Kopu-Thames Structure Plan
Technical Report

Urban Design and Land Use Assessment

Prepared by
Beca Carter Hollings & Fener Ltd
April 2009
Table of Contents

1 Introduction .......................................................................................................................... 1

2 Kopu to Thames Concept Plan and the Principles of Urban design ......................... 1
   2.1 Integrated communities .................................................................................................. 1
   2.2 Distinctive character .................................................................................................... 3
   2.3 Diversity and choice ..................................................................................................... 4
   2.4 Variety of networks ....................................................................................................... 6
   2.5 Imaginative places ......................................................................................................... 7
   2.6 Environmentally sustainable ......................................................................................... 8
   2.7 Collaborative knowledge sharing .................................................................................. 11

3 Conclusions .................................................................................................................... 12

4 Recommendations ........................................................................................................... 12

5 Alternative (slightly revised) Concept Plan ................................................................. 14

Entrance to State Highway 25 east of Kopu Industrial
1   Introduction

This brief report reviews urban design and land use principles that are relevant to the Kopu to Thames area. These principles are based largely on the “New Zealand Urban Design Protocol” published by the Ministry for the Environment in March 2005 and now adopted by most local authorities, Government Departments, Professional Institutes and Consultants in New Zealand (Including Beca).

There are seven community design principles that together create quality urban design. As set out in the Protocol, and reinforced by overseas urban design practices and growth trends including “smart growth” planning (which is an almost identical approach to community design), good urban design:

1. Treats all activities, buildings and spaces as integral parts of whole communities.
2. Reflects the distinctive character, heritage or identity of the community
3. Ensures diversity and choice for people within communities
4. Includes a wide variety of networks within communities linking activities and people
5. Encourages creativity and imaginative places within communities
6. Arranges communities so they are environmentally sustainable, safe and healthy
7. Facilitates community collaboration and knowledge sharing across all sectors.

These seven urban design principles, in relation to the Kopu to Thames Concept Plan, are discussed in more detail below.

2   Kopu to Thames Concept Plan and the Principles of Urban design

2.1   Integrated communities

The Kopu to Thames Concept plan (on the following page) is itself a good example of the first and perhaps most important principle for creating good urban design; integrated community planning.
In the modern world the usual way to solve problems is to focus expert attention on each problem separately. If a community needs more land for housing; suitable land is identified and zoned residential. If a road has too much traffic; the usual solution is to widen it. If a sewage treatment system gets overloaded; an upgrade inevitably follows.

However, a good solution to one problem in a community can sometimes make another one worse. Adding more housing may lead to overloaded public services. Widening a road may impact on important cultural, historic or archaeological sites. Enlarging an existing sewage treatment plant may upset nearby residents.
Good urban design considers all elements of a community together. The interests and needs of each household, each road, each school, each sewer line, each industrial development, each component of a community is balanced and considered together, as an integral part of the whole.

The Kopu to Thames Concept Plan has helped to begin this process. It has identified a number of issues and common objectives as well as a simple basic plan showing how competing interests might be balanced to achieve the best community outcome.

It has provided a draft framework within which the Thames-Coromandel District Council can provide a plan for industrial land and residential housing needs of Thames and its surrounding environs. In doing this it has also looked at recreational needs, roading, water supply, sewage treatment, drainage, ground stability, cultural concerns and a variety of other sustainable planning and environmental management considerations.

There are some details that the Concept Plan has not considered. The study area has left out a small residential neighbourhood across the highway from the airport despite being an integral part of the area and having 3 potentially conflicting road access points along a very short section of highway. It has not considered the eventual need for local primary education facilities and neighbourhood oriented shops to serve the area once fully developed. And finally, it is not clear how development will be staged in the area given that much more residential land is included in the study area than appears to be needed over the next 20 years.

However, these are all concerns that will be looked at in more detail in the preparation of the Structure Plan, the next stage of the planning process. In general the Concept Plan for Kopu to Thames has comprehensively identified the important issues that must be weighed up and balanced to achieve good urban design results.

2.2 Distinctive character

Floodplains, wetland areas, grasslands, rolling hills and native bush remnants are all visual characteristics of the Concept Plan area. In theory, good urban design should attempt to reinforce this identity where possible, but this will be difficult. Changing from a rural area to an urban one will affect development density and this alone will inevitably change the character of the area.

Nevertheless, parts of these distinctive features can be retained with careful planning. For instance, if the very tops of the ridges that are visible from Thames and from the main highway can be kept free of housing, power lines and other visual “urban” distractions, then the form and character of the existing hills can be retained. If the valley streams through the site can be set aside for walking tracks, open space and public utilities (such as sewer and power lines), then it would help protect most of the existing bush remnants in them as well as protect future residents from flooding. If the undeveloped flat land next to the Waihou River, now vulnerable to flooding, is left as open space, then the existing “plains” character of the town entrance can be retained.
The existing types of zones in the District Plan would need to be revisited to achieve these results, however. The current provisions of the Rural Zone (except Rural B), the Rural Residential Zone and the Residential Zone are not capable of protecting such characteristics at the moment, particularly on the flat land next to the Waihou River.

2.3 Diversity and choice

Good urban design should offer residents a variety of housing choices. Presently the Kopu to Thames Concept Plan identifies two types of residential development, full “urban” development in the north east quarter of the planning area and “rural residential” in the south east quarter. There is some logic to this, as the land in the north east is somewhat easier to develop, is closer to existing infrastructure and already has more housing on it.

However, it could be argued that offering only two housing types in mutually exclusive areas isn’t offering residents much choice, nor recognizing the complexity of the land form in either area. More over, developing a sewerage reticulation system for the north east area probably could not be undertaken immediately given the existing system is pretty well at capacity at the moment, and establishing water, power and other public infrastructure to supply a housing density of up to 10 units per hectare in this area in the near future could be challenging as well (particularly financially).

There are other ways to approach the question of housing choice that would not only offer a wider range of housing to choose from, but would recognize the complex landscape and help solve the development staging and utility finance problems as well.

One alternative would be to allow a full range of residential development to proceed anywhere on the east side of the State Highway in the Kopu to Thames area, provided that all subdivision and development was planned to fit into the agreed Structure Plan for the area, including the eventual...
installation of public utilities. The key here is “planned to fit into the agreed Structure Plan” which would by necessity include a utility development staging plan previously agreed (and amendable) by Council.

For instance, in an area where there was no existing reticulated sewerage system, any lot size and housing type could be permitted provided it complied with normal planning requirements (height, distance to boundary, etc.), the site owner(s) pre-paid a set sewerage connection fee (held in escrow) and they handled their own sewage treatment requirements on site until the public sewerage system was constructed.

In essence this would mean the development would have to be able to rely on septic tanks or package treatment systems for the time being in the same way existing rural development does.

Any lot created or built on that was more than 2000 m² would also have to be designed (and built upon) in a manner that would allow it to be further subdivided, and every potential future lot would have to be laid out in a way that allowed future site development access to all planned utilities.

A constraint of the approach that would bring some order to the staging of development in the area would be a firm requirement that any new development would have to construct the full planned road access to the development (or convince other adjacent property owners to help), and provide a bond that guaranteed all building sites created would connect to all public utilities and pay all standard connection fees once such public utilities were in place.

With careful planning, there are two potential benefits of the approach. One is that it would guarantee in advance both construction and operational funds for the needed public utilities. Secondly, the current lack of public utilities and facilities would not stop development in the area in the meantime (or worse, result in further rural subdivision that did not take into consideration future urban development opportunities).

Another alternative, possibly used together with the first, would be to allow use of transferable development rights for future housing in the area. In essence all land in the area would be zoned at a fixed relatively low average number of housing units per hectare (perhaps 5 units per gross hectare), but any particular area could be developed at a greater density provided the developer could buy the rights to build the additional units from adjacent land the council wanted to protect as reserves, such as remnant bush areas or valley bottoms subject to flooding. The technique is a particularly simple way of creating reserves without penalizing individual property owners for their “good fortune” of owning land that the council might rather keep for public use.

Both approaches would allow a good mix of housing types, from large lot rural residential development to small blocks of low rise flats in the area according to demand without being limited by immediate community resources to build new sewerage treatment plants or water reticulation systems. It would also help ensure the funding of such improvements though the establishment of a guaranteed connection fee from all future development in the area.

The value of diversity of choice is relevant to Industrial activities too. At the moment almost the only choice given to industries in the Thames area is to locate on land that is potentially vulnerable to flooding. While good flood protection measures can make the situation tolerable to most industries, some would prefer sites that avoided the possibility altogether. This matter is further discussed in the section on sustainability (2.6), below.
2.4 Variety of networks

The need to provide a variety of choice is most obvious in the area of transportation. Pedestrians, cars, busses and trucks all have different needs and they don’t mix well together.

For instance, trucks require larger turning radii than cars. Their size and wheel tracking can damage smaller roads and reduce their safe use by cars and pedestrians. As a result they are often discouraged from residential areas. However, they cannot be kept out of them all together as they and other large vehicles such as moving vans, emergency service vehicles and public busses sometimes provide essential neighbourhood services.

Vehicles turning into and out of activities along a highway are another potential transportation problem as they can severely disrupt the capacity of main roads. Limiting highway access to controlled intersections through the Kopu to Thames area is the stated goal of The New Zealand Transport Authority, but this may not be feasible in the short term, particularly where there are existing major developments along the main road. Until the ideal can be reached, traffic safety can still be improved by limiting access between controlled intersections to only left hand turn movements so no vehicle movements have to cross a moving lane of traffic.

![Approaching the entrance to the existing Kopu industrial area from the direction of Thames](image)

Pedestrians have their own unique needs. Footpaths should be installed along all public streets to reduce pedestrian – vehicle conflicts, but residents also benefit from off street pedestrian (and bicycle) networks that provide alternative access to shops and schools and which can be used for recreational purposes (and can also double up as drainage and utility corridors).

Fortunately, the Kopu to Thames Concept Plan recognises all of these potential problems (and opportunities), but one important urban design concern not yet addressed is the problem of single entrance neighbourhoods.

In urban areas, cul de sacs or “no exit” streets for small clusters of houses is a very common and successful urban design and “traffic calming” technique for eliminating through traffic in residential areas.

However, “no exit” streets have a down side when used to access large housing areas. A fallen tree or power line across the entrance to a short cul-de-sac may be an inconvenience for police, fire, ambulance or other emergency service personnel, but if the street provides the only access to hundreds of residents, not only is the likelihood of an emergency callout greater, but the difficulty of providing emergency services when the only access is blocked by such an obstruction is significantly compounded.

Good urban design means that housing areas containing more than 40 or 50 housing units should be arranged so that they have at least two public roads into them.
The same principle applies to the State Highway between Kopu and Thames. Although not the only access out of the Coromandel, it is the only access on the west side of the peninsula. The highway can now flood and literally stop all movement south out of Thames. This presents a significant public safety issue.

The existing road may be raised above the 100 year flood level at some point in the future, possibly when the road is widened to four lanes. This would partially resolve the problem, but it would be even better if there was an alternative way south from Thames should something like a serious traffic accident, fire or industrial mishap (or flood) block the main highway at Totara or Kopu.

The logical location for such a route would be through the Concept Plan area, and there is an ancient Maori trail that already identifies a possible alignment for the road with a reasonable gradient. The only obvious complication of the route (apart from possible cultural/heritage concerns) is at the northern end of the planning area where any road would have to drop down steeply to the Kaueranga River and cross the flood plain upstream of the race track. It would require some excavation of the hillside to get a major road down through the area but the removed fill could then be used to elevate the road above flood levels across the low lying river plain.

Of course, a second bridge across the Kaueranga River would be prohibitively expensive at this point in time, but not to plan for the long term possibility now when the only available land and realistic route is still undeveloped, would be a significant opportunity lost.

2.5 Imaginative places

Good urban design stimulates people and makes them smile. A well designed neighbourhood is a pleasure to live in and to visit. The Kopu to Thames area has all the ingredients to make such a neighbourhood; the hills, the valleys, the forest remnants, the wetland areas, but it would not take much to spoil it.

The reality of urban development is that public roads use between 12% and 25% of the total land in any residential neighbourhood. It would be unfortunate if the bush remnants now found in many of the valleys had to be cut down to put in roads, and equally unfortunate if all the roads had to cut across steep hillsides creating numerous deep scars in the landscape.

Also, as mentioned earlier, it would be unfortunate if houses and power poles cluttered the ridgelines and spoiled the existing character of the area. Time will partially heal hillside scaring as vegetation will grow back, but there could be an alternative to all of this.
One urban design technique that might be appropriate for the Kopu to Thames area involves aligning residential roads as far as practicable along the ridge lines. If this was done and the roofs of nearby houses were kept below the adjacent road level where possible, it would create an inspiring place to live. All residents would be exposed to grand views of Thames and the Waihou River plains as they travelled to and from their homes, and from a distance the hills where they lived would still retain their natural form on the skyline.

There are inherent problems with the design of utility systems for housing developments where the roads follow ridgelines, particularly for sewerage reticulation (assuming power is placed underground throughout the neighbourhood, or at least banned overhead along the ridgelines, for aesthetic reasons). They are not insurmountable problems, however. The ridgeline road concept just makes the need to have a good Structure Plan with clearly identified utility corridors very important.

2.6 Environmentally sustainable

Flooding is a serious issue for Thames. Thames must live with the fact that virtually half of it, including all of its public and commercial buildings will be flooded at least once every one hundred years. While this may not seem a major problem, there have been at least six damaging floods in the Thames area in the last century either from high rainfall or high seas, including in 1917, 1936, 1938, 1978, 1981 and 1985.
Developments like the new Goldfields Shopping Centre in Thames on the coast next to the central area, despite being in the floodplain, are entirely logical given the essential need to have such facilities right in town. Even the recent Totara Palms residential development by the airport makes some sense (ignoring some serious reverse sensitivity issues of the nearby wastewater treatment ponds) given that past studies have shown the specific location of the development on the west side of the State Highway (and only that location) is elevated just enough to avoid all but the most severe flood event.

However, while the Thames community is “use” to dealing with flooding issues, flood events are still a costly and potentially life threatening problem which all new development should avoided where possible. Thus the proposed use of land subject to flooding south of Totara Palms, west of the State Highway and north of Kopu for industrial purposes (see the Kopu to Thames Concept Plan on page 2), is a concern.

Other alternative sites have previously been investigated including the site of a former sawmill on the east side of State Highway 26 south of the Kirikiri Stream and golf course. This site is not included in the present Structure Plan investigations for several reasons, including its relative isolation from the remainder of Thames, the cost of providing utilities to the area, the preference of the New Zealand Transport Authority not to have development south of the proposed new Kopu Bridge, and the Urban design principal that communities should be as compact as possible.
It is good urban design practice to place residents as close as practicable to employment sources such as local industry, provided sensitivity issues can be well managed. In this situation, the contour differences between the proposed industrial area at Kopu and the new residential areas to the east suits this principle well.

It is also possible to provide flood barriers or raise land subject to flooding high enough to substantially reduce the risk of flooding in the area, options that are currently under investigation as part of this study.

However without spending an extraordinary amount of money such measures can never eliminate the risk of flooding all together. In most cases, the best level of protection that can be achieved practicably is against a 1 in 100 year flood event (or a 1% annual flood event). In the current climate of global warming, the existing risk of flooding is only likely to get worse.

Despite the potential benefits of creating a compact community if the floodplain north of the existing Kopu Industrial area is also developed for industrial activities and despite the technical ability to reduce the existing flood risk in the area, the question must be asked from an “Urban Design” point of view:  Is the proposed site north of Kopu for future Industrial development really the best option?

If the additional industrial area that is proposed is fully developed for industrial purposes, would the cost of the flood protection measures required to protect it, and the long term cost to private industry and the public of a flood at least once every 100 years (assuming such level of protection is provided), be worth the benefits gained by its selection over a site that is not subject to flooding but might incur greater costs in providing public services?

In the same vein, the same question must be asked about the proposed industrial activities near the airport. This area is also subject to flooding and while some industries might benefit from easy airport access, from an urban design point of view, it is not entirely clear that the benefits of such development would outweigh the long term public health and safety costs and the personal, commercial and public costs of both the necessary flood protection measures and the inevitable 1% flood event.

Airport in floodplain

It would be economically difficult to stop continuing industrial development in the existing historic Kopu area despite its flooding problem, but the benefit in extending industrial development further north is only clear for a small area east of the highway where the main road already offers some flood protection and an existing timber mill occupies most of the land.

Before the structure plan is finalized and major public works are undertaken to lower the risk of flooding in the area west of SH 25 north of Kopu as identified in the concept plan, it might be appropriate to undertake a full, formal cost benefit analysis of alternative sites, which considered the costs of servicing a more distant site not subject to flooding against the short term site development costs and long term liability costs of the one currently proposed.
One such site for comparison would be the vacant sawmill site just south of the golf course previously mentioned that has a well landscaped entrance which would lend itself to the development of a high value industrial estate.

While the NZTA is not comfortable with the expansion of urban activities south of the new Kopu Bridge, this particular site is somewhat unique and possibly worth considering as an exception. It already has an excellent industrial entrance to the State Highway, and nearby land could be used for other industrial developments which require large flat flood free areas to operate. Further away from the highway partially hidden by low hills, is also a possible site for a new sewage treatment plant, should the existing facility by the airport be replaced because of its exposure to potential flooding and its proximity to existing housing.

2.7 Collaborative knowledge sharing

The last Urban Design principle for achieving good urban design, namely collaborative knowledge sharing, is a difficult one to accomplish, for it can take considerable time and resources to undertake, and it is rarely ever enough or fully completed.
The Kopu to Thames Concept Plan has made a sincere effort so far to share knowledge and collaborate with the public. It has already held a design charrette to seek alternative ideas on the Concept Plan, and reinforced by the provisions of the RMA, it has built into the planning process numerous opportunities for the public to be involved in the creation of the final development objectives and controls for the area.

In addition to seeking input from Council staff, local residents, the commercial and industrial community and potential developers, it will be important to formally include local iwi in the preparation of the Structure Plan for the Kopu to Thames area.

Local iwi not only have a significant interest in almost all of the land involved, they manage a very key feature of the landscape, the Pukehue Pa on the Matai Whetu marae, which sit on an inspiring site at the entrance to the Coromandel and Thames area.

The Kopu to Thames Concept Plan already recognises the importance of this, so with continued careful attention, the needs and concerns of all interested parties should be fully understood and met in the final Structure Plan for the area.

Maori graves in study area

3 Conclusions

The Kopu to Thames Concept Plan covers and integrates most urban design practices very well and is a good beginning to the preparation of a comprehensive Structure Plan for the area. However, there are some details of the Concept Plan that could use refinement or revision before this plan is worked into a full Structure Plan.

4 Recommendations

The following recommendations are suggested to achieve quality urban design in the Kopu to Thames area

a. Consideration should be given to extending the study area for the Concept Plan and Structure Plan to include the existing residential area north of the cemetery between the State Highway

Maori graves in study area
and the Kauaeranga River in order to better integrate future nearby development and help resolve potential State Highway access problems in the area.

b. Further investigations should be undertaken to determine the practicality of allowing residential subdivision and development “on demand” anywhere east of the State Highway provided only that it comply with all provisions of the adopted Structure plan. In areas where power, water, sewer and/or road access did not currently exist, such development would have to construct full public road access and provide their own utilities and services in a manner that conformed with the planned layout and provide a bond to guarantee connection and fee payment for such public services once they became available.

c. Any development undertaken in accordance with “b” above that contained lots larger than 2000m², should also be designed so that the large lots could be further subdivided and each smaller lot serviced when public utilities became available, in accordance with the adopted Structure Plan.

d. The use of “transferable development rights” for all new housing in the area should be considered to allow greater mixture of housing densities and help create public reserves without penalizing existing land owners for their “good fortune” of owning important areas such as bush remnants or valleys subject to flooding.

e. Planning for the residential areas east of the State Highway up the Totara Valley should include the identification of sites for primary schools and neighbourhood shops to serve the new residential areas once fully developed, even though neither may be needed in the short term.

f. There should be at least two ways into residential areas containing more than 50 residential housing units.

g. Roads through residential subdivisions should be aligned as far as practicable along the ridge lines to provide inspiring views for local residents and visitors and limit the impact of development as seen from coastal areas.

h. The roofs of houses (and power poles if reticulation is not underground) should be kept below the ridge lines to preserve the natural form of the hills when seen from a distance.

i. As far as practicable, all valley floors with streams should be set aside for public open space, walking tracks, utility corridors, storm water drainage and the protection of bush remnants.

j. A second north-south route east of the existing State Highway through the residential area should be created to allow the eventual establishment of an alternative exit south from Thames. While a second bridge across the Kaueranga River may not be economically feasible for decades, it would be a lost opportunity not to provide for the potential alternative link at this early juncture. A possible route would be along an old Maori trail through the area.

k. In the long term all turning movements on and off the State Highway should be at controlled intersections, but in the short term, limiting turning movements to “left in, and left out” only, would improve traffic safety.

l. Further consideration should be given to extending the scope of this study to include land appropriate for industrial activities that is not currently subject to flooding. One possible site lies east of State Highway 26 south of the existing golf course. It is well landscaped, has excellent highway access and could become an up-market industrial estate.

m. The costs and benefits of further industrial (or residential) development north of the existing historic Kopu Industrial area and west of State Highway 25, should be formally assessed before further flood protection measures are undertaken and development permitted. The potential long
term cost to public health and safety, the private development costs from an inevitable flood event (1% value of potential loss over the entire fully developed site) and the cost of installing flood protection should be weighed against the cost of utilising an alternative site free of flooding but requiring more costly servicing; such as the site mentioned in “I” above.

n. When nearing the end of the plan development process for the Kopu to Thames Structure Plan, the Rural, Rural Residential and Residential zones should be revised to better reflect and preserve the local character and better limit the long term public health risk posed by flooding.

o. Consideration should be given to the eventual relocation of the Thames sewerage treatment plant because of reverse sensitivity issues and flooding concerns. One possible site might be somewhere behind the proposed industrial estate mentioned in “I” above.

p. Consultation with local Iwi should be formalized in order to reach mutually agreeable urban design solutions that can be incorporated in the final Structure Plan.

q. Bearing in mind the flooding concerns north of Kopu and other issues raised in this report, a slightly modified version of the original Concept Plan has been included on the following page as an alternative starting point for future public discussion purposes and technical investigations during the development of the full Structure Plan for the Kopu to Thames area.