



Ministry of Public Infrastructure & Land Transport
[Land Transport Division]

TRAFFIC IMPACT ASSESSMENT GUIDELINE

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1.0 Introduction

Understanding the demands placed on the road network by infrastructure developments is an important dimension of assessing the overall impact of development. All infrastructure development generates traffic, and it may generate enough traffic to create congestion that may lead to a need for improvements to the existing infrastructure. As a result, traffic impact assessment [TIA] is a powerful tool for engineers and transport planners to determine the possible effects of development on the transportation and traffic system and to mitigate any negative impacts.

2.0 Definition of a Traffic Impact Assessment

A TIA is a study which assesses the traffic and safety implications relating to a specific development. These studies vary in their range of detail and complexity depending on the type, size and location of the development. The TIA study for a new development is undertaken to assess whether the road network surrounding the proposed development will be able to handle the additional traffic while still maintaining an acceptable level of service [e.g. performance at level D or better].

The main functions of TIA study are:

- a. To determine the existing traffic condition, future conditions without the development, and future conditions with the development in place;
- b. To estimate the traffic likely to be generated by the proposed development;
- c. To assess the impact of additional traffic on the existing and future road network system;
- d. To identify roadway improvements and changes in the site plan of the proposed development necessary to minimize traffic impact;

3.0 Purposes of a Traffic Impact Assessment Guideline

The Traffic Management and Road Safety Unit [TMRSU] has developed this guideline to assist the consultant responsible to prepare the TIA study. The purposes of the guideline are to:

- a. Provide a standardized approach and methodology for the study;
- b. Evaluate the impacts of a proposed new development in a rational manner;
- c. Ensure consistency and uniformity for the study;

4.0 Traffic Impact Assessment Study Warrants

4.1 When is a Traffic Impact Assessment Necessary?

A traffic impact assessment study is not necessary for every development. Those development that are unlikely to generate significant traffic generally do not need a traffic impact assessment.

Generally, a comprehensive traffic impact assessment should be completed whenever a development is expected to generate 100 or more inbound or outbound trips during the peak hours [ITE recommended practice].

Developments having land use intensity greater than the threshold values given in **Table 1** will be required to prepare a complete traffic impact assessment depending on its location.

Table 1: Threshold Values for Traffic Impact Assessment

Land Use Type	Threshold Values
Morcellement	200 lots
Residential	100 Dwelling units
Retail/Shopping	1,000m ² Gross Floor Area
Office/business park	2,500m ² Gross Floor Area
Industrial	5,000m ² Gross Floor Area
Educational	2,500m ² Gross Floor Area
Stadium/Sports facilities	1,500 seats
Medical	2,500m ² Gross Floor Area
Leisure [hotels, cinemas, conference centres]	1,000m ² Gross Floor Area

For developments which cannot be grouped under the categories mentioned above, the requirement of a TIA will be decided by the Traffic Management and Road Safety Unit.

In some cases, a proposed development may generate fewer trips than the threshold indicated in **Table 1** above but a safety or capacity issue in the area of the proposed development may require a TIA for the following reasons:

- a. High accident intersection or section of a roadway;
- b. Proximity of proposed site to intersections;
- c. Sensitivity of adjacent neighbourhoods;
- d. Existing or projected level of service of road adjacent to proposed development, which is unacceptable;
- e. High traffic volumes on adjacent roadway that may affect movement into and out of the site.

4.2 Updating an Existing Traffic Impact Assessment Study

A Traffic Impact Assessment study for a proposed development is usually valid for a period not longer than two years. Any development that does not start within two years after receiving a building and land use permit will require an updated TIA study.

5.0 General Requirements for a Traffic Impact Assessment Study

5.1 Consultant Qualification

The Traffic Impact Study shall be prepared by a Civil Engineer registered with the Council of Registered Professional Engineers of Mauritius and having at least five years of post registration experience. The report must be dated and signed by the same registered professional Civil Engineer together with his registration number.

[Note: For complex development, the Civil Engineer who has prepared the TIA report may be invited to present his report at the TMRSU].

5.2 Study Area

The study area should contain all site access points and major intersections [signalized and unsignalized] adjacent to the site. In general, a complete TIA study will include all site access points, major intersections and roadway sections within 1km radius adjacent to the site. However, the Traffic Management and Road Safety Unit reserves the right to establish any additional area to be included in the study area.

5.3 Site Plan

The TIA must include a scaled site plan with the adjacent public roadways noting the existing lanes and their configuration and the location of street furniture. The plans noting the above traffic parameters shall be produced to an appropriate scale to allow proper review by the Traffic Management and Road Safety Unit.

5.4 Study Horizon Years

Horizon years are the year[s] for which results are to be characterized. The TIA report shall address traffic conditions:

- a. On opening day and/or anticipated completion year of the proposed development assuming completion and full occupancy [minimum 5 years from the opening day];
- b. If built in phases at completion of each major phase and/or a time period specified by the Traffic Management and Road Safety Unit not to exceed 10 years from opening date.

In general, the horizon year for traffic impact assessment should be twenty [20] years from the date of the TIA study.

5.5 Time Period to Be Analyzed

The time of the day to evaluate the traffic impact is when the most traffic from the development is expected. In general, the TIA study should include morning [AM peak] and evening [PM peak] hour analyses based on the location. Three time periods need to be identified in the TIA report including:

- a. Weekday AM peak, generally 07:00 to 09:30 AM;
- b. Weekday PM peak, generally 04:00 to 06:30 PM;
- c. Weekend peak.

However, for some proposed developments located in high traffic areas, analysis of a time period other than and in addition to weekday peak hours may be appropriate. Examples of land use classifications which typically have substantially higher site trip generation peaks at times other than weekday peak hours are: shopping centres, restaurants, places of worship and recreational uses.

5.6 Traffic Counts

Common practices for counting vehicular traffic include but are not limited to:

- a. Vehicle counts should normally be conducted during weekdays not containing a holiday and conducted in weather condition that is not abnormal;
- b. 15 minutes traffic counts should be conducted during anticipated peak hours.

6.0 Traffic Analysis

The following types of traffic should be considered in the traffic impact study:

6.1 Background Traffic

Background traffic volumes are composed of existing volumes, accepted general growth of traffic, and traffic generated by previously approved new developments in the study area.

A diagram showing the background traffic volumes and turning movements for roadways and intersections in the study area must be included for each analysis horizon.

6.2 Development Traffic

The number of trips from a proposed development shall be calculated using the latest edition of 'Trip Generation' report as published by the Institute of Transportation Engineers [ITE]/ any other equivalent guidelines or based on special studies of unique land uses as approved by the Traffic Management and Road Safety Unit.

The trip assignment of the proposed development may need to be adjusted to account for pass-by trips, diverted trips and internal trips.

6.3 Combined Traffic

Combined traffic for a particular time period is a summation of the background traffic and development traffic due to the proposed development. This information should be supplied in a graphical and/or tabular format.

7.0 Traffic Demand Analysis Steps

The following steps should be clearly described in the TIA study:

7.1 Trip Generation

Trip generation is the process of estimating the amount of traffic to be generated by a proposed development. Trips generated by the proposed development shall normally be calculated using the most current edition of the Institute of Transportation Engineers [ITE] "Trip Generation" report.

A table must be provided in the TIA report identifying the categories and quantities of land uses, with the corresponding trip generation rates and the resulting number of trips.

7.2 Trip Distribution

After the trip generation analysis for the proposed development has been completed, the traffic must be distributed and assigned to the roadway system for the impacts to be determined. The direction from which traffic will enter and exit the proposed development site may depend on several location specific factors, including:

- a. Size and type of the proposed development;
- b. Prevailing traffic conditions on the existing road systems;
- c. Surrounding land uses, growth areas, population and employment distributions.

The assumed trip distribution pattern is to be shown indicating the percentage values on the surrounding road network.

7.3 Trip Assignment

Traffic assignment should be estimated using an acceptable assignment algorithm, and if applicable, based on the existing traffic pattern, proposed development and future road network.

8.0 On Site Planning & Parking

Internal design will have a direct bearing on the adequacy of site access points. The identification of access points between the site and the external roadway system and subsequent recommendations concerning the design of those access points is directly related to both the directional distribution of site traffic and the internal circulation of the facility. Proposed pattern of internal circulation, internal road width, provision for bus movements and service area layout should be indicated.

Parking requirements should be according to existing Planning Policy Guidance [PPG] of the Ministry of Housing and Lands. Parking location and layout should also be shown in the layout drawing.

9.0 Capacity Analysis

The latest edition of the “**Highway Capacity Manual**”, published by the Transportation Research Board, is to be used for performing all capacity analyses of study intersections and roadway sections. Capacity analyses should be performed at all proposed site access locations and all intersections adjacent to the subject site.

For each horizon year, the capacity analyses should be conducted for conditions with and without the proposed development to determine the impacts of the proposed development and the improvements necessary to support each phase of the development.

The TIA report must provide capacity analysis results in a tabular form for all study intersections, study peak hour periods, and study horizon years listing the level of service [LOS], delay, queues and v/c [volume/capacity] ratio.

In general, capacity analyses for study intersections and roadway sections should show an overall minimum LOS D as well as individual movement minimum LOS D using “**Highway Capacity Manual**” methodology.

Improvement of study intersections and roadway sections should be recommended for the following scenarios:

- a. Overall LOS of intersections as well as individual movement LOS is worse than ‘D’.
- b. LOS of roadway sections is worse than ‘D’.
- c. Volume/Capacity [v/c] ratios for overall intersection operations or any individual movements [through, turning or shared through/turning movements are 0.85 or above.
- d. Queues for an individual movement are projected to exceed available turning storage based on the 95th percentile queue criteria.

In general, acceptable level of service for each intersection evaluated shall be as follows:

- a. When the LOS without development is LOS A, B, or C, the minimum acceptable projected LOS shall be LOS C for all movement within a specific intersection.
- b. When the LOS without development is LOS D, E, or F, the minimum acceptable projected LOS shall be equal to the LOS without development.

10.0 Safety Analysis

Safety analysis may be needed depending on the characteristics of the proposed development, its impact and the transportation system within the study area. These analyses may include accident analyses, sight distance, operational analyses, traffic calming and access management.

The study report should state the findings of all analyses and provide conclusions.

11.0 Recommendations

Recommendations should be developed to address the conclusions resulting from the analyses of the proposed development's access needs and impacts on the transportation system. Recommendations should be grouped into two categories, namely: **site-specific recommendations** and **non-site recommendations**.

12.0 Deliverables

On applying for the approval of a TIA, the proponent/consultant has to submit two copies of the Traffic Impact Assessment Report to the Traffic Management and Road Safety Unit. All TIA reports submitted must be dated and signed by a Civil Engineer registered with the Council of Registered Professional Engineers of Mauritius and having at least five years of post-registration experience.

After appraisal of the TIA report by the Traffic Management and Road Safety Unit, relevant recommendations will then be transmitted to the proponent/consultant or the local authority concerned.

13.0 Traffic Impact Assessment Report Outline

To provide consistency among individual applicants, this guide shall be used for preparing the TIA report and shall include the requirements as hereunder set down. This shall be the format in which the TIA report shall be presented for assessment and analysis.

1. Cover

- a. Development's name
- b. Development's location
- c. Applicant's name, address, telephone and fax number
- d. Consultant's name, address, telephone and fax number
- e. Report date

2. Table of Contents

3. List of Figures, Tables and Appendices

4. Executive Summary

- a. Site location and study area
- b. Development description
- c. Types of studies undertaken [capacity analysis, etc.]
- d. Main findings
- e. Conclusions and Recommendations

5. Introduction

- a. Describe purpose of study
- b. Provide general project description
- c. Study area, roadway network and intersections
- d. Design hours and design horizons

6. Traffic Analyses

- a. Existing traffic volumes and peak hours traffic volumes
- b. Design hour traffic volumes
- c. Site generated traffic volumes

- d. Combined traffic volumes in buildup year and design horizon

7. Capacity and Level of Service Analyses

- a. Capacity and LOS analysis for the study intersections for all scenarios
- b. Capacity and LOS analysis for the study roadway sections for all scenarios

8. Site Circulation and Parking

- a. On-site parking needs
- b. Ease of internal circulation
- c. On-site queuing provisions
- d. Site access [vehicular, service and emergency and pedestrian]

9. Safety Analysis

- a. Sight distance analysis
- b. Operational analysis
- c. Accident analysis
- d. Traffic calming measures
- e. Access management issues

10. Findings

- a. Site accessibility
- b. Traffic impacts
- c. Need for any improvement

11. Conclusions and Recommendations

12. Appendix

- a. Site plan
- b. Traffic count data
- c. Traffic analyses worksheets
- d. Capacity analyses worksheets

13. Figures

- a. Site location map with surrounding roadway network and proposed access
- b. Existing conditions of roadway network
- c. Background and future traffic volumes
- d. Site generated traffic volumes
- e. Combined traffic volumes
- f. Directional distribution of site traffic for each study intersections
- g. Existing roadway and intersection geometry
- h. Proposed roadway and intersection geometry
- i. Proposed traffic control

14. Tables

- a. Existing and projected traffic volumes
- b. Trip generation tables with land uses, trip rates, directional distribution and generated traffic volumes
- c. Level of Service and v/c ratio summary based on existing condition of roadway and intersection geometry and traffic controls
- d. Level of service and v/c ratio summary based on suggested roadway and intersection geometry and traffic controls