relatively few apartments approved in 2016, with only 157 total units from 13 approvals. Most of these were small-scale developments, with one 33-unit development in Boronia and only two other developments of more than 20 dwellings. This may represent a market where many of the easy apartment sites have already received permits, with a continuing cooling-off period following the large number of apartments approved in 2012. In addition, there is anecdotal evidence that developers that were previously interested in small-scale apartment buildings of 10-20 units may be shifting to townhouses that allow them to sell fewer dwellings at similar overall profit levels and less risk, without the additional design requirements and issues related to body corporates for apartments.

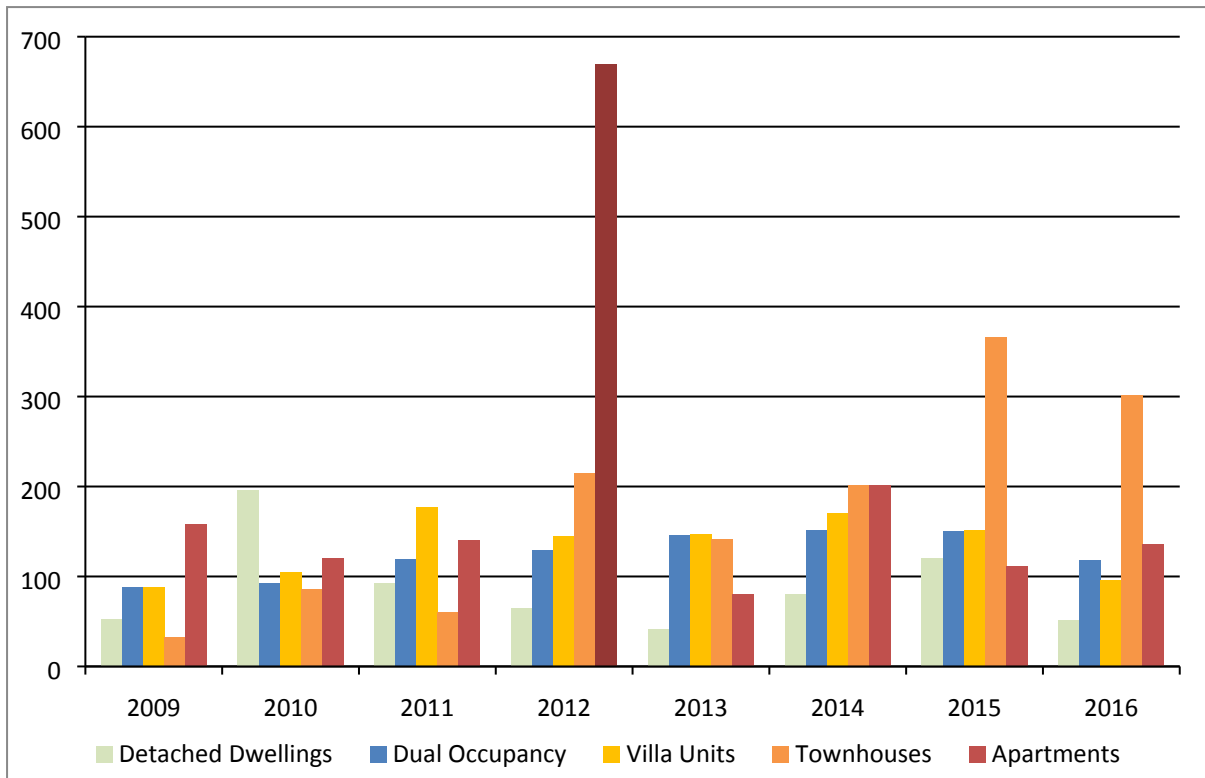
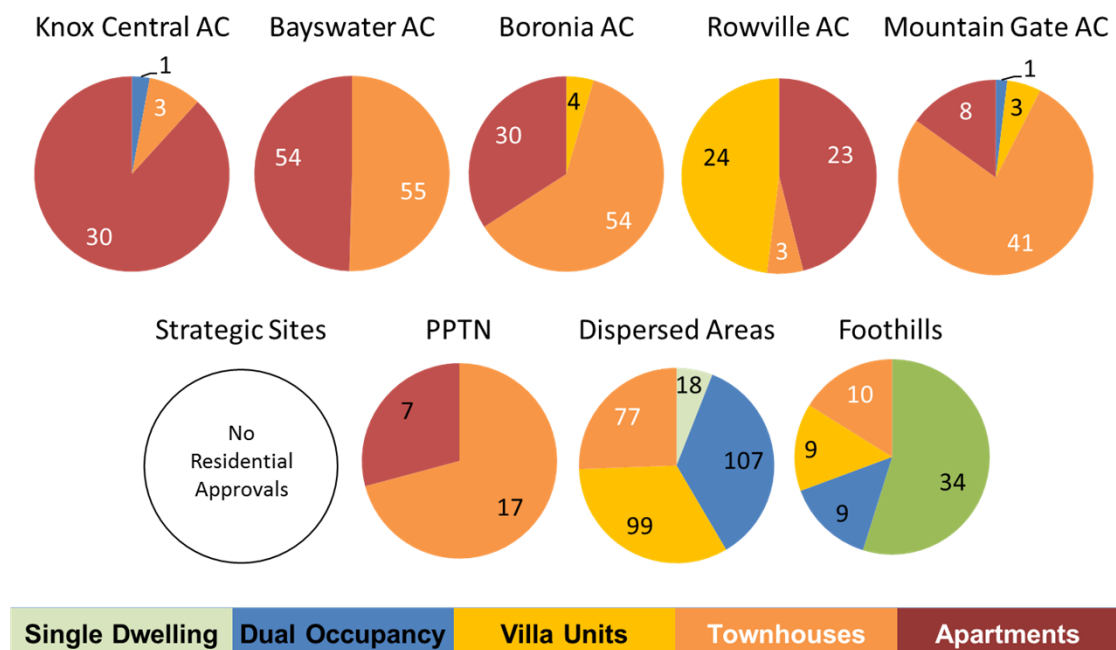


Figure 6: Number of net new dwellings approved by dwelling typology, 2016

## Typology by Location 2016



NOTE: Numbers on chart indicate net new dwellings for each typology

Figure 7: Mix of dwelling typologies across different location categories, 2016

## Dwelling Size

Knox will need more small dwellings in the future to accommodate an increasing number of smaller households. This is particularly important in the context of increasing housing prices and decreasing affordability, as larger detached houses are becoming increasingly out of reach for a large percentage of new homebuyers. Smaller dwellings tend to be less expensive to buy and maintain, which provides more choices for young people looking to enter the housing market, ageing residents looking to downsize, and anyone else looking to reduce their cost of living.

### Current Snapshot

Key Statistic
37% of net new dwellings approved in 2016 were for smaller dwellings (2 bedrooms or less)
67% of approvals in higher density areas were for smaller dwellings (2 bedrooms or less)
91% of approvals in lower density areas were for larger dwellings (3 bedrooms or more)

### Analysis

Only 37% of net new dwellings approved in 2016 had two bedrooms or less. This is up from 29% in 2015, but is still less than every other year since the Housing Monitoring Program began in 2008. Since the overall growth rate of Knox is relatively low, smaller dwellings may need to represent a greater percentage of new approvals in future years to keep up with the growth rate of smaller households.

While the overall percentage of new smaller dwellings is low, those that are being approved are in higher-density areas of Local Living, Activity Areas, and Commercial Areas where they are preferred by the *Knox Housing Strategy*. This suggests that continuing to direct a greater share of new development to Activity Centres could also help deliver more small dwellings in the future.

**Table 4: Percentage of smaller and larger dwellings approved by Housing Policy Area, 2016**

	Smaller Dwellings (2 BR or less)	Larger Dwellings (3 BR or more)
Outside the UGB	0%	<b>100%</b>
Bush Suburban	3%	<b>97%</b>
Knox Neighbourhood	10%	<b>90%</b>
Local Living	<b>63%</b>	21%
Activity Areas	<b>69%</b>	31%
Commercial Areas	<b>84%</b>	16%
<b>Overall</b>	<b>37%</b>	<b>64%</b>

Table 5: Number of net new dwellings by size and typology as defined in the Knox Housing Strategy

RESIDENTIAL AREA TYPES	TOTAL NEW DWELLINGS POSSIBLE	1 BR	2 BR	3 BR	4 BR	5 BR	6 BR
Outside the Urban Growth Boundary	14	0	0	1	13	0	1
Bush Suburban	68	0	2	24	41	1	0
Knox Neighbourhood	370	0	37	207	126	0	0
Local Living	280	6	171	89	14	0	0
Activity Areas	78	11	43	14	10	0	0
Commercial Areas	56	0	47	9	0	0	0

☐ PREFERRED HOUSING SIZE (NUMBER OF BEDROOMS)

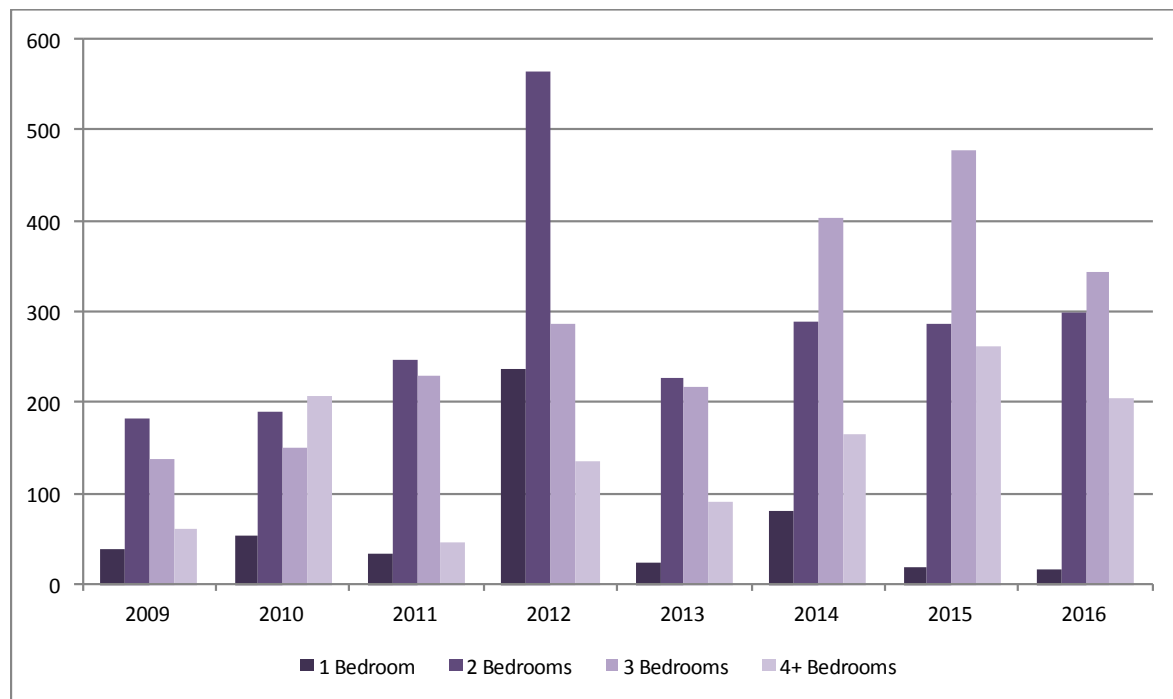


Figure 8: Number of net new dwellings approved by dwelling size (number of bedrooms), 2009-2016



## Rental Options

While owning a home is an aspiration for many households, rental housing provides serves several important functions in the local housing market. Rental housing provides flexibility and affordability for people looking to enter the local market, including first-time homebuyers and new residents looking to establish to the area. It provides an important option for people with changing life circumstances who would like to stay in the area, including young families looking to upsize and older residents looking to downsize. And it can even serve as a safety net to help people experiencing hardship maintain local ties to their community. The Knox Housing Strategy seeks to increase rental options by encouraging smaller dwellings and apartments in appropriate areas.

### Current Snapshot

Key Statistic
19.7% of Knox households rented their homes in 2016, compared to 30% of Greater Melbourne
4.6% of rental housing available in Knox was affordable for families in receipt of Centrelink in 2011

### Analysis

Between 1996 and 2011, the number of households renting in Knox increased from 6,478 (15%) to 9,150 (17%). However rental options are not distributed evenly across Knox. Bayswater and Boronia together make up 24% of Knox's households but are home to 34% of renters. These two denser suburbs have seen a number of new apartment developments in the last few years that have helped add rental options. At the same time, Rowville (12.6%), The Basin (11.1%), and Lysterfield (6.9%) were all underserved by rental options as of 2011.

The availability of affordable private rental housing has declined from 4.9% in 2011 to 4.6% of rental stock in 2016. However these figures are down from levels between 45% and 50% 10-15 years ago. While the most recent statistics on housing tenure from the ABS are from 2011, the 2016 figures will be released later this year and included in future Housing Monitoring Program reports.

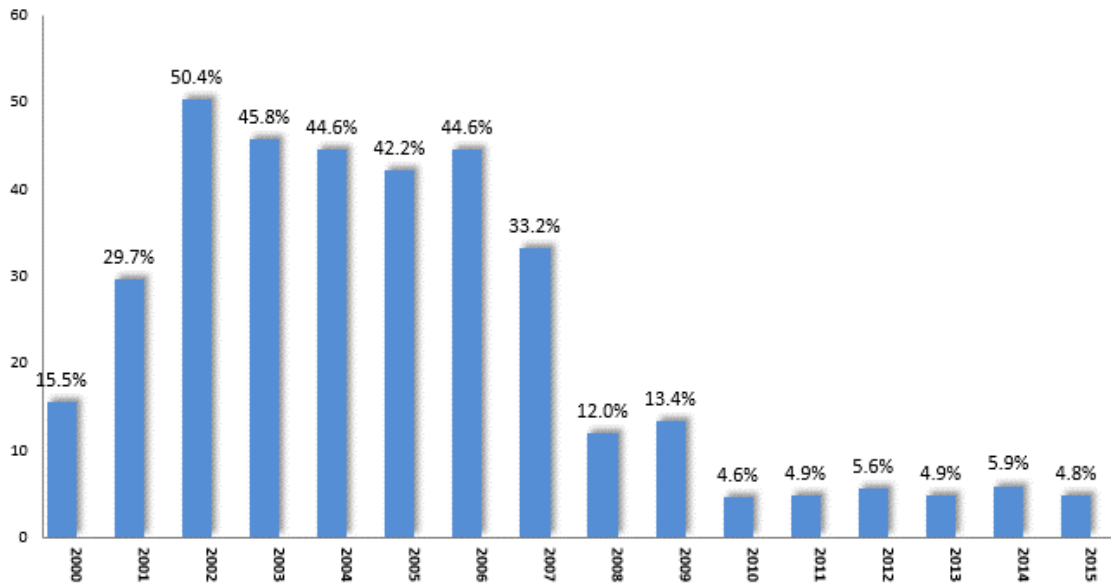


Figure 9: Percentage of private rentals in Knox considered affordable, 2000-2015

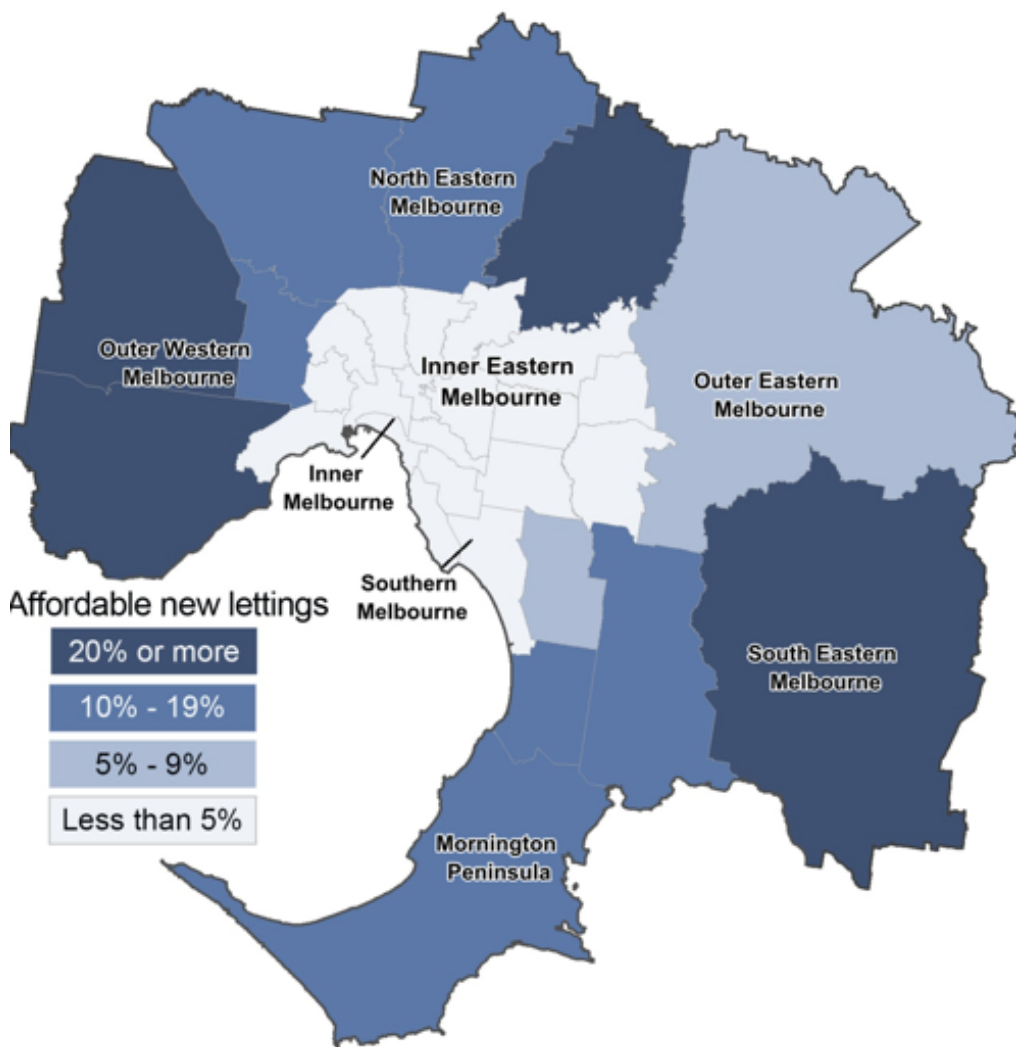


Figure 10: Affordable private rentals (December quarter, 2016)

## Housing Affordability

Housing represents the largest share of household budgets, so housing affordability is a major determinant of both the cost of living and the standard of living.

Housing affordability can be expressed more generally as a multiple of household incomes – how many median household incomes are needed to buy a median priced house in an area? This is a simple means of exploring shifts in housing affordability by relating change in house prices to change in people’s income. Higher median multiple incomes represent less affordable housing markets, with 3 median multiple incomes broadly defining the outer bounds of affordability<sup>10</sup>.

Housing affordability can also be framed in terms of ‘housing stress’ usually in relation to lower income households (lowest 40% of the income distribution nationally) where housing costs (mortgage or rent) exceed 30% of household income. Focus is on this cohort since housing stress is most likely to have major effect on lower income households. In this case, lower rates of housing stress are indicative of better housing affordability.

### Current Snapshot

Key Statistics
A typical home-buying household in Knox needed 8 times its annual income to purchase a median-price home in 2016
10.8% of mortgaged households in Knox (2,500) were experiencing ‘mortgage stress’ in 2011
24.4% of rented households in Knox (2,200) were experiencing ‘rental stress’ in 2011
9% of all households (4,700) were in financial stress from either mortgage or rental costs in 2011
28.7% of all low-income households in Knox (4,700) were experiencing ‘housing stress’ in 2011

### Analysis

US-based research firm Demographia publishes a series of annual reports that compare housing affordability across the world. One measure these reports use is “median multiple incomes,” which compares local housing prices with local income levels. Areas where median housing prices are less than three times median incomes are considered ‘affordable’ by this measure. The number of median multiple incomes needed to purchase a median price home in Knox has steadily increased from 5.2 in 2006, to 6.5 in 2011, to 8.0 in 2016, rating Knox as ‘severely unaffordable’ by this measure.

Whilst rates of mortgage and rental stress were slightly below metropolitan averages (2011), this varies across the municipality with highest rates of housing stress overall (mortgage and rent) in Bayswater and Boronia. Knox’s relatively large household base results in a significant number of stressed households (4,600) overall. Nearly 30% of all lower income households in Knox, were experiencing financial stress from either mortgage or rent in 2011. Data on mortgage and rental stress will be updated with pending release of further 2016 Census data.

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<sup>10</sup> Methodology taken from annual Demographia International Housing Survey

Figure 11: Percentage of households experiencing mortgage stress in Knox's suburbs, 2011

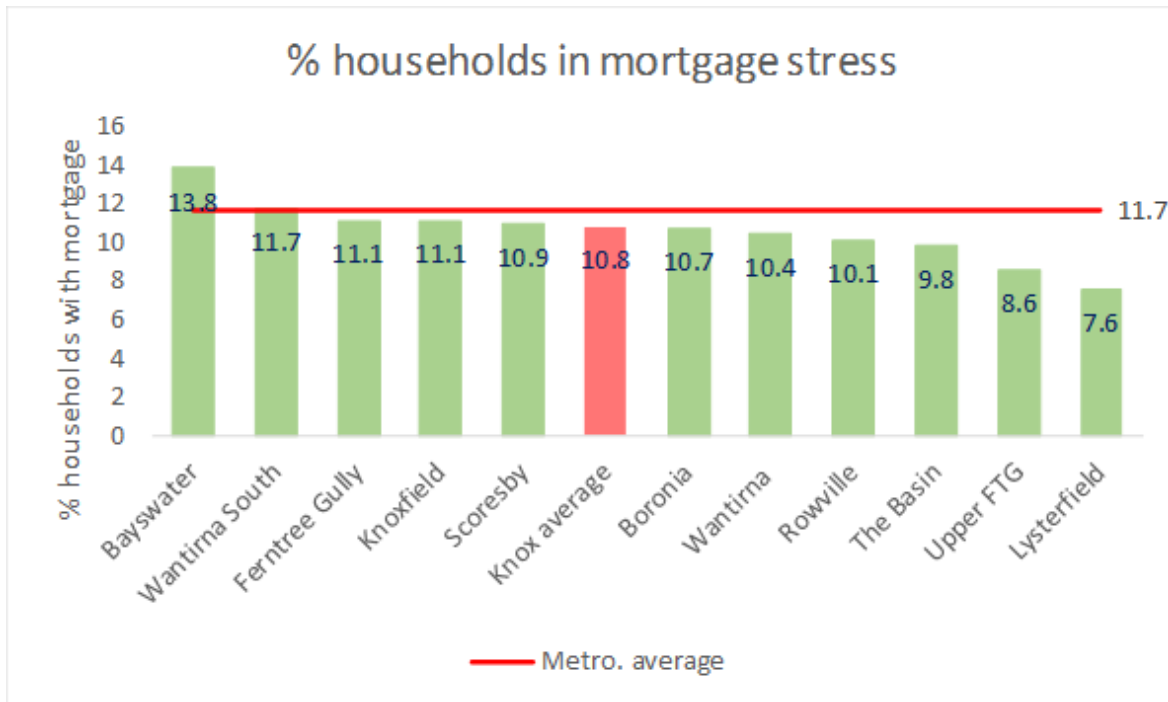
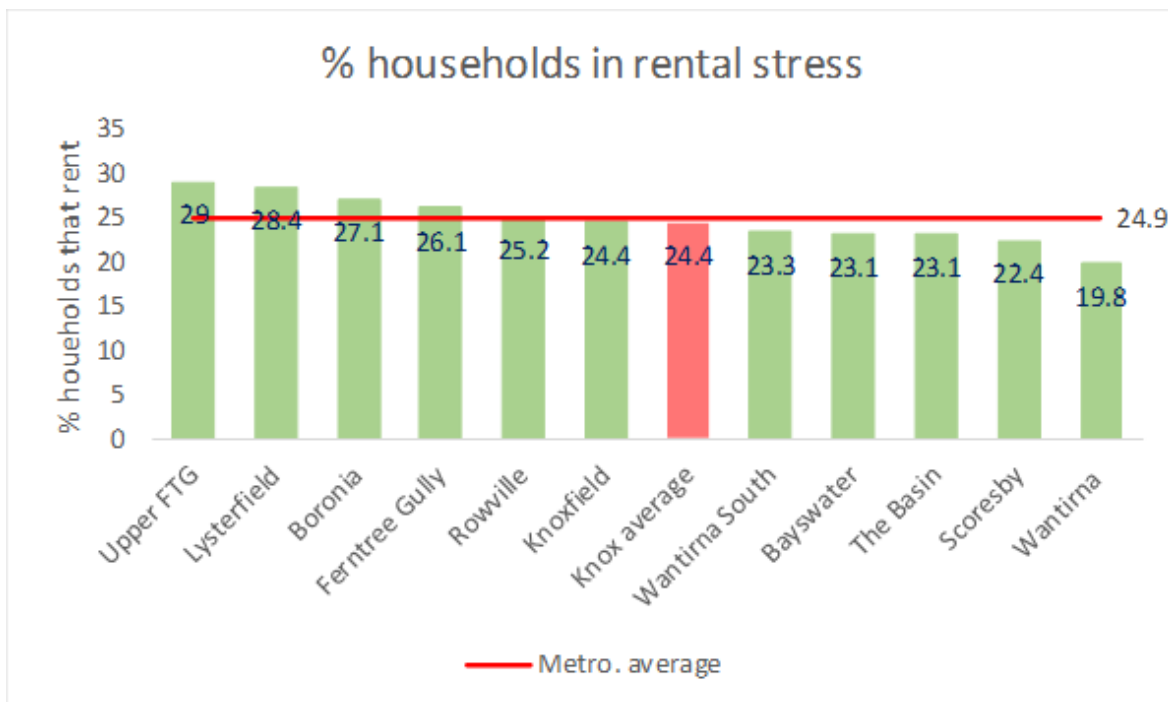


Figure 12: Percentage of households experiencing rental stress in Knox's suburbs, 2011



## Social Housing

It is the policy of Knox City council that shelter is a basic human right, as enshrined in international covenants and treaties<sup>11</sup>. Social housing, in the form of community housing and public housing, plays an important role for providing shelter for those most in need. The *Knox Affordable Housing Action Plan*, first developed in 2007 and renewed in 2015, was developed to help increase the supply of social housing in Knox. Council has estimated that an additional 860 social housing dwellings will be needed in Knox by 2036 to accommodate forecasted demand<sup>12</sup>.

### Current Snapshot

#### Key Statistic

No new social housing developments were built in 2016, for the third consecutive year.

### Analysis

For the third year in a row, there were no social housing developments built in Knox in 2016. However, there were two sites where requirements to deliver social housing as part of any future development were included in the planning scheme, Stamford Park in Rowville and Jenkins Orchard in Wantirna South.

- **Jenkins Orchard in Wantirna** – This site was rezoned for a mix of residential and commercial development in December 2015. The Development Plan Overlay approved for the site requires a future agreement to contribute land to accommodate 5% of future dwellings as social Housing.
- **Stamford Park Residential Estate in Rowville**– This former Council land was rezoned in 2016 and recently sold for the purpose of redevelopment as a sustainable residential precinct. The contract of sale required the inclusion of 5% of the new dwellings within the future residential estate to be social housing. A Development Plan has been approved and construction has commenced, though no agreements for the delivery of social housing on site have yet been finalised.

In addition, Council has been reviewing a rezoning and redevelopment proposal for the **Kingston Links Golf Course in Rowville**, which includes a proposal to deliver new social housing on site.

Another Strategic Investigation Sites is in the early stages of development feasibility studies. It is Council's intention to advocate for contributions related to social housing in future coordination related to possible redevelopment of the Norvel Road Quarry in Ferntree Gully.

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<sup>11</sup> International Covenant on Civil and Political Rights, International Covenant on Economic, Social and Cultural Rights, Convention on the Rights of the Child etc.

<sup>12</sup> Knox City Council, *Defining Affordable Housing and a Minimum Supply of Social Housing for Knox*, 2011.

## Walkability

Knox@50 was a large-scale community engagement project run by Knox Council in 2012, which was a key input into both the *Knox City Plan 2013-2017* and *Knox Housing Strategy 2015*. One of the main themes that emerged in conversations with residents, businesses, community groups, and other stakeholders was as desire for convenient access to services for day-to-day needs. This idea of ‘living locally’ aligns with the state government’s framework of Activity Centres as well as the scaled approach to housing in the *Knox Housing Strategy 2015*.

Walkscore is an index developed to estimate the ‘walkability’ of a place that has informed public policy and the real estate industry in the US, UK, Canada, and Australia. It examines the proximity of local shops, services, schools, entertainment, and jobs to develop a walkability score on a scale from 1 to 100. Areas that score under 50 are classed as “Car Dependent” while places that score over 90 are deemed a “Walker’s Paradise.” The Walkscore website is searchable by individual address and provides scores for entire neighbourhoods and suburbs.

The Housing Monitoring Program looks at individual Walkscores for each planning permit approved in 2016, as well as how they stack up against the average for their suburb. High Walkscores are considered desirable, but so are new developments that are in the more walkable parts of Knox.

### Current Snapshot

Key Statistics
48% of net new dwellings approved are classified as “Very Walkable” or “Walker’s Paradise”
65% of net new dwellings approved had a higher than average Walkscore for their suburb

### Analysis

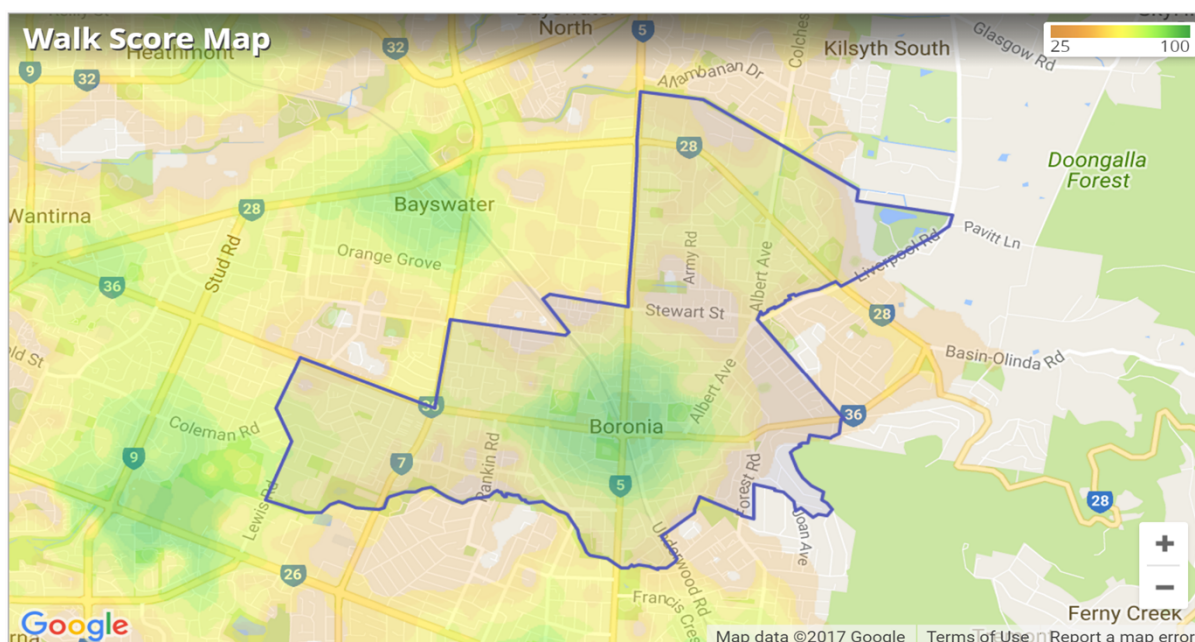
Although the activity centres of Bayswater, Boronia, and Ferntree Gully grew up around train stations and main streets lined with shops, much of Knox was built out during the 1970s, 1980s, and 1990s when suburbs were being designed for cars and driving. Much of Rowville, Lysterfield, and the upper Dandenong Foothills in particular are classified as “Car Dependent” overall by Walkscore.

Just under half of net new dwellings approved in 2016 were in areas with Walkscores of 70 or above, and nearly two-thirds were in areas that were considered more walkable than the average score for their suburb. This suggests that there is indeed a market for walkable neighbourhoods in Knox, and the *Knox Housing Strategy 2015* may be helping to deliver new development to those areas. For example, Rowville has an average Walkscore of 47, which is classified as “Car Dependent.” However, 86% of the net new dwellings approved this year in Rowville had a Walkscore greater than 47, suggesting that most approvals in Rowville are occurring in the most walkable parts of the suburb.

Overall there is still room for improvement in delivering on the goal of ‘local living,’ as 22% of net new dwellings were approved in areas of Knox considered “Car Dependent.”

**Table 6: Percentage of net new dwellings whose Walkscore is above the average Walkscore for the suburb**

Suburb	Suburb Average Walkscore	% of Net New Dwellings whose Walkscore is above the Suburb Average
Rowville	47	86%
Bayswater	61	84%
Ferntree Gully	56	75%
Wantirna	63	58%
Wantirna South	57	58%
Boronia	61	57%
Knoxfield	57	43%
Scoresby	59	40%
Upper Ferntree Gully	48	25%
The Basin	44	0%
Lysterfield	30	0%
<b>Overall</b>		<b>65%</b>



**Figure 13: Example Walkscore ‘heat map’ of Boronia and surrounding areas, 2016<sup>13</sup> (walkscore.com)**

<sup>13</sup> Walkscore, <https://www.walkscore.com/AU-VIC/Melbourne/Boronia>, accessed January 2017.

## Alignment with VCAT Decisions

Planning applications that are decided by Council can be appealed to VCAT, which hears the case and makes a final ruling on whether or not to issue a permit. These might be land owners appealing Council's refusal of a permit, neighbours objecting to Council's approval of a permit, or either party seeking variations to the original permit conditions. When making this determination, VCAT can only consider the text of the Knox Planning Scheme. The number of cases that go to VCAT and the percentage of decisions that are overturned are a good indicator of the degree of consistency between Council policy, the Knox Planning Scheme, and Council decision-making process.

### Current Snapshot

Key Statistics
24 planning applications related to new dwellings were referred to VCAT in 2016
67% of the Council refusals that went to VCAT resulted in a permit being granted (overturned)
100% of the Council approvals that went to VCAT resulted in a permit being granted (upheld)

### Analysis

The 24 residential planning applications referred to VCAT in 2016 was similar to the 26 applications that were referred to VCAT in 2015 and the 19 referrals in 2014.

There were 21 VCAT referrals for planning applications that were initially refused by Council Officers under delegation in 2016. This type of refusal is often the result of an appeal by the applicant (the developer). VCAT set aside the Council decision in 14 of these cases (67%), approving permits for a total of 78 new dwellings. This included a six-storey mixed use building with 33 dwellings at 16 Station Street, Bayswater. The rate at which Council refusals were overturned at VCAT is similar to that of previous years: 61% in 2015 and 55% in 2014.

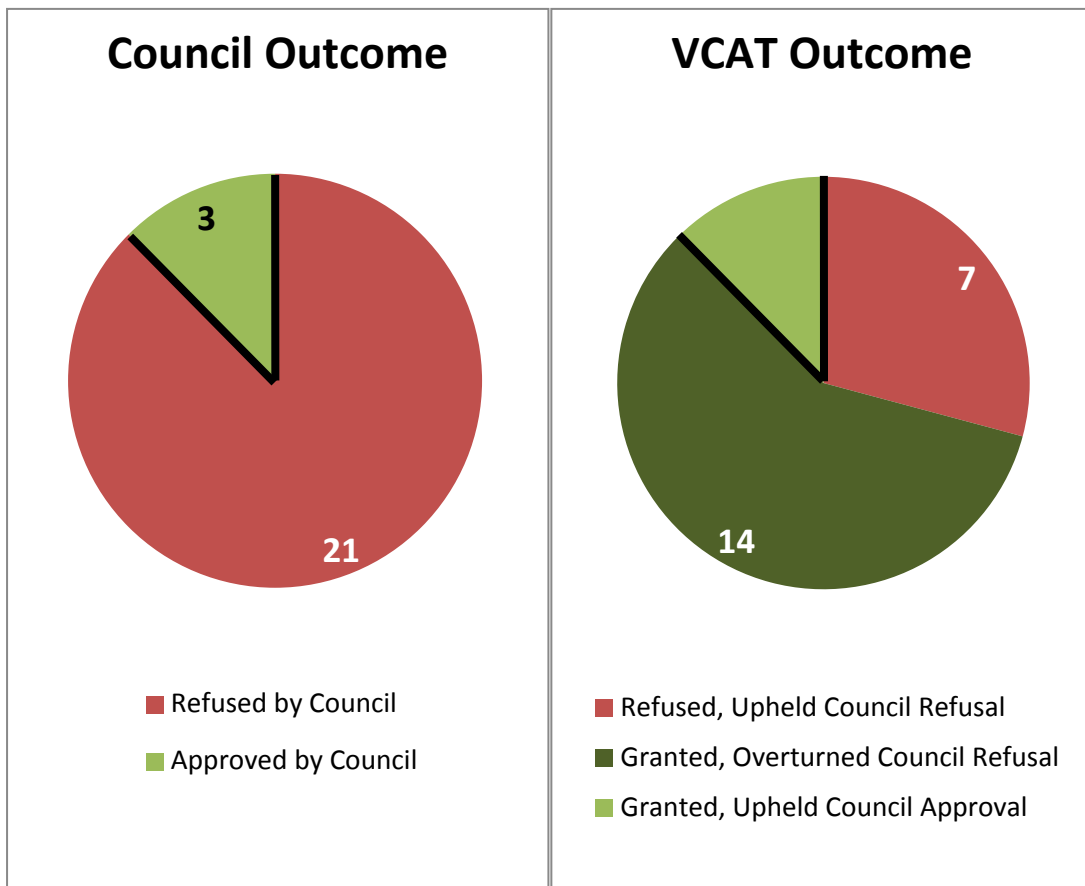
There were also three VCAT referrals for applications that were initially given a Notice of Decision to issue a permit by Council or Council officers through delegation in 2016. This type of referral is often the result of an appeal by neighbouring residents or other stakeholders opposed to a proposed development. VCAT affirmed the Council decision in all three of these cases (100%), upholding permits for a total of 11 new dwellings. This included a three-storey apartment building with 10 dwellings at 1 Jackson Road, Wantirna South. The rate at which Council approvals were upheld at VCAT is similar to that of previous years: 100% in both 2015 and 2014.

These figures suggest that the shift in housing policy from the previous *Knox Housing Statement 2005* to the *Knox Housing Strategy 2015* has not yet resulted in a noticeable change in the number or results of VCAT referrals. This may be due to the fact that many of the planning applications decided in 2016 were developed or filed before the *Knox Housing Strategy 2015* took effect in the Planning Scheme in March 2016. It will be important to track whether there is a noticeable change in VCAT referrals once the *Knox Housing Strategy 2016* has been in effect for a few years.



*Table 7: Outcomes of Planning Applications Referred to VCAT, 2016*

VCAT Outcome	Number of 2016 VCAT Cases	Percentage of 2016 VCAT Cases
VCAT Upheld Council Refusal, No Permit Issued	7	29%
VCAT Upheld Council Approval, Permit Granted	3	13%
VCAT Overturned Council Refusal, Permit Granted	14	58%



*Figure 14: Summary of Planning Applications Referred to VCAT in 2016*

## Integrated Place-Based Plans

The previous State Government Planning framework *Melbourne 2030* set up an approach to planning across the metropolitan area that focused on ‘activity centres,’ areas with good access a wide range of shopping, schools, open space, and community facilities. The current Victorian Planning framework document *Plan Melbourne* continues this focus on activity centres through its emphasis on ‘20-minute cities.’ Knox Council has developed a series of ‘structure plans’ and other strategic plans that have supported place-specific planning controls and rezoning and provide guidance for decisions on infrastructure and community services. These documents are developed with extensive community consultation and stakeholder input to help identify aspirations and give guidance balance competing priorities for future decisions by Council, residents, businesses and community organisations.

### Current Snapshot

Knox Activity Centres	Strategy Document	Status	Implementation Plan	Current Stage
<b>Knox Central</b>	Knox Central Structure Plan	Draft Under Consideration	Draft Under Development	Plan Development
<b>Bayswater</b>	Bayswater Activity Centre Structure Plan: “Bayswater 2020”	Adopted 2005	Yes	Implementation
<b>Boronia</b>	Boronia Structure Plan: “Your Life, Your Place, Our Future”	Adopted 2006, Amended 2012	Yes	Review Commencing 2017-2018
<b>Rowville</b>	Rowville Plan 2015: “Rowville: NEXT”	Adopted 2015	Draft	Implementation
<b>Ferntree Gully Village</b>	Ferntree Gully Village Structure Plan: “The Future of our Village”	Adopted 2014	Yes	Implementation
<b>Upper Ferntree Gully</b>	Upper Gully Strategic Plan: “A Bright Future for Upper Gully”	Adopted 2016	Yes	Implementation

### 2016 Activity

Knox Council progressed two important strategic documents and related planning controls in 2016:

- **Knox Central** – the Knox Central Structure Plan is currently under development. This documents sets directions for the large precinct that includes the Westfield Shopping Centre, Knox Civic Centre, Lewis Reserve, and the highest levels of residential density in Knox.
- **Upper Ferntree Gully** – the Upper Gully Strategic Plan was adopted by Council in 2016, providing guidance for the area that includes height controls for commercial areas that seek to preserve views to the Dandenong Ranges while enabling future development of commercial areas.

## 6. Future Program Development

The Housing Monitoring Report will continue to be published annually as the program is further refined to align with the *Knox Housing Strategy 2015* as well as the *Knox Community and Council Plan* and *State of Knox Report*. The future indicators mentioned in this report and others will be developed and refined as new data sources become available and are integrated into the monitoring program.

In addition to the main report, Council is developing a 'Housing Scorecard' to present some of the key insights in a format that can be distributed widely and shared easily. The scorecard is being designed to be visually engaging and easily understood by a wide range of audiences, from Councillors and policy makers to developers and Knox residents. This may be in the form of printed document, an interactive website, or a combination of formats. The shape and content of the Housing Scorecard will be tested with key stakeholders and is expected to evolve along with the main Housing Monitoring Report to reflect key issues and housing priorities from year to year.

The following is a list of potential future indicators that are under development as part of the Knox Housing Monitoring and Review Program. These indicators seek to introduce new data sources, including new

### Residential Construction Activity

One of the longstanding goals of the Knox Housing Monitoring Program has been to monitor new building construction in addition to new planning permit approvals. Planning permits are important milestones in the process of delivering new housing, and can provide important information about the type, size, and location of future housing in Knox. Residential planning permits are valid for two years and can be extended to four. But the decision to build under a permit is completely up to the landowner and developer, and is subject to market forces beyond the control of Council and the local planning scheme. This means that not all planning permits result in new housing. Looking at planning approvals tells us what might be built, not what has been built or even what is likely to be built.

The State Government of Victoria has been developing information about new constructions in the Housing Development Data (HDD) program that is helping to close that gap. The HDD uses automated analysis of aerial photography to determine where new construction and demolitions of existing housing is happening across the Melbourne metropolitan area. So far, the HDD includes data from 2004-2014, with additional years of analysis under development now. While it is not as up to date as planning approvals, Knox Council has compared HDD data with recent planning approvals data to learn more about which permits are likely to lead to new construction and which are more likely to be speculative in nature.

This examination is ongoing, but early analysis indicates that from 2008-2014 roughly 75% of planning permits led to new construction within the four-year permit window. If that percentage holds for permits issued in 2016, the 704 possible new dwellings would lead to 528 new dwellings – just under the aspirational target of 555 from *Melbourne 2030*. This is an area of analysis that will continue to be developed as part of the Housing Monitoring Program as more HDD estimates become available.

## Residential Aged Care Facilities

Demographic factors and increases in life expectancy have led to increasing numbers of older residents in Knox recently, a trend which is expected to continue over the next few decades. This population has different housing and health care needs from the rest of the population, and Knox will need an increasingly diverse range of housing and care facilities to meet the needs these residents in the future. This ranges from smaller and more accessible dwellings to retirement villages and assisted living facilities to aged care facilities offering hospital-grade services for specific health care needs.

The sector is also undergoing rapid innovation in the areas of home-based care and mixed models of residential care that promise new ways to address the needs of a population that is ageing across the country. The Housing Monitoring Program is developing ways to measure the range of aged care offerings across the city to track changes over time that can help adjust policy for housing.

## Household Water and Energy Use, Household Waste and Carbon Emissions

Knox City Council uses the Sustainable Design Assessment in the Planning Process (SDAPP) developed by Victorian councils with the Municipal Association of Victoria (MAV) to provide “a streamlined and consistent methodology for requesting build environment sustainability outcomes through the planning process.”<sup>14</sup> The *Knox Planning Scheme* requires that proposed residential developments of three or more dwellings in Activity Areas and Local Living Areas submit an environmental sustainable design assessment (SDA) as part of the planning application process. This SDA must demonstrate “how a development includes design features to respond to issues such as energy use and peak energy demand, water use, stormwater and waste management, transport and responsible use of building materials.”<sup>15</sup>

In previous years, Council has used an interactive web-based tool based on the Sustainable Tools for Environmental Performance Strategy (STEPS) project developed by Moreland City Council. The STEPS tool results from individual applications in Knox were compiled in a report called *Environmentally Sustainable Design in the City Planning Department* produced for Council by Organica Engineering, which has been used as the basis for assessing water and carbon dioxide savings in previous versions of the *Knox Housing Monitoring Report*.

Knox Council is currently transitioning to a new SDA tool developed by the Municipal Association of Victoria (MAV) as a replacement STEPS and other SDA tools used by individual Councils. The Built Environment Sustainability Scorecard (BESS) assesses the energy and water efficiency, thermal comfort, and overall environmental sustainable performance of new buildings.<sup>16</sup> New indicators will be developed in future versions of the *Knox Housing Monitoring Report* to report on the estimates savings in water and energy use as well as estimated reductions in household waste and carbon emissions from new residential planning approvals.

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<sup>14</sup> Municipal Association of Victoria, [www.mav.asn.au/policy-services/planning-building/sustainable-buildings/](http://www.mav.asn.au/policy-services/planning-building/sustainable-buildings/), accessed July 2017.

<sup>15</sup> Knox City Council, *Knox Housing Strategy 2015*, page 41

<sup>16</sup> Municipal Association of Victoria, [bess.net.au/about/](http://bess.net.au/about/), Version 1.5.0, accessed July 2017.

## Tree Canopy Cover

One key outcome of the Knox@50 community engagement project from 2012 was a confirmation of the community's appreciation of Knox's natural character, with trees representing an important characteristic of the identity of local neighbourhoods. The state government's new residential zones provided an opportunity to create customised planning controls, and the *Knox Housing Strategy 2015* introduced new requirements for canopy trees into the planning scheme in 2016.

While Council maintains detailed records of street trees in its asset database, there has not been a way to measure tree cover in front and back gardens. Council is currently working with the state government to develop a new tool for measuring levels of tree cover across the entire city. This new tool uses aerial photography and automated analysis to classify Knox into areas of vegetation, trees, buildings, roads, and other open areas. This technology, known as 'remote sensing' will allow Knox to measure the amount of the city covered by trees for the first time.

Comparing how areas of tree cover changes from year to year will help identify areas where the city is losing trees as single houses are replaced by denser forms of development. It will also help measure the effectiveness of planning controls that require new trees to be planted along the street and in the back gardens of new residential development. Understanding where the controls are working and where they are not will help Council adjust its planning controls to ensure they deliver the right outcomes for the Knox community.

**Figure 15: Test images for Knox Tree Canopy Remote Sensing Tool, currently under development**



## Neighbourhood Character and Urban Design

Neighbourhood character is an important part of community identity in Knox and represented a strong theme represented the local community processes during the engagement for *Knox@50*, the *Knox Housing Strategy 2015*, and the *Knox Community and Council Plan 2017-2021*. Each of these engagement efforts highlighted a level of concern in some parts of Knox that changes the city is at risk of losing its identity due to rapid changes in the look and feel of neighbourhoods. The quality of urban design and the look and feel of streets are difficult to quantify, since they are aesthetic judgements that differ widely within every community. Not everyone has the same tastes and sensibilities. Where a new house with a modern design aesthetic maybe viewed as exciting and fresh by some people, while at the same time seeming undesirable and out of place and by others. Knox Council seeks out professional urban design advice for some large and important planning applications, but even the option of third-party experts is ultimately subjective.

One of the ways the Knox Housing Monitoring Program is exploring as a way to measure these issues related to identity and changes is to measure the perceptions and preferences related to neighbourhood character and urban design. The *Knox Community and Council Plan* was informed by a broad survey of community sentiment and focused engagement with residents and stakeholders to understand and unpack the range of opinions held by the community. Future surveys related to specific issues, such as housing and development, could help address questions about how people view the changes happening across Knox and help understand how well Council's housing policy is with community identity and perceptions.