Living Liveable.
The impact of the Liveable Neighbourhoods Policy on the health and wellbeing of Perth residents
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The Centre for the Built Environment and Health investigates the relationships between urban planning and community design, and the physical, mental and social health of residents. Our multi-disciplinary research teams explore which aspects of the built environment can promote health and wellbeing, and reduce illness and preventable disease. We utilise an extensive data platform covering the Perth and Peel metropolitan area developed over a 10 year period, which supports spatial analysis of urban form and community design, combined with extensive experience in public health and social science research principles and practice.

The Centre’s academics and GIS professionals undertake a diverse range of projects, including national, competitively funded studies. Our clients include national, state and local government agencies, private sector partners in planning and land development, and non-government organisations in health, sports, transport, planning and community services.

We collaborate with research groups across Australia including the University of Melbourne, Queensland University of Technology, the University of Queensland, Deakin University and internationally with leading research centres in the UK, Europe and USA. Current research includes our work in partnership with the NMHRC Centre for Research Excellence on Healthy Liveable Communities led by University of Melbourne and the NESP funded Clean Air and Urban Landscapes initiative.

Our research is enhanced by strong links with government and industry, external guidance from our industry Advisory Board and our collaborative approach to undertaking research and evaluation projects that address ‘real word’ problems.
RESIDE: The Residential Environments Project

Answering the question: Does the Liveable Neighbourhoods policy work?

In 1998, the Western Australian Government introduced the Liveable Neighbourhoods Design Code; a policy aimed at utilising design principles to enhance the health and wellbeing of residents of new suburban developments.

The RESIDential Environments Project (known as RESIDE) commenced in 2003 to evaluate the impact of the Liveable Neighbourhoods (LN) policy on people living in LN designed communities. The study focuses on five elements with most relevance to health, based on the 2nd edition of LN and subsequent additions.

Utilising results from over 60 academic RESIDE publications* reporting across 10 different health outcomes, as well as other relevant studies undertaken at our centre, this report presents a summary of results relevant to the Liveable Neighbourhoods policy and its potential to impact on residents’ health.

Four key questions are addressed in this report:
1. How much of the LN policy was implemented on the ground?
2. Does the amount of policy implementation affect health outcomes?
3. How do the design features from each of the policy elements impact on different health outcomes?
4. What combinations of design features have the greatest impact on health?

The report is structured around five LN components:

- Movement network
- Urban structure: activity centres and destinations
- Schools
- Residential density and housing diversity
- Public open space

*Readers interested in accessing the RESIDE academic publications used in the compilation of this report can visit our website at http://www.see.uwa.edu.au/research/cbeh for further information.
The WA Liveable Neighbourhoods (LN) policy was established to guide the development of more compact and sustainable suburban neighbourhoods, reducing car dependence, encouraging walking, cycling and public transport use, and promoting a sense of community. The RESIDE project shows that government policies and planning initiatives play a vital role in creating cities, towns and neighbourhoods that can positively impact community health and wellbeing.

RESIDE provides strong evidence that new communities built in accordance with LN principles will likely promote the health and wellbeing of residents.

The key findings around this include:

- Getting the movement network right is vital for creating a ‘walkable’ neighbourhood. The results show that living in a neighborhood with increased connectivity is essential for increasing walking. It provides more route choices, more direct routes and good proximity to core destinations.

- When a supportive movement network and diverse residential density is combined with good access to community centres, adequate local retail, community amenities and quality public parks, the ‘liveability’ of the neighbourhood is enhanced. Local shops and services are critical determinants of residents’ walking. Access to quality public open spaces encourages more walking and protects mental health.

- Design features and street-level characteristics can make the neighbourhood a safe, attractive and desirable location. This in turn can enhance community health and wellbeing.

- The street network surrounding school sites should be highly connected but importantly, have lower levels of traffic to create safe, short, and direct walking or cycling trips to school by children.

- Urban planning policy is only as good as its implementation. Despite strong impacts on health, RESIDE results on compliance indicate a substantial short fall in ‘on-ground’ implementation of the Liveable Neighbourhoods policy in new communities across Perth.

- Barriers to implementing LN policy must be addressed. A combination of supporting strategies is needed including greater clarification of LN policy requirements, clearer metrics, more rigorous enforcement of LN policy requirements within the planning approval process and ongoing review of LN implementation.

- Developer incentives and disincentives are required to both ‘push and pull’ change in planning practice and supportive professional development programs. For example, facilitating the early establishment of local retail and community amenities would provide speedy activation of the neighbourhood town centres in new developments.

For every 10% increase in overall Liveable Neighbourhoods policy compliance, participants were:

- 53% more likely to do any walking within their neighbourhood
- 40% less likely to feel unsafe from crime
- 14% more likely to have better mental health
The Importance Of Implementing Liveable Neighbourhoods

Given the complexity of designing neighbourhoods and the need to optimise design requirements within a specific context, we studied how groups of design characteristics (i.e., LN policy requirements) impact collectively to influence health outcomes.

Based on different combinations of LN requirements and their level of implementation, the RESIDE results identified four different housing development profiles.

Compared with developments with low levels of LN implementation, residents in the following developments enjoyed the benefits of a more walkable neighbourhood:

- Highest levels of movement network and lot layout implementation:
  - 2 x more likely to walk for over an hour each week.

- Highest levels of public parkland and good community design implementation:
  - 3 x more likely to walk for over an hour each week.

- Highest levels of community design, movement network, lot layout and public parkland implementation:
  - 2 x more likely to walk for over an hour each week
  - 50% more likely to walk for over 150 minutes per week
  (meeting Australian national physical activity recommendations).

RESIDE ‘Walkability Index’

The RESIDE ‘Walkability Index’ combines measures of connectivity, residential density and land use mix into a single score.

RESIDE participants living in highly ‘walkable neighbourhoods’ with higher levels of street connectivity, higher residential density and higher mix of land uses were almost 2 x more likely to walk for transport.

Is There A Demand For More Walkable Communities?

Perth residents want more walkable communities.

62% of the RESIDE participants who lived in low walkable neighbourhoods told us they would prefer to live in a neighbourhood where they could walk to shops, cafes, libraries and other services.
The RESIDE Study Design

Almost 2000 new home owners who were planning to relocate to one of 73 new housing developments across metropolitan Perth and Peel agreed to join the RESIDE study. They completed up to four surveys over a period of about 9 years:

1. Between 2003-2005 - while their new home was being built (n=1813)
2. Between 2004-2006 - one year after moving into their new home (n=1465)
3. Between 2006-2008 - about three years after moving into their new housing development (n=1229)
4. Between 2011-2012 - about 5-7 years after moving into their new housing development (n=565)

Built environment measures were created in GIS for each participant, with their ‘neighbourhood’ defined as a 1600m road network buffer (approx. 10-15 minute walk) around their home. Changes in the neighbourhood over the survey periods were monitored. Design measures included:

- Street connectivity
- Mixed land use
- Destinations - community facilities and shops
- Public transport
- Residential density and diversity
- Access to public open space
- Provision of footpaths
- Street trees.

RESIDE also assessed the degree to which the LN policy had been implemented ‘on the ground’ using GIS measures at the scale of the housing development. Novel measures of LN policy compliance were created.

The participants’ health and wellbeing at each time point was assessed with survey items asking about recent walking, cycling and public transport use, diet, mental health, sense of community, perceptions of crime and feelings of safety. Respondents also told us why they chose their new development, and their preferred type of neighbourhood.

RESIDE selected housing developments based on their intended adherence to the LN policy requirements. Analysis comparing 19 ‘liveable’, 44 ‘conventional’ and 10 ‘hybrid’ developments found few differences indicating that at least some of the LN principles were being widely adopted. Therefore this report presents pooled results from all three development types combined.
Is Liveable Neighbourhoods Being Implemented?

Any policy is only as good as its implementation, and identifying those aspects of the LN policy that are (or are not) being delivered can help to identify problems and guide future policy and practice.

RESIDE assessed the level of LN policy implementation in neighbourhoods by developing measures of how much of the policy was delivered 'on the ground'. The compliance evaluation reflects the stage of development in 2009 (around three years after residents moved into their new home).

Implementation results:
Overall – 47% of 42 policy requirements assessed had been implemented on the ground. Range: 30% - 56%

Specific results on implementation of each element showed:
- Movement network - 48% implemented as intended
  Range: 37% - 59%
- Urban structure / activity centres - 29% implemented as intended
  Range: 0% to 67%
- Lot layout - 58% implemented as intended
  Range: 19% - 88%
- Public parkland - 46% implemented as intended
  Range: 5% - 69%
- Schools – 49% of primary schools meet the policy recommendations of a Pedshed score 0.6 or above

FINDINGS:
- RESIDE found that implementation of LN policy requirements fell short of expectations with only around half implemented.
- However, for every 10% increase in overall policy compliance, participants were 53% more likely to walk in their neighbourhood.
The design of the movement network determines the overall structure or ‘footprint’ of a new residential development. A well designed movement network facilitates walking within the neighbourhood, because a highly connected street network increases the number of route choices and increases the directness and proximity to destinations.

In assessing the implementation of the LN policy in the design of a development, the following features were measured:

i. The number of 3 or 4 way intersections
ii. The percentage of blocks that were ≤620m in perimeter (as per the LN policy standard)
iii. Provision of footpaths
iv. Access to public transport stops
v. Street trees
vi. Evidence of street-level incivilities and disorder (e.g., graffiti, litter and vandalism, discarded alcohol containers, broken glass and vehicle skid marks)

Results: for every 10% increase in compliance with the movement network element participants were:

- 2.5 x more likely to do any walking within their neighbourhood
- twice as likely to do an hour or more of walking per week
- 50% less likely to feel unsafe from crime
Results on specific design features of the movement network indicated that:

- In places with more connected streets, participants were 12% more likely to walk in their neighbourhood, and 20% more likely to cycle.
- Residents in neighbourhoods with smaller street block perimeters were 4 x more likely to walk to and from local destinations, and 5 x more likely to walk for an hour or more each week.
- In neighbourhoods with a high proportion of cul-de-sacs with pedestrian linking routes, participants were 3 x more likely to walk for over 150 minutes per week, meeting Australian national physical activity recommendations.
- A more comprehensive network of footpaths along the street network meant residents were 3 x more likely to walk for over an hour each week.
- Having a train station within a 15 minute walk meant residents were 50% more likely to walk for active transport.
- Participants with better access to more bus stops were 88% more likely to walk for active transport.

- Residents with public transport stops close to both home and work were 16 x more likely to use public transport than those with neither.
- The more street trees along the footpath network, the more likely residents were to walk for more than hour each week – and for every additional tree along the footpath, participants were 4% more likely to do any walking.

Perceptions of their neighbourhood are also important:

- Residents who reported having an accessible network of bike or shared use paths were 77% more likely to cycle as a form of transport.
- Participants who thought their neighbourhood provided good management of traffic speeds were 76% more likely to cycle recreationally around their neighbourhood.
- Residents who perceived their neighbourhoods to be “leafy and attractive” were almost twice as likely to cycle as a form of transport.
- After moving, residents who thought they had better aesthetics, street lighting and fewer incivilities, reported improved feelings of safety from crime.
Urban Structure – Activity Centres Encourage Walking And Generate Social Behaviour

Well designed and accessible urban centres with local retail, social and entertainment amenities, can attract residents to walk and cycle to undertake local errands. They also provide a place to meet and interact with others, and to get to know the community, giving residents a reason to get out and about in their neighbourhood.

The design features* we measured included:

i. The mix of land uses (combination of retail, office, health, welfare and community, entertainment, culture and recreation amenities) within the neighbourhood

ii. Access to a neighbourhood centre within 1.6km walking distance

iii. The format of the centre – main street or big box

iv. The number and types of different destinations

Specific results of the Urban Structure part of the study include:

- RESIDE participants who moved to a neighbourhood with a better mix of land uses were 29% more likely to do any walking
- The number and type of destinations mattered: participants reported around 6 minutes more walking for every additional shop or service
- Those living within 1.6km of a convenience store, shopping centre or newsagent were about 2 x more likely to regularly walk
- A greater diversity of destinations within their neighbourhood centre encouraged residents to walk; and for every additional type of destination provided, participants were 36% more likely to walk
- Older adults living in neighbourhoods with services and social infrastructure within 800m of their home were about 20% more likely to walk
- Residents with a supermarket within 800m from home were more likely to consume healthier food options
- The configuration of the activity centres mattered: participants living within 1.6km of a ‘big-box’ shopping centre were 3 x more likely to walk within their neighbourhood, but those with access to a ‘main-street’ centre were 5 x more likely to do any walking and nearly 7 x more likely to walk for over an hour each week
- For mothers with young children, local amenities provide opportunities to interact with other residents, parents and children, helping to build a sense of community in a new neighbourhood
- Women living in neighbourhoods with more social destinations and community infrastructure spent about 15 minutes less time sitting each day.

Results: for every 10% increase in compliance with the community design element, participants were:

- 27% more likely to do any walking within their neighbourhood
- 17% more likely to do an hour or more of walking per week
- 8% more likely to have better mental health

*RESIDE assessed requirements from the Community Design element (Edition 2). Results are presented using the heading Urban Structure and Activity Centres to align with the draft 2015 Edition.
Residential Density And Housing Diversity – Variety Encourages Health And Safety

Higher residential densities create more compact urban development, decrease the distance between home and local destinations, and help to ensure the viability of local destinations and public transport services.

A mixture of residential lot sizes facilitates housing variety, choice and affordability, and caters for increasingly diverse household types.

How do these aspects of Liveable Neighbourhood design affect the health, wellbeing and security of residents? In this part of the study we measured the following to determine the answers:

i. Residential density
ii. Mixture of residential lot sizes
iii. Housing diversity
iv. House design characteristics (e.g., presence of porches, balconies, permeable front fences, garden)

The specific impacts of housing diversity and density on RESIDE participants include:

• Those who moved to a neighbourhood with higher residential densities were 54% more likely to take up cycling as a form of active transport
• In neighbourhoods with higher residential densities, respondents were 14% more likely to walk as a form of transport, and women reported spending less time sitting each day
• A mixture of residential lot sizes and architectural variety was associated with greater levels of walking, improved perceptions of safety, and better mental health
• Streets with houses designed to have increased opportunities for passive surveillance, (through the presence of visible windows from the street, porches or verandahs, low front walls /fences) were 60% less likely to have incidents of disorder.

Results: for every 10% increase in compliance with the lot layout element participants were:

• 26% more likely to do any walking in their neighbourhood
• 16% less likely to feel unsafe from crime
High quality public open green spaces are important for residents to visit and use, and provide a wide range of ecosystem services. Parks motivate residents to get out and about in their neighbourhood as places to be active, meet, socialise, and experience nature.

To assess the impact of public open green space RESIDE measured:

i. Distance (access) to a public open space (i.e., parks)

ii. The number and size of public open green spaces

iii. The quality, functions and amenity provided within the park (including measures of the presence of walking paths, shaded areas, water features, irrigated lawns, lighting, sports facilities, playgrounds, and indicators of incivilities)

Our results indicate that the location and size of green open spaces and the amenities within them are important for health outcomes. The positive impacts on participants included:

• Residents with access to parks and well-connected footpaths were 2.5 x more likely to walk for more than an hour each week

• After relocation, residents who had better access to recreational spaces increased their walking by around 18 minutes per week for each additional space they gained

• Participants with access to a larger park with more amenities were 38% more likely to do over an hour of walking each week

• Presence of graffiti, litter and vandalism in parks meant residents were around 50% less likely to walk for recreation in their neighbourhood

• More green space – in terms of both the number and area of parks – was associated with better mental health

• Participants with access to at least one high quality park within their neighbourhood were 2x more likely to have better mental health

• Residents who regarded their neighbourhood parks to be of high quality (with fewer signs of incivilities) reported a higher sense of community and were over 2 x more likely to have better mental health.

Results: for every 10% increase in compliance with the public parkland element, participants were

• 22% less likely to feel unsafe from crime

• There was no association between compliance with public parkland requirements alone and walking, however compliance with public parkland in combination with the movement network, housing diversity and urban structure requirements was associated with a 3.5-fold increased likelihood of walking
Schools are an important element in designing healthy and liveable communities. As well as providing for the education needs of local children, schools provide a focal point and hub for a range of community uses and activities out of school hours.

Walking or cycling to school or ‘active commuting’ helps children be more physically active, and contributes to them achieving the Australian recommended levels of physical activity. The locations of schools within the neighbourhood, the access routes and levels of safety can promote or hinder children and parents walking or cycling to or from school.

To determine the influence school design and location has on respondents’ lives, we measured:

i. Distance (access) to school from home
ii. Connectivity of the street network within a 2km catchment around school
iii. Traffic volume on the streets within a 2km catchment around school
iv. A School Specific ‘Walkability Index’ (based on a ‘pedshed’* + vehicular traffic exposure) within a 2km catchment around school

Results on the specific design characteristics relating to the location and routes to schools show that:

- Distance from home to school can predict whether children walk or cycle to school. For example, for each additional kilometre a child had to travel to get to school, they were 86% less likely to walk.
- Boys were more likely to cycle to school than girls, but the likelihood of cycling declined for every additional 1km they had to travel.
- Children attending schools located in areas with highly connected street networks and low traffic volumes were nearly 4 x more likely to regularly walk to and from school but those exposed to high traffic volumes were almost 70% less likely to do so.
- Perceptions were important: children (and their parents) who were confident they could safely navigate to school, were more likely to walk or cycle to school. For example, children whose parents thought the neighbourhood was safe enough to cycle to school were nearly 3 x more likely to do so.

*Pedshed = the ratio of the area of land accessible along the pedestrian network from the school to the maximum possible area within a Euclidean (as the crow flies) distance.
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- Department of Transport
- Department of Planning
- Western Australian Planning Commission
- Petcare

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