

PLANNING FOR PUBLIC TRANSPORT AND ROAD FREIGHT INFRASTRUCTURE IMPROVEMENTS AT LOCAL MUNICIPAL LEVEL: LESSONS LEARNT THROUGH THE CITY OF uMHLATHUZE PUBLIC TRANSPORT AMENITIES STUDY

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ABSTRACT

The City of uMhlathuze is a Local Municipality that forms part of the uThungulu District Municipality in KwaZulu-Natal with approximately 80% of the public transport trips within the District has one end in this Local Municipality. The Local Municipality comprises Richards Bay with one of the busiest ports in the country; attracting a rising number of freight trucks. The City of uMhlathuze encountered a situation where the Integrated Transport Plan prepared at District level, did not have sufficient detail to inform its development strategy and address transportation challenges, in particular concerning public transport and road freight facilities. One of the challenges was that a number of the public transport facilities in the City of uMhlathuze form part of retail commercial developments located on either leased land from the Municipality or private land, this placed limits on options for expansion of the facilities. Another challenge was the lack of appropriate truck stop facilities, as a result, trucks would park at any open area in the Empangeni and Richards Bay CBD including at ranks/terminals. The Public Transport Amenities Study was undertaken by the City of uMhlathuze to address these challenges through investigation of the challenges at the ranks/terminals, an assessment of the condition and accessibility of public transport stops, establishing the demand for truck stop facilities and developing conceptual proposals for improvements. The process followed was akin to that of statutory transport plans, with the added level of conceptual proposals developed through substantial consultation with private sector stakeholders.

1 INTRODUCTION

The City of uMhlathuze Municipality is one of six local municipalities in the uThungulu District Municipality in KwaZulu-Natal. City of uMhlathuze Municipality incorporates the towns of Richards Bay, Empangeni and the townships of Ngwelezane, Esikhawini, Vulindlela and Enseleni. Richards Bay has a deep-water port that is 160km from the Port of Durban and 465km from the Port of Maputo. This major port attracts significant volumes of road freight (transporting primarily ferrochrome and anthracite) and is at the terminal end of the country's highest volume freight rail line (transporting primarily coal). The City of uMhlathuze is connected to the coastal towns of Durban and St Lucia by the N2 national freeway and connected to the interior towns by provincial roads. The City of uMhlathuze Municipality, as a major employment node, attracts approximately 80% of the public transport trips within the uThungulu District (uThungulu, 2005).

The City of uMhlathuze Municipality encountered a situation where the Integrated Transport Plan prepared at District level in 2005, did not have sufficient detail to inform the City of uMhlathuze Municipality's development strategy and address transportation challenges, in particular concerning public transport and road freight facilities. One of the challenges was that a number of the public transport facilities in the City of uMhlathuze form part of retail commercial developments located on either leased land from the Municipality or private land, this placed limits on options for expansion of the facilities. Another challenge was the lack of appropriate truck stop facilities, as a result, trucks would park at any open area in the Empangeni and Richards Bay CBD including at ranks/terminals. In 2008, the City of uMhlathuze appointed planning consultants to undertake a Public Transport Amenities Study. The Public Transport Amenities Study (Study) was undertaken by the City of uMhlathuze to address these challenges through proper investigation of the problems, an assessment of the condition and accessibility of public transport stops, establishing the demand for truck stop facilities and developing conceptual proposals for improvements.

The approach adopted from the outset of the Study, was not to try to reproduce the integrated transport planning process undertaken at District level, but to use elements of this process related to public transport and freight. In this vein, the data collection processes were similar to those of the Current Public Transport Record. This Study however went on to propose and develop conceptual layouts for the facilities, a detail not normally achievable in integrated transport plans. In order to allow alignment of activities and to keep all stakeholders abreast of periodic developments, a Project Steering Committee comprised of municipal officials from relevant departments was established. The outcomes of the Study were also presented to the municipal portfolio committee. The consultation process undertaken through the Study is illustrated in Figure 1 below:

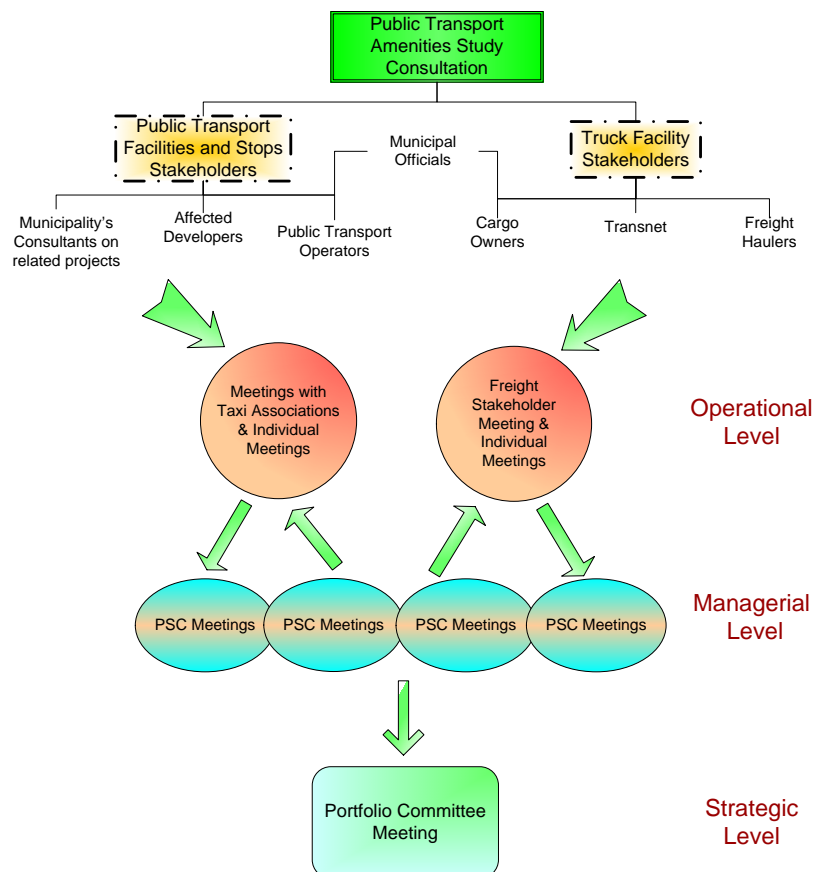


Figure 1 Consultation Framework of the Study

Some of the challenges encountered during the course of this Study that relate to the public transport planning process are highlighted in this paper. These in the authors' view, add to the case presented by Brits (2010) for a separate public transport planning process preceding the integrated transport planning process. Brits (2010) argued that a Public Transport Plan should precede an ITP due to the following:

- To have relevant (and accurate) public transport data available for the ITP;
- To allow sufficient focus and resources for the integrated transport planning;
- To prevent the ITP from largely becoming a dressed up PTP with superficial integration efforts; and
- To provide greater clarity in terms of the definition of, approach to, and expected outcome of a true ITP.

It is proposed in this paper that the additional benefit of treating public transport planning separately, is that its elements are given the necessary consideration such that operational inefficiencies in the layout of ranks/terminals, improvements in ancillary facilities such as ablutions, provision of infrastructure for pedestrians, etc., are addressed adequately.

2 STUDY APPROACH AND OUTCOMES

2.1 Public Transport Facilities (Ranks and Terminals)

The first element of the Study was to develop a status quo of each public transport facility. The status quo would establish the operational characteristics (modes, routes, volumes of passengers/volumes, bottlenecks, etc.), the physical condition of the facility (condition/provision of ablutions, provision of shelter, etc.) and safety concerns (vehicle-pedestrian conflicts, vehicle-vehicle conflicts, etc.). This process started by engaging with the bus operators and taxi associations at each facility in order to obtain their assistance. Firstly, their buy-in was gained through group meetings facilitated by the City of uMhlathuze Municipality so that they would understand the purpose of the investigation. Secondly, each taxi association was consulted individually. This was done at the request of the taxi associations as they did not want loss of detail or miscommunication when explaining to their members about the Study. At the individual meetings, the taxi association was requested to provide staff who would be trained to assist during the surveys; the association was also asked for information on the route it operates and from which facilities they operate.

The information gained from the operators together with visual observations made at each facility, was used to plan the surveys. Survey forms were then developed. The staff was trained on the use of the forms on the day prior to the survey. The surveys focussed on obtaining the following information: the number of PT vehicles that were either holding or loading at 15 minute intervals of the day; the volume of vehicles and passengers entering and leaving the facility at 15 minute intervals throughout the day; which routes had higher demand. The surveys were carried out between 06h00 and 18h00, with ongoing quality control of the data recorded on the forms. Photographs were also taken of each facility. These photos served to record information that could not otherwise be captured appropriately using a form, such as the unsafe condition shown in Figure 2. The condition of ancillary facilities such as ablutions, trader stalls, loading bays, shelter was also recorded. Safety concerns affecting vehicles and pedestrians were also noted. The data was then processed, analysed, reported and presented at the PSC meetings. Two reports on the status quo of the facilities were prepared. The first presented the status quo of ranks/terminals that had linkages with development proposals under consideration by the City of uMhlathuze; the second presented the status quo of the rest of the ranks/terminals. Figure 3 shows the loading and holding patterns at the Richards Bay Plaza Rank.

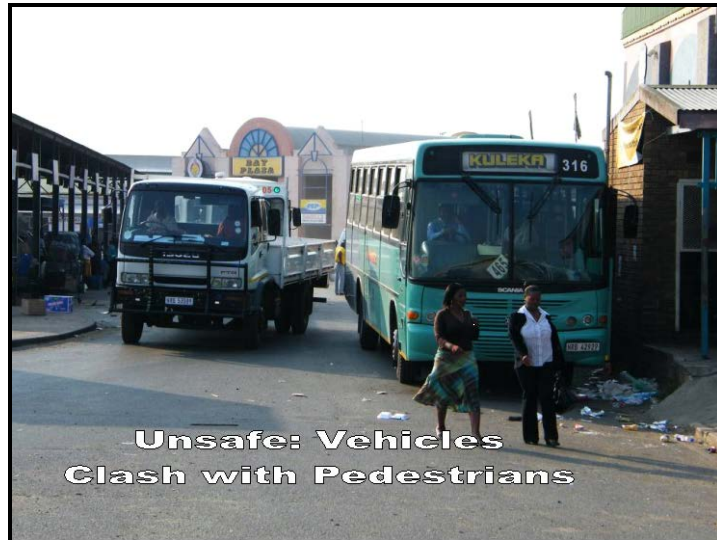


Figure 2 Safety concern in front of minibus taxi loading area at Richards Bay Plaza Rank.

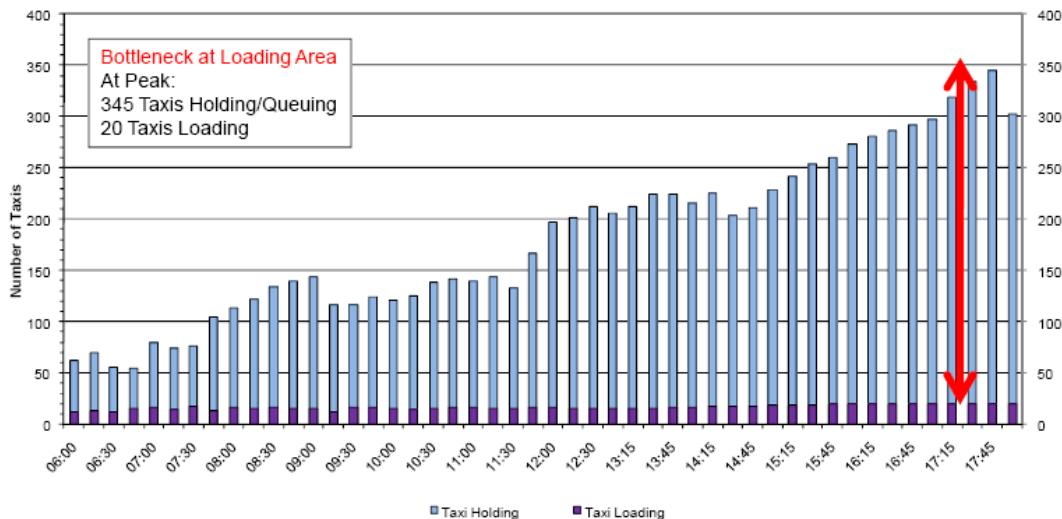


Figure 3 Graphical representation of minibus taxi loading and holding trend at Richards Bay Plaza Rank

During the course of the status quo investigation, it became known that at some of the ranks/terminals under consideration, there were already plans in place for modifications to entrances and layouts and at other ranks, plans for commercial development of adjacent land belonging to the municipality. Some of the ranks/terminals were located on private property or property leased from the municipality, comprising commercial developments such as wholesale shops and furniture stores. Upon consultation with the relevant municipal departments and the affected owners, a decision was taken by the Municipality to put these plans on hold until the Study was completed.

The next phase for the ranks/terminals improvement process, was the development of conceptual proposals outlining options for improvement, high level cost estimates and potential phasing of implementation. The future demand at ranks/termini was estimated by observing growth trends between survey data and available information such as the uThungulu ITP (uThungulu, 2005), together with consideration of population growth through development of new and expansion of existing townships and commercial developments. The potential phasing was based on addressing high priority

improvements. The Bus Terminals and Bus Stations: Planning and Design Guidelines (RSADOT, 1985), the Guidelines for the Design of Mini/Midibus Taxi Facilities (RSADOT, 2006) and the Planning and Design Guidelines for Public Transport Interchanges in Gauteng (GPGDPTRW, 2002) were used as references in the process. In developing the conceptual proposals, consideration was given to addressing all the needs identified in the investigation phase among others, the following was proposed:

- Firstly, to improve the functioning of the loading areas, the routes were categorised into high, medium and low flow. The high flow routes were allocated more than one loading lane according to demand, the medium routes were allocated one lane each and the low volume routes shared loading lanes. The dimensions for the loading lanes for high and medium routes were those recommended for commuter routes in the guidelines and those for the low flow routes were similar to those for long distance operations;
- Secondly, the layout of the facilities was reconfigured to reduce conflicting movements of vehicles and pedestrians. The loading area was situated as close as possible to where pedestrians enter/leave the facility and in such a way that there would be a limited number of pedestrians walking through the holding areas;
- Thirdly, the number of additional ablution facilities was determined using passenger and operators volumes and the SABS/SANS building code; and
- Lastly, as far as possible provision was made for appropriate trader facilities and passenger waiting areas;

The conceptual proposals were workshopped with the relevant departments in the City of uMhlathuze Municipality and other affected stakeholders (including developers and operators). The input provided was used to refine the conceptual proposals, including phasing of implementation and high level costing. Reports describing the conceptual design process, its outcomes and high level cost estimates were prepared. Figure 4 shows a schematic example of the process followed to improve the minibus taxi loading area at the Richards Bay Plaza Bus and Minibus Taxi Rank. The final conceptual layouts for this facility (not shown) also provided for the integration of ablutions, waiting areas and traders. A conceptual proposal indicating an additional level of this facility was also developed, however this might not prove a popular alternative as Richards Bay lies on relatively flat terrain and there are few multi-level buildings.

2.2 Public Transport Stops

The second element of the Study was to assess the status quo of the public transport stops. The assessment of the stops started with obtaining the locations of the stops from the Municipality's existing database. Thereafter the operators both minibus taxi and bus, were consulted to assist with recording routes on a map. Survey forms were then developed to assess the condition of the stops, taking note of the dimensions of the elements of the stop facility, the presence or absence of shelters/seating, safety concerns, etc. The survey of the stops was undertaken with the assistance of a representative of each operator; photographs and dimensions of elements of each facility were taken and the location recorded through the use of a GPS. The data collected was processed and compared to the existing database, to determine if there were areas that had not been surveyed; those missing areas were then surveyed similarly. All the data was then analysed and the stops categorised according to type, missing elements (signage, lay byes, shelters, etc), mode (bus, minibus taxi), and safety concerns (sight distance, etc); this was then captured to GIS. The data gathered through the investigation was then analysed to assess whether the walking distance to the stops was appropriate and

whether the distance to the routes was adequate; new stop locations and new routes were proposed together with proposals for improvements to roads. Improvement proposals were made for existing transport stops that had missing elements and were in a condition of disrepair. High level cost estimates were developed for each stop. A report describing the process of the public transport stop investigation and the proposed remedies was prepared. This report included assessments of each public transport stop, maps indicating the condition of existing stops per sub-area, maps indicating remedies per sub-area, and maps indicating proposed new stops and routes.

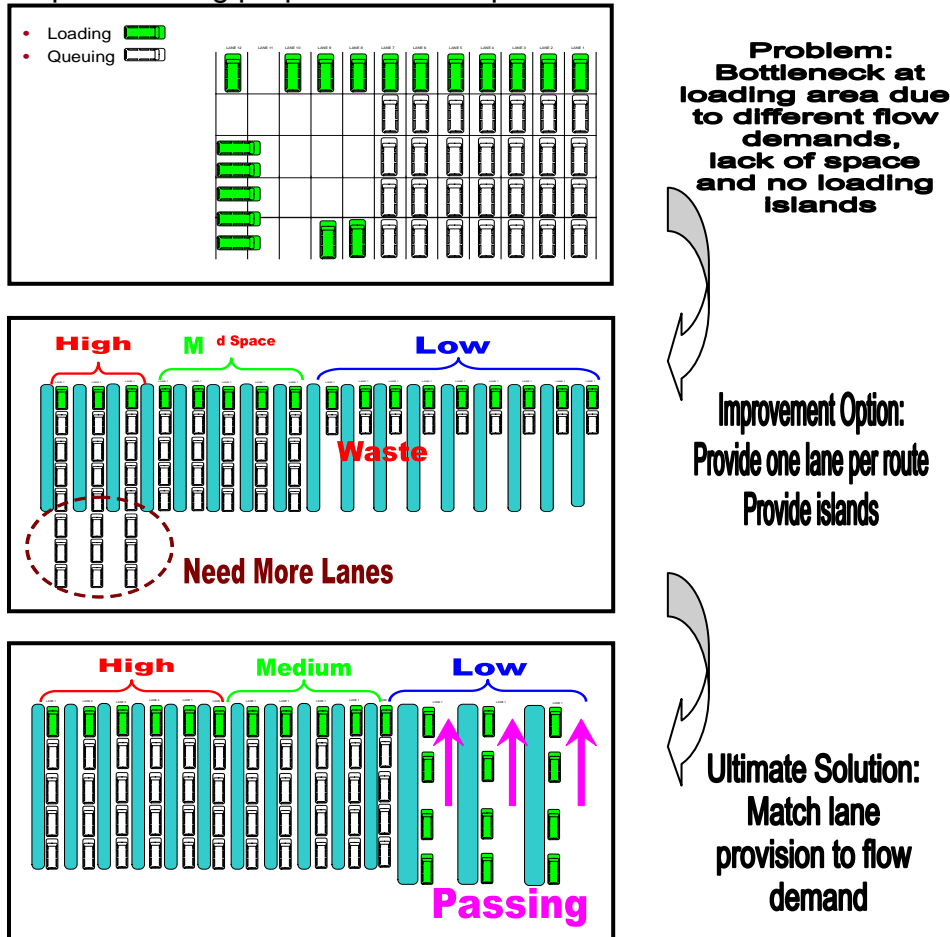


Figure 4 Schematic of development of improvements to the minibus taxi loading area at Richards Bay Plaza Rank

2.3 Truck Stop Facilities

The third element of the Study was to assess the status quo of the truck stop facilities. The assessment began by organising a stakeholder meeting at the Port in order to develop a holistic picture of this need. Among the stakeholders were Transnet representatives from the land/infrastructure provision, terminal operation and security business units; representatives of companies who own the cargo transported by road freight to/from the Port and the freight haulers who transport the cargo. The meeting concluded that there were needs within the Port that would need to be addressed by Transnet directly including the need for a staging area; secondly that there were needs outside of the Port that would need to be addressed by the City of uMhlatuze Municipality in partnership with the affected stakeholders. It is on these external needs that the Study focussed, namely:

- The needs of drivers for a place to park their vehicles during the day while they get refreshments and other shopping goods that are found in a developed town such as Richards Bay and Empangeni;
- The need for a place with appropriate drainage to wash truck loading bins so that the product offloaded on the forward journey does not contaminate the product loaded on the return journey;
- The need for a place where trucks can park overnight when waiting to load or unload product;
- The need for a place where trucks can park for the drivers to rest while en-route to a further destination; and
- The Municipality's need to stop the practise of trucks parking at any open area in the Richards Bay and Empangeni CBD and also to stop trucks parking at public transport facilities.

The stakeholders were consulted individually to obtain information and an understanding of their operations, including volumes of trucks going to/from the Port, the types of cargo and their handling needs, needs of the drivers at truck stop facility, road freight routes throughout the City of uMhlathuze Municipality. The City of uMhlathuze Municipality was consulted on available land for the development of a truck stop facility and development proposals that had been submitted for the development of such a facility. An overnight survey of the number of trucks parked in Richards Bay and Empangeni was also carried out. All the data collected was processed and analysed to determine the number of trucks that the truck stop would need to accommodate and the appropriate location of the truck stop. During the analysis it was found that it would be appropriate to develop two facilities, one serving Richards Bay and the other serving Empangeni due to operational characteristics of road freight at the two centres. Four potential sites were then identified and conceptual layout proposals for a truck stop facility at these sites were developed. The outcomes of the investigation were workshopped with the City of uMhlathuze Municipality. A report was prepared outlining the investigation and outcomes.

3 CHALLENGES ENCOUNTERED AND LESSONS LEARNT

3.1 Design Standards

In developing the conceptual layouts for the minibus taxi loading and holding areas there was challenge in choosing the dimensions to be used. Firstly the hypothetical re-cap vehicle proposed in the RSADOT (2006) guidelines is not similar to the vehicles on the market. Secondly, there are various makes of re-cap vehicles on the market and all are bigger than the previous models, hence they do not fit into the current facilities. Furthermore, some of the existing holding areas were developed using dimensions for a car parking area. The specifications of the two most popular re-cap vehicles in the Study area were used to determine dimensions of parking stalls and aisles; these were compared with those of the guideline and minor adjustments made. The application of these final dimensions to the existing facilities sometimes resulted in fewer parking spaces than current, in such cases consideration was given to having a separate holding facility; incorporating the holding demand at another facility nearby; or providing a second level on the same site.

The operating characteristics of the ranks/terminals at work nodes are different from those at residential nodes and require different approaches to their improvement. Firstly, it was found that taxi operators use the ranks at residential nodes as a queuing point in the morning from which a minibus taxi would depart to collect passengers within the township.

The minibus taxi would then either bring the passengers back to the rank to fill a minibus taxi that has been loading at the rank or would go on to drop the passengers at the work node. Further, ranks/terminals at the residential node tend to develop informally adjacent to social amenities or shopping centres and are then formalised over time. Thirdly, the residential nodes typically have only one taxi association operating from them and routes are generally towards work nodes, and in larger townships, towards other parts of the township. The work node rank/terminal however has multiple taxi associations, routes to residential nodes primarily and planned and located in downtown areas, due to other competing land uses. This difference in the operating characteristics has an impact on the layout of the facility, for instance at one of the work node facilities due to long-standing friction between two associations the operators insisted that the layout of the loading and holding areas should demarcate separate areas for each association. In the interest of public safety, this request was incorporated into the design process, emphasising the need for socio-economic as well as scientific solutions to public transport challenges. At residential nodes the need for holding space is far more than for loading space, due to the lower number of routes, this then requires a different approach to setting out the loading area.

Assessing whether an area has adequate number of PT stops proved challenging because some parts of the City of uMhlathuze Municipality are characterised by sparse, typically rural communities while others are dense residential/CBD/industrial areas. Therefore as part of this Study, the areas were categorised by density and type of settlement and different criteria used for each category. New stops were then proposed where the coverage of an area did not fit with the criteria. Further, it was found that it was necessary to propose new routes in addition to proposing new stop locations as especially in rural areas, the routes are located on the main roads. However, the routes are operated on the main roads due to the poor condition of minor roads, hence discouraging use by operators due to potential increased operating costs. Therefore, it was proposed that some of these roads be upgraded.

2.4 Integration at Ranks/Terminals

One of the trends identified during the status quo investigation of the ranks/terminals was the use of bakkies (utility vehicles) on PT routes to rural areas, most of them outside of the uMhlathuze municipal area. This practise is as a result of the poor condition of the roads in these rural areas and the lower maintenance cost to operate bakkies on these roads as opposed to minibus taxis. Another trend observed was that of increasing use of minibus taxis compared to buses by PT users over time. In view of these two trends, which modes should an integrated, intermodal facility provide for?

Linked to the above, there is the question of the size of an integrated facility. The surveys conducted provide a picture of current demand at the facilities and current modes. However, the City of uMhlathuze Municipality is planning for growth in both residential and work nodes, through its Spatial Development Framework and Integrated Development Plans. This then requires planning for future demand at public transport facilities as well, some challenges here are:

- There is limited space for expansion at the current sites;
- Future mode shift among PT modes in the area is unknown;
- Public transport in South Africa is moving towards rapid transit, with implementation starting in metropolitan municipalities. As uMhlathuze Municipality aspires to be a metropolitan area, it is possible that in future it might be required to implement a

rapid transit system. If this were to be done, the demand for public transport facilities would change dramatically. However, the time to plan and implement such a system would take time, including adoption by operators. What would happen in the intervening period?

- The bigger the size of the facility, the higher the capital and maintenance costs. This could either result in public transport infrastructure losing to other competing (equally important) interests in the fight for a slice of the municipality's budget, or a skew in the budget in favour of public transport infrastructure to the detriment of competing interests. The question of user charging also arises here, although not addressed by the Study; however it is a subject whose effect on fares needs careful consideration especially as a significant number of commuters in the study area resides in distant rural areas and might be particularly sensitive to transport cost increases.

There was not a one-size-fits-all solution found for the above during the course of the Study, rather each case was dealt with on its own merits. Some of the solutions included in one case designing the conceptual layout such that additional levels could be added in future; in another case, earmarking an adjacent piece of municipal land for future expansion of the rank, in another case proposing the use of a privately owned parking area as a holding area for minibuses.

A significant characteristic of the ranks in the study area is that a number are part of commercial developments, especially in the Richards Bay and Empangeni CBDs. This feature promotes the idea of integrated development, by integrating complementary land uses. Further, the user experience is enhanced as PT users are able to shop in close proximity to where they board vehicles. The challenge however comes when changes in PT demand require a change in the layout or location of the public transport facility. The considerations move from being focussed on the transportation need to a wider consideration of economic factors. For example, if the vehicles at a small, over utilised rank are moved to a bigger, less utilised rank, then the businesses at the small rank could suffer reduced revenue due to reduced demand. In an extreme case, this could result in the shops shutting down entirely, leaving a vacant business premises and a vacant public transport facility. As these developments are often purpose built, it might be difficult to convert into another land use. Therefore, in each case a balance between transportation integration and economic factors needs to be found, which might not be the best public transport solution.

2.5 Developing Truck Stops

The element of the Study dealing with truck stop facilities was primarily an exercise in balancing the needs and expectations of a number of stakeholders. Among the needs were:

- The City of uMhlathuze Municipality need for a clean city environment. A truck stop facility would result in the reduction of illegally parked trucks. An appropriately designed truck stop would also reduce the contamination of stormwater by residue from the washing of truck bins;
- The freight carriers need for a viable logistics business. A truck stop would allow their trucks to wait for a load for the return trip;
- The truck drivers' need for shopping facilities and rest/refreshment area. A truck stop with commercial elements would provide for this need or alternatively the site would need to be located along PT routes so that drivers could park their vehicles and use public transport to go into the CBD;

- Transnet's need for its Port entrance to be clear of parked trucks, waiting for ships carrying their cargo. The truck stop would provide an area separate from the Port for this purpose;
- The cargo owner's need for their goods to be secure at all times. A truck stop with appropriate security would address this need; and
- The need by all stakeholders for a truck stop that is aligned with existing freight routes in order to reduce unnecessary movements.

The above needs placed a challenge in finding an appropriate site for the truck stop. Hence, four possible sites were identified, each satisfying the above needs in varying degrees. A further consideration related to the above that was not concluded as part of this Study, is the funding/implementation model for the truck stop. The questions that arise are:

- Who owns the land? Who pays for capital costs? Who pays for running costs? Whose revenue is it? What would be an appropriate user charging strategy?

This could be an opportunity for a Private-Public-Partnership between the Municipality, the freight carriers and cargo owners. However, the operation and management of such a facility does not fall within the core business of either stakeholder. The involvement of a private developer could address this shortfall.

Another consideration related to the truck stop facility is that of future demand. The City of uMhlathuze Municipality has noted in its development planning documents the possible future expansion of the Port. There is an indication that the Port could extend right up to the N2. While there is a well utilised rail line to the Port, it is used to transport coal primarily. If this remains the case going forward, the demand for transport of goods to and from the Port would fall onto road freight, hence more trucks. There was insufficient information available during the course of this Study to ascertain what impact this scenario would have on the truck stop facilities proposed, however it seems it would be substantial. Therefore, this is an aspect that still requires further investigation.

3 CONCLUSION

This paper highlights a number of considerations that arose during the course of the Study, among them those related to the appropriateness of current design guidelines, the effect of road condition on PT mode use, uncertainty in future demand at public transport facilities. It is the authors' contention that such considerations might be overlooked or not given sufficient consideration in the normal Integrated Transport Planning process. Brits (2010) presented a case, with reference to Type 1 planning authorities, for a separate public transport planning process preceding the ITP process. The authors' experience through undertaking this Study leads to the conclusion that there is a case for similar separation for planning authorities at a lower level. The inclusion of a freight matter as part of this Public Transport Study however shows that public transport planning may not be considered separately from other elements of the transport system.

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