

INTEGRATED FREIGHT AND LOGISTICS STRATEGIC FRAMEWORK AND ACTION PLAN FOR THE ETHEKWINI MUNICIPALITY

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ABSTRACT

The Port of Durban is the busiest in South Africa. As the port has expanded over time, freight and logistics developments have located in close proximity to the port, leading to the infiltration of trucking into all areas around the city, and this has affected businesses, residents, public transport and general traffic. The permeation of trucking throughout the municipal area impacts negatively on air quality, road safety, road maintenance and general business efficiency in the city. This paper commences with a status quo assessment which included a comprehensive literature review on port cities and innovative transport and logistics solutions. Interviews were held with key stakeholders. The analysis covered freight commodity flows, hazardous and abnormal goods movement, freight movements (including empty containers), container depots, impacts of truck overloading on the municipal road network, and assessment of freight accident records. The status quo analysis was followed by a 20-year phased strategic framework which developed a vision for freight and logistics in the municipal area that identifies, describes and explains each intervention and the anticipated time frame over which interventions need to be implemented. Interventions were categorised into short-, medium- and long-term freight and logistics solutions for the eThekwini Municipal Area (EMA). Short-term interventions were taken through a more detailed planning process, the implementation of which will commence in the next five years. Budgets were prepared and an indication was given of the responsibilities of different spheres of government and parastatals such as Transnet, the KwaZulu-Natal Department of Transport, DubeTradePort and SANRAL.

1. INTRODUCTION

Background

The Port of Durban is the most important general cargo port in Southern Africa, handling container, break-bulk and bulk cargo for the local and inland areas of South Africa as well as the Southern African Development Community (SADC) in general. It generates extensive freight transport movements in the region. In addition to the port, significant local industries and economic activities (including cement, solid waste disposal, petroleum and chemicals distribution) also provide demand for freight.

The low modal share of freight traffic by rail and the rapid growth of road freight demand together with the uncoordinated expansion of transport and logistics services have resulted in unplanned freight land use. This is observed in the local spatial allocation of major logistics facilities such as the car terminal, container depots, back-of-wharf space for containers, distribution centres, warehousing, bulk storage, handling facilities, parking, staging and handling space for road freight vehicles. This situation has resulted in large areas in close proximity to the port being unusable for institutional or zoning reasons, while facilities for freight logistics are being built close to the port(ETA, 2012, p 17).

Continual growth of import-export cargoes and local industries and the consequent expansion of freight transport have resulted in the present situation in which the demands for port, road and rail services are greater than the capacity of the available infrastructure and facilities. This has been observed around the port and in the critical South Durban Industrial Basin (SDIB). This is further supported by ship delays, road freight congestion at many points around the port area, long delays in rail services, and excessive costs of transport and logistics(ETA, 2012, p18).

The problems have been exacerbated by the fragmented responsibility for planning of the freight logistics infrastructure and facilities between national agencies, the local municipality and the private sector. Each of these entities is making decisions which are not coordinated, but serving their own objectives(ETA, 2012, p21).

The Integrated Freight and Logistics Strategic Framework and Action Plan (IFLSF&AP) study was initiated by the eThekweni Transport Authority (ETA) with the aim of developing a set of interventions that will essentially address freight and logistics infrastructure and operations in the municipal area, minimise logistics costs in South Africa, and enhance the city's industrial opportunities and competitiveness by having the largest port in both Africa and Southern Africa on its doorstep. The IFLSF&AP was integrated with the Strategic Infrastructure Project 2: Durban-Free State-Gauteng Logistics and Industrial Corridor Study.

Aim and Scope

The aim of the paper is to describe the Integrated Freight and Logistics Strategic Framework and Action Plan for the eThekweni Municipality. It describes the methodology followed, key findings and issues identified, freight and logistics approach, key thrusts, intervention categories and more important action programmes, and summarises projects into a consolidated plan.

2. FREIGHT AND LOGISTICS STRATEGIC APPROACH

The Methodology

The work plan for undertaking the study consisted of the following tasks as shown in Table 1.

Table 1: Methodology

Number	Tasks
1	Freight and logistics status quo and gap analysis
2	Freight and logistics scenario options, traffic modelling, and route and modal projections
3	Assessment of the dedicated freight route, rail developments and possible Cato Ridge Inter-modal Hub
4	Freight and logistics strategic framework
5	Project prioritisation and decision matrix
6	Integrated freight and logistics action plan

Task 1 entailed a literature review of relevant studies, researching development strategies in other international ports, consultation with key stakeholders, and analysis of freight generator locations, freight commodity data, operations cost and tariffs data. The air cargo data and potential of the DubeTradePort Development were examined. Data collection consisted of classified traffic counts and two origin destination surveys. From this information, a gap analysis was done and a status quo report was prepared.

Task 2 entailed economic and transportation modelling. The transportation model was detailed enough to model the movements of Classes 2, 3 and 4 heavy-vehicles for future horizon years.

Task 3 consisted of economic modelling of a proposed dedicated freight route parallel to the N3 between Durban and Cato Ridge, and a proposed Cato Ridge Intermodal Hub.

Task 4 developed the freight and logistics strategic framework. The initial steps were to develop a Strengths, Weaknesses, Opportunities and Threats matrix and to respond to the various plans prepared by the government and parastatal entities. When preparing the freight and logistics framework, the benefits to the freight user were given priority. Key strategic thrusts were identified to provide an effective, efficient and reliable freight system. Interventions were identified that need to be implemented to achieve a freight system which reduces cost to users, provides competitive advantage to industry, creates employment, and reduces negative environmental and social impacts. Maps were produced indicating the location of interventions that need to be implemented.

Task 5 and 6 were undertaken simultaneously. During these tasks, the following were developed: an action programme, categorised into infrastructure, policy and regulation, operations, land use and support; conceptual layouts for interventions; cost estimates; time lines for implementation; human resources impacts as a result of the implementation of interventions; linkages to other interventions; a consolidated plan showing the interrelationship of interventions; and measures of effectiveness to indicate the impact of the implementation of interventions.

3. KEY FINDINGS AND ISSUES IDENTIFIED

The following key findings and issues that were identified during the status quo phase were:

Freight and logistics developments have been sporadic, filtering into all aspects and areas in the EMA and no longer just along major freight routes. Stuffing and destuffing of the majority of containers occur as close to the port as possible as this is the most efficient and cost-effective business practice in the current environment. The permeation of trucking throughout the municipal area impacts negatively on air quality, road safety, road maintenance and general business efficiency in the city. The key issues include the high number of heavy vehicles transporting goods in the EMA, rail transport not being fully utilised, port inefficiency, the lack of adequate institutional capacity in all spheres of government and parastatals, and high levels of congestion on many municipal routes during peak hours.

Typical negative impacts of port cities include congestion, environmental and community impacts, competition for land and ineffective land use. These negative impacts are also experienced in the South Durban Basin. Logistics and transport firms encroach into residential property as a result of a lack of suitable land.

Port-related issues were identified, namely port performance and inefficiencies, congested access roads to the port, port tariffs which are seen as expensive, and the dominance of the public sector in port and rail operations.

Rail-related issues include the time taken to deliver containers to inland destinations, insufficient inland terminal capacity for modern containers, and service reliability that remains below customer expectations.

Road transport issues include congestion due to inadequate access to the port precinct, the lack of designated parking and truck-staging areas to minimise delays, regulation that is not in step with logistics developments, and the lack of enforcement that is leading to overloading and safety problems.

4. FREIGHT AND LOGISTICS STRATEGIC APPROACH

A strategy sets the direction for an organisation, identifies the decisions it needs to make, and determines how resources should be allocated to pursue and realise the strategy.

The IFLSF&AP presents an intervention programme that focuses, plans and identifies decisions that need to be made, and directs resources to realise the freight vision. This strategy has been developed to address the current issues and envisaged problems relating to the freight and logistics industry.

The benefits to the freight user have been given priority during the process as illustrated in Figure 1. These benefits include:

1. *The need to reduce logistics costs*
2. *Create more employment*

3. *Building on eThekwinI's natural competitive advantage*
4. *Ensure efficient freight movement*

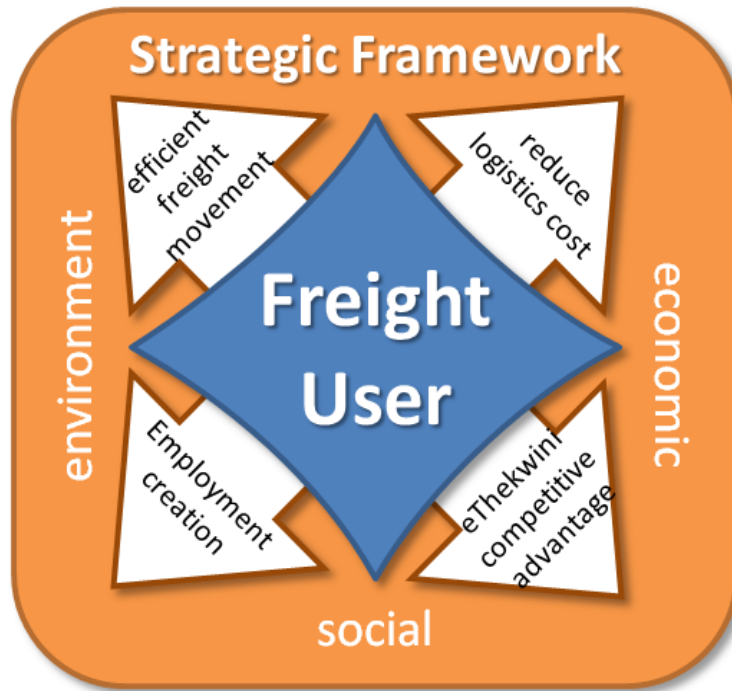


Figure 1: Needs of Freight Users



Figure 2: Key Strategic Thrusts

Four key strategic thrusts (Figure 2) were identified as necessary to provide an effective, efficient and reliable freight system which reduces costs to users, provides competitive advantage to industry, creates employment, and reduces negative environmental and social impacts.

These thrusts are as follows:

1. *Optimise modal split.*
2. *Provide an efficient freight system: Optimise land use:*
3. *Creating supporting institutions:*

Figure 3 shows the relationship between the intervention categories, strategic thrusts and freight user needs.

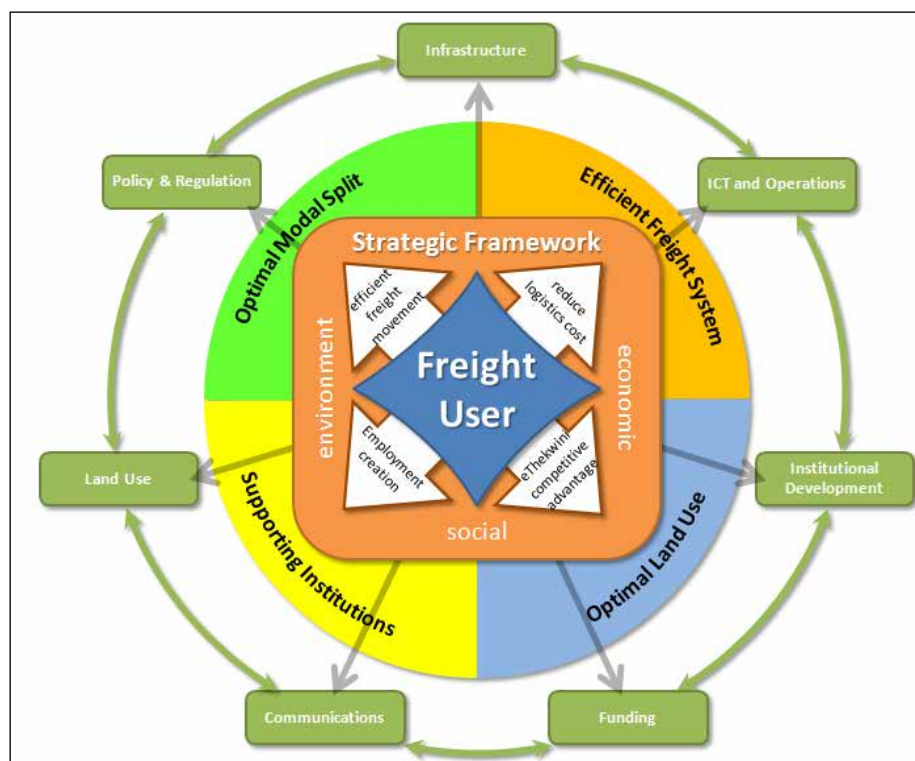


Figure 3: Intervention Categories, Strategic Thrusts and Freight User Needs

The definitions of the each of the seven interventions in Figure 3 are as follows:

- *Infrastructure* – includes facilities such as new and improved rail infrastructure, port infrastructure, road network, truck stops and staging areas, intermodal facilities/hubs, weigh-in-motion(WIM) and weighbridges, and implementation of traffic management systems.
- *Operations* – relate to interventions that address systems and performance issues such as incident and freight management systems. The availability of information and communications technology is necessary to ensure the functioning of the incident and freight management systems.
- *Institutional development* – addresses the people, skills, structures and mechanisms required to support the strategy.
- *Funding* – identifies sources and options.
- *Communications* – recommends how the strategy is to be communicated to stakeholders and the broader community.

- *Land use* – develops an integrated plan for freight-related activities that considers port, back-of-port, intermodal hubs and developments in industrial and commercial areas.
- *Policy and Regulation* – looks at how (and why) policy and regulations can improve freight efficiency and orderliness. Bylaws are implemented and enforced by the Metro Police.

5. FREIGHT AND LOGISTICS PROGRAMMES

Action programmes are plans that have to be implemented to ensure that the strategy is implemented. The action plans consider details of the interventions to be undertaken and identify the person responsible and accountable for tracing the progress, keeping the team informed, and ensuring that timely actions are occurring. The action programmes have been described by means of the following features to enable the eThekweni Transport Authority to implement these interventions:

- The key interventions have to be scheduled into a phased freight and logistics plan which details the interim, medium- and long-term freight and logistics solutions.
- More detailed assessments have to be undertaken for the infrastructure-type interventions such as: environmental, socio-economic, planning, engineering and logistics.
- Specific locations have been identified for infrastructure-type interventions, and broad site designs have been developed.
- Cost estimates have been prepared for construction, operations and maintenance. Sustainable funding sources have been identified and projects that are candidates for private-sector involvement were included.
- Information for the detailed assessment of business and operational plans has been included.
- The implementation and operational agencies that will be responsible for the roll-out of the interventions are described. For government agencies, an indication is given as to which sphere of government or parastatal or public-private partnership needs to take responsibility.
- It is clearly stipulated where economic and catalytic projects are required to successfully and sustainably implement the plan.

Description of Action Programmes

The action programmes have been divided into five categories, namely: infrastructure, policy and regulation, operations, land use and support.



Figure 4: Categorisation of Action Programmes

In Figure 4 the first four programmes are shown in the inner ring while the fifth – the support programme – is shown in the outer ring. The support programme is applicable to each of the other programmes. The interventions that are linked to each of the programmes are shown in the middle and outer rings.

The implementation plan for most interventions has different options which require varying levels of resources and different dependencies, based on freight growth and demand, funding availability, and the availability or ability of supporting institutions to implement. Therefore, most of the interventions have three levels of implementation – basic, intermediate and advanced.

As the IFLSF&AP is in its first stage of implementation, the basic option is initially preferred. Once basic capabilities are in place and progress can be monitored, other options may be considered.

Description of the Strategic Interventions

The following strategic interventions as shown in Table 2 will be described in more detail.

Table 2: Key Strategic Interventions

ACTION PROGRAMME	INTERVENTIONS
Infrastructure	§ Provision of truck stops and staging areas
Policy and Regulations	§ Policy implementation § Development of truck route hierarchy
Operations	§ Development of Freight Management System
Optimal Land Use	§ Update of Land Use Plan to complement the Freight Strategy
Supporting Institutions	§ Dedicated resources

Infrastructure

Truck Stops and Staging Areas

The objectives of the provision of trucks stops are to: minimise internal trips by heavy vehicles in the South Durban Basin; reduce noise, accidents and the encroachment of trucking companies into residential areas; and to provide safe parking for heavy vehicles and resting facilities for drivers.

The truck stops are provided on the boundaries of the city, as well as in the South Durban Basin. A truck staging area is a temporary (short duration) parking facility where heavy vehicles can wait until they are required by the port or other businesses (warehouses, container yards, etc.) to collect or deliver the goods. The truck staging areas are located close to the port and in all established industrial areas with good access, and are provided with basic facilities such as good lighting, water, rest rooms and visible enforcement for safety. The locations of truck stops are shown in Figure 5.

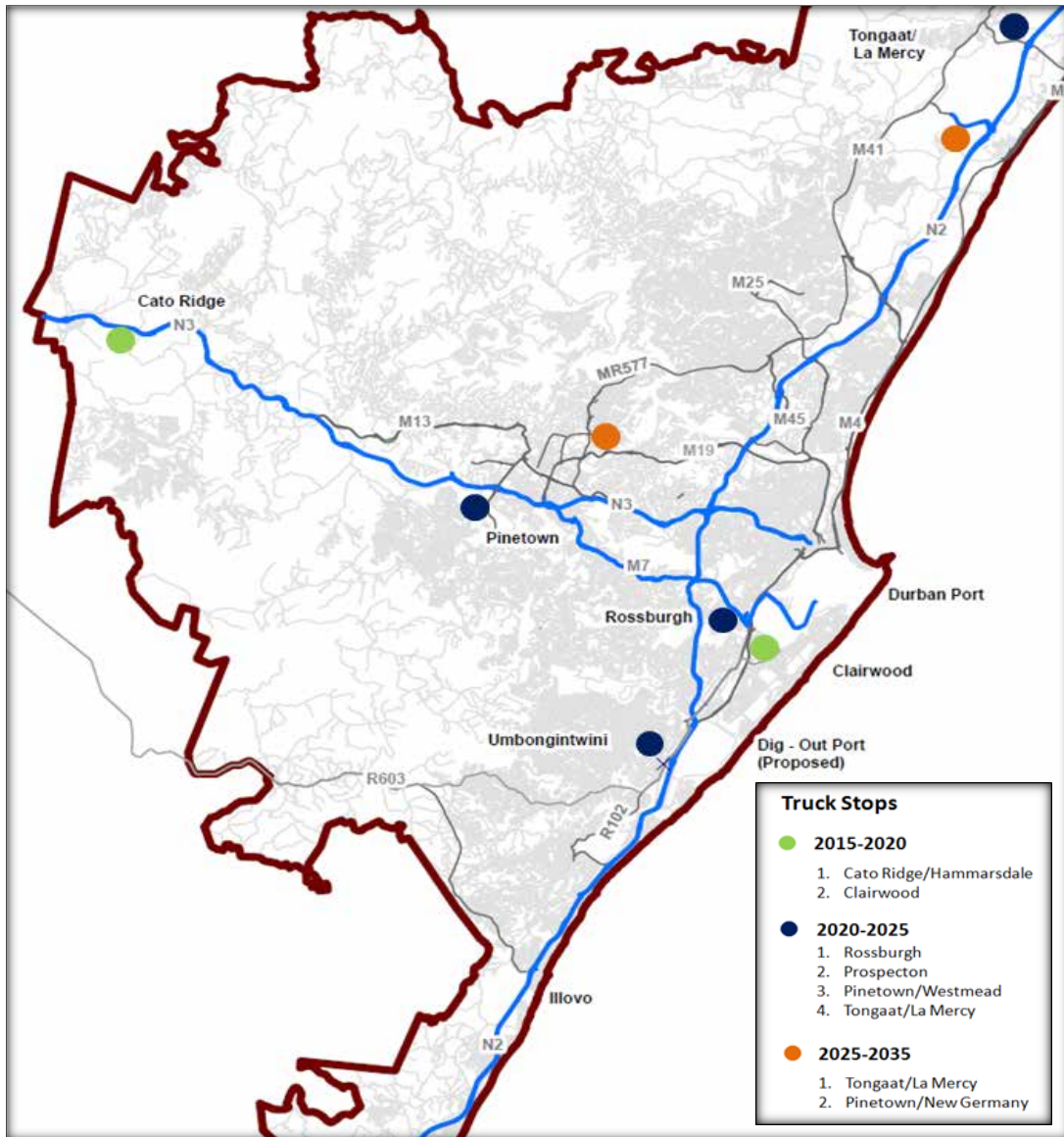


Figure 5: Locations of Truck Stops

The Cato Ridge and Clairwood Truck Stops will be implemented in the short term. The Cato Ridge truck stop will predominately service Gauteng-Durban traffic along the N3 and, in the long term, the proposed dedicated freight route. These sites are expected to be accessed via the existing Cato Ridge Interchange. Trucks travelling from Gauteng to Durban will be able to stop for long periods of time until they are required by the respective businesses in Durban. The South Durban Basin, industrial areas such as Clairwood, Moberi East and Jacobs, as well as the Port will be served by the Clairwood truck stop. This stop will be accessed via the M7 and the planned dedicated freight route.

Policy and Regulations

Policy Implementation

Although the stated policy of the government as articulated by the Minister of Transport and other senior officials is to shift freight from road to rail, there is little sign as yet of any movement towards implementing the necessary steps. The time is ripe, therefore, for some entity to seize the initiative. The EMA has the largest container and general cargo port in South Africa and the region, and therefore has a vital interest not only in the efficiency of the transport and logistics sector but also in eliminating the present external costs that militate against Durban achieving its vision of becoming the most liveable city in the country. This requires a fundamental shift of freight traffic from road to rail. The eThekweni Transport Authority therefore should take the lead in initiating the establishment of a lobby group to persuade government to revise national transport policy and legislation.

Truck Route Hierarchy

With the growth of road transport and the encroachment of logistics companies into certain residential areas, particularly those adjoining the main arterial routes, large heavy-vehicle combinations travel on many roads and streets that were not designed to accommodate them. In residential areas and on streets, this gives rise to significant external costs (noise, pollution, visual intrusion) to residents and the public, leading to a deteriorating quality of life.

This intervention is designed to restore the purpose of the Road Traffic Management System and to ensure that large trucks travel only on those parts of the eThekweni municipal road and street network that were designed to carry them. The routes that accommodate abnormal loads and hazardous freight have to form part of the truck route hierarchy.

The alignment of the proposed truck route hierarchy is shown in Figure 6.

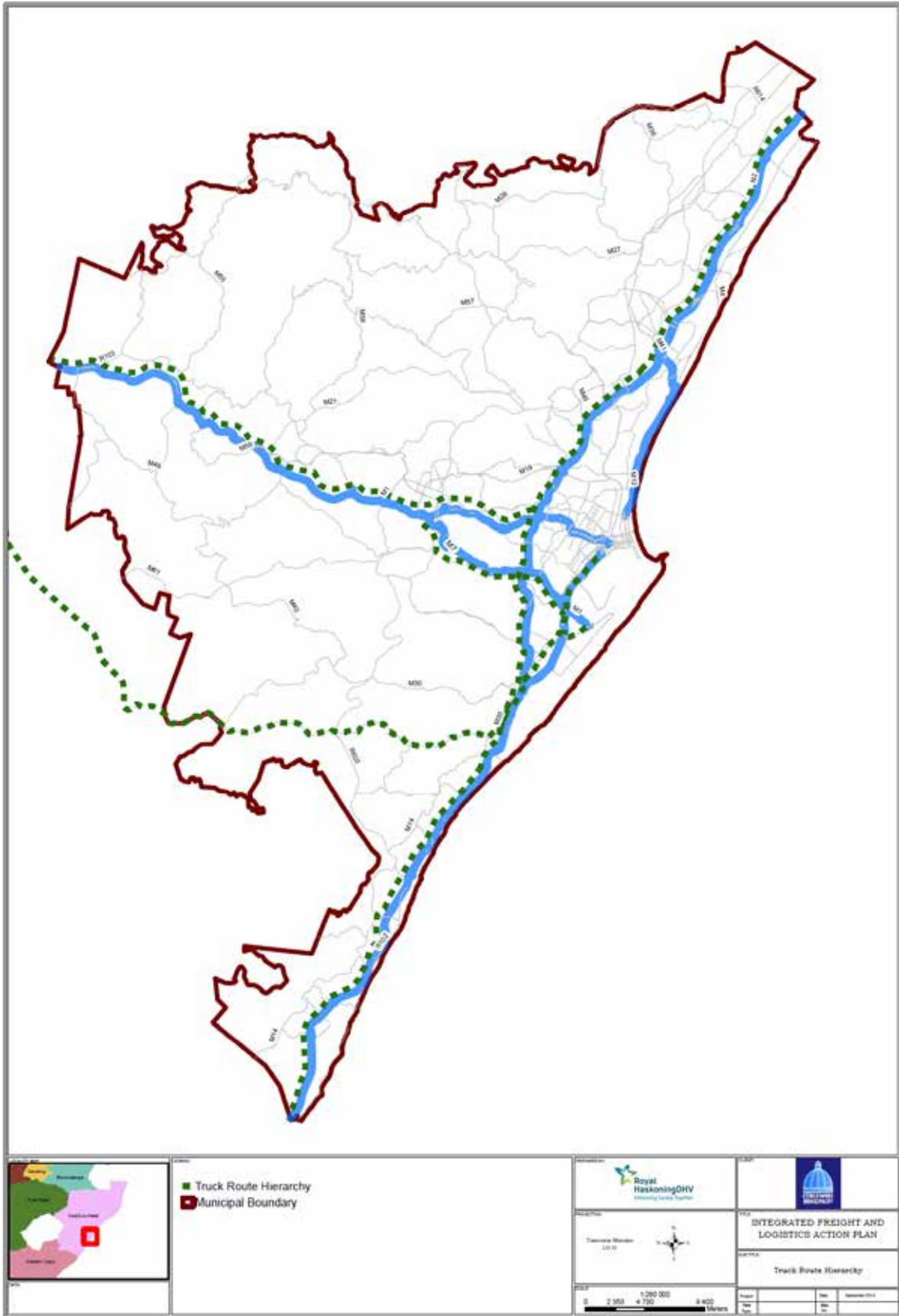


Figure 6: Alignment of the Proposed Truck Route Hierarchy

Operations

Freight Management System

The Freight Management System covers the collection, management and communication of freight flow data, allowing improved tracking and response capabilities. The system provides opportunities to make more effective use of logistics infrastructure, reduce logistics costs, and improve freight efficiency.

A Freight Management System would capture, process and report on freight movements within the EMA. This information should be collected real-time where feasible through monitoring and tracking systems, and be communicated to role players through a Traffic Management Centre. Freight forwarders, port terminals, rail, heavy goods vehicle operators and infrastructure providers in the EMA are some of the stakeholders that can benefit from a freight management system.

Optimal Land Use

Freight Land Use Plan

In order to build both a sustainable community and a sustainable transportation system for the future, it is essential that a proper spatial structure be established with appropriate land use management systems implemented and enforced. This system needs to support, and be supported by, a functional and efficient transportation system.

In order to accommodate logistics as an activity, eThekweni's regional spatial planning needs to be reviewed so as to ensure land use and urban design compatibility with the Freight Strategy.

The side-effects such as loss of pavement strength, increased noise, pollution leading to health hazards, and nuisance factors including parking and safety for citizens of the area, will also be addressed.

Supporting Institutions

Dedicated Freight Resources

The ETA requires dedicated resources to anticipate, plan, and manage freight developments and projects in order to position the City to achieve freight and broader EMA objectives. The current staff complement at the ETA is limited and will not meet the institutional capacity required to address the freight challenge that the City faces.

A comprehensive organisational review is required to compare resource skill requirements within existing structures in the Municipality in order to identify overlaps/gaps and ensure an appropriate allocation of resources and responsibilities. The number of staff required is also dependent on the pace and complexity of implementation. Initially, implementation involves setting up the institutional capacity, including staffing and skills required to drive the strategy.

The eThekweni Municipality will require additional dedicated staff resources in the ETA Freight Section, Metropolitan Police and Hazardous Freight Section.

6. CONSOLIDATED PLAN

A consolidated plan has been prepared to ensure the implementation of interventions in an integrated manner. The plans show priorities, major milestones and timelines. Figure 7 shows the short term interventions to be implemented from 2015 to 2020.

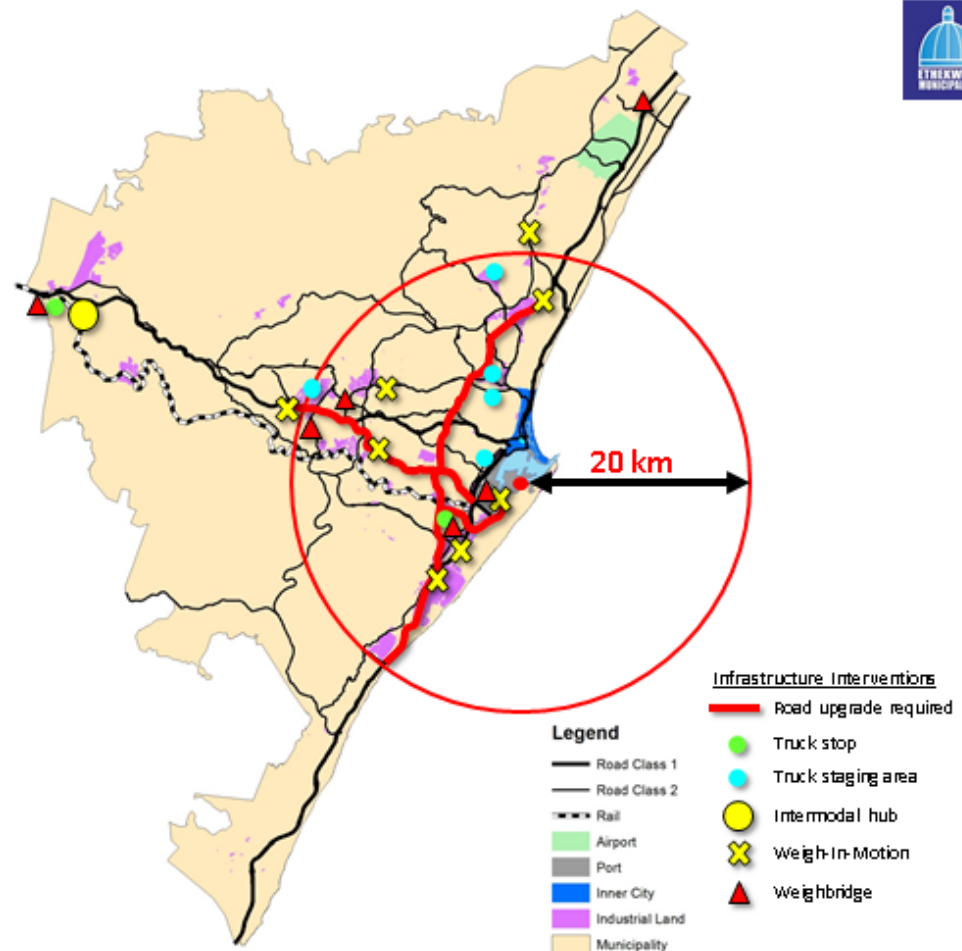


Figure 7: Short Term Interventions

7. CONCLUSIONS

The IFLSF&AP is only the beginning of a journey to implement the strategy. Focus is important, as resources and time are limited. An organised approach is needed and includes: appropriate programme management structures; clear responsibilities; constant measurement and response; on-going communication (internal and external); and periodic reviews.

Planning for adequate infrastructure, systems and operations relating to the freight and logistics industry has been lacking over the last decade. In addition to this, growth in the South African economy and more especially in the EMA has placed the city in a compromised position in terms of an inefficient transport system.

The growth in freight moving through the Port of Durban as well as the sporadic developments in the freight and logistics sector have contributed to the current sub-optimal system. The freight and logistics system is multimodal and complex, and experiences many problems. From the Status Quo assessment in the project, it was evident that several problems affect the freight and logistics system, thereby affecting the overall transport system in the EMA.

At present, freight traffic hinders the efficiency of the City and its road network due to exponential growth of traffic on major corridors as well as on central city and residential streets. Without implementing effective and freight strategic plans, such continued freight traffic growth will negatively affect the City's economic potential by increasing the environmental and social costs (health, nuisance, etc.) that will reduce the quality of life for all residents in the region.

Implementation of the IFLSF&AP is a necessary component in achieving the Municipality's goal of making Durban the most liveable city in Southern Africa by 2030. This will create an attractive environment for businesses and industry to locate in the EMA, leading to improved economic growth with associated positive social impacts. This plan should not be regarded as eThekweni Municipality's plan but rather as a freight and logistics plan for the EMA with support (planning, resource, funding etc.) from all role players.

8. REFERENCES

eThekweni Transport Authority (ETA), 2012, Back of Port Study

9. ACKNOWLEDGEMENT

The permission of the eThekweni Transport Authority to publish this paper is hereby acknowledged