

**TINLEY MANOR SOUTH BANKS  
DEVELOPMENT, KWADUKUZA**

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Tinley Manor South banks - Traffic  
Management Plan

**Client: Tongaat Hulett Developments**

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# TRAFFIC MANAGEMENT PLAN FOR THE TINLEY MANOR SOUTHBANKS PROJECT

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# 1 Introduction

## 1.1 Background

Tongaat Hulett Developments (THD) proposes to develop a tract of their land south of the Umhlali River, as shown below. This development is referred to as the Tinley Manor South Banks Development referred to as the TMSB development hereafter. The proposed development will be mixed use development that will consist of the development scheme:

- Resorts
- Private residential units
- Mixed residential units
- Retail
- Mixed use units i.e. offices, commercial & residential.

As revealed by the Traffic Impact Assessment (TIA) for this development, undertaken by Aurecon in 2016, this development is expected to generate a substantial volume of traffic onto the external road network. As such, the external road network needs to be bolstered by implementing the road network improvements mentioned in the TIA.

It is envisaged that the construction activities required to improve the external road network will have an impact on the existing traffic that uses the road network. Considering the nature of the possible construction activities and its envisaged impact on the surrounding road network, it is necessary to develop an effective Traffic Management Plan (TMP) in mitigation of these envisaged impacts. Therefore, this document serves as a high level TMP which must be used by the appointed contractor to develop specific traffic management strategies to deal with each aspect of the construction phase. The purpose of the TMP is to propose a set of coordinated traffic management strategies that will help to mitigate the impact of the proposed construction on the surrounding road network. The TMP will be a multi-faceted plan of operational, communications and demand management strategies to maintain acceptable levels of traffic flow during the construction period of the external roadworks for the Tinley Manor Southbanks Development.

The key objectives of the TMP are to:

- Maintain roadway capacity and traffic flow at the highest achievable level to minimise congestion, delays and accidents due to the construction work taking place on the external road network.
- Address the broader safety and mobility impacts of construction work zones at a local and network level.
- Improve work zone safety for construction workers and the travelling public.
- Develop in drivers extra vigilance, by means of exclusive temporary construction signs that creates a high level of awareness about the upcoming construction.
- Promote more efficient and effective construction phasing and staging, minimize contract duration and control costs.
- Improve efficiency within and around the construction zone.



- Provide drivers with adequate information to re-direct them in instances where detour routes are available.
- Maintain a high degree of discipline in the management of the construction zone on a daily basis.
- Minimise the complaints from the travelling public, local businesses and communities.

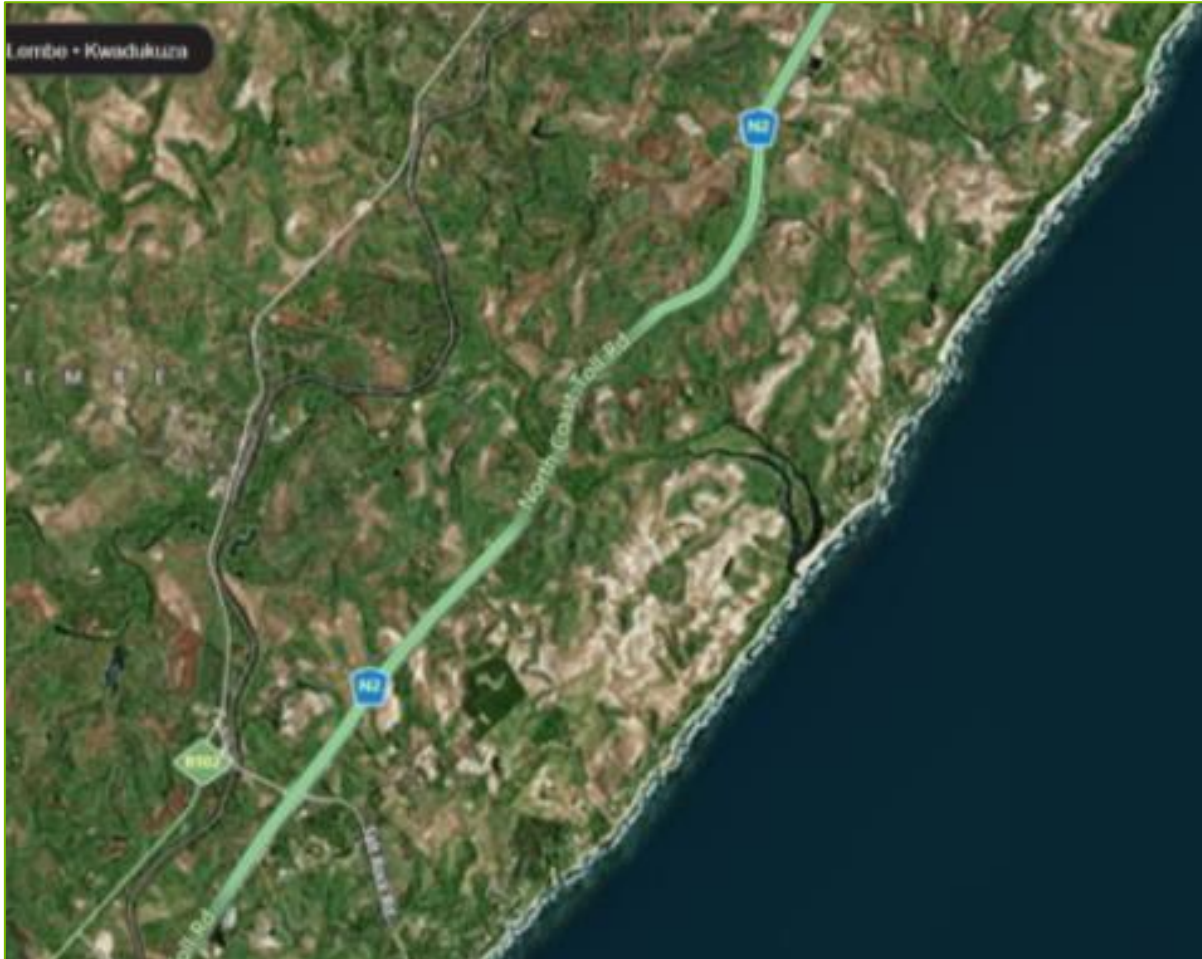



Figure 1: Location of Tinley Manor South Banks Development.

This Traffic Management Plan (TMP) serves to mitigate the disruption to the public and formulate a viable traffic management plan that conforms to the South African Road Traffic Signs Manual (SARTSM) Volume 2, Chapter 13 Roadworks Signing.

It is envisaged that during the execution of the external roadworks for this particular projects, the construction activities may result in the following impacts on the existing road network:

- Partial Lane Closures
- Full Lane Closures
- Full Road Closure (very unlikely)
- Temporary Traffic Lights



The possible mitigation strategies that are available to the appointed contractor are discussed in the subsequent chapters.

Proper Temporary Traffic Control (TTC) strategies based on the guidelines provided in this document must be developed by the Contractor for each specific construction activity to ensure the safe and efficient movement of traffic and pedestrians around the construction zones, as well as in the general construction areas. The purpose of this Chapter is to outline the procedures to be followed and define the responsibilities of the Contractor to maintain safer construction zones, with minimal impact on the travelling public. Careful consideration of the impact of construction work on the existing travel patterns shall be given when the Contractor draws up his construction programme and method statements. Public compliance with these guidelines will benefit road users by minimising delays, reducing accidents and providing greater safety for all project stakeholders.



# 2 TEMPORARY TRAFFIC CONTROL STRATEGIES

The manner in which the road network will be affected by each construction activity will vary considerably. Therefore, it is impractical to provide a temporary Traffic Control Strategy and layout diagram for section of construction for the external roadworks. Hence, it is important for the Contractor to use the guidelines provided in this document and adapt the layout diagrams, which are provided in this Chapter, in a manner that best suits the situation as it presents itself. Where special conditions, instructions or additional notes are provided, then these must be strictly adhered to. The Contractor shall develop a systematic approach to the development of TTC strategies, such that the proposed interventions present the driver with one change at a time. In this way, the reaction of the driver can be anticipated and catered for with an acceptable degree of certainty and effectiveness.

The various proposed Traffic Control Strategy, for each specific location, shall be presented to the Engineer, by the Traffic Safety Officer, for approval, one week before implementation of the TMP at any specific location.

## 2.1 OBJECTIVES OF THE TEMPORARY TRAFFIC CONTROL STRATEGIES

In order to achieve the safest possible environment for the travelling public and construction workers, the Contractor shall establish a standard pattern of Temporary Traffic Control (TTC) strategies that is simple and clear to understand. The objectives of these strategies are to:

Develop in drivers extra vigilance, by means of exclusive temporary construction signs that creates a high level of awareness about the upcoming construction.

- Maintain roadway capacity and traffic flow at the highest achievable level to minimise congestion, delays and accidents due to the construction.
- Provide drivers with adequate information to re-direct them in instances where detour routes are available.
- Maintain a high degree of discipline in the management of the construction zone on a daily basis.

Where a roadway is either partially or totally closed, the new alignment to be followed by vehicles must be sufficiently visible by means of delineators, cones, barricades or an appropriate combination of these devices. This traffic accommodation should be continuous and consistent both night and day. These devices should be kept free of anything which could create a hazard if struck by a passing vehicle. The Contractor shall have an emergency response team available on a 24 hour basis, which can respond to public complaints related to insufficient or deteriorating devices as mentioned.





## 2.2 COMPONENTS OF A TEMPORARY TRAFFIC CONTROL ZONE

This chapter goes beyond just merely providing typical layout diagrams for the various scenarios. The rationale for the systematic layout of the construction zone is explained in detail. This systematic breakdown of the construction zone into standardised components results in more efficient and safe site operations, as it allows the Contractor an opportunity to clearly understand the traffic operations of all construction sites. A typical TTC layout is shown in Figure 2. As shown in this typical layout, the construction zone must be divided into five components as follows:

- Advance warning area
- Transition area
- Buffer zone
- Work zone
- Termination area

### 2.2.1 ADVANCE WARNING AREA

The advanced warning area is used to advise motorists of the temporary and possibly adverse conditions that lie ahead, which requires particular vigilance. Furthermore, it provides adequate time for motorists to reduce their speed. At the beginning of the warning zone, an incremental decrease in speed is invariably signposted, at approximately 200m intervals until the desired speed is attained. It is good practice to repeat the final speed once more. The length of the warning zone is generally proportionate to the approach speed and should be realistic enough to facilitate the required reduction in speed. For speeds between 80 km/h– 120km/h, the recommended range for the warning area length should be between 600m – 1000m. Due to the limited space in urban areas, as well as the fact that design speeds in these areas are substantially lower, it is rather difficult and not required to achieve long advanced warning zones. It is recommended that for arterials roads a distance of 300m – 600m is used and for lower order roads a range of 75m – 150m should be used.

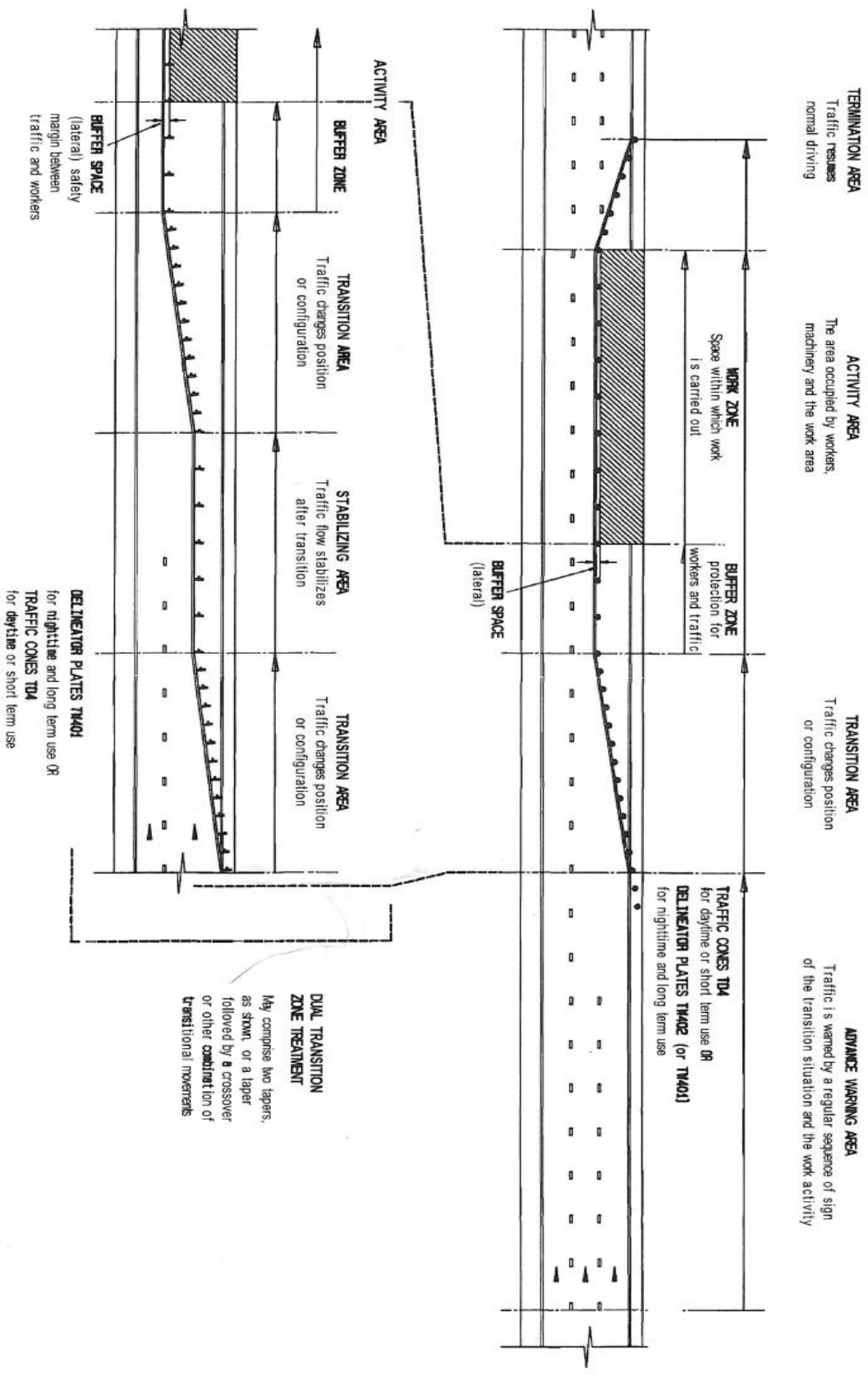


Figure 2: Components of a Temporary Traffic Control Zone



## **2.2.2 TRANSITION AREA**

The transition area allows drivers to take an action such as:

- Merge two lanes into one (lane drop)
- Cross the centre median (cross over)
- Enter a detour
- Shift position in the current lane.

The transition area is clearly defined using delineators and should conform to the layout of the guidance signs that precede it. In complex situations more than one transition zone can be used. The length of a transition zone is dependent on the approach speed and the amount of shift required by the transition.

## **2.2.3 BUFFER ZONE**

The principle function of the buffer zone is to separate the traffic from the workers before entering the work area in the interests of worker safety. The provision of longitudinal and lateral buffer zones within the work zone is considered as fundamental to worker safety.

## **2.2.4 WORK AREA**

The work area is adequately defined by delineators in simple situations and temporary barriers in more complex and demanding situations. If the parallel detour lane configuration is asymmetrical then drivers should be informed using lane arrangement signs. If the work area is rather lengthy then these signs should be repeated regularly.

## **2.2.5 TERMINATION AREA**

This area involves the return of traffic to normal flow conditions through a rapid taper in simple situations and a much longer one in complex situations. Signs of gratitude, thanking the travelling public for their compliance must be displayed in this area.



## 2.3 TYPICAL ROADWORKS LAYOUT DIAGRAMMES

The construction activities will vary along the road network within the study area dependant on the road network upgrades proposed in the TIA. It is incumbent upon the Contractor to assess each scenario uniquely and devise a TTC strategy in accordance to the needs of that particular situation. It is envisaged that the Traffic Safety Officer that will be appointed by the contractor will play a major role in the assessment of the construction activities and its probable impact on the road network and subsequently compile a specific TTC strategy in mitigation of the envisaged impacts.

As mentioned in Section 2.1, the construction activities required for the successful execution of the external roadworks will result in the following impacts on the road network:

- Partial Lane Closures
- Full Lane Closures
- Full Road Closure (very unlikely)
- Temporary Traffic Lights

Each of the above scenarios different requires a different traffic control strategies. The TTC strategies which are most applicable to the installation of the Western Aqueduct are shown in Figures 2 to 6.

**Figure 2: Partial Lane Closure** – this application will be typically used when the construction zone for the external roadworks encroaches into the verge or shoulder and partially into one lane. The width of the work zone will not warrant the full closure of a lane but merely a partial closure of the affected lane. A dual traffic operation is still possible although the lane widths are reduced, therefore, reduced speed limits and flagmen are a necessity.

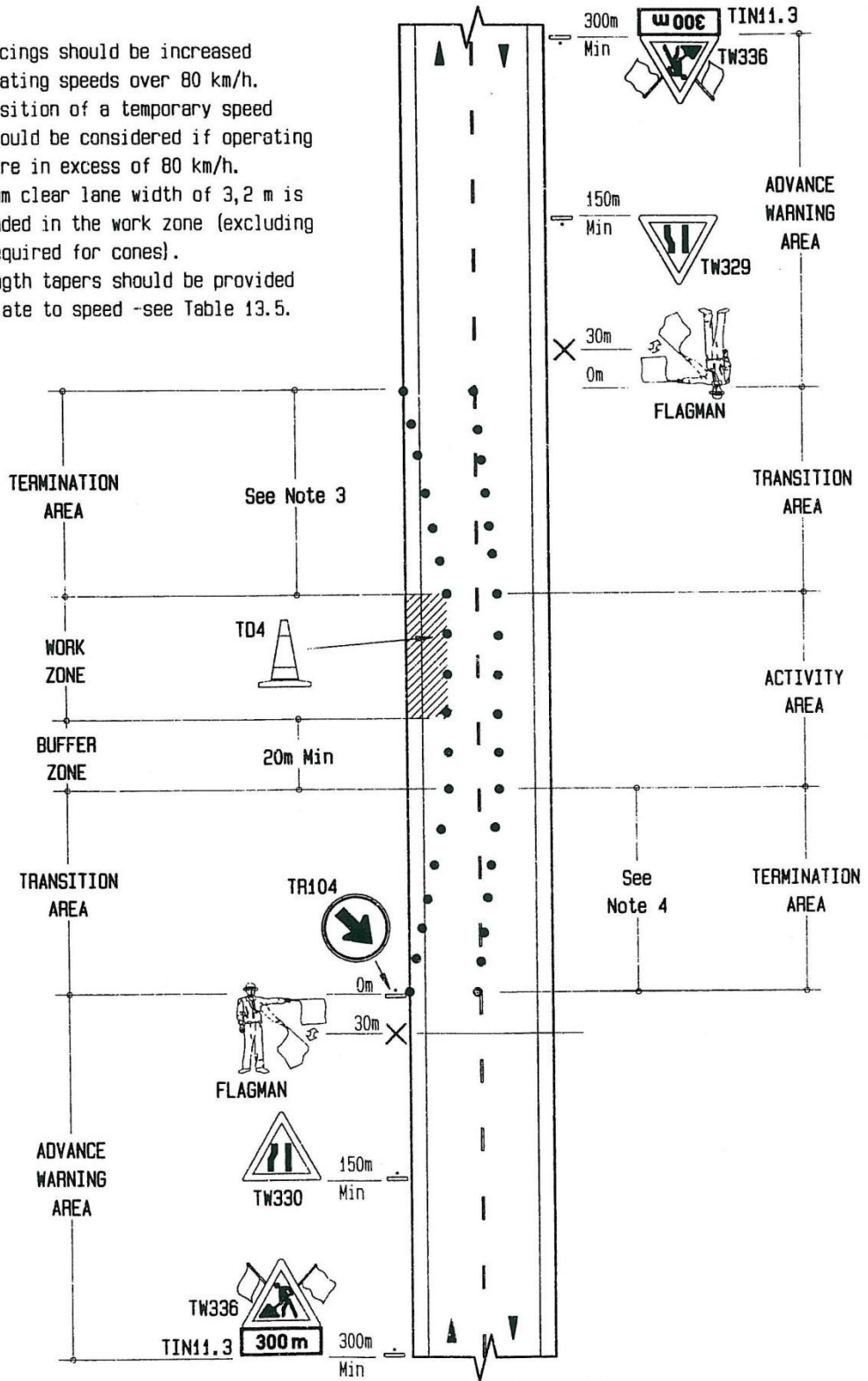
**Figure 3: Full Lane Closure** – The use of this application is warranted in instances where the construction zone encroaches onto one lane of the roadway and the subsequent work zone will require the entire width of the lane thereby seizing all traffic operations on that lane. Two-way traffic is no longer possible. Therefore, a Stop and Go system needs to be introduced. However, it is imperative to ensure that a stop and go operation is not used during dusk or darkness. Instead the stop and go operation must be replaced by temporary signals during dusk or dawn.

**Figure 4: Temporary Traffic Light** – Temporary traffic signals will be used on two way roads that have been reduced to one lane during roadworks as discussed previously. The use of temporary signs is appropriate at all times subject to the cost effectiveness of the operation. Their use is highly recommended during the hours of dusk and darkness.

**Figure 2: Partial Lane Closure**

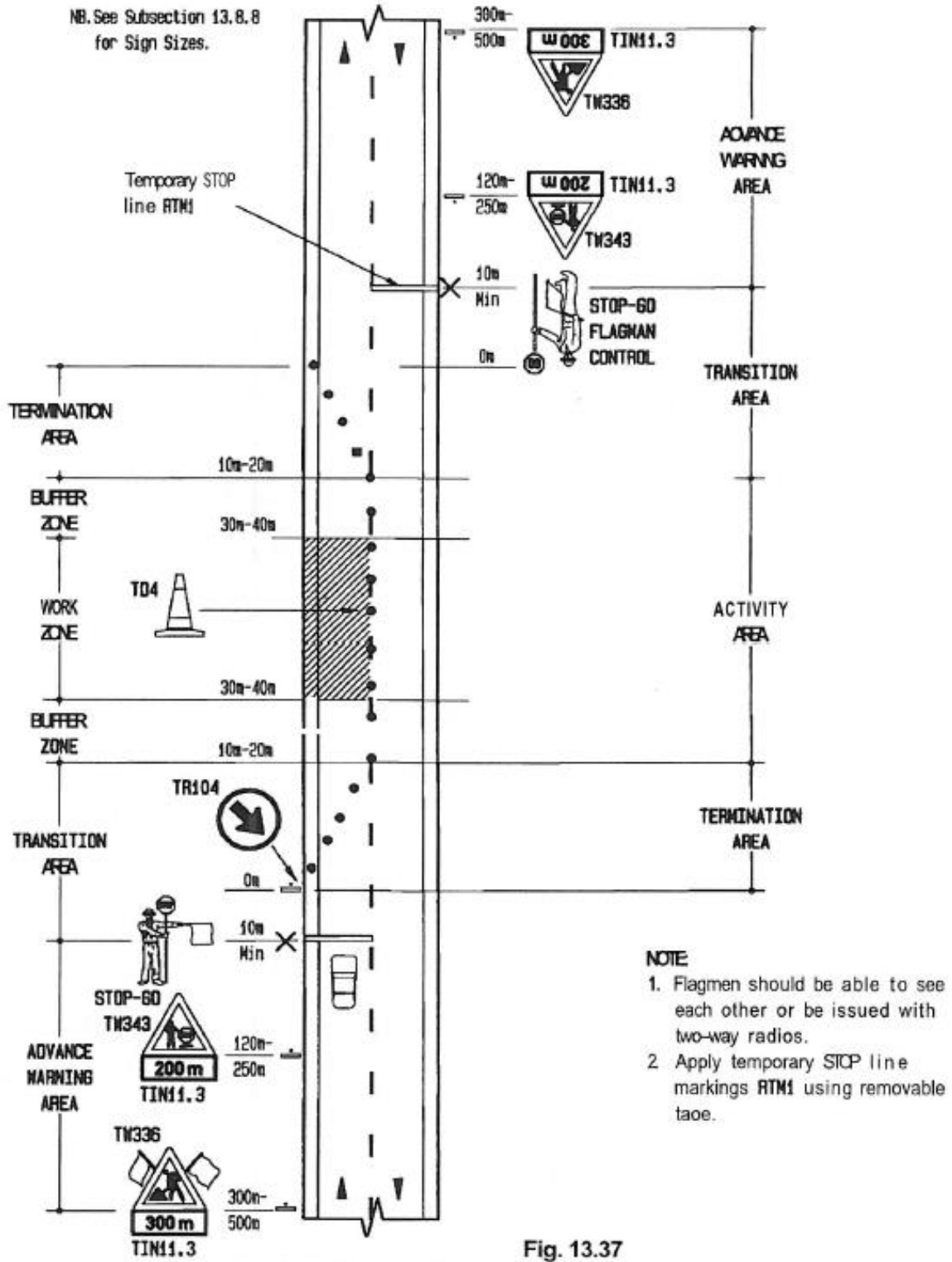
**NOTES:**

1. Sign spacings should be increased for operating speeds over 80 km/h.
2. The imposition of a temporary speed limit should be considered if operating speeds are in excess of 80 km/h.
3. A minimum clear lane width of 3,2 m is recommended in the work zone (excluding space required for cones).
4. Full length tapers should be provided appropriate to speed -see Table 13.5.



Detail 13.37.1 Partial Lane Closure

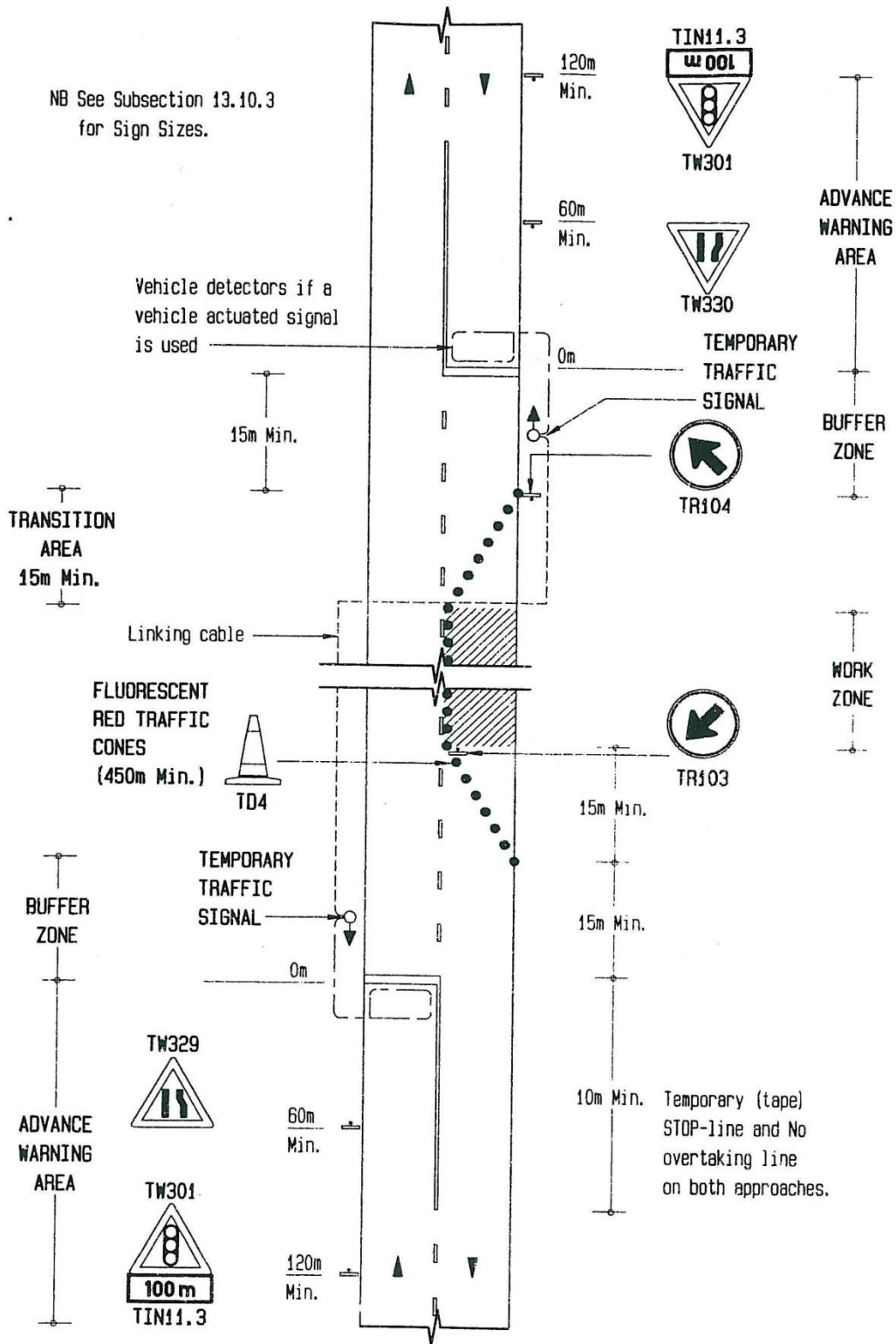
Figure 3: Full Lane Closure



Detail 13.37.2 Lane Closure Short Term Lane Closure



**Figure 4: Temporary Traffic Light**



# 3 Non-motorised Transport

It was observed that during the site visits that the non-motorised transport activities within the study area are generally low as only a few pedestrians and no cyclists were observed on the road network, particularly in close proximity to the Tinley Manor Southbanks Development. Nevertheless, the contractor must make the necessary arrangements to safely accommodate pedestrians around the working zone. The typical arrangement that can be used by the contractor nor NMT users is shown in Figure 5 hereafter.

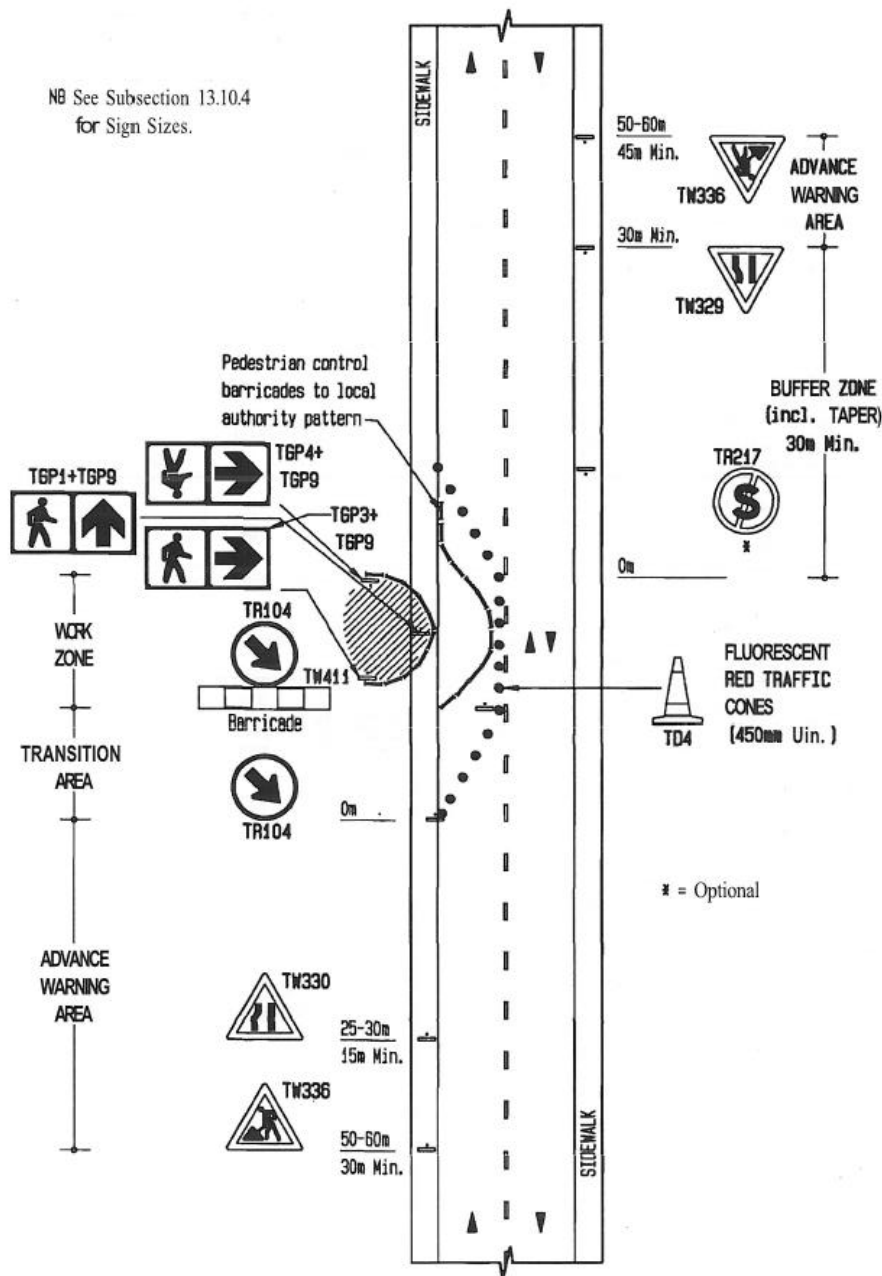


Figure 5: Accommodation of NMT



## 4 Emergency Vehicle Access

At each working front, the contractor must ensure that the emergency vehicles can access the site in case there is an incident on site. Furthermore, the contractor must ensure that emergency can easily pass through the working zone at all times to access areas that are located outside the study area.

## 5 Public Awareness Campaigns


The construction activities required for the proposed road network improvements within the study area will have some impact on the safety and mobility of road users. As such, it is suggested that the contractor develop and implement a Public Awareness Campaign to mitigate the impacts of the construction on safety and mobility. Please note that this is not a mandatory requirement but rather an initiative that will complement the TTC strategies that were discussed in the previous chapters.

The purpose of Chapter 5 is to provide a set of guidelines for the Contractor to develop and implement a Public Awareness Campaign. The objectives of the awareness campaign are to involve and inform all stakeholders at an early stage about the potential impacts of the construction, and, to ensure that effective mitigation strategies are developed and implemented. The sections in this chapter of the TMP provide the guidelines that should be adopted to develop and implement an awareness campaign, such that all stakeholders are amenable and supportive of the envisaged construction activities.

### 5.1 Determine the Appropriate Size and Nature of the Campaign

The first step in developing any awareness campaign is to determine the size and nature of the campaign, to better understand the needs of the project. A range of elements should be considered when determining the size and nature of a public information and outreach campaign as follows:

- Traffic delay and safety, at both the corridor and network levels, including the effects on parallel corridors and alternate routes.
- Traffic delay and safety at nearby intersections, interchanges and railroad crossings if any.
- Special traffic and safety conditions such as heavy truck traffic, steep grades and poor weather.
- Disruptions of other modes of transportation including public transportation and rail.
- Emergency Response routes (hospitals, fire stations, enforcement, etc.).
- Dangerous Goods routes.

- 
- Emergency response units.
  - Other public and private entities (such as schools and universities).
  - Planned special events (comrade's marathon, holiday parades, concerts, etc.).
  - Businesses and residences.

## 5.2 Identify Resources

All public awareness campaigns have some cost implications however the expenditure for such a campaign is not frivolous, as the benefits derived from a good public awareness campaign are likely to outweigh the costs.


The success of the awareness campaign is dependent on internal resources from the authorities and external resources from the contractor. The internal resources will play a vital role in developing and implementing a good awareness campaign for the construction. The internal resources may include a public relations expert to communicate with the mass media and public, graphic designer and a perhaps webmaster. Other resources will include many of the Municipality's community and traveller information systems including web sites, radio and variable message signs that can be effectively used to provide awareness to the motorists of the proposed construction within activities the study area.

The municipality can leverage and stretch their resources by incorporating the use of available resources that are low cost or free of charge. External resources that may be essentially free of charge include radio traffic broadcasts and newspaper articles. This will require establishing a relationship with the media to ensure that the correct information is reported.

## 5.3 Identify Stakeholders

In both the planning and implementation stages of the public awareness campaign, the road authorities and the contractor need to work in collaboration with a range of stakeholders. The stakeholders that should be involved in the campaign should include:

- Public transport providers
- emergency response teams
- work zone personnel
- law enforcement
- hospitals in the affected areas
- traveller information providers
- radio and newspapers
- planned special event coordinators
- schools



The relationship with the media will be particularly important during major periods of disruption and when changes occur. Furthermore, the involvement of outside groups in the planning of an outreach campaign is in itself a way to distribute information. Holding a meeting with the aim of soliciting community input, for example, is also a way to inform the public of disruptions and plans to deal with them. The involvement of stakeholders in developing awareness strategies will bring unique perspectives about successful types of messages and methods of communication.

## 5.4 Identify the Target Audiences

The key to any public awareness campaign is to identify the target audience, as this will help to determine the types of messages that need to be conveyed and the best methods of communicating those messages. Ultimately, the target audiences are travellers or potential travellers such as residents, workers, school traffic, customers, etc. However, travellers can be thought of in different ways and can be reached through different methods. Audiences, therefore, can be conceived of in three overlapping categories:

### Types of Travellers


- Pre-trip
- En route
- Personal – local, commute
- Personal – local, non-commute
- Personal – non-local (e.g., tourists)
- Commercial – local
- Commercial – non-local (long distance)

### Types of Trip Generators

- Major employers
- Shopping malls
- Recreation and tourist facilities (e.g., parks, sporting facilities, etc.)
- Organizers of planned special events
- Emergency response teams and hospitals
- Business associations
- Public Transport Associations
- Schools
- Small Business Owners

### Types of People

- Residents (and neighbourhood associations)
- Groups with limited English-speaking capability
- Special demographics (particularly elderly, children & disabled)



The major audience for the awareness campaign are travellers. However, all travellers cannot be tackled in the same manner as travellers are not all homogenous. A traveller may be reached pre-trip or en route and will have different means of receiving information. Pre-trip travellers will possibly access information through a project web site, word of mouth or a newspaper publication and will change their trip timing, mode, route and destination before they embark on a trip. Travellers en route, with good timely information via radio or variable message signs may alter some characteristics of their trip en route to lessen delay.

Personal travellers also differ in terms of the purpose of a trip. A major distinction is between commuters and non-commuters. Commuters tend to be very aware of travel conditions and thus relatively easy to inform, but less flexible about aspects of their trip, particularly the origin and destination. Non-commuters by contrast are typically harder to reach but may be more likely to respond to messages about changing the timing of a trip and their destination.

Another distinction is between local and non-local travellers. Non-local travellers will be generally harder to identify and inform about the construction. Furthermore, the information needs of non-locals may differ because of the nature of their trips and their unfamiliarity with the area. Such factors are particularly important in tourist areas and therefore it will be necessary to publicize information in different ways and in a wider area for non-local travellers.

Commercial drivers are another group who may have different needs for work zone information because of tight schedules, oversized or dangerous loads and overnight travel. Therefore, it is imperative to determine if the construction on the viaduct affects a route with heavy truck traffic. Truckers carrying special loads such as abnormal loads and dangerous goods may need to avoid the work zone entirely. Other types of commercial drivers such as ambulance drivers may also require special attention.

Another way to establish the target audiences is to identify major trip generators near the construction zone, such as major businesses, schools, hospitals, public transport routes, etc. At the outset of developing the campaign it is crucial to develop a list of the main trip generators in the affected area. These entities will require help to mitigate the impacts of the construction zone on their customers, patients, suppliers and etc by suggesting appropriate alternative routes.

Considering the vast diversity in the South African demographics, the awareness campaign must consider the different types of people affected by the construction. Certain groups may need special information or information provided in a different language such as Zulu. Residents who live near the work zone are the primary audience since they will be affected by the work zone on a daily basis. Children are often conduits of information to parents therefore information can be disseminated at schools in the surrounding areas.

## 5.5 Develop the Campaign Message(s)

The public awareness campaign should at the very least incorporate three messages:

- Safety first
- Plan ahead to minimize delay
- We care

The underlying principles behind these messages are explained hereafter.





## Safety First

The primary message of all awareness campaigns must be to promote safety in order to protect road users and construction workers. Drivers should be continuously reminded to adhere to posted speed limits and stay alert for changes in lane configuration, road geometry, slowing traffic, construction equipment and traffic, etc. These messages can be reinforced with warnings of increased traffic fines and enforcement activity if appropriate. The campaign team may also want to provide facts about work zone crashes.

## Plan Ahead to Minimize Delay and Frustration

It is vital to provide motorists with adequate information to facilitate pre-trip planning. The congestion created by the construction can be minimised if motorists plan ahead. Furthermore, if travellers know what to expect there will be less frustration due to delays. Hence, it is important for the campaign message to provide sufficient information to allow motorists to think ahead about the timing of their journeys, the route, the mode and the destination. The specific messages concerning these aspects will typically form the essence of the campaign and is discussed next. It will be necessary to advertise well in advance the dates and the duration of the road closures and the details of the detours.

## Work Zone Details

The absolute basic details of the construction work zone must be given, which should include the dates and times of work zone activity and the routes, lanes and ramps affected and finally the recommended alternate routes that should be used. These details will vary across the duration of the construction; therefore it is important to update the information regularly as inaccurate information will compromise the effectiveness of the campaign.

## Travel Times and Delays


Public information on travel times and delays can range from very general e.g. "Expect delays" to very specific e.g. "Travel time through work zone is 20 minutes". More specific information is generally more useful to travellers. Travel time and delay information can also be presented as average or typical conditions for the work zone or real-time conditions.

## Alternate Routes

Adequate signage for alternate routes is essential at all times especially when there are total road closures. Alternate route signage must be placed at decision points for drivers. There are a variety of means for communicating alternate routes such as handing out alternate route maps, flyers, brochures, newspapers and radio traffic broadcasts. It is recommended that these means of communication are used in combination with each other, as this will ensure a wider awareness campaign.

## We Care

Motorists are more willing to cope with disruptions and cooperate with directions when they feel that all necessary steps are being taken to make the situation more acceptable. Acceptance of the inconvenience related to the work being performed is more likely to be accepted with a genuine message from the project implementers. Thus, public awareness strategies should incorporate macro level details



of the project including what is involved, the duration of the work, the benefits and periodic updates of the progress of the project.

## 5.6 Determine Communication Strategies

Upon identifying the appropriate audience and messages, it is necessary to determine the mediums that will be used to convey the messages to the target audiences. There is a wide range of ways to communicate with the public with regard to the construction. The awareness campaign will comprise of several strategies that can be implemented simultaneously or independently depending on the need at that particular point. There must be integration and consistency between the various means of communication, for example, brochures and web sites must provide the same accuracy with regard to dates, times, impacts, etc. This sort of accuracy and detail will ensure the sustained integrity of the campaign. The various means of communication are as follows:

### Brochures, Flyers & Factsheets

This form of printed material containing project related information such as advanced notice of the project's commencement, work plan, maps, detour routes, etc. should be disseminated at key nodes such as intersections, filling stations, shopping centres, residences, etc. We do not see this as a viable option.

### Press Releases

Regular updates of project related information should be forwarded to all the local newspapers within the greater Kwadakuza region. All unscheduled changes to the normal work plan should be forwarded to the press as a matter of urgency in order to reduce the impact of these changes.

### Radio Advertisements

Radio advertisements or announcements on regional radio stations such as East Coast Radio, Ukhozi FM, etc should be made periodically to convey any project related information.

### Telephone Hotline


A telephone hotline could be established to provide traffic and travel information. In addition this hotline service can provide recorded messages or a real time complaint line. It is advisable that the line is toll free to encourage effectual usage.

## 5.7 Determine When to Communicate

The awareness campaign must consider the distinct phases of the project. The awareness strategies to be implemented must consider the pre-construction phase, the construction phase and the post completion phase of the project. Before the commencement of the project, the campaign should concentrate on general information about the project, such as the need for the upgrading of the road network, the problems it may cause and how to gather more information. At the commencement of the project it will be necessary to utilise other methods such as free media coverage and paid advertising, a telephone "hotline", traffic broadcasts and variable message boards. Upon completion of the project, the project team should document the successes and failures of the project and thank the public for their sustained co-operation. This will ensure that the stakeholders will be receptive to future projects.

## 5.8 Evaluate Effectiveness

The effectiveness of the campaign should be evaluated through an on-going iterative process to improve safety and mobility in the vicinity of the construction zone. The evaluation should include:

- 
- Documenting and reporting the impacts of the work zone, such as the number of crashes and traffic delays.
  - Documenting and reporting the questions, comments, compliments and complaints received from the public.
  - Assessing perceptions of successes and failures among the stakeholders.
  - Interviewing the residents, businesses and drivers affected by the work zone.

## 6 TMP Monitoring

Monitoring the performance of the TMP during the construction is important; to see how closely the predicted impacts resemble the actual conditions in the field and whether the strategies of the TMP are adequate in managing the impacts. Examples of possible performance measures for TMP monitoring include volume, travel time, queue length, delays, number of incidents, incident response, clearance times, contractor incidents and community complaints.

The responsibility to monitor the TMP on a daily basis will be the responsibility of the Contractor. The design consultant will on an adhoc basis visit the site to ensure that the contractor is fulfilling his responsibility in terms of the TMP.

The strategies that can be used to evaluate the TMP are as follows:

- **Designated inspectors** must be appointed by the contractor to frequently monitor the performance of the TMP.
- Where **electronic surveillance** (CCTV) footage is available, it can be used to assess the TMP.
- **Incident Management records** that document accidents, recovery times, etc can be used.


### 6.1 Update/Revise TMP Based on Monitoring

If the performance requirements of the TMP are not met within reasonable tolerances, the contractor in collaboration with consultant should revisit the TMP. Alternate management strategies and/or phasing approaches that meet the needs of the actual transportation demands must be considered.

### 6.2 Post Project TMP Evaluation

Following the completion of the construction, it will be useful to prepare a short report that evaluates the TMP. This evaluation may include significant successes and failures of the TMP, changes made to the TMP and results of those changes, any feedback from businesses and the public, actual measurements of conditions versus what was predicted, cost for implementation of the strategies and suggested improvements. This given report should be given to the road authorities as it will be useful for future projects of a similar nature.

At the least the post-project evaluation report should include the following:


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- Overall Statement on the usefulness of the TMP.
  - Changes to the TMP during the construction or implementation
  - Discussion on whether the changes were successful.
  - Public reaction to the TMP.
  - Average delay, queue length, etc.
  - Type and frequency of legitimate complaints and their nature.
  - Types of crashes that occurred during construction.
  - Lessons learnt for future projects.

## 7 Contingency Plans

Contingency Plans are a key part of the TMP, as it describes processes to transform an unplanned event into a planned response. The Contingency Plan will ensure that the right people are in the right place, at the right time with the right information and resources in the event of an incident/accident. It does this by early identification of a problem. Fundamentally the Contingency Plan should be designed to be a management guide as opposed to a procedural handbook for each incident. It is the responsibility of the Contractor to develop contingency plans as the construction progresses. These contingency plans must be approved by the client. At the very least the Contractor's contingency plan should include the following:

- The Contractor needs to establish a set of trigger points that should be evaluated to determine whether an incident warrants the implementation of a contingency plan (i.e. accident, inclement weather, length of traffic queue exceeds threshold).
- The lines of communication and authority need to be properly articulated.
- Specific duties of all participants during lane closure operations, such as, coordination with law enforcement or local police, etc. needs to be defined.
- Names, phone numbers and pager numbers for the TMP manager or their designee, the resident engineer (RE), law enforcement agencies, radio stations and other applicable personnel, must be included in the contingency plan and must be readily available.
- A coordination strategy and special agreements if applicable between the above mentioned personnel must be properly articulated and documented, so that everybody knows their roles and responsibilities in the event of an accident.
- Standby equipment and personnel for callout must be readily available.

In the event of an incident, the Contractor should give as much information and guidance to motorists on the use of alternative routes as possible. The Contractor and his team must ensure that content of the messages issued to the media, especially radio stations, must provide clear indication of the degree



of congestion and alternative routes that must be used. The message should indicate the reopening time of the road where possible to give such details, then the Contractor must inform the public of the uncertainty of the road closure duration. Furthermore, the Contractor needs to liaise with public transport operators to ensure that public transport route diversions are feasible and acceptable to passengers on board. The Contractor should continue to adopt traffic management measures after the clearance of the incident to ensure that traffic will return to normal in a smooth and swift manner. The Contractor should monitor the traffic condition in the affected region for effective queue management and dissipation.

The Contractor should store records involving the types of incidents, duration, clearance time, responses, etc. for evaluation and analysis to improve the accuracy of future traffic impact assessments. In addition, after every incident debriefings session should be conducted, so that lessons learnt from an incident can be consolidated for future reference, to enable better handling of similar situations in the future.



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