



**Government of the Republic of Trinidad and Tobago**

**Ministry of Works and Transport**

**Traffic Impact Study Guidelines**  
**for Developers**

**Traffic Management Branch**

**Draft May 2017**

**Revised June 2018**

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## ***1. Introduction***

All land uses generate a certain amount of travel. Land use decisions have transport consequences and planning applicants need to address them through the development control system by producing a Traffic Impact Study. A traffic impact study is an important part of the design process for all developments and is the method by which planning applicants demonstrate how they proposed to deal with this new travel and its impacts on the existing transport system.

The following are guidelines for seeking approval from the Traffic Management Branch of the Ministry of Works and Transport. These are periodically reviewed and subject to change.

This document is an outline of the proposed technical standard for the evaluation of the adequacy of transportation facilities by the Traffic Management Branch (TMB). The *Guidelines* establish criteria by which TMB and applicants with land development proposals can assess the traffic impact of the development proposals.

## ***2. Submission Requirements***

The following items must be submitted to Traffic Management Branch for review.

- a) Covering letter giving the following details of the land development: -
  - Name and contact information of developer/land owner (mailing address, email address and phone number).
  - Name of development
  - Purpose of development (proposed land use(s))
  - Type of development (residential, agricultural, commercial, mixed use, education etc.)
  - Number and type of units in development (e.g. residential - single, townhouse etc.) or size (gross floor area (GFA), square area)
  - Details of phased development and proposed opening year.
  - In the case of retail/ commercial/ leisure development number of employees to be at proposed development in the case of hours of operation/ shift working patterns, servicing arrangements.
  - Existing/ previous use of the land (greenfield, brownfield etc.)
  - Description of the junctions and/or links adjacent to the site (to be shown in relation to the proposed development site on a plan).
- b) Description of special events (time, date, change in trips) which may cause a significant change in trips to and from site.
- c) All relevant plans for processing of land development including, but not limited to, the following: -
  - Site Location Plan - indicating site location from the nearest highway, major road or land mark (street, town, ward, county),
  - Site Layout Plans (Lotification) - indicating all existing accesses and bordering roads
  - Road layout Plans (proposed) – indicating all accesses, internal roads, their respective reserves, paved widths, sidewalks and drains.

- Access/Egress Details – including detailed geometric design of access/egress with dimensions, horizontal and vertical curves, laybys, road marking, and acceleration and deceleration lanes. Include all street names where access/egress is being requested. Plans to be submitted preferably in scale 1:500.
- Plans showing details of all phases (if phased development).
- Electronic copy of Site Layout Plan clearly showing:
  - Sub-division/ lotification and road layout
  - Property Boundaries
  - All accesses and egresses (existing and proposed)
  - Proposed internal roads, their reserves and paved widths
  - Layout of drop-off and / or pick-up points for pedestrians and dimensions of parking spaces highlighting the location of disabled parking as appropriate, and proposed turning facilities for vehicles within site.
  - Setbacks (Building line, buffer, river reserve etc.)
- Electronic copy of detailed geometric design for each access /egress
- Other plans as deemed necessary

**\* All drawings should be stamped and signed with a registered board of engineers' stamp.**

- d) Traffic Impact Study – The purpose of the traffic study is as follows:
- To know the traffic and transport impacts of the proposed development;
  - To clearly convey the impacts which will assist in the decision making process;
  - To mitigate any negative transport impacts through the design process;
  - To try to maximize the accessibility of the development by non-car modes.

Depending on the scale and potential impact of the development a Traffic Impact Statement, Traffic Impact Assessment or Traffic Impact Study for larger developments will be required.

- *Traffic Impact Statement* – for developments with relatively small transport impacts, providing a predominantly qualitative description of the existing transport conditions and those related to the proposed development. Collection of traffic data that provides anticipated site specific list of requirements to be met (for very low density residential).
- *Traffic Impact Assessment* – for developments with significant transport impacts. Determines Level of Service (LOS) (existing and projected) (for low density residential). Provide outputs of degree of saturation or ratio of flow to capacity (RFC) as well as Degree of Saturation (DOS) and LOS at intersections for the existing, projected and projected plus development scenarios. Analysis of other scenarios which include traffic generated from committed developments may be required. Drawings of scale 1:500 of all the junctions analysed must be included showing the existing and proposed geometry of the junction and the existing and proposed road markings.
- *Traffic Impact Studies for larger developments* – for developments with significant transport impacts. Determine the appropriate location, spacing and design of access points and appropriate improvements for safety and satisfactory LOS (for density residential and all agricultural, industrial, institutional and commercial developments). Provide outputs of degree of saturation or ratio of flow (RFC) to capacity as well as DOS and LOS at intersections for the existing, projected and projected plus development scenarios. Analysis of other scenarios which include traffic generated from committed developments may be required. Drawings of scale 1:500 of all the junctions analysed must be included showing the existing and proposed geometry of the junction and the existing and proposed road markings.

NOTE: Full input and output details of all capacity analysis models are required. Any diagrams related to the models must be included. Phase and stage diagrams for signalised junctions must be included. Reference must

be made to flow diagrams showing traffic flows used in the capacity analysis. Validation of modelling is required. If validation is based on queue length data this data must be included. Any assumptions used in the modelling exercise must be stated. Any anomalies such as modelled queues not matching existing queues must be explained and justified.

- h) Traffic Management Plan for construction phase that affect traffic flow (for road works along main roads/highways) requires Traffic Management Branch Approval.

### ***3. Description of the Development Proposals***

In order to facilitate full review, all traffic impact submissions details of the development proposals should include the following:

1. Name of the project, applicant and correspondent.
2. Application type and/or number (if available).
3. A plan of appropriate scale (say 1:500 scale) showing all proposed access arrangements, driveways and internal roadways and the acreage of the subject parcel.
4. A vicinity map showing the exact location of the proposed development.
5. Any previous application numbers and approvals associated with the parcel.

An assessment of the area that will be affected by traffic generated (including modes other than the car) by the proposed development must be made. The size and shape of the study area will depend on the size and type of development proposed, the existing and planned roadway system, adjacent and proposed land uses, and the presence of natural or man-made barriers.



## ***4. Traffic Impact Study Requirements***

### **4.1. Need and justification**

The purpose of the traffic impact study is as follows:

- To know the traffic and transport impacts of the proposed development;
- To clearly convey the impacts which will assist in the decision making process;
- To mitigate any negative transport impacts through the design process;
- To try to maximize the accessibility of the development by non-car modes.

### **4.2. Scoping Agreement**

Prior to beginning a traffic study, the applicant or designee shall submit a Scoping Agreement after having completed a scoping study. A scoping study is an investigation into the requirements of the traffic study in terms of the data required, the area of influence of the development, the methodologies to be used and the assessment of the projected year scenario. The Scoping Agreement specifies the study area (including geographical extent), the proposed traffic study methodology, measures to be considered and data to be collected and analysed by the developer and the other relevant assumptions associated with the traffic study. The study area should generally include all significant transportation facilities (defined as any site access point, intersection between collector, arterial, interchange, or roadway link between signalised intersections) to which trips of the applicant's site-generated traffic is assigned. Applicants should liaise with TMB in order to identify relevant special engineering difficulties which might arise.

TMB will review the applicant's proposed Scoping Agreement and respond with comments or concurrence. The scope of the traffic study will be agreed with the developer at the end of this stage.

### **4.3. Roadway Configuration**

Within the study area an inventory indicating the characteristics of existing roadways should be compiled, shown on a map of appropriate scale (e.g. 1:500 scale), and included in the traffic study. A field inspection of the roadways which will be affected by traffic

generated by the proposed development should be made to determine the number of lanes, the number of approach lanes at intersections, the location of median openings, type of intersection controls in place, signal phasing, horizontal and vertical alignment (if irregular), and location of existing access points.

Swept path analyses of proposed modifications to the highway layout which will affect the flow of traffic should be included.

#### **4.4. Internal Layout**

The internal layout of the proposed development should be designed in such a way that it does not allow for queues of traffic to or from the development to interfere with the safety and / or free flow of other traffic on the public highway.

#### **4.5. Traffic Data Collection and Traffic Flow Assessments**

Recent traffic counts (i.e. no older than 1 year prior to the date of submission of the traffic study) must be included for all links and intersections within the study area. Counts at intersections must consist of AM and PM weekday peak-hour turning movements. Saturday counts may be necessary for retail/ commercial development proposals. Turning movements at other times must be undertaken as deemed necessary by TMB.

The beginning and ending times for the peak hours will be identified by inspection of peak period or longer duration count tabulations based on counts not more than one year old at the time the traffic study is submitted.

Traffic data must reflect existing normal peak hour conditions at the time of the study, and should not be used if more than one year old at the time of original submission of the traffic study or if significant changes for example, in landuse and/or highway layout have occurred at or near the count location. The traffic consultant or the applicant shall be responsible for providing traffic counts. Traffic counts should not be conducted during periods or days when schools are closed, or on days before or after public holidays. Ideally traffic counts should be undertaken on a Tuesday, Wednesday or a Thursday.

Traffic counts may be required on other days of the week depending on the nature of the development proposed. The occurrence of significant traffic incidents (accidents, closures, etc.) or inclement weather in the vicinity of the count location during the count may provide a basis for disallowing the count. In addition, ongoing construction on nearby roadways may cause temporary diversions that could result in counts which do not reflect normal conditions. Adjustments to counts taken under these circumstances should be made using a method acceptable to and approved by TMB. Applicants should create and refer to flow diagrams showing the results of the traffic surveys for the highway network peak periods and the development network peak periods if they do not coincide.

Traffic flow assessments provide quantification of the current movements (e.g. vehicular flows, pedestrian flows) within the development's area of influence based on traffic data collected.

#### **4.6. Trip Generation and Trip Distribution**

An estimation of new trips from the proposed development must be undertaken. The likely pedestrian, cyclist, car, van, lorry (rigid, articulated, drawbar), taxi, maxi, and service bus generation must be identified if relevant.

The method of estimating new trips is to be agreed during the scoping study. The distribution of these trips including construction traffic and abnormal loads is to be based on the size, type and design of development and surrounding land uses and traffic patterns.

Trip generation and trip distribution estimates must be justified. These estimates are required.

#### **4.7. Assignment of Traffic**

Determine and show the turning movements at critical intersections adjacent to the development in order to allocate the development trips to the highway network. Provide information on how this was done. The assignment of development can be shown on traffic flow diagrams during the peak periods.

#### **4.8. Transit**

Existing transit services that serve the proposed development should be noted. The location of bus routes, location of bus stops, frequency of service, and hours of operation should be noted; however, this information is required if vehicle trip reductions are being assumed because of these services.

#### **4.9. Facilities for people with disabilities**

Identify the facilities available for the disabled or mobility impaired. Tactile paving, dropped kerbs and adequate pavement widths must be provided within the development site and adjacent to the site if relevant. Dropped kerbs are required to aid crossing by disabled persons at points where access to the roadway is required. Thus dropped kerbs and ramps must be flush at the point where they meet the carriageway and should be a minimum of 2 meters wide.

Consideration must be given to providing transportation facilities which make it easy for visually impaired, blind, wheelchair users to negotiate e.g. no steep gradients. Highlight any places where elderly/ disabled people may stop and rest in comfort. Any proposed pedestrian crossings must have facilities people with disabilities such as dropped kerbs, and ramps.

#### **4.10. Walking Assessment**

Describe any existing footways adjacent to the site which are likely to be used by trips associated with the site. Describe their width, type and condition of the surface. Identify existing pedestrian desire lines and future pedestrian desire lines. Specify whether or not there dropped kerbs and tactile paving a pedestrian crossing desire lines.

Determine whether or not there are facility gaps in the walking routes/ desire lines, for example a lack of pedestrian crossing facilities or a lack of directional signage. Also state whether adequate lighting is present taking into account local street lighting requirements. The outcome of the walking assessment can be shown on a plan where appropriate.

#### **4.11. Parking**

Provide information about on-site parking e.g. number and dimension of spaces if relevant. Also provide information about the turnover of spaces if relevant, location of spaces, and overspill parking. Also provide information justifying the number of parking spaces proposed. The parking layout should be shown on a plan.

#### **4.12. Existing Land Use and Committed Development**

Acknowledgement of nearby existing land uses and their approved access locations is useful in assessing the access required from the roadways in the study area. Field inspection will determine existing land uses. The future/ projected year traffic levels within a study area should include traffic generated by other planned and committed development in the study area and an estimate of growth in background traffic (trips with both an origin and a destination outside the study area). Growth in background traffic may be estimated using historical traffic data and knowledge of the surrounding area. Extrapolation of historical data from at least the past ten years may be considered acceptable for developments that will be built within a six-year time horizon. More in-depth study of the surrounding area is encouraged for development proposals of a broader scale. The technique utilised should be decided in consultation with TMB.

Once a traffic impact study is received by TMB, a review of the study for sufficiency will be completed. This review consists of the following:

- 1 Verifying existing conditions.
- 2 Checking consistency of all assumptions with the Scoping Agreement and other supporting documentation of the application.
- 3 Confirming the appropriate use of procedures and methods of analysis and any departures from the methodology agreed at the scoping stage.
- 4 Confirming the submission of all traffic count sheets, surveys or other site-specific field data. Upon completion of this review, if the traffic study is acceptable, it is referred to other agencies for review and comment if necessary.

#### **4.13 Assessment Years**

For validation purposes assessment must be undertaken for the year in which the traffic flow data was collected. Assessment must also be undertaken for the opening year of the full development which will be the assessment for the base year. Another future year to be assessed is a year after the opening year to be agreed with TMB during the scoping study. The treatment/ method of estimating pass-by trips, linked trips, diverted trips and transferred trips is also to be agreed during the scoping study in the case of larger developments. Trips from committed developments may also be considered but this must be discussed and agreed with TMB during the scoping study.

#### **4.14 Traffic Impact Analysis**

Capacity analysis must be undertaken for the existing year as well as for future years for the “without development” and “with development” scenarios to understand the traffic impact of the development at junctions and links.

Drawings of scale 1:500 of all the junctions analysed must be included showing the existing and proposed geometry of the junction and the existing and proposed road markings. Certified land ownership boundaries must be included on all drawings showing proposed modifications which require land take as necessary.

Full input and output details of all capacity analysis traffic models are required. Link/ node diagrams for models must be included if appropriate. Phase and Stage diagrams for signalised junctions must be included. Reference must be made to flow diagrams showing traffic flows used in the capacity analysis. Validation of modelling is required.

Summary tables of the results and the conclusions drawn must be included and contain the following performance statistics where relevant: Practical Reserve Capacity (PRC), Cycle time, degree of saturation (DOS) and level of service (LOS), mean max queues, GEH statistic, link numbers, link name/ description, arm name. An acceptable RFC value is less than or equal to 0.90.

Determine the Congestion Reference Flow of a link where appropriate.

Cyclic flow profiles must be included in all capacity analysis to prove coordination of linked signals. Surveyed queue length data if collected must be included in summary tables of analysis of existing junctions as a means of proving that the base model is valid.

Modelling assumptions must be stated. Any anomalies such as modelled queues not matching existing queues must be explained and justified.

Departures from any of the standards identified above must be agreed and approved by TMB.

## ***Table of contents of a standard Traffic Impact Study document***

This is **only** a guide. It is the applicant's responsibility to retain a qualified transportation planning/ engineering consultant experienced in traffic engineering and transportation planning to undertake the traffic impact study. An example of table of contents for a traffic impact study is shown below.

### **Introduction**

### **Summary of Scoping Study**

### **Development Proposals**

- 3.1 Description of the proposed development
- 3.2 Internal Layout
- 3.3 Sustainable Access Audit
- 3.4 Trip Attraction and Trip Distribution

### **4 Transport Evaluation**

- 4.1 Traffic Flow Assessments
- 4.2 Existing Modal Split estimation
- 4.3 Public Transport Assessment
- 4.4 Walking Assessment/ Active Travel
- 4.5 Assessment of facilities for People with Disabilities
- 4.6 Parking Evaluation
- 4.7 Catchment Area
- 4.8 Assignment of Development Traffic
- 4.9 Accident Data Analysis
- 4.10 Vehicular Access

### **5 Traffic Measures for the proposed development**

- 5.1 Travel Plan including Modal Split
- 5.2 Public Transport
- 5.3 Pedestrians
- 5.4 Cyclists



- 5.5 People with disabilities
- 5.6 Parking
- 5.7 Road Signs and Traffic Regulation Orders
- 5.8 Road Safety
- 5.9 Other mitigation measures

## **6 Assessment of Traffic Impact**

- 6.1 Assessment Years
- 6.2 Traffic Impact Analysis

## **7 Conclusions**

### **Figures**

Figure 1 (Title)

Figure 2 (Title)

### **Photographs**

Photograph 1 (Caption)

Photograph 2 (Caption)

### **Appendices**

Appendix A (Title)

Appendix B (Title)

It must be noted that undertaking and presenting a traffic impact study in accordance with these guidelines is not a guarantee that an applicant will gain planning consent, as other material planning considerations may militate against the proposed development.

*Chief Traffic Engineer*

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