



Thames Urban Design Strategy

Literature Review

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Executive summary

This literature review is one component of a rapid health impact assessment (HIA) applied to the proposed Thames Coromandel Urban Design Strategy developed by CMA+U with Cranleigh eCubed for the Thames Focus Group to inform the District Plan review. Interactive engagement with the Thames community in 2012 showed broad support for and interest in the need for a more compact and sustainable urban vision for Thames that incorporated heritage hubs, compact sustainable housing and urban food gardens.

Population Health assisted in this process by focusing the literature review on the determinants of health already identified through the broad consultative process undertaken with the Thames community. These include housing, pedestrian friendly streetscapes, transport, and public space and ecology.

Urban environments and health are deeply entangled. The way our environments have been developed in recent decades often opposes good health. Health challenges of modern planning include the over use of private transport, sedentary lifestyles and social dislocation.

The proposed Thames Urban Design Strategy presents opportunities to reshape the current urban structure into a compact urban development that encompasses all the components necessary to maximise health and wellbeing for all.

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1 Introduction

Public health risks associated with urbanisation are complex. The fundamental urban design challenge today, is to build, re-build and/or retrofit urban environments that counter the direction of many years of development. The way much of our built environment has been developed often opposes good health.

The determinants of health are the social factors and the physical conditions in the environment, that influence where people are born, where they live, learn, play, work and age; the opportunities they have and the choices they make. These circumstances are shaped by how money, power and resources are distributed at the global, national, regional and local levels¹.

The major influences on the health of people in the community lie outside the health sector. It is the policies of other sectors that influence where and how people live their lives i.e. their social, cultural, and economic environments. The determinants of health and wellbeing are founded in these arenas.

This literature review is one component of a rapid Health Impact Assessment (HIA) on the Thames Urban Design Strategy. Population Health, Waikato District Health Board (DHB) is assisting the Thames Focus Group and Thames Coromandel District Council (TCDC) apply components of HIA methodology to its proposed urban design strategy for Thames town.

HIA is a tool which can assist key decision-makers in non-health areas consider the unintended health impacts of their decisions. HIA has its origins in environmental impact assessments (EIA) and later the scope was broadened to include public health. HIA is now applied to a range of plans, strategies and policies that have the potential to impact on health². HIA is a forward looking approach that is best applied in the early stages of policy or planning.

The HIA process includes the collation and analysis of relevant evidence and data, along with key stakeholder and community engagement with the aim of identifying:

- how health and wellbeing effects can be enhanced
- how negative health and wellbeing effects can be mitigated or removed
- ways in which health inequalities may be reduced or widened as a result of the policy or plan.

Population Health's involvement comes after considerable work had already been carried out by CMA+U in consultation with Cranleigh and eCubed who were commissioned by the Thames Focus Group and TCDC to establish an Urban Design Strategy for the Thames Town Centre. Key objectives were to:

- establish a plan that identifies and enhances the unique character and heritage of Thames while providing for future development in a form that will contribute to these qualities
- engage the community in the process through charette/consultation so the outcomes reflect local values and aspirations
- liaise with Council planners and document the Urban Design Concept Plan in a form so it will contribute to the District Plan Review³.

Interactive engagement with the Thames community and key stakeholders in 2012 has shown broad support for and interest in the need for a more compact and sustainable urban environment. Key features include a pedestrian and cycle friendly streetscape with mixed-use development and activities intertwined with the unique heritage and historic character of the Thames Township³.

1.1 Process undertaken for this literature review

This brief literature review examines the linkages between urban planning and health. The review gives particular attention to a number of key areas that emerged from a consultative process undertaken with the Thames community in December 2012 by CMA+U consultants. These include housing, pedestrian friendly streetscapes, transport and public space and ecology. The review draws from and updates work Population Health has undertaken or been involved with in previous HIA and other projects. Relevant literature was identified primarily by use of the computerised Medline database

and Google search engine and focused on the areas alluded to in the previous paragraph. Publications were limited to the English language. Thames specific information has been included as available and applicable.

1.2 Limitations of this review

This review represents a component of HIA methodology. Given the short timeframe, a broad-brush approach has been applied to the range of topics guiding the proposed Thames Urban Design Strategy. This review is not systematic and should not be considered a comprehensive or in-depth piece of work.

2 Summary of literature

2.1 Urban development and health

During the mid-nineteenth century, urban planning and the public health movement became closely connected in response to the diseases that emerged from poverty, poor housing, work conditions and the lack of basic sewerage and water treatment. Today, the health challenges are less to do with sanitation and disease control and more to do with the impacts of modern planning, the over-use of private transport, social dislocation and the health-related risk factors that follow e.g. heart disease and diabetes⁴.

Today, New Zealand is highly urbanised. Despite more than half of New Zealand's landmass being in agriculture and forestry and a further third in native forest and conservation land, New Zealand is one of the most urbanised countries in the world^{5,6}. Seventy two percent of the population lives in 16 main urban centres and nearly 87% live in 138 recognised urban centres with populations from around 1000 to more than a million people⁶. New Zealand's towns and cities are uniquely different from each other, the landscapes often dictating how growth can occur.

How our town centres and suburbs are shaped has a significant impact on economic performance, social cohesion and how well people do in their day-to-day lives. The way our environments have developed in recent decades often opposes good health. For example, New Zealand's pattern of housing development is typically characterised by segregated land use, an expansion of suburbs of low residential density and a high dependence on private motor vehicles. Sedentary lifestyles typify this sprawl and more

often than not a car is required to pick up milk and a newspaper⁷. Reduced levels of transport-related physical activity and the consequent health impacts are key public health concerns.

Public health risks associated with urbanisation are complex and include housing supply, choice, quality and affordability, over-reliance on vehicles and its impact on active transport, stress, pollution, higher costs of living, crime and other social issues.

Public health risks

- Rapid urbanisation and sprawl
- Over reliance on vehicles
- Sedentary lifestyles result
- Social and health issues emerge

The Thames Coromandel Peninsula is unique in that its dramatic coastline and proximity to Auckland, Hamilton and Tauranga makes it a popular holiday home and holiday destination that sees the population peak to more than five times its usual size during holiday times⁸. Its temperate climate is attractive to a range of people. Thames Coromandel now has a growing number of older people and a declining younger population⁹.

A growing concern about the impact change and development is having on the Coromandel Peninsula and in particular the coastline and natural landscape, led to the Coromandel Peninsula Blueprint, an interagency project developed to manage growth in an integrated manner⁹. A series of local documents including the 2011 Local Area Blueprint are guiding the proposed Thames Urban Design Strategy.

2.2 Housing

Housing is a key determinant of health. Where we live is at the very core of how we live our daily lives. Location, quality of housing, level of crowding, and cost of housing, all impact on health. Poor housing conditions are associated with a wide range of health conditions such as respiratory infections, asthma, injuries, and mental health problems. Exposure to lead from older lead based paint and asbestos are also concerns. Issues of overcrowding are consistent with housing affordability and tenure insecurity may result in an inability to provide a stable environment for children or provide improvements in health, employment and educational outcomes. Overcrowding is strongly associated with a range of infectious diseases such as meningococcal disease, tuberculosis, acute

rheumatic fever, and respiratory infections. High housing costs can leave less money for other items essential to good health like nutritious diet, access to primary health care services, heating and transport costs¹⁰.

2.2.1 Affordability

Home ownership rates have declined over recent years. By 2006, only 66.9% of all private dwellings were owned by their occupants and this is predicted to fall further by 2016¹¹. Census 2006 data across two census area units in Thames (Moanataiari and Parawai) shows that only 53.9% own or partly own their own home¹². Thames and Coromandel have the highest density of housing as they are one of the seven main serviced settlements identified for growth and are zoned for future residential intensification. Thames and Coromandel are expected to grow by around 25-30% by 2026¹³. Demand for housing will increase as a result. The proportion of unoccupied homes on the Peninsula is predicted to increase by 27% to 2,951 homes by 2022¹⁴.

Thames-Coromandel District has the second highest house price to income ratio of all territorial authorities in New Zealand and has high house price growth compared with other locations in NZ. In April 2006 the average sale price in the Thames-Coromandel District was \$434,261¹⁵. Housing affordability is largely an issue for usual residents. However, within the usual resident population a higher proportion of people earn less than \$20,000 per year compared with the national average. By contrast, around 47% of the district's absentee ratepayers earn between \$70,000 and \$100,000 per year¹⁴. Continued investment and demand for holiday homes by purchasers outside the district continues to drive housing market demand and price¹³.

Seasonal workers struggle to find affordable accommodation over the summer period due to pressures on camping grounds and short-term rental accommodation being too expensive for the workers.

Public health risks

- **Housing affordability and quality**
- **Poor health outcomes result i.e. rheumatic fever, respiratory infections**
- **TCDC expensive - demand for holiday homes driving market price. Impacts on**
 - **Seasonal workers**
 - **Low-medium paid workers**
 - **Families**
- **High numbers of absentee ratepayers**
- **Less opportunities for more social housing due to high land prices**

Issues of housing affordability could drive some low-medium paid workers to migrate elsewhere in search of affordable housing and sustainable lifestyles resulting in possible labour shortages in some locations and occupations across the peninsula. Families may also be at risk of leaving the district which in turn could threaten the sustainability of service providers such as education providers. Some parts of the peninsula have already expressed concern that the lack of affordable housing is impacting on the ability to provide adequate service industries¹³.

Housing New Zealand provides 200 state houses on the peninsula, the majority of which are located in Thames. It is possible that housing NZ will be reluctant to provide additional social housing in the peninsula because of the high prices asked for land. Research indicates that tenants in social housing in New Zealand tend to live in less crowded conditions than in the private rental market and these better living conditions reduce avoidable hospitalisations¹⁶.

Thames has a lower proportion of holiday homes than other locations on the peninsula and therefore has a correspondingly lower proportion of absentee ratepayers. New planning in urban design has moved to a more compact way of living which includes a well-connected network of streets, mixed use land areas and higher population density. The quarter-acre dream of the 1970s is now almost a thing of the past.

Under the Thames Urban Design Strategy, new housing market options are being proposed. These include medium density low-rise (one to two levels and two to four levels), and medium density medium rise (four to eight levels). Medium housing density has developed in the last decade as a response to combat urban growth. Good design becomes critical to ensuring the quality of the whole living environment for all units¹⁷.

However, a critical step in its success is public acceptability for medium density housing as a common and popular housing typology; particularly in Thames.

2.2.2 Quality

The standard of housing affects health. Poorly constructed and older houses are difficult and expensive to heat. Colder houses place more physiological stress on older people, babies and sick people. These groups of people have less robust thermoregulatory systems and spend more time indoors. In some developed countries up to 90% of time is spent indoors, and much of this time is in one's home¹⁸.

The World Health Organisation recommends that the average house temperatures are between 18-21°C¹⁹. In New Zealand at least one third of houses regularly fall below this level. Only 40% of pre-2000 houses reach 1978 ceiling insulation standards²⁰, 64% of houses have no under floor insulation and 56% have no wall insulation. Up to 90% of houses in New Zealand fail to meet 1996 standards for insulation.

There is now a solid base of evidence linking substandard housing with poor health outcomes. Exposure to damp, cold and mouldy housing can significantly increase the risk of a number of respiratory symptoms including the common cold and asthma and other non-respiratory problems such as fatigue and poor concentration. Cross-sectional epidemiology studies link recurrent headaches, fever, nausea and vomiting, and sore throats with damp mouldy housing²¹. Anxiety and depression are also linked²².

Initiatives to insulate and install heating within substandard housing in the Waikato region began in 2001 with the nationwide Healthy Housing programme. The Warm Up New Zealand Heat Smart programme followed in July 2009 which was a \$323m economic stimulus package designed to be carried out for a period of four years.

Within the Waikato region, Thames-Coromandel District has the highest number of older people in their population. By 2010, a relatively high number of insulations had occurred in areas where high proportions of older people reside (Table 1).

An evaluation of the Warm Up New Zealand Homes project in October 2011 showed a number of key results for those participating in the programme. These include:

- 27% reduction in mortality for participants aged 65 and over that had recently undergone cardiovascular hospitalisation. The estimated ongoing benefit could be valued at \$439.95 per year per treated household.
- \$64.44 saving per year in total hospitalisation costs for a household that received some combination of ceiling or floor insulation.
- \$67.44 yearly saving in circulatory illness related hospitalisation costs.
- \$98.88 reduction in respiratory illness related hospitalisation costs and for asthma related hospitalisation costs a higher saving at \$107.52.
- 0.96% reduction in average annual household electricity.
- 0.66% reduction in annual total metered energy used.
- 1.92% increase in electricity use as a result of heat pump installation and a 0.75% increase in total metered energy used²³.

From an environmental, energy and health perspective, the value of retrofitting insulation is compelling.

Table 1: Insulation retrofits in 20 towns with higher proportions of people over 65 years old

Urban Area	Population		Houses insulated	
	Total population	% of population who are 65+ years	Number insulated	% of pre-2000 houses insulated
Whangamata	3561	28%	8	0%
Matamata	6315	24%	121	5%
Thames	7701	24%	388	13%
Ngatea	1167	23%	22	6%
Te Aroha	3768	23%	57	4%
Te Kauwhata	1191	22%	90	39%
Waihi	4500	22%	129	7%
Paeroa	3969	21%	219	14%
Tairua	1263	20%	6	1%
Morrinsville	6603	18%	111	5%
Te Awamutu	10902	18%	273	8%
Cambridge	13344	18%	131	3%
Putaruru	3783	18%	61	4%
Whitianga	3768	18%	4	0%
Coromandel	1473	17%	10	3%
Tirau	729	16%	5	2%
Piopio	462	16%	4	2%
Pauanui Beach	735	15%	2	0%
Raglan	2634	15%	68	5%
Taupo	23493	14%	223	2%
Waikato Total	396,441	12%	9249	7%

Source: Environment Waikato and Waikato District Health Board -Warm Home Clear Air Needs Assessment (2010)

2.3 Pedestrian friendly streetscapes

Streetscapes help create an inviting and safe pedestrian environment. Trees and landscape strips, planters, curb extensions, seating, rubbish disposal facilities, screening and good lighting increases pedestrian use and opportunities for social interaction and physical activity. Physical inactivity is globally recognised as the fourth-leading cause of death and a global public health issue. In fact, a recent study showed the cost of physical inactivity in the Waikato region was around \$106 million. The cost for New Zealand was estimated at \$1.3 billion or 0.7% of total GDP in 2010²⁴.

Every trip begins and ends as a pedestrian trip, whether it's walking to a bus stop, train or car. New Zealanders are a nation of people who enjoy the outdoors and being active. The NZ Household Travel Survey 2007-2010 reported that walking made up about 13% of total travel time. During that period, around 211 million hours per year of walking occurred with approximately 822 million kilometres walked per year²⁵. But this is declining in almost all age groups.

Public health risks

- **Physical activity declining in almost all age groups**
- **Children driven to school = 58% of journeys to primary school (2007-11)**
- 48% increase since 1997/98
- **We are getting fatter**
- **Each additional hour in car = 6% increase in odds of becoming obese**
- **Each additional kilometre walked = 4.8% reduction in odds of becoming obese**
- **22.5% children overweight**
- **13% obese**
- **Obese children more likely to be obese adults**
- **Associated health risks increase**

Driver and passenger travel time accounted for 78% of all time spent travelling. Walking and cycling by children aged 5-14 years decreased nearly 60 minutes per week between 1989/90 and 2008-2011 – from 130 minutes in 1989/90 to 72 minutes per week in 2008-2011²⁵. The number of primary school aged children being driven to school is increasing significantly. In 1989/90, being driven to school made up 31% of primary student journeys. By

1997/98, this had increased to 48% and by 2007-11 children being driven to school made up 58% of journeys to primary school²⁵. Parental concern for child safety is one reason cited for this increase.

There are corresponding health implications for this increase in travel time in vehicles for both children and adults. New Zealanders are getting fatter and reduced physical activity appears to be the major cause for this obesity trend. Every additional hour spent in a car each day has been found to be associated with 6% increase in the odds of becoming obese. Conversely every additional kilometre walked each day has been associated with a 4.8% reduction in the odds of becoming obese²⁶.

A national survey reported that most children and young people (60.6%) were in the normal range for Body Mass Index (BMI); 22.5% were overweight, 13% were obese and 3.9% were underweight. The prevalence of obesity varied by ethnic group (Pacific 35.7%, Maori 20.6%, New Zealand European/Other 9.0% and Asian 7.1%).

Obesity in children and young people is associated with many serious health problems, including poor self-esteem, depression, cardiovascular risk factors, Type 2 diabetes and musculoskeletal problems. Children and young people who are obese are also likely to be obese as adults. Currently there is limited access to comparable data related to body size in the Waikato against New Zealand but it would be fair to assume Waikato data would reflect a similar picture²⁷.

Good urban planning and design can significantly increase physical activity and encourage the use of active transport.

People with disabilities are less physically active than those without physical disabilities (Edwards & Tsouros, 2006), yet physical activity is important for their health. Barriers to active transport for those with physical disabilities include inaccessible facilities, a lack of footpaths and of curb ramps at intersections, and rough surfaces making balance and mobility difficult (Edwards & Tsouros, 2006). Around one in five New Zealanders has a disability. This will increase in line with the group of baby-boomers while not old yet, will in the next decade change the profile of the population in ways not yet experienced. With age comes a natural decline in agility and mobility.

Urban planning must consider all aspects of the accessible journey i.e. all steps needed for a person to get from their home to their destination and back. Local government plays an important role in motivating and providing the infrastructure for people's physical activity, including transport infrastructure and active transport opportunities.

Health and wellbeing opportunities

- **Understand pedestrian travel and movement**
- **Plan well**
- **Create friendly streetscapes**
- **Make active transport easy**
- **Provide for the disabled**
- **Build wide paths**
- **Maintain level walking surfaces well**
- **Create sense of personal safety and security**
- **Mixed land use = reduced vehicle miles**

Thames has the opportunity now through the proposed Urban Design Strategy to undertake an all-of-community approach and ensure the needs of all population groups are catered for.

Research indicates that a well connected network of streets with many intersections, small block sizes and only a small number of cul-de-sacs will encourage active transport²⁸. People are usually only willing to walk or cycle a limited distance to get to their destination. Increased street connectivity increases the range of destinations within comfortable walking or cycling distance²⁹. Grid patterns of streets contain many intersections where traffic must slow, which allow pedestrians to cross safely and further encourage active transport³⁰.

A large number of US studies have shown an association between a high level of street connectivity and a high level of physical activity. The association between high street connectivity and a lower level of physical activity related morbidity and mortality has also been seen³¹.

An Auckland study of people who lived within five kilometres from their workplace found that those people who lived on the most connected streets were seven times as likely to walk or cycle to work as those living on the least connected streets²⁸.

A mixed use of land areas also provides destinations within walking and cycling range and therefore encourages the use of active transport. Residential and commercial use of land being within close proximity gives the greatest benefits²⁸. Land mix has been shown to be associated with reduced vehicle miles travelled³².

Pedestrians and cyclists tend to be more sensitive to the aesthetic details of the environment than those using motor vehicles for transport. Areas with aesthetic features such as attractiveness of a place, landscaping and good design of building have increased walkability²⁸.

Deteriorated physical environments have higher rates of crime, making neighbourhoods less safe for walking³³. Bike paths and footpaths not only need to exist, but must be

sufficiently wide, maintained, well lit and linked to other paths and public transport for them to be widely used³².

A well maintained level walking surface has been found to significantly increase the likelihood of walking both as a means of transport and as a leisure activity³⁴. The number of active people living in the neighbourhood³⁵ and the presence of parks³⁶ are also associated with the use of active transport.

Understanding the needs and characteristics of pedestrian travel is essential when designing pedestrian facilities and streetscape appeal.

2.4 Transport

Transport is critical to participation in society. The ability to get from A to B is vital to staying healthy. New Zealand has a high dependence on motor vehicles and ranks third in the world with 82% of people owning a car. New Zealanders are also amongst the lowest users of public transport in the world ranking 22nd out of 28 countries³⁷. In 2007, the average New Zealander spent about 14% of their income on transport. For low income families this cost would be much greater. For those without a vehicle, with driving restrictions and/or mobility challenges alternative transport options becomes a necessity in order to participate in life. The World Health Organisation recommends minimum walking distances to public transport be planned for in all new developments (residential, office, retail and leisure) and that public transport have priority over other road traffic in main routes³⁸. Well planned urban environments which separate cyclists and pedestrians from car traffic significantly increase the safety of cycling and walking. New Zealand's transport policies heavily prioritise the development of new roads.

2.5 Public space and ecology

Green space policies are an important part of urban planning, sustainable development, biodiversity, public health and community development³⁹. Great public space has been described as the living room of a city⁴⁰. The open space network extends well beyond playgrounds, parks and reserves to include neighbourhood streets, city centres, walkways, greenery, waterways, structures and views⁴¹.

At the time of writing this review it was unclear as to what extent Thames-Coromandel District Council was planning a greater integration and connection of open spaces to green spaces. The Draft 2012-2022 Ten Year Plan makes reference to the maintenance of an open space network for a variety of recreational and leisure purposes and recognises open space as an important asset for the district¹⁴. Currently, Thames has 10ha of playing fields at Rhodes Park, 6.383km of recreational footpaths and tracks on reserves, four playgrounds, 49 gardens (10574sqm) and 466sqm of annual bedding⁴².

Thames has significant natural values and resources. Māori concepts of wellbeing are strongly connected with the environment in which they live. Ngati Maru settled in Thames in the 1400s and there are now 11 iwi with many hapu and whānau who have strong genealogy links (whakapapa) to the land. When seen from a Māori perspective, urban design has a need to maintain and protect the integrity of the land and waterways, including sources for food, landmarks and wahi tapu (sacred areas)⁴³.

Thames is also vulnerable to some natural hazards due to its proximity to the sea, steep hills and reclaimed land. Planning must acknowledge this as part of its process to ensure that urban design is sustainable. A more compact approach to urban design may be able to protect currently existing natural environments⁴⁴. Urban development will need to evaluate environmental resources and hazards, deciding what future losses are acceptable, and ensuring developers and the community adhere to goals for sustainability.

Opportunities exist through urban design to complement and utilise the environment to improve built environments. The challenge with urban design is to allow communities to still have access to natural environments and green spaces. There is a large degree of evidence indicating that for those living in urban environments, access to natural environments and green spaces is a key determinant in physical and mental wellbeing⁴⁵. There are also opportunities to create more sustainable buildings, through the collection of roof water and the utilisation of solar, wind and tidal power to create a more environmentally sustainable urban environment, and provide health and economic benefits to those living in them⁴⁴.

2.5.1 Water quality

Due to its unique geography the Thames-Coromandel District has 10 waste water plants and 11 water treatment plants. How water quality is managed is a public health concern and potential risk. Contamination of drinking and recreational water through toxins, excess nutrients and human and animal waste can lead to health problems such as gastrointestinal (enteric) diseases. Water can also become polluted from the runoff from roads and also from suburban, rural and industrial areas. Urban planning must consider how infrastructure will meet and cope with anticipated growth i.e. adequacy of drinking water supply, waste water and emergency management such as fire fighting. Maintenance and improvement of recreational and drinking water quality continue to be key public health concerns.

Urban planning must consider maintenance and improvement of recreational water quality in order to adequately cater for its anticipated growth.

2.5.2 Soil contamination

Soil contamination as a result of historic mining has been well documented in Moanataiari, and there is some evidence that indicates other parts of the town may also be affected. The potential for adverse effects on human health can be minimised if land use planning takes this into consideration when planning urban development within the town.

2.5.3 Hazard management

Thames is vulnerable to coastal flooding as a result of storm surges and other natural hazards such as tsunamis. The long term effects of coastal erosion may also have an impact. It will be important that urban design reflects these risks and develops in a way that is responsive to that risk⁴⁶.

3 Conclusion

Urban environments and health are deeply entangled. People's lifestyles and the conditions in which they live and work; strongly influences their health. Transport policy for example, can play a key role in combating sedentary lifestyles by reducing reliance on cars, increasing walking and cycling, and expanding public transport. Changes in land use that convert road space into green spaces have the potential to enhance health and wellbeing. The proposed Thames Urban Design Strategy presents opportunities to

reshape the current urban structure into a compact urban development that encompasses all the components necessary to maximise health and wellbeing for all.

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