

# Chapter 6



## **6.0 CONCLUSION - PLANNING FUTURE URBAN SETTLEMENT IN THE LOWER HUNTER: INSIGHTS FROM A FLOWS ANALYSIS**

### **6.1 INTRODUCTION**

Drawing on Amin and Thrift's (2002) conception of urban settlements as sites of networks and flows, this report focuses on understanding the urban development context of the lower Hunter through the lens of connections and flows. It approaches lower Hunter urban development as an interconnected set of origins, destinations and nodes of activity, providing a detailed analysis of the connections and flows that structure the urban and regional setting, providing differentially for its residents and businesses, and setting the context for future development. This concluding chapter synthesises the insights arising from this approach in reference to future urban development scenarios envisaged for the lower Hunter in the Lower Hunter Regional Strategy (LHRS) released in late 2006.

Section 6.2 provides a brief overview of the analysis developed in the previous chapters. It highlights the distinctively ordered patterns of connection, flow and circulation both within and external to the region.

Section 6.3 considers the future of urban settlement in the lower Hunter through a discussion of the LHRS which provides the blueprint for development in the lower Hunter to 2030. The section provides commentary on the urban development scenarios proposed in the LHRS framework both for new release areas and for each lower Hunter LGA in light of the insights generated by this report's analysis of the lower Hunter's extant patterns of flow and connection.

Section 6.4 reflects on the wider-scaled context of the lower Hunter's urban development related to the region's emergent polycentric structure and to the nature and positioning of the urban economy of Newcastle as the region's highest order urban centre.

Finally, section 6.5 concludes the report, highlighting the benefits of understanding the flows and connections through which regions are constructed and built.

## 6.2 KEY FINDINGS SUMMARY

*Chapter 2* analyses lower Hunter demography as a set of distinct communities connected to urbanisation trends and growth impulses, to NSW coastal development, and to the global city-region of Sydney. Recent and projected demographic trends strongly reflect national demographic shifts: continued yet slowing population growth, population aging, declining working age population driving higher dependency ratios, and shifts towards more numerous, smaller households. The Department of Planning (DoP) projections (2005), on which this chapter is based, suggest that existing trends are likely to intensify in the lower Hunter, and population aging in particular is likely to drive significant new trends in household composition and labour force participation, with significant implications for dwelling and service demand. It must be noted, however, that DoP projections (+93 000 in the next 25 years) differ substantially from those adopted in the LHRS (+160 000 in the next 25 years). The degree to which LHRS expectations are fulfilled will shape the extent, nature and distribution of population across the region.

Key projected trends for the lower Hunter are:

- Continued though slowing rate of population increase.

The DoP (2005) projections predict a population increase of 93 301 by 2031, while the LHRS is planning for an increase of 160 000. Both indicate that the rate of population increase will slow progressively.

- Significant population aging.

All LGAs in the region will experience significant aging in their population profile. The proportion of children in the regional population will decline from 20% to 15%. The proportion of working age population will decline from 65% to 57%, though its absolute number will increase. The proportion of population aged over 65 years will increase from 15% to 28%. Lake Macquarie and Port Stephens will have above the regional proportion of their populations aged over 65 years.

- Rising dependency ratios.

As the proportion of working age population declines, the dependency ratio for the region will increase from 55 to 74. Lake Macquarie and Port Stephens will have the highest dependency ratios according to DoP projections.

- Expanding number of households and increasingly atomised household structure.

The lower Hunter will experience significant increases in the number of households. Between 2001 and 2019 there will be a 20% increase in the number of households with the bulk of this increase found in one and two person households. All LGAs will experience the trend towards smaller households. By 2019 56% of all lower Hunter households will be one or two person households. Couple family *without* children households will become the dominant household type, increasing to make up 30% of all households. Lone person households will increase to 26%. Couple family *with* children households will still make up a substantial proportion of total households though they will decrease to 30% as a proportion of all households.

*Chapter 3* traces and analyses the flows of people and money connected to patterns of use in retail, leisure and recreation, as well as education and work. The details of the lower Hunter's social infrastructure, services and physical infrastructure supplied in Appendices A and B provide key support to this analysis. The chapter reveals the importance of the availability of employment and services within each LGA, as well as the role of Newcastle LGA as a regional centre.

Key characteristics of the lower Hunter's flows are:

- Retailing.

Most shopping trips occur within the LGA of origin, reflecting the widespread distribution of regional and sub-regional shopping centres throughout the lower Hunter. Some specific types of retail outlets, for example department stores, are only located in Newcastle and Lake Macquarie. These LGAs provide the greatest number

and diversity of retail opportunities in the region. Nonetheless, travel-to-retail patterns remain dominated by local flows.

- Leisure and recreation.

There is a good supply of recreational facilities dispersed throughout the lower Hunter. However, Newcastle LGA clearly attracts intense flows of people through its function as a regional centre with a diversity of recreational opportunities. Travel patterns for recreation reveal that people travel greater distances for recreational opportunities during the weekend.

- Education.

Most school education services are accessed within the users' LGA. Children's education is primarily provided through state education in the lower Hunter, highlighting the importance of timely state provision of education for new urban developments targeted at families with young children. Newcastle LGA acts as a regional centre for education, largely due to the role of the University of Newcastle, but also because of the concentration of specialist school education within Newcastle.

- Work.

Work trips in the lower Hunter are concentrated locally. 64% of all trips to 'go to work' begin and end within a single LGA. Nonetheless, Newcastle's importance as a regional centre for employment is clear, and this is particularly the case for employment on the weekend.

- Variations in travel patterns by age and occupation.

Travel patterns vary by age and occupation across the lower Hunter. Younger residents and labourers travel the shortest distances to access recreation, shopping and work.

*Chapter 4* focuses on the business sector and provides a comprehensive analysis of existing patterns of business activity and of the lower Hunter's business connection and flows both within and external to the region.

Key insights from this chapter are:

- The lower Hunter has an integrated, diverse regional economy that has become increasingly services intense.

No single sector dominates the regional economy as coalmining and manufacturing once did. The economy is now based around a diverse and interdependent sectoral mix. Reflecting the demands of a highly suburbanised region, there is marked employment concentration in services activities, particularly community and consumer services (including retailing). Comparatively, the high value-added 'professional and business services' sector underperforms.

- Business and work related trips in the lower Hunter exhibit a high level of self-containment at an LGA level.

All LGAs in the lower Hunter have high local absorption rates (a measure of the extent to which work trips commencing in an LGA terminate within the LGA). Between five and six out of ten of all work trips start and finish locally for all LGAs except Newcastle, where the rate rises to above seven. The business links of inner Newcastle are heavily dependent on Newcastle's outer urban areas. Inner Newcastle generates few outward and inward bound commercial flows across the region compared to other LGAs and lower Hunter townships. Where broader cross-Hunter connections are stronger, they occur in specialist activities such as mining (31.5% of all business trips), personal services (6.7%), education (6.7%), and manufacturing (5.3%).

- Regional business connections are overwhelmingly confined within the lower Hunter.

Where connections to regions outside the Hunter occur they are concentrated in two key areas. First are the traditional materials flows related to material and energy

processing (10.9% of business trips are to destinations outside the wider Hunter region), manufacturing (10%) and electricity, gas and water utilities (8.1%). Second is the consumption supply chain sector, particularly the wholesale trade (10.7%) and transport and storage (8.9%).

- Aggregate geographical concentrations of flows are found along the F3 axis of urbanisation and along the New England highway, running west from Newcastle.

When disaggregated by sector, strong flows are to be found between the lower Hunter and the Central Coast in the construction sector and in the health and community services sector. Flow concentrations arising from the lower Hunter's consumption supply chain links to the Central Coast, Sydney and west along the New England Highway are also clearly identifiable. Notably, flows arising from the property and business services sector have localised reach and are confined to within the lower Hunter.

*Chapter 5* focuses on the development of neighbourhoods as key to the success of urban developments. It uses three case studies to derive insights into the critical roles of government, the private sector and transport systems in the formation and development of residential communities.

Key insights from the chapter are:

- Neighbourhoods are the building blocks of urban development.

Successful urban developments take account of neighbourhood complexity. Neighbourhoods need to be understood as having particular configurations of buildings, infrastructure, demographic profile, class characteristics, public services, environmental characteristics, proximity characteristics, political characteristics, social interaction characteristics and sentimental characteristics. Anticipation of the likely interplay of these characteristics in a particular site is necessary to promote successful urban development.

- Neighbourhood satisfaction is related to perceptions about key neighbourhood characteristics.

The most important factors shaping resident satisfaction are perceptions of choice, of access to amenities and services, of the balance between positive and negative social features (such as safety, community spirit, neighbourhood cohesion), and of the quality of the neighbourhood environment. Residents may attempt to ameliorate neighbourhood characteristics by mobilising economic, social or cultural capital through links with nearby neighbourhoods. How new urban developments integrate with nearby existing neighbourhoods is likely to be influential on the generation of residential satisfaction.

- Both adequate planning and timely plan implementation are vital for successful urban development.

It is insufficient to build housing to create successful neighbourhoods. Neighbourhoods need a range of services, amenities and transport links to be provided by a range of public and private service providers in a timely manner in order to flourish. Planned, timely provision of neighbourhood services and amenities and integration of transport links to provide access to regional level services, facilities and employment can maximise levels of residential satisfaction and well-being, enhance community formation processes, improve service-use efficiencies, and reduce the levels of car dependence and environmental impact of new development.

- The relationship between government and the private sector is of critical importance for urban development.

Coordination both between levels of governments (state and local), between departments of government and between the public and private sectors is critically important. It is also important to note that the vast majority of new housing development is conducted by the private sector, while many of the goods and services essential for successful urban development are provided by the public sector.

## 6.3 PROSPECTS FOR FUTURE URBAN DEVELOPMENT IN THE LOWER HUNTER

The following sections focus on the insights developed from the flows analysis of this report for the prospects of successful urban developments across the lower Hunter in light of:

- the nature and distribution of residential development envisaged in the Lower Hunter Regional Strategy's planned new land releases; and
- the implications and service demands arising from the Lower Hunter Regional Strategy's planned residential development across each of the lower Hunter's LGAs.

In October 2006 the Lower Hunter Regional Strategy (LHRS) was released as the 'agreed NSW government position on the future of the Lower Hunter' (DOP 2006). This section considers the LHRS in relation to key implications for future urban settlement scenarios in the lower Hunter from the perspective of the flows analysis presented in this report. It is worth reasserting here that the LHRS anticipates total population growth of 160 000 for the region over the next 25 years, as opposed to the more conservative projections deployed by the Department of Planning (2005) on which chapter 2 of this report is based.

The LHRS sets out a development blueprint for the lower Hunter. The major points of the overall strategy are summarised below. The strategy plans to:

- Provide up to 115 000 new dwellings by 2031, based on projections of :
  - population increase of 160 000
  - smaller households
  - reduced occupancy rates.
- Protect aspects of the natural environment through the development of:
  - green corridors
  - a Regional Conservation Plan.
- Promote Newcastle as a regional city supported by:
  - regional centres at Charlestown, Cessnock, Maitland, Raymond Terrace

- emerging major regional centres at Morisset and Glendale-Cardiff
- specialised and lower order centres.
- Boost the economic and housing capacity of centres by refocusing a higher proportion of housing in these centres.
- Develop detailed planning for centres.
- Provide capacity within employment zones, major centres and strategic centres to accommodate up to 85% of the anticipated jobs required.
- Create a Lower Hunter Urban Development Program to monitor the supply of residential dwellings and employment lands.
- Enable the release of up to 69 000 greenfield lots in a coordinated way, with improved neighbourhood design and more efficient infrastructure use.
- Identify the needs for expanded state government infrastructure caused by development (which may require a development contribution).
- Identify and protect environmental assets, rural land and natural resources, landscape and rural amenity, rural communities and the character of existing rural villages.

**(Source DOP 2006 pp. 10-11)**

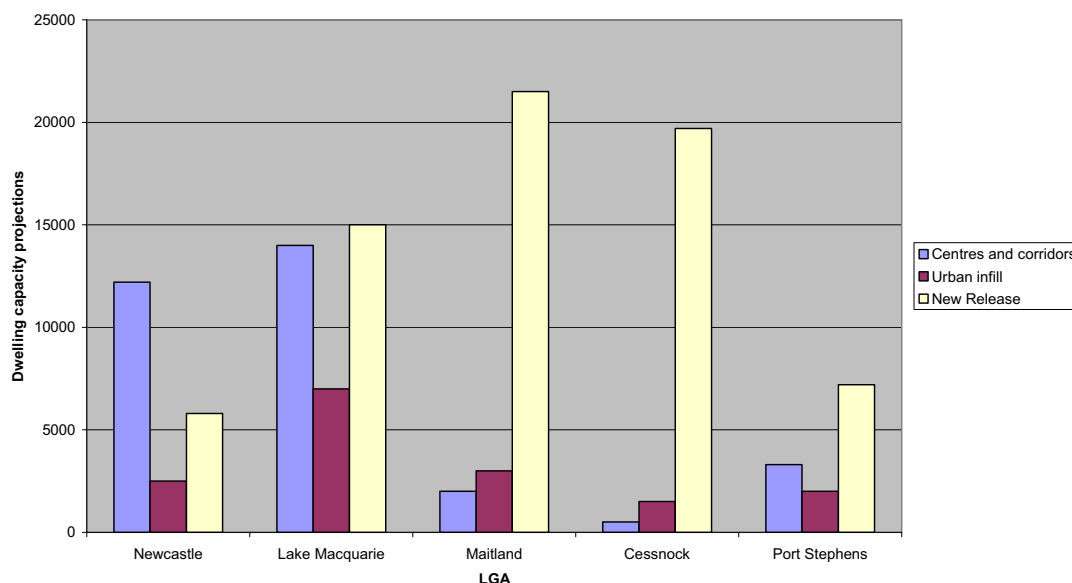
Before assessing development scenarios (section 6.3.1), the following discussion outlines the proposed geographical distribution and patterns of residential development envisaged in the LHRS.

The LHRS plans for more compact settlement in the future with increased housing in existing areas and the regional centres, through increasing the density of housing in renewal corridors and through general urban infill. Nonetheless, the majority of future development is still planned to occur in new release areas (60%), with the remainder (40%) to occur in existing urban areas.

The distribution of new urban development is highly spatially uneven. Figure 80 shows the total planned new residential development (by dwelling capacity) in the lower Hunter by LGA, illustrating the concentrations of planned new release

development in Maitland and Cessnock LGAs, where stocks of land are available. New release development in these two LGAs constitutes over 35% of all planned additional residential development in the lower Hunter. Adding the new release development proposed for Lake Macquarie brings the total to 48%.

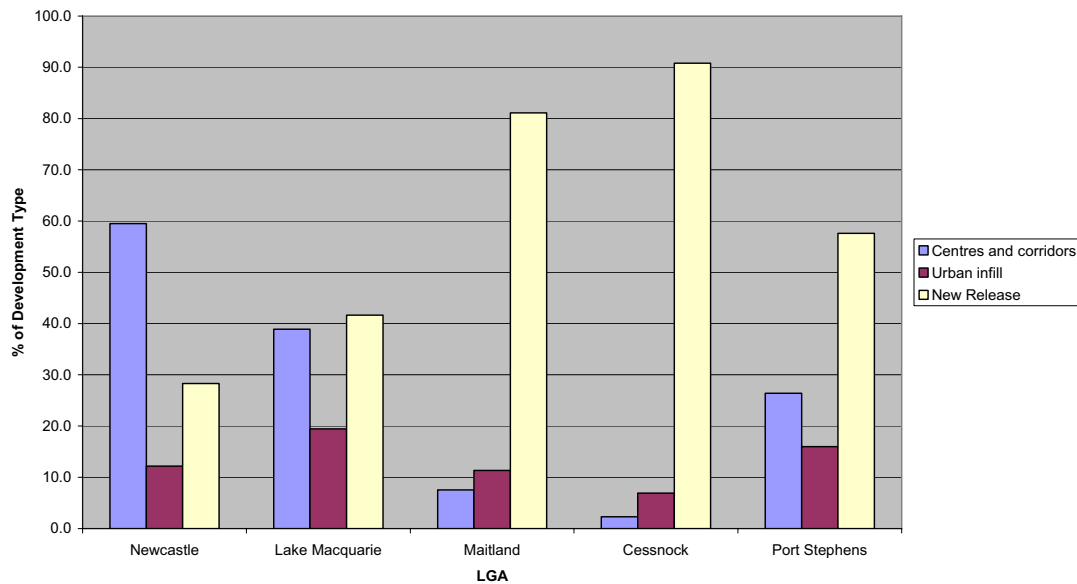
**Figure 80: Projected new development, lower Hunter LGAs**



**Source: Lower Hunter Regional Strategy 2006**

Figure 81 shows the proportion of new development (by development type) for each LGA. In Newcastle LGA nearly 60% of new urban development will take place in centres and corridors with a little over 10% as urban infill, while new release areas will constitute less than 30% of development. In Lake Macquarie centres and corridors development constitutes just less than 40% of planned development and new release development just over 40%, with urban infill being more prominent in this LGA than elsewhere in the lower Hunter at just under 20%. The pattern for Maitland and Cessnock LGAs is clearly very different with, respectively, over 80% and over 90% of all new urban development planned for new release areas. Development of new release areas is also planned to be the most important type of development in Port Stephens (over 58%) but further development in centres and corridors is also important (26%).

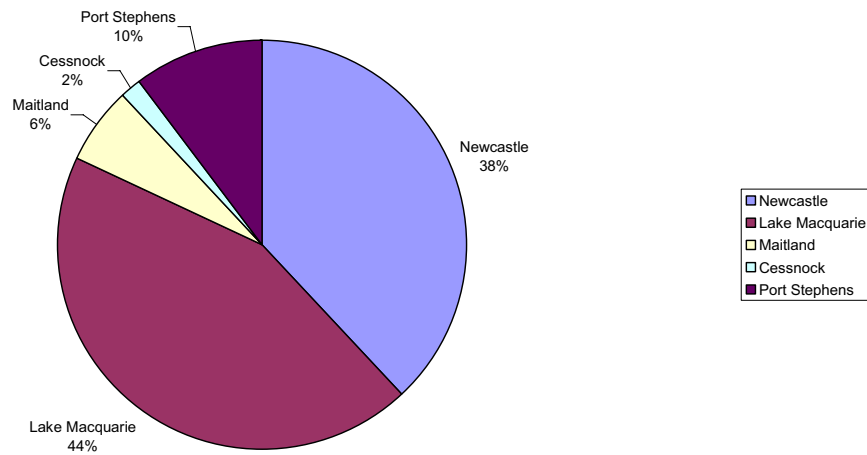
**Figure 81: Percentage of projected development by development type, lower Hunter LGAs**



**Source: Lower Hunter Regional Strategy 2006**

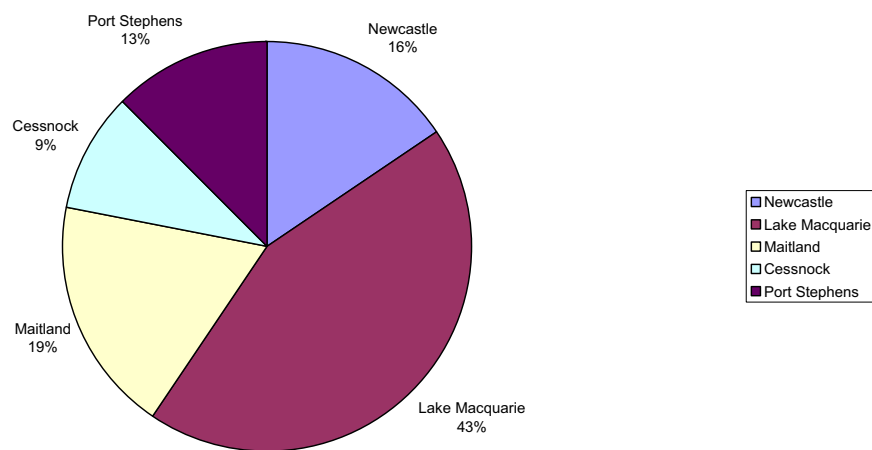
Figure 82 to Figure 85 illustrates this information in a different way, using pie charts to illustrate the distribution across the region of each anticipated development type (centres and corridors, urban infill and new release). Figure 82 highlights the dominance of Newcastle and Lake Macquarie for planned centres and corridors development. Figure 83 shows the importance of planned urban infill development in Lake Macquarie. Figure 84 shows the importance of Cessnock, Lake Macquarie and Maitland for new release urban development. The LHRS nominated locations for ‘major priority release areas’ for urban development, captured in Table 87 below. Planning for the release of these areas—Thornton North, Cooranbong, Bellbird and North Raymond Terrace—is well advanced. These priority release areas constitute about 54% of all planned development in new release areas in the region, and 32% of all development in the lower Hunter in the life of the plan. Finally Figure 85 shows the distribution of all planned development in the lower Hunter. While the overall level of development is spread throughout all LGAs, the mix of planned urban development differs substantially across them, suggesting diverse implications, particularly in regard to service and transport demand (see section 6.3.2).

**Figure 82: Distribution of centres and corridors development (%), lower Hunter LGA's**



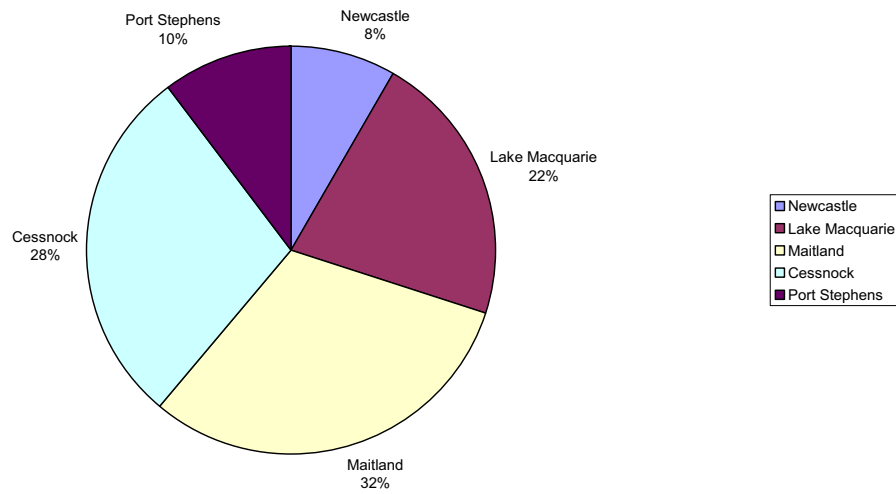
**Source: Lower Hunter Regional Strategy 2006**

**Figure 83: Distribution of urban infill development (%), lower Hunter LGA's**



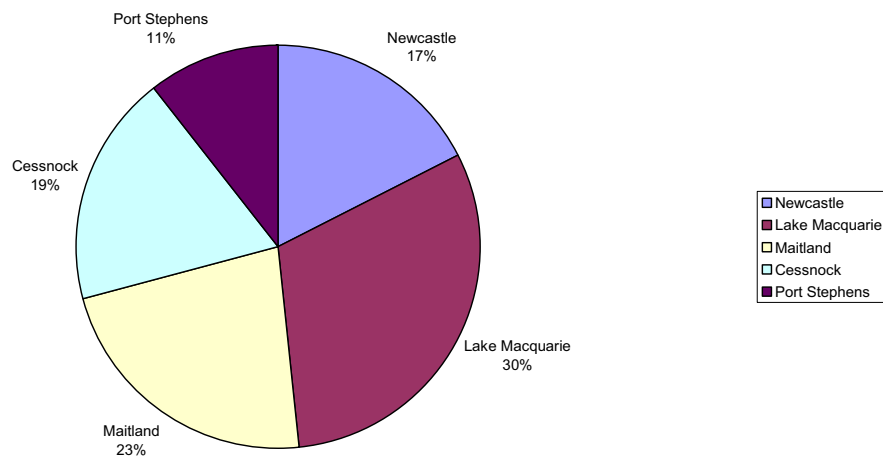
**Source: Lower Hunter Regional Strategy 2006**

**Figure 84: Distribution of new release development (%), lower Hunter LGA's**



**Source: Lower Hunter Regional Strategy 2006**

**Figure 85: Distribution of total planned development (%), lower Hunter LGA's**



**Source: Lower Hunter Regional Strategy 2006**

**Table 87: New release areas nominated in the LHRS**

Type of release area	Nominated release area	Projected size of new release area (dwellings)	Local Government Area
Major priority release areas	Thornton North	7000	Maitland
	Cooranbong	3000	Lake Macquarie
	Bellbird	4000	Cessnock
	North Raymond Terrace	5000	Port Stephens
Other major release sites	Lochinvar	5000	Maitland
	Anambah	4000	Maitland
	Wyee	2000	Lake Macquarie
	Branxton-Huntlee	7200	Cessnock

Section 6.3.1 assesses the implications of urban development scenarios in the major new release areas nominated by the strategy. This is followed by commentary in section 6.4.2 on the specific implications of planned patterns of development (all development types) for each LGA.

### **6.3.1 Prospects for new release development**

Development of the LHRS new release areas is to be designed according to seven Neighbourhood Planning Principles (NPP) aimed to ensure local access to jobs, service centres and transport choice. New release development scenarios are assessed below by reference to each of these principles in turn, informed by the report's understanding of the lower Hunter's existing patterns of flows and connections.

#### ***NPP1. A range of land uses to provide the right mix of houses, jobs, open space, recreational space and green space.***

The principle is admirable, particularly given this report's demonstration of the extent of local absorption for work-related trips and of the dependence on local recreation resources. In particular, attention will need to be given to how recreational and open space and facilities are to be supplied and maintained in new release areas, particularly for facilities provided by local councils. Chapter 5 points to the difficulties that rapid urban development poses for local government areas with low resource bases. Given the projections for future new release development shown in Figure 80 and Figure 81 this burden will fall most heavily on Maitland and Cessnock councils.

***NPP2. Easy access to major town centres with a full range of shops, recreational facilities and services, along with smaller village centres and neighbourhood shops.***

The principle of access for new developments to a range of service centres providing the full range of high order to low order goods and services is an ideal. The analysis of flows presented in this report reveals, for instance, the extent to which shopping activity is conducted locally at present, emphasising the importance of the availability of local shops as well as access to higher order shopping facilities. The case studies in Chapter 5 reveal the importance of ensuring that local facilities are developed in a timely fashion, simultaneous with urban development rather than at a lag. More generally though, the report's analysis suggests the need for further planning and provision of government services in new release areas, as well as in other areas of the lower Hunter. Of the planned social and physical infrastructure projects in the LHRS (listed in Appendix 2 of the LHRS), which includes human service facilities; the majority constitute upgrades to existing infrastructure. It is expected that higher order services and facilities are likely to remain somewhat centralised and the noted upgrades are clearly needed, particularly in areas where there is planned urban infill and centres and corridors development. Nonetheless, further planning for provision to new release areas across a range of services will be necessary if the principle of easy access is to be fulfilled and the success of new urban developments is enhanced.

***NPP3. Jobs available locally and regionally to reduce the demand for transport services.***

The analysis in this report highlights the dispersed pattern of employment location across the lower Hunter (including in a diverse range of centres), in part accounting for high levels of employment self-containment at the LGA level. It also noted the importance of Newcastle as a regional employment centre, while demonstrating that employment within Newcastle is also dispersed across the LGA rather than excessively concentrated in the city centre. This pattern has created high levels of car dependency regionally for journey to work purposes. Thus the principle of reducing the demand for transport services by promoting job availability locally and regionally is commendable. However attaining it will require greater articulation in the

LHRS between the plan's twin aspirations for the location of new release urban developments and the development of a hierarchy of regional centres as employment hubs. The LHRS designates much of the proposed new release residential development to the outer parts of Maitland and Cessnock LGAs, both of which are relatively distant from the planned centres of employment growth, and are poorly served by public transport. Enhanced attention to the development of transport links between these new release areas and proposed employment hubs will be needed to prevent the early entrenchment of car dependency in these new urban developments.

More generally, the range of employment centres envisaged will require greater attention to the provision of adequate alternative transport options—notably public transport—serving a range of important employment nodes, not just the regional city centre. The intention to focus employment in a hierarchy of employment nodes across the region may indeed reduce the vehicle kilometres travelled (VKT) for journey to work purposes, but addressing the issue of car dependency requires, in addition, the provision of viable alternatives modes of transport.

***NPP4. Streets and suburbs planned so that residents can walk to shops for their daily needs.***

Particular attention will need to be given to the viability of local shopping facilities in new release areas. Long term viability will be dependent, first, on ensuring adequate development densities to ensure a viable customer base exists within walking distance of a shop. The LHRS is actively seeking to increase development densities. However, viability is also dependent upon residents' shopping habits and routines. Adequate planning to ensure the provision and long term viability of local shops requires an understanding of the way that shopping is incorporated into other aspects of daily life (e.g. incorporated into journey-to-work trips, undertaken as part of multi-purpose trips). Given the importance of local services to successful urban development, in-depth attention to planning these facilities in co-ordination with business providers is required to fulfil these needs.

***NPP5. A wide range of housing choices to provide for different needs and different incomes. Traditional houses on individual blocks will be available along with smaller, lower maintenance homes, units and terraces for older people and young singles or couples.***

It goes without saying that an adequate supply of well-located, affordable and appropriate housing is a fundamental requirement for the development of strong successful and sustainable communities. The demographic trends outlined in chapter 2 suggest that, beyond accommodating absolute growth with high rates of household formation, substantial departures from the predominant dwelling stock of the lower Hunter (currently 85% single detached cottages) will be needed to accommodate (i) growing diversity of household composition and diversification and (ii) the proliferation of small households, likely to make up 56% of all households in the lower Hunter by 2019. Both the pressures of demand and the opportunities for change will be most intense in those areas targeted for the most rapid new release growth, Branxton-Huntlee, Thornton North, North Raymond Terrace and Lochinvar. As such, the LHRS' adoption of this principle to guide new research development is welcomed.

Nonetheless, there is a need to adopt a broader vision of the way in which housing is utilised by population groups. There is not a simple association between, on the one hand, traditional housing and households with children and, on the other, smaller, higher density dwellings types (e.g. units and terraces) and older people, singles or couples without children. For instance people frequent age *in situ*, remaining in larger houses for reasons of attachment and convenience, often reutilising 'excess' space to accommodate visitors or lifestyle activities (e.g. hobbies). Similarly households with children increasingly live in higher density dwelling due both to declining housing affordability and to a complex shifting of values and consumer preferences. Increasing the density of regional centres may accelerate this trend. New urban development therefore needs to anticipate that a range of groups will inhabit a range of different housing types in order to plan for adequate services to be provided for those groups. Moreover, diversification of housing provision needs to be applied as a principle beyond new release areas in order to address potential considerable latent demand for a greater diversity and density of housing types arising from trends in household diversification, unserved demand, and shifts in consumer preferences and

values. There is considerable community, household and individual benefits to be gained from the widespread existence of diverse housing markets in which people can locate a dwelling type that is affordable, suited to demand and to household need.

***NPP6. Conservation lands in and around development sites to help protect biodiversity and provide open space for recreation.***

Greater consideration of environmental flows is necessary to plan for successful future urban development. As chapter 5 notes engagement with natural surroundings is valued by residents of new release areas and contributes substantially to resident satisfaction. The extent of population growth realised in the lower Hunter over the next generation will, to a significant extent, determine the intensity of development pressure which may threaten the survival of appropriate conservation lands and adequate open space. It will be critical that protection of these lands and of appropriately located and accessible recreational lands progress beyond abstract principle to be enacted throughout the planning process.

***NPP7. Public transport networks that link frequent buses into the rail system.***

The prominence of car dependency in the lower Hunter for accessing employment is clearly evident in chapter 3. As noted above, the LHRs' aspiration that employment and services be concentrated in a hierarchy of centres dispersed across the region will require particular attention to enhancing the provision of transport options, particularly public transport, if patterns of car dependence are to be reduced. Many of the identified centres are in Newcastle LGA, the LGA with the best quality and densest network of public transport services. However, Appendix B notes the existence of public transport 'blackspots', largely outside the Newcastle LGA, that are irregularly or poorly serviced and experience problems of service coordination. Particular attention will need to be paid to public transport provision and network coordination in these areas. Additionally, many of the new release areas set for intensive residential development are distant from public transport, with those in Cessnock also being distant from a rail line. Without appropriate service and coordination improvements, the only viable alternative for many households will be continued use of cars with associated individual and environmental implications.

### 6.3.2 Urban development scenarios and key issues for LGAs

This section draws on the report's general findings regarding the region's flows and connections as a framework for discussing the prospects for urban development arising from the development scenarios envisaged in the LHRS framework for each of the lower Hunter LGAs. Discussion here is based on the assumption that LHRS population projections will be realised. The more conservative DoP projections adopted in chapter 2 suggest substantially lower growth levels and these do not attend to the potential influence of planning policy on the distribution of population growth across the lower Hunter LGAs.

*Newcastle* According to the LHRS Newcastle LGA will absorb over 17% of planned future residential development in the lower Hunter (see Figure 85). Development in centres and corridors is most important in Newcastle LGA. Development in these zones will constitute nearly 60% of the planned residential development in the LGA and this will provide just over 38% of all centres and corridors development in the region.

There are, of course, good reasons for increasing city density through concentration of development in key centres and growth corridors to improve resource use and maximise the potential use of services and public transport. This report has demonstrated that people within Newcastle LGA mostly access services within the LGA at present. However the analysis in chapter 3 establishes that these services are located throughout the Newcastle LGA not just in the planned regional city, focussed on the city centre. Planned new development in centres and corridors is likely to continue to generate flows of people across and through the LGA and thus ,transport from these centres to a range of other locales within Newcastle LGA will need to be adequate.

New urban development may result in a better use of existing services where these services are currently underutilised. However the service demands of population

moving into redeveloped centres and corridors may also necessitate the expansion or new construction of services in central areas.

Moreover, as previously explained, new residential development at higher densities in centres and corridors is likely to be inhabited by a range of household types covering older people, couples, singles and households with children. While households with children are currently concentrated into separate houses in Australia, studies have indicated that, for a variety of economic and socio-cultural reasons, the proportion of households with children living in apartments is increasing. Service provision needs to be planned for the range of households that will move into new urban areas.

A pertinent example here is the impact of apartment construction in inner Newcastle on enrolments in Newcastle East Public School. The drawing zone for the school has been significantly reduced by the Department of Education as planning for future educational needs for inner Newcastle were partly based on population projections which presumed that few children would be living in the newly developed (and existing) apartment blocks. However enrolments have increased and a school survey indicates that an increasing proportion of the enrolments are coming from children living in apartments, as households with children have moved into both new and older apartment dwellings.

The example illustrates the ways in which new urban development in centres and corridors may impact on existing services. Considering the adequacy of current resources, and how demands on these may change through urban development is a particularly pressing issue for Newcastle (especially for planning inner Newcastle), given the emphasis on centre and corridor development in that LGA.

*Lake Macquarie* The highest overall amount of new urban development (all development types) anticipated in the LHRS is in Lake Macquarie LGA (36 000 dwellings), constituting 30% of all new development in the lower Hunter. The mix of residential development planned in Lake Macquarie is diverse. The LGA will have

significant centres and corridors development, the highest proportion of urban infill development in the region in addition to a substantial amount of new release development. As chapter 5 illustrates, it is often difficult for local government areas to manage rapidly growing urban areas. In the case of Lake Macquarie the projected growth will occur through a range of modes of development, adding to the complexity and resource demands of managing new urban development in this location.

Similar to the case of Newcastle, consideration will need to be given to the adequacy of existing services to deal with population growth in centres and corridors. However planning for service provision to the significant new release areas envisaged for Lake Macquarie LGA will require a different emphasis. The two new release areas in the LGA (see Table 87) are both in the southern part of Lake Macquarie. Access to the services across the Lake Macquarie LGA from this area is limited by the physical geography and the transportation difficulties that arise from accessing services on the western and eastern sides of Lake Macquarie itself. For Wyee in particular the development of the emerging regional centre at Morisset will be important. As chapter 5 notes when residential development occurs before service centres are built residents' welfare and levels of neighbourhood satisfaction are compromised. For these new southern residential developments access to services in the Wyong LGA will also be important.

Chapter 3 highlights the interconnected nature of Lake Macquarie and Newcastle LGA's in relation to a range of flows, with Newcastle playing an important role as a secondary destination for Lake Macquarie especially in terms of employment. Given this, the urban development in Lake Macquarie is likely to result in more pressure on employment and services within Newcastle. At present the lower Hunter, particularly Newcastle and Lake Macquarie, are quite contained in terms of flows. In the future Lake Macquarie may become more enmeshed in the Sydney and Central Coast economies, changing the pattern of flows in the region. Successful development in Lake Macquarie will be dependent upon adequate transport and infrastructure to support these flows.

*Maitland* One of the largest of the priority new release areas in the LHRS is in the Maitland LGA, along with two other new release areas (see Table 87). Together, these new release areas are planned to accommodate 21 500 new dwellings. This is the highest amount of new release development across the lower Hunter LGAs. New release development also dominates planned residential development in the LGA, with over 80% to occur in new release areas. Fulfilling the neighbourhood planning principles of the LHRS will demand significant development of both transport and service infrastructure to underpin successful development within these areas. Given the likelihood that Maitland's affordability over other parts of the lower Hunter will attract new-start family households, the demands for government family services are likely to be intense and require timely investments. This is the case particularly for services such as schooling wherein local access is critical.

The analysis of flows in chapter 3 show that Maitland has the highest level of connections to areas outside the lower Hunter for work. Newcastle is an important secondary destination for flows from Maitland for work (especially on the weekend) and for education. Growth in Maitland may lead to intensification of flows into Newcastle to access services and jobs within the LGA.

Maitland is located on the Hunter railway line and currently has the highest level of train use for journey to work (although this is still comparatively low). The LHRS specifies the importance of bus transport which can connect to the train network. This, may be particularly important in the new release areas of Maitland which are more distant from the train line.

*Cessnock* According to the LHRS 18.5% of development in the lower Hunter will occur in Cessnock. As in Maitland the vast majority of this development is planned to be new release development (19 500 new dwellings) (see Figure 80 and Figure 81). Major developments sites are Bellbird, south west of Cessnock, and Branxton, to the north west of the adjacent new development area of Lochinvar in Maitland LGA (see Table 87).

The development of appropriate regional centres to support these populations will be important. The analysis of flows in Cessnock LGA demonstrated high levels of local service dependence. Supplementing existing and developing new services in these new areas will, therefore, be particularly important. As in Maitland, contemporary patterns of service use suggest that the provision of government services will have a particularly important role in addressing the service demands generated by new development in the LGA. Again the example of education serves to make this point. At present a higher proportion of Cessnock children attend government-provided primary schools than elsewhere in the lower Hunter region. The planned new development areas of Bellbird and Branxton both have public schools. Given the scale of the planned developments it may be necessary to expand these schools, or to build a new primary school in each of these areas, depending on the extent to which the population growth anticipated in the LHRS is fulfilled. As chapter 5 demonstrates, successful urban development and resident satisfaction relies on such mechanisms being in place prior to the arrival of a substantial residential population.

Flows analysis reveals that Cessnock differs from most other lower Hunter LGAs in that it is more dependent on Maitland than Newcastle as a secondary destination. This is explicable given the poor transport links and distance between Newcastle and Cessnock. However, given that large amounts of new release development are planned in both Maitland and Cessnock, this may mean that existing services in Maitland will be over-stretched by urban development in the absence of careful monitoring and attention to service provision.

Moreover the LHRS emphasises the importance of the development of Newcastle as a regional city and as a focus for higher order functions located within the regional city. At present both the physical location of Cessnock and the existing pattern of flows within it mean that Cessnock is both absolutely and relatively distant from the regional city and future further concentrations of amenities. Transport networks connecting Cessnock and Newcastle may require upgrading in order to improve access for an expanding population in the LGA to the more diverse and higher order services available in Newcastle.

*Port Stephens* The level of projected new residential development planned in the LHRS for Port Stephens is the lowest of the lower Hunter LGAs. The strategy plans for 12 500 new dwellings and growth in Port Stephens accounts for only 11% of all projected growth in the region (see Figure 80 and Figure 85). The LGA contains only one of the nominated new release areas in the LHRS, North Raymond Terrace (see Table 87). Development in the new release area is planned to make up 58% of new development in the LGA, with 26% in centres and corridors (see Figure 81)<sup>11</sup>. As in other LGAs, adequate provision of resources for both new urban development and to ensure that the current provision of services in centres and corridors is adequate to cope with population growth will be a priority.

The analysis in chapter 3 points to the importance of flows from Port Stephens LGA into Newcastle, particularly for education and work journeys. The developments planned for Newcastle LGA as an enhanced regional centre may well be of benefit to Port Stephens residents, and generate further flows of people into Newcastle LGA. The transportation connections between Port Stephens and Newcastle will need to be considered in planning this development. The residents of Port Stephens currently have the highest level of car ownership per household of any LGA in the lower Hunter. Few currently use public transport as a means of travelling to work. Ensuring adequate public transport to a range of destinations, including those within Newcastle LGA (not just the designated regional city), will be important to ensuring that car dependence is not further entrenched by future development patterns.

#### **6.4 Urban development and its broader development context**

Section 6.4 reflects on the wider-scaled context of the lower Hunter's urban development related both to the region's emergent polycentric structure and to the nature and positioning of Newcastle and its urban economy as the highest order regional urban centre.

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<sup>11</sup> Comparatively DoP (2005) projections suggest the Port Stephens along with Lake Macquarie will experience the highest absolute population growth in the region, adding c. 25 000 people each.

The urban hierarchy of the lower Hunter is made up of a connected network of urban and town centres with varying concentrations of population and economic activity and service functions. The highest order centre, Newcastle, is variously connected by economic links and flows of people both to shopping and business centres within its immediate urban area (Charlestown, the Junction, Mayfield etc.), to other urban centres such as Maitland, Cessnock and Raymond Terrace, and to a range of lower order town centres across the region such as East Maitland, Rutherford and Warners Bay. The future development trajectory for the region is set to produce an intensification of activity, development and population in and around these centres and to produce an increasingly polycentric region. The LHRS's overarching vision for the lower Hunter's urban development is set within the frame of a hierarchy and network of centres, with Newcastle City Centre as the apex. As the region's complexity increases in this way, access to appropriate and adequate economic and social infrastructure becomes increasingly important as a determinant of the success of urban development and, relatedly, as a determinant of the distribution of well-being across the population.

The understanding of existing patterns of flows and connections arising from the lower Hunter's current urban hierarchy developed in this report demonstrates the extent of Newcastle's centrality as a focus for a range of population, household and economic flows in the region. In particular, the report demonstrates that:

- Newcastle acts as an important secondary destination for all lower Hunter LGAs except Cessnock.
- Flows into Newcastle LGA are explicable in relation to the concentration of facilities, workplaces and high order functions in Newcastle LGA.
- The Newcastle LGA is an important destination for employment flows, with an increase in the intensity of flows on weekends.

However the report also demonstrates that:

- Business links in Newcastle demonstrate particularly high levels of self-containment within the LGA

- Inner Newcastle's business links generate few commercial flows across the region.

Two key insights can be derived from these findings. First, there is good reason to enhance the role of Newcastle City Centre as a high profile and high order regional centre. However there is a pressing need to build externally linked demand in the development of business connections into more geographically extensive supply chains and to expand the industrial and service role of the local economy beyond its current focus on consumer services. These connections are currently poorly developed. Their development will be particularly necessary in order to take advantage of the 'new economy' service and production opportunities arising from the continued economic expansion of the Greater Metropolitan Region of Sydney. The region needs to engage positively with these processes of change in order to attract higher value-added economic activities which would provide greater regional prosperity including flow-on effects into the consumer services base.

Second, the future development of Newcastle as the highest order regional centre needs to be underpinned by an appreciation of the drivers of key flows into the Newcastle LGA. These include travel to access tertiary education, health care, culture and recreational facilities, and higher order shopping facilities as well as travel to access employment. The flows analysis of this report revealed that many of the flow-attracting nodes are located in the suburbs of Newcastle: the Callaghan campus of the University of Newcastle, suburban campuses of TAFE colleges, the John Hunter and Mater hospitals, Kotara shopping centre. The implication is that future development aimed at the development of Newcastle as the highest order regional centre needs both to support developments in the City Centre and to ensure continued and enhanced access to the diverse locations of facilities across the Newcastle LGA. These are critical drivers of existing population and household flows as well as business links currently sustaining Newcastle's central positioning in the lower Hunter's urban hierarchy.

Finally, one further observation must be made based on the implications of the increasingly polycentric trajectory of the lower Hunter's urban development. This report consistently demonstrates the propensity for high levels of self-containment at the LGA level with regards to access to shopping, education and service use. The proposed increased concentration of residential, commercial, service and employment lands in a hierarchy of centres across the lower Hunter will need to be accompanied by careful attention to the transport network serving these centres to ensure that access to these centres from surrounding urban settlement is maintained. Continuation of current levels of car dependency in the region, combined with service and employment concentration and additional residential expansion in centres, will otherwise produce problematic congestion. This is particularly the case for the existing centres of Maitland and Cessnock which will absorb considerable amounts of demand from new residential development in new release areas.

## **6.5 Understanding urban development through flows analysis**

This concluding chapter provides a synthesis of the key findings of the report and a commentary on scenarios for future urban residential development as envisaged in the LHRS from the point of view of the report's flows analysis.

The report represents a methodologically unique attempt to understand the ways in which the region is constituted by flows and connections. An understanding of the lower Hunter's flows illustrates the dynamics of the region and its urban development and provides unique insights into the current development context, specifically in terms of demographic flows, flow and patterns of movement to access key services and employment, and business flows. More importantly, it provides a critical basis from which to interpret and assess future urban development scenarios from the point of view of its spatial distributions, embeddedness in patterns of flow and connection, and the critical components likely to contribute to its successful functioning, economically and socio-culturally.

The report has identified key pressures that will be felt in new centre and corridor developments and in new release areas, especially for locally accessed services and transport networks. Moreover it has identified the need to build and enrich business links, particularly to take advantage of the region's location in relation to the booming Sydney metropolitan economy. This will be necessary to expand economic activity in higher value adding sectors, to deepen the region's skills based, and to enhance the region's prosperity by embedding it in networks of inward and outward commercial flows.

In closing it is worth pointing to some of the limitations of a flows approach as practiced in this report. The analysis undertaken here focused primarily on household flows generated in relation to work, recreation, shopping and education. It also examined the use of business vehicles for travel to trace the interconnections between businesses in the Hunter and beyond. Supplemented with case studies of past residential development, demographic analysis and a compendium of the region's existing social and physical infrastructure base, these analyses provided the basis for assessing the implications of planned future urban development.

However, there are a number of other important flows which constitute a region that are not analysed in this report: for example, flows of goods (which might be measured as freight flows into and out of a region); flows of services; smaller-scaled financial flows around the region; telecommunication flows; and transport flows (including volumes of road and rail traffic, bus utilisation, air traffic into and out of the region). A broader conceptualisation of flows could construct equity flows, examining how the distribution of advantage and disadvantage is reflected in flows around the region. This report has not commented directly on the existing pattern of advantage and disadvantage in the lower Hunter and how this might influence future urban development. Clearly, however, future patterns of development have equity implications in terms of access to resources within the region that will require redress.

Finally we could consider ecological flows, considering human flows as part of the myriad of ecological flows around the region, in terms of resource utilisation and

waste generation. While this report has not attempted to address ecological flow, there is urgent need to tackle such flows more directly as the subject of a separate analysis.

These extensions would be complementary to the approach taken here. Nonetheless, flows analysis represents a significant advance in understanding the construction of a region, providing a rich and detailed basis from which to assess the urban development context and future development prospects in the region.