

TRANSLATING ETHEKWINI'S VISION OF COMPACT CITY INTO REALITY THROUGH INTEGRATED TRANSPORTATION AND LAND USE PLANNING

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ABSTRACT

Municipalities across South Africa are challenged by the need to develop more sustainable cities and one of the means for doing this is to encourage, and plan for, the development of “compact cities” (i.e. higher density, diverse and public transport oriented and pedestrian oriented cities). All this is in the interests of achieving more efficient, more sustainable and more convenient living environments and more economically productive communities.

The EtheKwini Municipality has recently explored an integrated approach to planning for the “compact city” through an urban development corridor project located in its northern metropolitan area called the Northern Urban Development Corridor (NUDC). The project was co-funded by the KwaZulu-Natal Corridor Development Programme and seeks to consolidate the infrastructure and other features of the emerging logistics platform of the City and the country which are located in this area, as well as, to redress the economic and social imbalances of historic settlement in this part of the municipal area.

This paper outlines the project process that was followed, sketches the regional development context and highlights the integrated nature of the planning process. It describes the approach taken and strategies introduced by the project team to translate strategic level policy, aimed at achieving more sustainable settlement structure and form (i.e. “compact city”), into more realistic and achievable local level implementation plans. In so doing it outlines the various development and management strategies employed in the NUDC plan to achieve “compact city” objectives whilst focussing on the transportation planning techniques that were employed in the preparation of the plan.

1 INTRODUCTION

Metropolitan municipalities throughout South Africa are continually attempting to achieve more sustainable settlement structure and form (i.e. “compact city”) within their areas of jurisdiction. Their primary tools are the planning policies and development management tools they are obliged to set up in terms of various pieces of legislation relating to the planning, development and management of the environment, economy, transportation, infrastructure (i.e. water, sanitation and electricity and social facilities), housing, land use and the built form.

The Ethekwini Municipality (EM), with 3.5 million people, has developed a number of these planning policies and is translating them into a suite of spatial planning and development management tools referred to as the “package of plans” (see Figure 1). These include a Long Term Development Framework, an Integrated Development Plan, a Spatial Development Framework, Sub-metropolitan Spatial Development Plans (i.e. central, west, south and north), Local Area Plans (i.e. LAP’s), Precinct Plans and Land Use Management Plans (also known as Town Planning Schemes). The plans form a hierarchy of spatial planning instruments which operate from the strategic and metropolitan scale through to the detail of the individual site, or erf, scale and they are reviewed periodically in terms of legislative requirements.

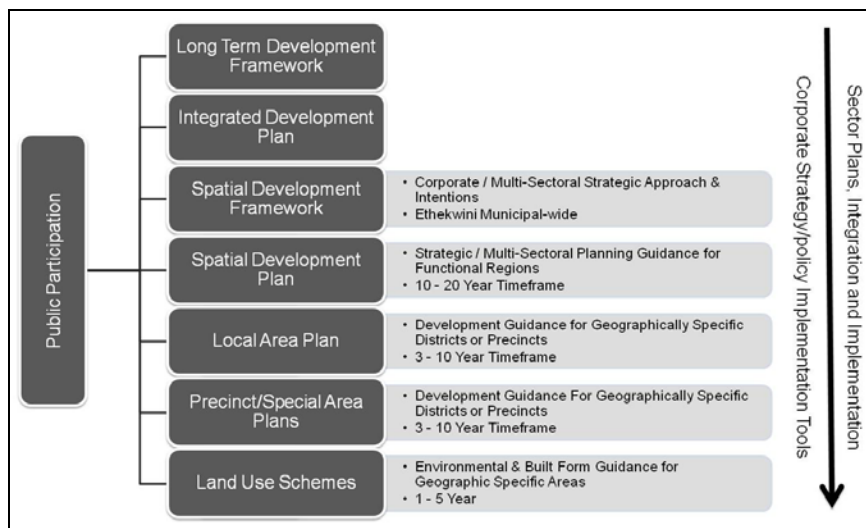


Figure 1: Ethekwini Municipality "Package of Plans"

In their efforts to respond proactively to the significant changes in the development dynamic of the metropolis, as well as, to the need to transform the historically and spatially imbalanced development and settlement footprint of the municipality, the EM has recently focused on reviewing and/or preparing the various scales of planning for the northern sub-metropolitan area. This is the area to which the City’s airport has recently been relocated and which has come under significant development pressure. It is also the area that has been historically one of the most imbalanced in terms of the distribution of economic and social development opportunity and which also displays poor settlement structure, form and performance.

The EM’s planning efforts in this part of the municipality were boosted by additional funding that was allocated by the KwaZulu-Natal Corridor Development Programme towards the preparation of three LAP’s within the area which were identified in the Northern Spatial Development Plan (NSDP) and known collectively as the Northern Urban Development Corridor (See Figure 2). As a result the NUDC Project was initiated.

This paper outlines the project process that was followed, sketches the regional development context, highlights the integrated nature of the planning process and describes the approach taken and strategies introduced by the project team to translate strategic level policy, aimed at achieving more sustainable settlement structure and form (i.e. “compact city”), into more realistic and achievable local level implementation plans. In so doing it outlines the various land use and transportation strategies adopted to achieve “compact city” whilst focussing on the transportation interventions that were employed to assist in achieving “compact city” objectives.

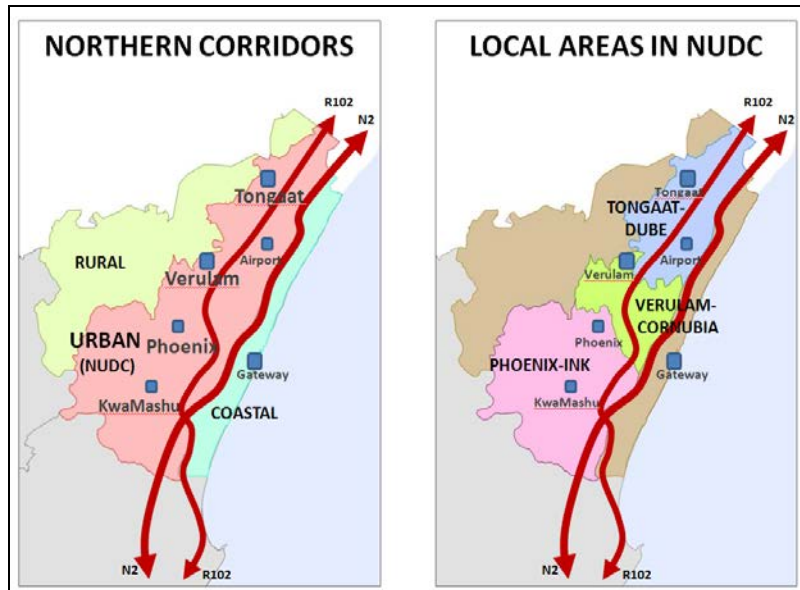


Figure 2: NUDC and LAP Boundaries

2 CONTEXT TO THE PROJECT

The spatial structure of the EM is changing. Whereas, previously the structure was focused primarily around the Central Business District (CBD), the Port related South Durban Basin (SDB) and the western Pinetown/New Germany nodes, the spatial structure is reforming and new key strategic zones or hubs are emerging outside of these existing nodes in other areas of the Municipality. The new King Shaka Airport and Dube Tradeport have been established in the north and Cato Ridge in the west is growing in importance as a new business and industrial zone (Figure 3).

These four existing and emerging new zones and hubs collectively contribute to the role of the EM as the largest and southernmost node of the national Gauteng/Durban Development Corridor and the provincial Ethekewini/Umhlathuze Development Corridor (Figure 4) and are therefore important features in the regional and national economic development context.

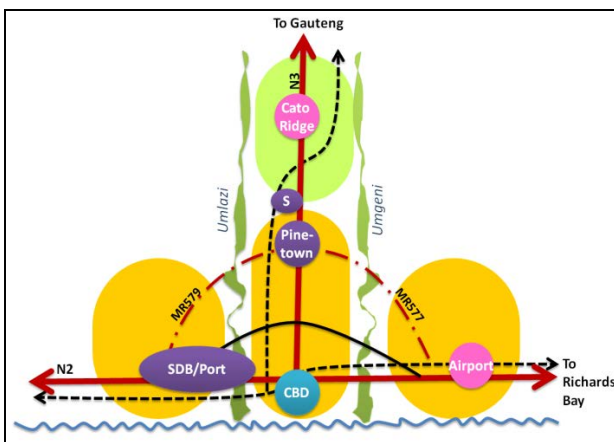


Figure 3: Emerging Spatial Structure

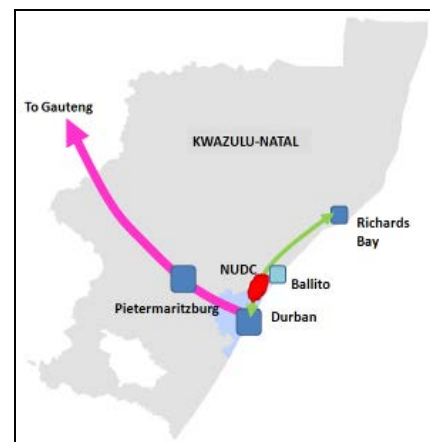


Figure 4: Provincial & National Context

Each zone/hub has a different role. The CBD and Port are the business engine of Durban focussed around transportation, maritime industry and logistics and business support, the SDB's role is to support the Port and forms the petrochemical hub, the West's role is to support road based logistics and industrial development whilst the new northern hub provides the air-based logistics installations and related supportive industrial, agro-industrial and business development.

The challenge that the EM faces in this broader context is to ensure that whilst it is responding to local level mandates of transforming spatial and economic imbalances it will need to simultaneously accommodate provincial and national accessibility and mobility imperatives associated with the provincial and national development objectives.

3 PROJECT PROCESS

3.1 Overview

Figure 5 outlines the overall project process that was followed.

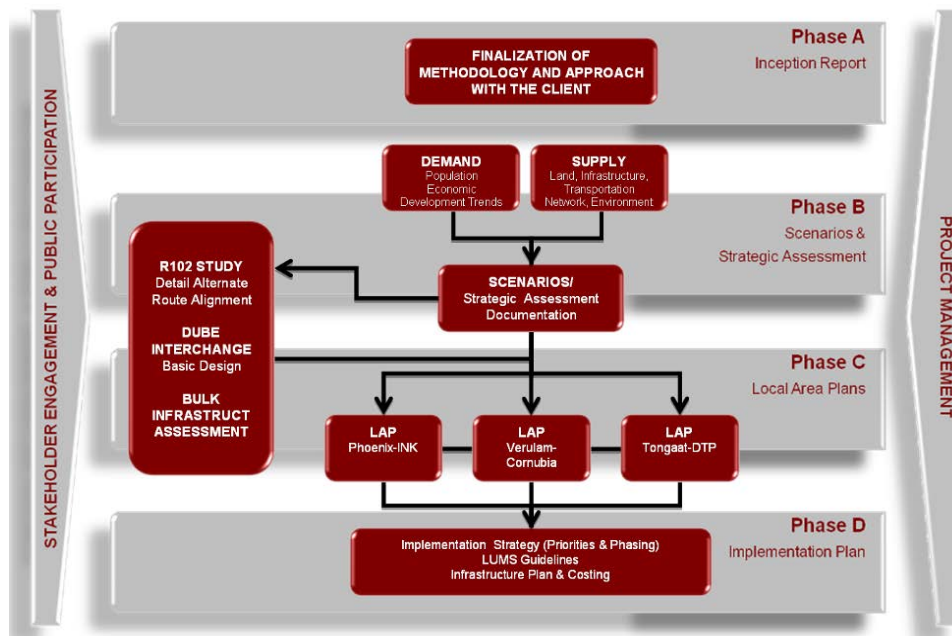


Figure 5: Project Process

The key objectives of the project were:-

- to produce three LAP's, which collectively would constitute a detailed corridor plan for the NUDC
- to update and enhance the Municipality's EMM and AIMS transport models for the northern areas,
- to assess alternate route alignments for the R102
- to assess infrastructure requirements for water and sanitation

The major phases of the project as indicated in Figure 5 included a status quo and strategic assessment of the study area, development of economic and demographic growth scenarios, transportation modelling based on the spatial application of the outcomes of the scenarios, development of the NUDC Plan, generation of three LAP's including the identification of water and sanitation requirements to accommodate the

spatial planning, and finally the identification and preliminary design of alternative alignments for the R102.

3.2 Integrated planning process

Integrated planning was achieved in the project through the following activities:-

- Integrated preparation of the project terms of reference between the EM's transportation and planning departments as well as the KwaZulu-Natal Corridor Development Programme
- Appointment by the EM of an integrated multi-disciplinary project team
- Empowering the Project Steering Committee to enforce deadlines for feedback and comment from various municipal departments and other represented stakeholders and to prepare consolidate feedback to the Project Team
- Rigorous and regular project management meetings supported by dedicated project management capacity
- Employment of local knowledge ensuring ground truthing and more nuanced interpretation of data
- Joint development scenario generation by the Project Team and the Municipality
- Integration of, and calibration of, data sets generated from various municipal departments and sources
- Integrating planning unit boundaries used by the municipal spatial and development planners with transport zones used by the municipal transportation planners for modelling purposes
- Employment of land use strategies that supported transport and infrastructure objectives and vice versa

In addition to the above the opportunity to work as a team under the same roof was created by the great majority of the consultant project team being from the same consultant company. This enabled convenient, efficient, regular as well as spontaneous and creative interaction to occur between spatial planners, transport planners, infrastructure planners and environmental specialists.

4 SPATIAL RE-STRUCTURING STRATEGIES

Some of the innovative strategies generated and employed in the project in order to achieve objectives of “compact city” are described below.

4.1 Introduction of the urban development line (UDL)

The UDL concept envisages the demarcation, and adoption, by the Municipality of a line, or lines, that would define the long term edge of urban development so as to promote:-

- the short and long term protection of high value agricultural land in the metropolitan hinterland (i.e. “outside” the line) that would be linked to long term food security objectives for the metropolitan region
- the short and long term protection of upper catchment ecological and biodiversity assets that would be linked to climate change mitigation and the development of a “resilient” city (i.e. resilient to natural disaster)

4.2 Introduction of the development phasing Line (DPL)

The phasing of urban development within the UDL will be determined by a “development phasing line”. This line indicates the interim spatial limits to which development will be allowed to establish in accordance with transportation and infrastructure availability and capacity, and municipal planning objectives.

4.3 Release land for development in a coordinated manner.

The key element of the land release approach is to release land for both residential and non residential purposes in a manner that consolidates the existing fragmented urban form and that concentrates development around the proposed main transportation spines. In this context priority should be given to releasing land in areas where market demands intersect with infrastructure capacity or where infrastructure can be easily extended whether it is by the private sector or public sector or in some form of partnership

4.4 Establishment of distinctive “towns”

The current municipal area is an amalgam of towns and villages that were established prior to 1994 each having their own character and serving specific communities. The independence or integrity of these towns and villages can be threatened by metropolitan planning and management practice as they are consolidated under metropolitan management systems. Accordingly, it was a specific objective to ensure that each of these is recognised in lower levels of planning and management initiatives and their role and character identified and protected so as to provide diversity in the urban landscape and to ensure that the urban footprint does not coalesce into inefficient urban sprawl.

4.5 Introduction of higher densities

Whilst densification of the NUDC is occurring on a daily basis through the conversion of agricultural land to residential uses, adhoc redevelopment in existing areas and the development of backyard shacks within informal areas; major planning concerns that remain include low development yields (i.e. low net residential density) and a fragmented pattern of urban settlement.

The goal for the corridor is to achieve higher overall “gross” densities through the application of higher “net” residential densities in targeted areas. Settlement should be directed into concentrated development nodes/precincts and along major transportation routes.

4.6 Urban form guidelines

Residents within the corridor will find themselves in different lifecycle/stages and their demands and needs for residential and employment spaces will change over time. The corridor must therefore provide for a range of lifestyle choices. Future planning for the corridor should also protect against a banality to the landscape and living environment and should seek to ensure that a distinctive local character and identity is ascribed to new, and redeveloped residential areas.

The primary lifestyle options and associated settlement forms that can be identified within the NUDC and that need to be protected, enhanced and or established include Urban, Suburban and Rural Agricultural (i.e. those areas within the NUDC, but which will fall outside the DPL)

4.7 Introduction of “transit-orientated development”

Transport Oriented Development (TOD) has the following key characteristics (Newman & Kenworthy, 1999):-

- A regional node containing a mixture of uses in close proximity including office, residential, retail, and civic uses. High density, high-quality development within 10-minute walk circle surrounding public transport nodes
- Walkable design with the pedestrian as the highest priority
- Public Transport Nodes as a prominent feature of town centres
- Feeder Transport systems with buses and minibus taxis
- Reduced and managed parking inside 10-minute walk circle around public transport nodes

Transport Oriented Development has the following key benefits:-

- Transport investment has double the economic benefit to a city than highway investment.
- Transport can enable a city to use market forces to increase densities near stations, where most services are located, thus creating more efficient sub centres and minimizing sprawl.
- Transport enables a city to be more corridor-oriented, making it easier to provide infrastructure.
- Transport enhances the overall economic efficiency of a city.
- Transport reduces carbon emissions and increases energy efficiency

4.8 Implementation imperatives

The following key interventions were identified as the Critical Success Factors in order to initiate and/or consolidate development investment spatially within the NUDC in a manner that reinforces sustainable economic growth objectives in the eThekweni IDP and that are necessary to create employment and reduce poverty.

4.8.1 Coordinate, integrate and align activities and energies of all key stakeholders.

It will be necessary for the Municipality to take the lead through playing an active coordinating and directing role in the area. In this regard three areas of coordination should be targeted.

- Alignment of municipal stakeholders
- Alignment of other key public stakeholders
- Coordination of private stakeholders

4.8.2 Align public investment for infrastructure, transportation, housing, community facilities.

Key bulk infrastructure elements relating to transportation, water and sanitation should be phased and prioritised towards the servicing of the targeted land release areas

4.8.3 *Prioritise more detailed levels of planning in areas that will require rezoning.*

Given the approach described above and the focus that this has on aligning stakeholders and their investment it follows that the next levels of detailed planning and design for the targeted areas needs to be prioritised.

5 DEVELOPMENT OF A TRANSPORT FRAMEWORK

With the TOD characteristics described above in mind, several transportation scenarios were developed together with spatial planning concepts in an intensive and iterative process with the aim of exploring the level of intervention required within each scenario, (e.g. providing high quality public transport and/or expanding private vehicle (road) infrastructure). The objective was to find a mix of policies that ensured connectivity and accessibility to the north of Ethekwini. Within the transport system for the NUDC area five key interventions and/or behavioural changes were identified.

1. Trip Reduction: The transport system as a whole will adjust over time due to the congestion on the road network and changes in lifestyle (e.g. working from home) resulting in a reduction of 3% in the private vehicle trips for the morning peak.
2. Modal Shift: By limiting the increase in road capacity and increasing the capacity and quality of public transport services it can be expected that more people in all income groups will use public transport for their daily commute.
3. Peak Spreading: The existing road capacity cannot accommodate the forecasted private vehicle trips in a one hour morning peak. It can be expected that commuters will adjust their behaviour to avoid long travel times. Some motorists will therefore be forced to either travel earlier or later, thereby reducing the demand within the peak hour.
4. Peak Spreading and Modal Shift: The expected change as a result of future land uses is of such a magnitude that it is likely that a combination of interventions 2 and 3 will arise. In intervention 4 the combined effect of peak spreading and modal shift was determined.
5. Maximize Short Distance trips within the NUDC: With the further development of the city it can be expected that people will relocate to be as close to their jobs as possible to reduce their travel time and distance.

The impact of these five strategic transport interventions was also analysed with Ethekwini's EMME/2 Transportation Model. From these analyses it was concluded that investing in a public transport system with guaranteed travel time will attract 'captive' private vehicle users. Even if people adjusted their behaviour and travelled outside of the morning peak hour, as the result of limited road capacity, public transport would be a viable alternative. With these results in mind, the share of public transport is likely to be between 56% (the current average for EM) and 65% as an average for all the people expecting to live and work in the study area. In addition to these modelled results the modal split was benchmarked against values in the South American cities Lima and Bogotá, (Urban Age, 2008) which are considered similar cities to Durban in terms of employment, income, topography and the city layout.

The strategies described above as well as the outputs of the various scenarios that were developed in the initial stages of the project informed the generation and development of a transport framework for the NUDC and this is depicted in Figure 6.

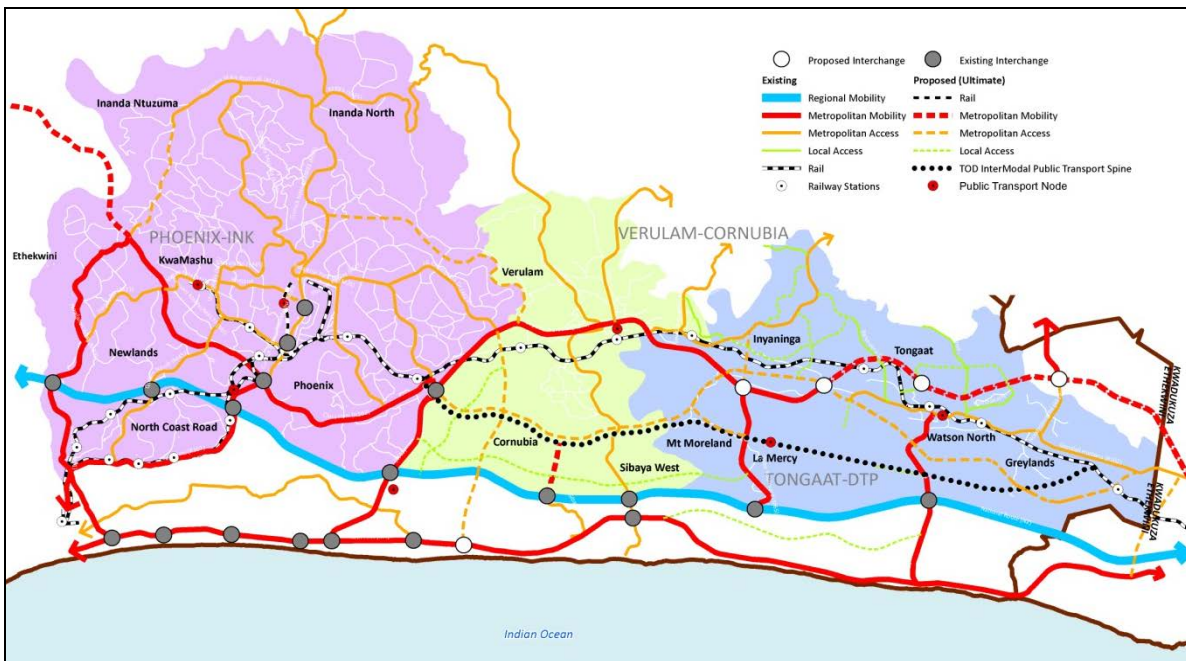


Figure 6: Transportation Framework NUDC

The following key concepts underpin the proposed NUDC Transport Framework:

5.1 Transit oriented development

To support compact urban development and the proposed restructuring of the NUDC a new central mobility corridor element is proposed in the centre of the corridor, parallel to the N2. This multi modal transportation element will form the central spine of the higher density and mixed land uses proposed for this part of the corridor. It will also form the extended public transport trunk route linking key nodes in the corridor (e.g. Bridge City through the proposed Cornubia Town Centre with Dube Tradeport/King Shaka International Airport) with the other nodes in the NUDC. It will also link the NUDC with the Durban CBD in the south and with destinations further north of the metropolitan area.

5.2 Regional mobility

High quality mobility on the national road network is essential if the metropolitan area, the province and the country are to maintain and or increase economic growth. One of the key strengths of the NUDC is the high quality road connectivity in the metropolitan area and the region via the N2. To ensure these benefits remain now, and are enhanced in the future, the role of the N2 needs to be protected and strengthened as a national and regional mobility corridor that provides reliable travel times for goods and persons.

Strengthening the R102 as an additional metropolitan and regional mobility corridor is a fundamental strategy for protecting and supporting the N2 as the strategic national corridor linking Durban to Richards Bay and further north. Providing for local trips starting and ending within the region will ensure that the R102 becomes a viable alternative for the N2.

5.3 Integration with the metropolitan area and the surrounding region

The abovementioned networks and systems, in addition to the completion of the MR577 south of the Umgeni River, will provide a high quality regional mobility corridor that will link the NUDC with the large industrial areas in Pinetown/New Germany and the other parts of the metropolitan area. This presents a much shorter travel time for residents of Inanda, Ntuzuma and KwaMashu (INK) to the main employment nodes outside of the NUDC.

The INK area will also be linked to the existing and future commercial and industrial developments in the north via the Northern Expressway. The additional link will open up new opportunities for these fragmented communities as a result of the shorter travel time and higher levels of accessibility to employment and amenities.

5.4 East-west connectivity

In addition to strengthening the regional mobility corridors with the R102 and the M4, east-west cross linkages are proposed between them to strengthen the north-south oriented networks and provide linkages to N2 at strategic locations offering increased and improved choice and accessibility.

6 CONCLUSIONS AND WAY FORWARD

It is posited that a 'business as usual' scenario for land use and transport planning is not likely to optimize the benefits from the opportunities that will be enabled by the restructuring of the spatial economy of the metropolitan area, nor will it respond effectively to past socio-economic imbalances highly prevalent in the northern metropolitan area of Ethekwini. A significant shift of policy and investment to 'transit oriented development' is more likely to enable meaningful spatial restructuring and the concomitant achievement of the urban sustainability objectives of the Ethekwini Municipality.

The NUDC is at present not set up as a special project or initiative within the Municipality and therefore is not likely to be developed effectively and efficiently if it is left to happen in a 'business as usual' and largely reactive development control manner.

The Ethekwini Municipality has however, through this project, initiated the significant first step towards achieving its visions of "compact city". It has done so by enabling a planning and development process which is proactive, integrated and forward looking by identifying and assessing short and long term land needs for, transport corridors, environmental sustainability, economic development and residential development. More importantly, it has also recognised that the additional steps required for efficient and sustainable development of the NUDC will entail substantial, ongoing, focused, strategic and proactive intervention, led by the Municipality in conjunction with other key role players, to influence the future spatial redirection of both private and public investment.

7 REFERENCES

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