UMHLANGA NODE STUDY
SUMMARY OF STUDY FINDINGS

1. Introduction
The eThekwini Municipality’s Spatial Development Framework (in its Integrated Development Plan) defines Umhlanga as a ‘major economic investment node’. While the exact boundaries of this node are not defined, it is clear that developers view Umhlanga as a highly sought after location. New and proposed beachfront developments indicate renewed interest in the area. These tie up with municipal plans to upgrade traffic infrastructure, develop a pier and upgrade the beach and bathing area including the existing promenade. Apart from the Ukusa site, a municipal property situated adjacent to the existing commercial area, most properties in this coastal section of Umhlanga are already developed. The municipality is therefore under growing pressure to increase the density of development permitted, particularly through the redevelopment of beachfront properties, by amending the Umhlanga Town Planning Scheme.

While all development decisions should be made within the context of sustainability, development in coastal areas requires special care, as required by national and provincial environmental and coastal legislation. Coastal areas such as Umhlanga play a key role in tourism and the local economy, however development needs to ensure that the special qualities of these areas and the sensitive nature of the coastal environment are protected and enhanced. With this context of sustainable and appropriate coastal development in mind, and in order to formulate an appropriate response to development pressure in Umhlanga, the eThekwini Municipality recently initiated the Umhlanga Node Study in conjunction with a team of consultants.

The purpose of the study was to investigate the range of potential impacts associated with an increase in development density based on two development scenarios: (1) the full take-up of current development rights; and (2) an increase in bulk to a Floor Area Ratio (FAR) of 2.0. The key impacts of concern to the Municipality were as follows:

- **Visual impacts** – As the Town Planning Scheme has no direct height restrictions for General Residential 1 properties the visual impact of new developments, especially those adjacent to the beachfront, could be considerable.
- **Shadow effects** – Likewise, high-rise buildings could cause considerable impact by overshadowing the beach and neighbouring properties. This has important implications for tourism as overshadowing could potentially discourage visitors from the area.
- **Impacts on property values** – The potential loss or partial loss of sea views through the development of new high-rise buildings needed consideration, especially in light of increased litigation in this area.
- **Environmental impacts** – Concerns were raised regarding the potential negative impacts on marine life and coastal vegetation through shadowing of the coastal environment.
• Impacts on infrastructure – An increase in development densities will result in increased demands on traffic, stormwater, water, wastewater and electricity infrastructure.

The findings of the study have been used to inform the delineation of the Umhlanga node, planning decision-making with respect to applications for increased development rights, the related consideration of amendments to the Umhlanga Town Planning Scheme, and the range of associated future infrastructure needs.

For the purpose of the study, the Umhlanga node was defined as shown in Figure 1. The node area included all beachfront properties zoned General Residential 1 as well as the core commercial area situated between the beach and the M4 highway. These properties were chosen due to current or potential interest for additional development rights.

![Figure 1: Umhlanga Node Study Area](image)

The project consisted of six key phases: (1) the compilation of planning data and production of development scenarios, (2) a visual simulation of development scenarios and shadow impacts, (3) an assessment of shadow impacts, (4) a coastal ecology impact assessment, (5) an assessment of the potential impact on property values, and (6) a range of assessments of the potential impacts of the
development scenarios on services infrastructure. The first two phases provided the information used for the assessments undertaken in remaining phases.

2. Compilation of planning data and production of development scenarios

Detailed planning data on each property within the node area was collected, including zoning, site area, current floor area and coverage, number of floors of each existing building, number of units and parking bays, and hardened surface area. The Town Planning Scheme was also reviewed with respect to the zoning of the subject properties, and to determine the potential form of development in Umhlanga if existing rights were fully utilised or the FAR increased. Once the development status quo was quantified, the potential densification of the Umhlanga node area was calculated for the two development scenarios. Certain judgements and assumptions were made with respect to adherence to the requirements of the Scheme, as well as to the choice of sites considered for additional development in the development scenarios.

Table 1 summarises the results of this exercise with respect to the number of residential units (apartments or hotel bedrooms) that would result in each development scenario. Scenario 2 did not represent a major increase in density as most sites have been fully developed – it resulted in 577 additional units or a densification of 24%, most of which would be located on two large properties. Scenario 3 however, resulted in 3019 more units than at present, a densification of 124%.

<table>
<thead>
<tr>
<th>Scenarios</th>
<th>General Residential 1</th>
<th>General Commercial</th>
<th>Special Zones</th>
<th>Total</th>
<th>Additional units compared to Scenario 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1 (current development)</td>
<td>2172</td>
<td>250</td>
<td>3</td>
<td>2425</td>
<td>0</td>
</tr>
<tr>
<td>Scenario 2 (full take up of existing rights)</td>
<td>2399</td>
<td>258</td>
<td>345</td>
<td>3002</td>
<td>577</td>
</tr>
<tr>
<td>Scenario 3 (FAR of 2.0)</td>
<td>4833</td>
<td>266</td>
<td>345</td>
<td>5444</td>
<td>3019</td>
</tr>
</tbody>
</table>

3. Visual simulation of development scenarios and shadow analysis

The planning information collected in the first phase was translated into a 3D visual simulation of development in Umhlanga, illustrating of the development scenarios described in Table 1 above. Since both the General Residential 1 and General Commercial zones do not have a height restriction in terms of the Umhlanga Town Planning Scheme, the model attempted to maximise both height and bulk, creating a ‘worst case’ scenario in order to assess the maximum impacts that could result from increased densification in the node area.

Four key products were produced in this phase, each relating to the three development scenarios: (a) A 3D visual impact study animation (a 360° bird’s eye view of the study area); (b) Visual impact study
perspectives of the Umhlanga node from 14 different viewpoints; (c) Sun study plan views taken at 30 minute intervals from sunrise to sunset for the two solstices and two equinoxes (22 December, 22 March, 22 June and 22 September); and (d) Sun study animations showing the continuous movement of shadows from sunrise to sunset for the same four days. These products were used in the next three phases of the project to assess the shadow and visual impacts of the development scenarios.

4. Assessment of shadow impacts

The Umhlanga beachfront is one of the municipality’s key tourism and recreation assets, and any future development needs to ensure that this asset is not undermined through extensive overshadowing. The recreational use of any beach is highly dependent on direct sunlight, and therefore the positioning of developments close to the beach can compromise beach amenity. This is particularly evident in Umhlanga where properties are already developed immediately adjacent to the beach, unlike the Durban beachfront where residential buildings are set further back from the beach across Marine Parade. Umhlanga also has a relatively narrow beach, and therefore limited space to ‘contain’ shadow impacts.

A detailed assessment of the current and potential impact of shadows cast by buildings on the beach and neighbouring properties was conducted using the sun study plan views and animations. This assessment focused on winter conditions as the worst case scenario – when direct sunlight is most wanted, but also when beach overshadowing is most extreme. Currently, the earliest onset of shadows from tall buildings onto the beach is experienced in mid-winter, starting at about 1pm. By 3pm a significant portion of the beach is in shadow. While the Scenario 2 development saw no real change in shadow impacts, the implementation of Scenario 3 (where some buildings could range from 21 to 56 storeys high) would result in overshadowing starting earlier and being more extensive than at present. Considerable overshadowing of properties to the south during the prime solar collection period (between 10am and 2pm) would also be problematic during the winter months if Scenario 3 were implemented.

The Study therefore recommended that development in Umhlanga should be limited both in height and linear extent to minimise shadow impacts. Developers should be required to submit accurate shadow projections with their development proposals and buildings should be orientated to maximise sun both on their site and adjacent properties, while at the same time reducing shadow impacts. Appropriate controls will also need to be developed to enforce shadow free areas on the beach at certain times. Within ‘shadow free’ zones, particularly swimming beaches such as Umhlanga’s main Blue Flag beach, no shading should be permitted before 3pm in winter.

5. Coastal ecology impact assessment

An assessment of the potential impact of shadowing on the coastal environment was conducted based on the sun study plan views. It was found that although shadows on the beach in the afternoons would reduce temperature and light intensity to some degree, no impacts could be identified either on coastal fauna and flora, or on the marine environment.
6. Assessment of potential impact on property values

This phase of the project considered the impact of the potential increase in bulk in the study area on property values, specifically in relation to view impediments and the impact of shadows on neighbouring properties. The study investigated whether the additional development suggested in the development scenarios would result in a direct derogation of value of neighbouring properties. It was found firstly, that there was no qualitative evidence to suggest a drop in property values due to increased overshadowing by either of the development scenarios.

With respect to view impediments, the study indicated that the impact of view on property value is difficult to quantify for valuation purposes. A sales analysis of the recent property sales in the Umhlanga area was inconclusive about the relative importance of view in property values. The study concluded that the full take-up of development rights (Scenario 2) was unlikely to bring about any significant view impediment issues, due to the already 'visually cluttered' beachfront strip. However, the bulk, height and coverage of the Scenario 3 perspectives were considered to be 'colossal and overbearing' in relation to the properties in the north and south areas of Umhlanga east of the M4 (ibid). The property value assessment therefore recommended that viewshed impairment studies should be undertaken for any Scenario 3 type development proposal.

7. Impact on infrastructural services

Assessments were undertaken to determine the potential impact of the development scenarios on infrastructure services, including traffic, waste water, water, electricity and storm water. Considerable costs are associated with the upgrading of services in Umhlanga, more so than other established areas of the city (as indicated in the municipality’s Cost Services Model), mainly because much of Umhlanga’s services infrastructure is nearing full capacity and major upgrades or new services infrastructure will be required.

The assessment of water requirements indicated that to meet any further demand in the area a new 10Ml reservoir is required, which will be constructed to meet the needs of the broader Umhlanga area. The existing McCauseland sewage pump station in the Umhlanga node area only has capacity for 900 additional apartments, which would be taken up by existing development rights. Therefore the full implementation of Scenario 3 development would not be possible using the existing infrastructure - any further development would require the development of a new pump station. The stormwater assessment noted that all stormwater associated with any further development in Umhlanga must be attenuated on site, except for some of the commercial properties.

An assessment of the potential impact of additional development on the existing road network was undertaken, taking into account the sewerage capacity limitations. A range of road upgrades would be required in the central area of the Umhlanga node at substantial cost. It should be noted that the
densification of Umhlanga assumes a continued reliance on private transport, a lifestyle choice that is yet to be challenged seriously in upper income areas.

These assessments therefore indicated that considerable costs would be associated with the upgrade of infrastructure services in Umhlanga, particularly if calculated on a per unit basis. These costs will need to be balanced against the benefits of densification which would include an extended rates base, increased tourist numbers and therefore their contribution to the local economy, and the benefits to surrounding property owners in terms of increased property value.

8. Conclusions and recommendations

The study concluded that in light of the findings of the study, an appropriate response needs to be developed by the municipality to maximise the development potential of the area while ensuring that the quality of development and the overall amenity of the area are maintained and even enhanced. Associated services infrastructure costs and limitations will also need to be taken account, and cost-sharing arrangements defined. The study therefore recommended that the municipality clearly defines the core Umhlanga node development area, in order to minimise services infrastructure costs as well as visual and shadow impacts. This would inform decisions about which properties could be allocated additional development rights, i.e. increased FAR. All proposed developments within the node area should be reviewed together in light of the project’s findings and to ensure equitable cost sharing related to infrastructure upgrades required.

The study also recommended that appropriate measures are put in place to ensure that the amenity and quality of life of Umhlanga as a coastal development area is protected and enhanced. The Town Planning Scheme needs substantial review to bring it in line with sustainability and coastal development policy. Amendments to the scheme could include the delineation of shadow-free zones on the beach to align with key public areas such as the Blue Flag swimming beaches and public walkways, and requirements for shadow and visual assessments especially for beachfront development proposals. Guidelines for coastal development including coastal building design, the optimum orientation of buildings and building control lines associated with the future impacts of sea-level rise were also recommended. Other measures apart from the Scheme also require consideration, particularly in relation to the enhancement and ongoing management of the public areas of Umhlanga in light of its key role as a tourism destination.

Contributing consultants and associated reports:

(1) Vicky Sim, Planning Consultant – planning components and final consolidated report:

(2) Andre Strauss, KZNCADcc – 3D and shadow modelling of development scenarios.
(3) Prof Derek Wang, University of KwaZulu-Natal – Assessment of shadow impacts:

(4) Ticky Forbes, Nicolette Demetriades and Ronel Nel – Assessment of potential impacts of shadows on the coastal environment:

(5) CB Richard Ellis – Assessment of potential impacts on property values:

(6) ARUP Transport Planning – Traffic assessment of development scenarios: