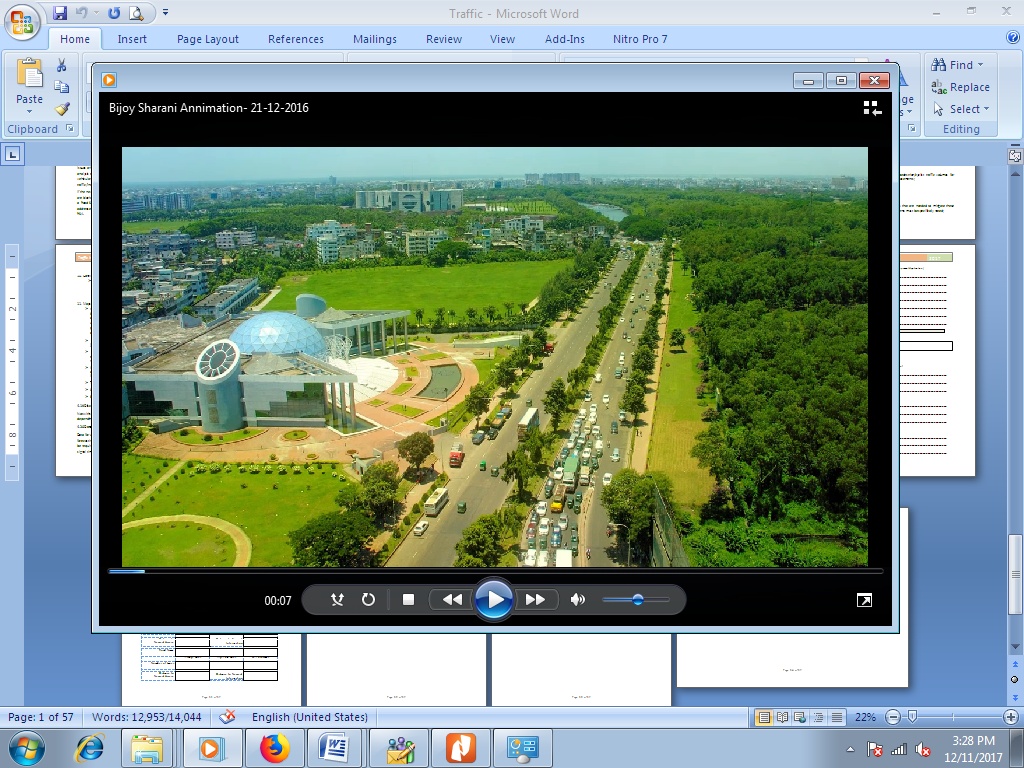


**Dhaka Transport Coordination Authority (DTCA)**



**Traffic Impact Assessment (TIA) Guideline**

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**APPENDIXES**

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Appendix E – Institutional Framework

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**ACRONYM**

|  |  |
| --- | --- |
| A.M. | Ante meridiem |
| CBD | Central Business District |
| DA | Development Authority |
| DAP | Detailed Area Plan |
| DNCC | Dhaka North City Corporation |
| DSCC | Dhaka South City Corporation |
| DTCA | Dhaka Transport Coordination Authority |
| ECA | Environment Conservation Act |
| ECR | Environment Conservation Rules |
| EIA | Environmental Impact Assessment |
| FAR | Floor Area Ratio |
| GFA | Gross Floor Area |
| HCM | Highway Capacity Manual |
| HTIA | High Traffic Impact Areas |
| IEB | Institution of Engineers, Bangladesh |
| ITE | Institute of Transportation Engineers |
| LOS | Level of Service |
| LUIC | Land Use Intensity Control |
| NLTP | National Land Transport Policy |
| P.M. | Post Meridiem |
| RAJUK | RajdhaniUnnayanKartripakkha |
| RSA | Road Safety Audit |
| RSTP | Revised and Updated Strategic Transport Plan |
| SSP | Significantly Sized Projects |
| TAR | Traffic Impact Assessment |
| TCD | Traffic Control Device |
| TDM | Travel Demand Management |
| TEF | Traffic Effect Form |
| TIA | Traffic Impact Assessment |
| v/c | Volume / Capacity Ratio |

**CHAPTER ONE**

# 1. INTRODUCTION

## Background

One of the fundamental aspects of transportation planning is the interdependency of land use and transportation. The pattern of land use is affected by the level of accessibility provided by the existing transportation system. Any new development leads to the production or attraction of trips and thus creates new travel demands. Hence there is a need for improvement of the existing transportation facilities either in the form of new infrastructure or in the form of improved operational conditions. Such improvements, in turn, make the land more accessible to the existing activity centers and the attractiveness of the land increases. This spurs new development, and the cycle starts again. This process continues until some kind of equilibrium is attained.

The assessment of transport effects is a key part of good land use and transport planning. Currently, a wide variety of different methods and guidelines are used in preparing these assessments. Dhaka Transport Coordination Authority and RAJUK have a role in ensuring that a high degree of integration between land use and transport planning takes place. Effective land use and transport integration require land use provisions which facilitate the development of long-term transport solutions, while also providing for land uses that support sustainable management within the Dhaka region.

Appropriate land use provisions within the district plans/ structure plans, can help deliver sustainable transport outcomes. Inappropriate land use provisions are more likely to hinder or prevent positive outcomes for both transport and land use from being realized. The relationship between land use and transport planning is fundamental to the success of the Dhaka region. The development of the Traffic Impact Assessment (TIA) Guidelines is a direct result of the requirement to integrate Land Transport and Land use provisions in the Regional Policy Statement and District Plans.

It is important to understand that traditional traffic impact assessments seek to mitigate effects, whereas an Integrated Transport Assessment (ITA) can consider the potential to avoid adverse effects. Hence it may be worthwhile to prepare guidelines for integrated transport assessments (ITA) rather than the traditional TIA keeping in view with the reference to national, regional and local policy objectives within Dhaka City.

## Terminology

There is a wide variety of names for the assessment of transport impacts arising from a development proposal. For the purposes of this report, it has been assumed that the following titles are interchangeable:

* Transport assessment.
* Transport impact assessment.
* Transportation assessment.
* Traffic impact assessment.
* Traffic impact study.
* Traffic report.

While many of these titles refer only to traffic, it is often clear from the corresponding guidelines that consideration of all relevant modes of travel is included. For the purposes of this report, the generic term Traffic Impact Assessment, or the abbreviation TIA, has been used.

## Policy Context

Rising Air pollution is becoming a menace in Dhaka and other cities of Bangladesh. Nearly 4,00,000 vehicles ply on Dhaka city roads everyday of which about 3,00,000 are motorized vehicles that contribute the most to deteriorating Dhaka’s air quality. Increasing traffic is deteriorating environment & air pollution conditions and has prompted the government to find sustainable long term solutions.

As part of the government’s action, improved enforcement to control the pollution due to traffic has become imperative. The 1995 Environment Conservation Act (ECA) and the 1997 Environment Conservation Rules (ECR) are the *Legislative basis* for the environmental assessment and to control & reduce the environmental pollution under this law. Also under the Section (9.7.5) of (NLTP) adoption of a TIA for new large real estate, institutions, shopping complex & places of public gathering have been mentioned.

Both the above mentioned policies derive the need for preparing Traffic Impact Assessment (TIA) guidelines for developing all transport projects to attain sustainable development in urban transport in Bangladesh. Hence developing TIA guidelines is the need of the hour. TIA to be made a prerequisite for all new proposed development projects by RAJUK in designated urban areas in Strategic Plan and Detailed Area Plan (DAP) where public gathering will be high enough to impact traffic movement.

The guidelines included herein are not intended to be perception. Rather, the intention is to establish the minimum requirements for the conduct of TIA. Note that at the outset, it is required to determine, if a TIA is indeed necessary and thresholds are identified for this purpose. These guidelines intended to assist the stakeholders in determining the level and scope of assessment required for the development proposals. The recommended contents of a TIA shall assist reviewers of TIA as to the completeness and substance of TIA undertaken for proposed development projects.

## Definition of Traffic Impact Assessment (TIA)

A Traffic Impact Assessment (TIA) is a study which assesses the *traffic and safety* implications relating to a specific development. TIA determines the transportation impacts a particular development will have on the existing roadway network system.

A TIA study identifies the need for any improvements and mitigating measures to the adjacent and nearby roadway system to maintain a satisfactory Level of Service (LOS) and safety of the roadway network in the vicinity of the proposed development. It also identifies improvements needed to integrate the proposed development within the pedestrian and cyclist pathway system.

## Purpose of the TIA Study

The purpose of a TIA study is to:

* To identify the benefits and impacts of a proposed development or re - development;
* To identify how the proposed development can benefit the existing transportation network and vice versa; and
* To identify how any transportation impacts associated with the proposed development can be mitigated and addressed in a manner that is consistent with the policy objectives of Dhaka Region and the Local Municipalities.

The TIA study also serves as the basis for the identification of existing or proposed safety concerns and evaluation of transportation related improvements or measures to be included as a condition of access approval for the development or re - development. The TIA addresses connectivity between the development and the existing transportation networks, for all modes (cars, trucks, transit, cyclists and pedestrians) expected to access or leave the development.

## Purpose of the Guidelines

DTCA and Development Authority has prepared this document to provide guidance to developers and consultants in the preparation of TIA Study and the details required in a TIA that would be considered acceptable to the authorities. Following these guidelines and contacting appropriate DTCA/RAJUK staff in the preliminary stages of the development planning process will provide a more consistent and efficient review process. The authorities will also use these guidelines for Environmental Assessment Studies for Capital Works Projects and for transportation analysis associated with Secondary Planning.

The purpose of the guidelines is:

* Provide a standardized approach and methodology for the study,
* Evaluate the impacts of proposed new development in a rational manner,
* Ensure consistency and uniformity of the TIA studies,
* Ensure that sustainable transport goals and strategies are incorporated into the TIA process;
* Assist consultants to adopt assumptions consistent with the accepted standards of the Engineering Department, and
* Reduce confusion and delay in processing development proposals.

It should be noted that it is not the intention of this guideline to be a “barrier” to development within the Region; rather it is meant to assist all parties in identifying what is required upfront to achieve a complete TIA document that will best serve the needs of all involved.

This guideline should be used in conjunction with the RSTP. The RSTP gives a conceptual guidance related to how a Traffic Impact Assessment should be undertaken, particularly with regard to traffic issues. As it is intended to be multi-jurisdictional, it is general in nature. This guideline will be known as the Traffic Impact Assessment Guidelines (or TIA Guidelines).

The TIA Guidelines provide practitioners and stakeholders involved in land-use and transport planning a reference document for managing Transport / Traffic Impact Assessments resulting from land – use development proposals. The TIA Guidelines will promote a common understanding of the process aligned with the National Land Transport Policy (NLTP) and be tailored to the statutory requirements, policies and strategies. Unlike the RSTP, it is focused on what is required rather than on how to conduct an assessment work. The TIA guidelines will also help achieve the goal of NLTP to reduce the modal share of private cars to 30% of the total mechanized trips by 2022 in Bangladesh.

The TIA process will most commonly be applied to merit – track and impact – track development applications. In the case of impact – track development applications, the TIA should be undertaken in conjunction with an Environmental Impact Assessment (EIA) where applicable.

## Requirement for a Traffic Impact Assessment Study

A Traffic Impact Assessment (TIA) study will be typically required for any proposed development or redevelopment that meets one or more of the following criteria:

* More than 100 (inbound + outbound trips) new peak hour vehicle trips are generated as a result of the project/development/redevelopment/rezoning; and/or
* When development will occur in a sensitive area?
* Localized safety or capacity issues already exist; and/or
* Localized safety or capacity issues are anticipated as a result of the proposed project/development/redevelopment; and/or
* For parking generation, the threshold is a parking deficiency of one or more parking spaces generated by the project; and /or
* For site approvals as there are site-specific or project-specific characteristics that warrant more detailed transportation analysis
* When financial assessments are required and the extent of impact must be determined?
* At the judgment or discretion of the staff\*\*

An analysis can be prepared for any type of developments such as: residential, commercial, office, industrial, mixed-use project, etc. A TIA usually needs to be submitted by a developer before any changes in land use zoning, sub–division maps, site plan or new driveways are approved.

NOTE\*\*: *If a TIA is not required as per the above mentioned criteria, RAJUK / DTCA reserves the right to require the submission of a traffic operations analysis to address local transportation issues, which may be have an impact due to the proposed development.*

*As per the Global standards, a TIA study for any proposed development is usually valid for two years. Any development that does not commence within two years will require an updated TIA study. Major changes within the study area or land uses may prompt the need for an updated impact analysis.*

## Sustainable Transport Objectives

A key stage of the TIA guide as mentioned above is the way in which sustainable transportation objectives are considered in the Traffic Assessment Report. The relationship between land use and transport / traffic is of fundamental importance to the completion of Traffic Impact Assessments. TIA should address the key sustainable transport / traffic objectives as referenced in the RSTP and should specifically identify how the proposed development will support those objectives.

The principle of sustainable development is focused on ensuring appropriate development in appropriate locations. This development planning (integrated land use transport planning) can assist in managing car use and limiting the need for long distance trips, thereby promoting energy efficiency and protecting the economic viability of existing urban settlements. It is this principle that for example discourages large scale out-of-town retail centers accessed by high capacity roads, and large clusters of residential development with limited access to jobs, services, public transport nodes or education.

Also the purpose to undertake TIA for development projects helps to identify any mitigating measures which are more sustainable and fit in the holistic frame of RSTP and promote lasting sustainable development with long term benefits. *Global research shows that absence of national guidelines for transport impact assessment may be limiting the opportunities for sustainable development in that country.*

The review of TIA guidelines in other countries suggests that in some countries, such as Hong Kong and to a lesser extent the United Kingdom, sustainable development is a key aspect of the planning process. The integration of travel plans and access by sustainable travel modes in development planning, are a key element in the transport impact guidelines that are developed.

## When a Transportation Impact Assessment needs to be prepared

A TIA should preferably start at the planning stages of the project itself i.e. during site selection. This would assist in the preparation of a more responsive and cost effective site plan. In lieu of other locally preferred thresholds, it is suggested that a TIA be conducted whenever a proposed development falls under any of the criteria as mentioned in Section 1.7 above.

Developers should have a TIA undertaken in advance of submitting a project to the government for approval, communicating with the concerned agencies (e.g., Dhaka Transport Coordination Authority (DTCA), RajdhaniUnnayanKartripakkha (RAJUK), Dhaka North City Corporation (DNCC), Dhaka South City Corporation (DSCC), etc.) obtain specific TIA requirements.

## Scope of the TIA Study

A TIA study is required whenever a development proposal has a significant impact on traffic operations and on other components of the transportation system. The scope of the TIA study may vary depending on the magnitude of the potential impact on the roadway system due to the proposed development.

The primary objectives of a TIA study are to assess the transportation impacts of a proposed development, identify the need for any improvements to the affected roadway system to provide satisfactory Levels of Service (LOS), and address the safety issues as well.

The TIA study should also address relevant transportation issues associated with a proposed development that may be of concern to neighboring residents, businesses & property owners, identify access management issues, such as appropriate location, spacing, and design of the access(es) for the proposed development and evaluate the internal circulation of the proposed development to/from the adjacent and nearby municipal roadway system to provide safe and efficient internal traffic flow and access.

The need for a TIA is dependent on the location, type & size of the development and the ability of road network to handle traffic generated by the proposed development. The development of the Guidelines is to assist and provide certainty around what is required for a TIA:

The scope of work for the conduct of TIA includes but is not limited to the following:

* Provide information on how the proposed development fits in with regional and local policies and objectives (or at least does not compromise them);
* Assessment of the scale of the development proposals and provision of development thresholds;
* Provide information on how a proposed development will function in terms of its accessibility by all modes; Management of traffic impacts through existing infrastructure, provision of additional infrastructure or modifying the development proposal for improvements in travel times;
* Alignment of the assessment with the existing policies and plans;
* Ensure that development is located, designed and managed to promote access by a choice of modes;
* Identify and mitigate any adverse impacts on the transport system;
* TIA Report with Summary and Conclusions.

The aim in developing the guidelines is therefore to ensure that assessments address the same questions, and that these are “the right questions”.

The TIA guidelines emphasize the importance of an initial scoping exercise, which is to be agreed with the relevant authority i.e. DTCA, RAJUK, DNCC and DSCC. This is intended to provide developers and consenting authorities with certainty in regard to what is required from the assessment, thus avoiding surprises later. This requirement is also intended to recognize that no two assessments will be the same, so the scope of each will be different.

**CHAPTER TWO**

# 2. THRESHOLD FOR REQUIRING A TIA

## Introduction

The thresholds for undertaking a traffic or transport assessment has been discussed in this section. In general, a TIA is required to be submitted if the type and size of the proposed development meets one or more of the criteria stipulated in Table 2.3 below. The size of the development reflects the level at which the development is likely to generate sufficient additional traffic that is likely to impact on the surrounding road network.

Because of the difference in the type, size and location of a development(s), it is not practical to describe a single scope of work that can be applicable for all proposals. The document is therefore intended to serve as a guide for developers and consultants who are strongly encouraged to discuss and review their scope of work with the Development Authority before proceeding with their assessment studies.

## Step – by – Step Process

Consistent with the TIA process the step by step manner in carrying out the TIA study for a development project is shown flow diagram in Figure 2.1. It recommends preparing a scoping study for agreement with the stakeholders to determine the methodologies to be adopted, additional supporting data required and the extents of the assessment area. Detailed information regarding the input into the sections of the TIA is outlined within the guidance.

It is crucial to follow each step of the process since they are related. Furthermore, it is important in the first step to have full knowledge of the magnitude and phasing of the development so as to determine the scope of work and phasing of implementation.

**Figure: 2.1 Step-by-step TIA Process**

In the data collection stage, it is important to know what particular data are needed for the traffic impact analysis step. Inventory of existing transportation facilities, present developments in the area, future developments and future transportation improvements in the area are among the data required for the analysis. It is advisable that the analytical tools employed and presentation of outputs should be easily understood. This is important especially for local government units that would evaluate the results of the TIA study.

## Intent and Criteria

This guideline should be considered during the development application approval process in the impact track applications. The development application process is summarized in Figure 2.2.

**Figure: 2.2 Development application approval process**

This process applies to Detailed Area Plan (DAP). DAPs are lodged as Development Approvals and agencies are consulted by the proponent prior to lodgment. Proponents should note that:

* The preparation of a concept plan occurs prior to an DAP requiring transport assessment for which a Traffic Assessment will provide useful background information; and
* Guidelines exist for the preparation of DAPs.

Not all development applications require a TIA. The appropriate planning codes identify the thresholds for TIA’s. The need for a TIA should be included in the Dhaka Master Plan by RAJUK.

## Threshold and Criteria

This section gives thresholds for typical land uses that set out which form of assessment should be used. These thresholds are not absolute values but do represent a useful opening point for discussions.

Measurable thresholds include daily development trips, peak-hour development trips, site area being developed and dwelling units or development gross floor area (GFA). Thresholds suggested in the guidelines are based on the size and land use of the development proposals.

**Table 2.3**: **Rules and Criteria for Traffic Assessments to be undertaken**

|  |  |  |
| --- | --- | --- |
| **Rules** | | **Criteria** |
| **Traffic Impact** | |  |
| Where the proposed development is expected to generate in excess of 10 vehicle trips per hour in the peak period, the proposed development will be endorsed by the Dhaka Transport Coordination Authority (DTCA) and RAJUK stating that transport impacts have been adequately assessed in accordance with the current version of this Rules and Regulations.  For individual land uses, the following can be taken to indicate the extent of development which will generate 10 vehicle trips per peak hour: | | Existing and future transport infrastructure and access networks to proposed site can accommodate the number of vehicular and non–vehicular trips that are likely to be generated by the proposed development. |
| **Land Use** | **Scale of Development** |  |
| *Residential Zones*  Single Dwelling Housing  Multi-unit Housing  *Educational Uses*  *Commercial Zones*  City Centre Precinct  Town Centers Precinct  Group Centers Precinct  Local Centers Precinct  Commercial Accommodation  Offices  Medical/Dental Centre  Day Care Centre  *Industrial Zones*  General Industrial  Community Facility Zone & Parks&  Recreation Zone  Offices  Outdoor Recreation Facility/  Indoor Recreation Facility  +Community Activity Centre | 10 dwelling units.  17 dwelling units.  100 Students  Varies. Use 10 vehicle trips per hour.  17 rooms  1000 m2 GFA  7 employees  2 employees  1000 m2 GFA  1000 m2 GFA  1 playing surface with  stadia seating less than 50 people  650 m2 GFA  650 m2 GFA |

It should be noted that the Rule does not specify the scope or level of TIA that is required in any specific circumstances.

## Zoning Thresholds (Deviations)

A TIA shall be required if a proposal falls under the Deviations Clause of the Zoning Ordinance (RAJUK DAP). The assessment as to whether a project falls under this clause simply entails the comparison of the proposal with the allowed uses and land use intensities in the zone where it is located.

For this purpose, the Zoning Administrator shall provide the following information for the zone in consideration:

* List of Allowed Land Uses.
* Land Use Intensity Control (LUIC) ratings.

The project proponent, in turn, provides the basic information on the project as follows:

* Project location.
* Project classification according to the latest RAJUK Guidelines.
* Total land area of project site.
* Total floor area of buildings in square meters.
* Resultant floor to area ratio (considering all buildings within the project site), FAR.
* Percentage of land occupancy.

## Project Size Thresholds

The Zoning Administrator, RAJUK shall prepare a list of Significantly Sized Projects (SSP) with the corresponding thresholds. The project proponent shall, in turn, submit information that corresponds to the required threshold criteria. Proposals within the list of SSP’s and exceed the specified threshold criteria shall be required to conduct TIA regardless of conformance with the use or land use intensity provisions of the Zoning Ordinance.

## Public Roadway Modification Thresholds

The project proponent shall submit its requirements for the Public Roadway Modifications to the RAJUK. A TIA shall be conducted if the modifications required fall under the criteria specified herein.

**CHAPTER THREE**

# 3. ESTABLISHING THE TYPE OF ASSESSMENT REPORT REQUIRED

## Introduction:

The Dhaka Structural Plan requires a transport assessment to be completed for all developments as identified in Table–2.3 above. These threshold figures are generally used in different Codes practiced all across the globe.The type and scope of a Traffic Impact Assessment can be determined by a number of factors, including but not limited to:

* Size and nature of the proposed development;
* Location;
* Catchment / influencing area;
* Surrounding road network;
* Public transport; and
* Accessibility for pedestrians, cyclists and people with disabilities.

For the purpose of Traffic Impact Assessments in this guideline, the primary factor to be used to determine the type of assessment is the scale of proposed development, with vehicle trip generation, used to define scale for larger and/or more complex assessments.

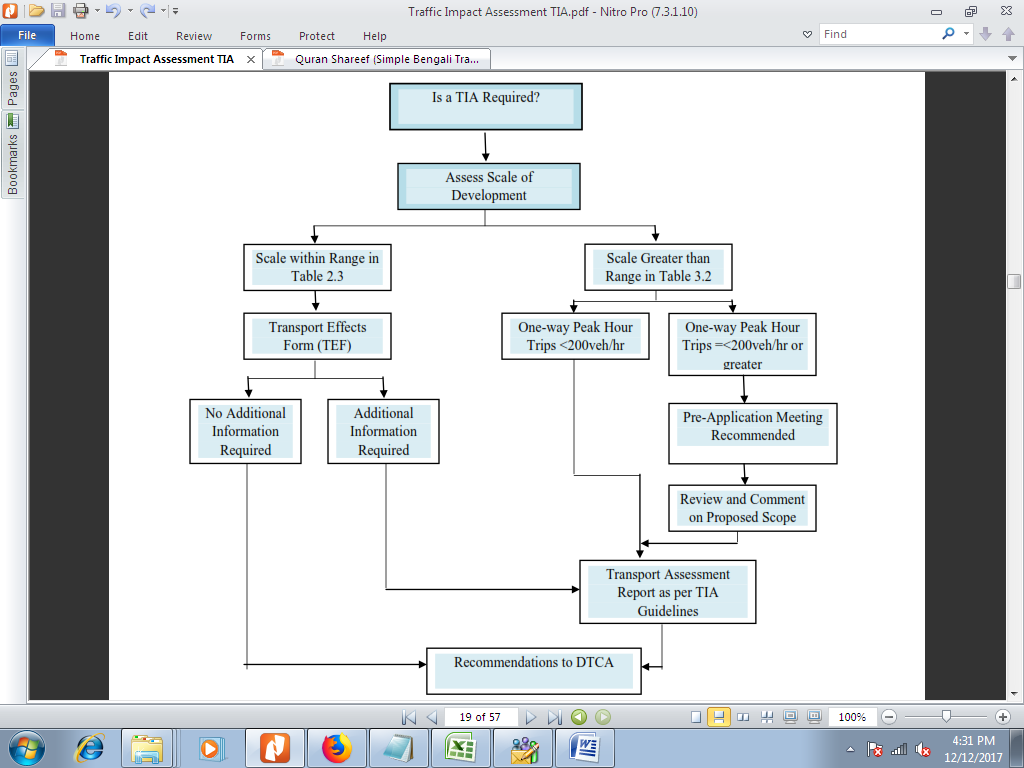
## Two types of Assessments identified:

1. Traffic Effects Form (TEF) – The form is to be used for small and simple proposed developments that will have minimal traffic effects as given in Table 3.2below. The form is intended to collect generally factual (rather than interpreted) information about the development and can be completed by the applicant with little or no assistance from a Traffic Engineer/ Technical Consultant. The information will be used by Traffic Engineering staff to confirm that the effect of the proposed development on the transport system will be minimal. In rare situations where there is insufficient information to adequately understand the effects, the applicant may be requested to complete a full Traffic Assessment Report. Although the intention is that the TEF can be completed by the applicant without professional assistance, a development applicant should seek professional guidance on site planning and design elements, including accesses, parking and on-site circulation for all modes.

A format of this TEF is attached with this report as Appendix A.

1. Traffic Assessment Report (TAR) **–** A traffic assessment report presents the findings of a thorough transport assessment based on these guidelines. This level of assessment would normally be undertaken by Traffic Engineer/ Transport Planning professional as it requires judgment and interpretation of results. Reporting needs to be done in the required format as given in the standardized template. For straightforward, moderate scale developments a Traffic Assessment Report should be prepared in accordance with these guidelines. For larger complex developments it is advisable for the applicant’s engineer to meet with Traffic Engineering staff of DTCA at the pre-application stage (i.e. prior to lodging the development application) to discuss Traffic Impact Assessment scope and extent, using these guidelines as the basis. The Traffic Assessment Report will then be prepared based on these guidelines and the finalized scope as per the discussions at the pre-application meeting with DTCA.

The Figure 3.1 below summarizes the process for establishing the type of assessment required for any development project.



Is a TIA Required?

Assess Scale of Development

Scale within Range in Table 2.3

Transport Effects Form (TEF)

Scale Greater than Range in Table 3.2

One-way Peak Hour Trips <200veh/hr

One-way Peak Hour Trips =<200veh/hr or greater

Pre-Application Meeting Recommended

Review and Comment on Proposed Scope

Transport Assessment Report as per TIA Guidelines

Recommendations to DTCA

Additional Information Required

No Additional Information Required

**Figure: 3.1 Establishing Type of Assessment Required**

Table 3.2 outlines the scale of developments for which a Traffic Effects Form (TEF) is sufficient as a TIA. Under most circumstances, the effects will be easily defined from the form and no further assessment will be required. However, there may be rare situations where additional information or expanded analysis is required for even a small scale development. Those situations will be determined by DTCA Transport related staff and may require specific assessment to address identified issues, or elevate the assessment to a Traffic Impact Assessment Report. The subsequent Chapter 4 will give details of how to fill the TEF form.

**Table 3.2:Maximum Threshold for Use of Transport Effects Form (TEF)**

| **Land Use** | **Range for Which a TEF is Acceptable** |
| --- | --- |
| Airport | TEF not applicable |
| Automatic Teller Machine (ATM) | Less than 4 ATMs |
| Boarding house | Less than 60 beds |
| Bulk landscape supplies | Less than 1250 m2 GFA |
| Car park | Less than 50 car park spaces |
| Caravan park/camping ground | Less than 90 caravan sites |
| Civic administration | Less than 800 m2 GFA |
| Club | Less than 300 m2 GFA |
| Commercial Accommodation Use (generation for restaurant/bar to be accounted for separately) | Less than 60 rooms/units |
| Community Use  Child care centre  Community activity centre  Community Theatre  Cultural facility  Educational establishment  Health Facility  Hospital  Place of worship | Less than 10 child places  Less than 800 m2 GFA  Less than 50 seats  Less than 800 m2 GFA  Less than 100 students  Less than 20 staff  Less than 40 beds  Less than 60 seats |
| Corrections facility | TEF not applicable |
| Craft workshop | Less than 300 m2 GFA |
| Drive-in cinema | TEF not applicable |
| Emergency services facility | Less than 3 emergency vehicles |
| Freight transport facility | Less than 3 ha land area |
| General industry | TEF not applicable |
| Group or organized camp | Less than 60 camper capacity |
| Hazardous industry/waste facility | TEF not applicable |
| Home business | Less than 3 employees |
| Indoor entertainment facility | TEF not applicable |
| Industrial trades | Less than 800m2 GFA |
| Landfill site | TEF not applicable |
| Land Management Facility | TEF not applicable |
| Light industry | Less than 800 m2 GFA |
| Liquid fuel depot | TEF not applicable |
| Mining industry | TEF not applicable |
| Mobile home park | Less than 60 sites |
| Movie Theatre | TEF not applicable |
| Multi-unit housing | Less than 60 dwellings |
| Municipal depot | TEF not applicable |
| Non-Retail Commercial Use | Less than 800 m2 GFA |
| Office | Less than 800 m2 GFA |
| Outdoor recreation facility/Playing fields | 2 or fewer playing surfaces (fields) |
| Overnight camping area | Less than 60 campsites |
| Place of assembly | Capacity less than 50 occupants |
| Plant and equipment hire establishment | Less than 800 m2 GFA |
| Public transport facility | TEF not applicable |
| Recyclable materials collection/recycling facility | TEF not applicable |
| Residential Use  Multi unit housing | Less than 60 units |
| Residential care accommodation  Retirement complex  Single dwelling housing  Supportive housing | Less than 40 units  Less than 60 units  Less than 40 units  Less than 40 units |
| Restaurant | Less than 300 m2 GFA |
| Scientific research establishment | Less than 800 m2 GFA |
| Service station | TEF not applicable |
| Serviced apartment | Less than 60 dwellings |
| Shop  Bulky goods retailing  Department store  Personal service  Supermarket  Take away food shop | Less than 800 m2 GFA  Less than 800 m2 GFA  Less than 500 m2 GFA  Less than 300 m2 GFA  Less than 300 m2 GFA |
| Stock/sale yard | TEF not applicable |
| Store | Less than 2 ha land area |
| Tourist facility | TEF not applicable |
| Transport depot | TEF not applicable |
| Vehicle Sales | Less than 1500 m2 GFA |
| Warehouse | Less than 2000 m2 GFA |
| Waste transfer station | TEF not applicable |
| Zoo | TEF not applicable |

## Traffic Impact Assessment Report

For developments greater than the range indicated in Table 3.2, a Traffic Impact Assessment Report will be prepared in accordance with this TIA Guidelines. Where the total trip generation is expected to be high (i.e. greater than 200 one way vehicle trips in peak hour) it is recommended that the applicant’s Traffic/ Transport Engineer meet with DTCA Transport related staff during the pre – application phase. The “scoping “process may include confirmation of:

* the Extent (i.e. the boundary) of the assessment
* Recommended source of trip rate information/ Trip generation estimates;
* Intersections and network links to be assessed;
* Peak hours and horizon periods/design years;
* Operational targets and
* General approach to modeling and assessment

Although these items are all included in the report, assessments of larger or more complex developments will benefit from early discussion on these items prior to the start of the assessment. In all cases, developments that require a variation in the RAJUK Plan will require a TIA Report.

**CHAPTER FOUR**

# 4. TRAFFIC EFFECTS FORM & TRAFFIC IMPACT ASSESSMENT REPORT

## Introduction

A Traffic Effects Form (TEF) is an easy to use form that can be completed by a development applicant to provide basic information about the transport-related aspects of the proposed development. In most situations, a TEF will satisfy the requirement for a Traffic Impact Assessment as required in the General Development Controls for developments within the range defined in Table 3.2. The completion of a TEF does not remove the need for all relevant RAJUK Plan, codes and rules to be met, nor does it preclude the need to complete other forms and provide additional information that may be required for the Development Approval (DA) process.

A sample form is attached as Appendix A. The contents of the attached form are described below.

Industrial and institutional land use will require completion of a full Traffic Impact Assessment Report and are therefore not discussed in this section.

## Development Details

The site will need to be described with the suburb name and number of section and block, and the same should also be labeled on the site plan.

A site plan should be provided showing:

* Access / egress points for private vehicles, pedestrians, cyclists, service / delivery vehicles;
* Location of the building(s);
* Parking lot layout including dimensions of parking stalls and widths of aisles and locations of bicycle parking;
* Widths of vehicle access / egress points; and
* Adjacent streets (labeled).

Similar plans will need to be submitted for other components of the development application process and should be readily available. The study area limits may be confirmed with the Development Authorities at the pre- application meeting.

The scale of development should be described based on the type of land use using the following measures:

* Retail, office, institutional uses – gross floor area (m2)
* Residential – number of dwelling units
* Accommodation – number of rooms
* Medical / dental centre – number of employees
* Day care centre – number of employees

It may be appropriate to describe the size of the development using more than one descriptor – more information is better than less.

The hours of operation should be described, along with the best available estimates of traffic through the day. This may be achieved through descriptions of staff shifts, percentage of sales by time of day or other similar description. The information needs to be indicative only. Describe the existing use of the site.

Note it also needs to be mentioned when the development will be complete, whether any phased development and by when the development will be operational or occupied.

## Surround Road Network Details

The streets that are adjacent to the site should be noted, as well as the number of lanes on each road (with through lane and turning lanes). The study area map should extend far enough to contain all roadways and highways (Arterial roads, National/State highways), major local roads/driveways, intersections, interchanges, railway line, bikeways, sidewalks/footpaths, and transit services that will be affected by the traffic generated by the proposed development, up to 1 km from the proposed development/redevelopment in all directions.

If a road has a non-traversable median, this should be noted and also the openings/cuts in the median needs to be mentioned. The distance from access points to the nearest adjacent access and to the nearest intersection should be calculated (from existing maps, or readily available services such as Google Earth. Traffic Control Devices’ (TCD) drawings and other asset information can be accessed on-line, through Project Wise portal. The web site address has the process to access the data, including the information on getting the access license.

## Traffic Distribution

This describes methods and assumptions for distribution and route assignment of all modes of traffic attracted /produced due to development.The direction from which people will come to visit the site should be estimated. This needs to be detailed (in percentage share if possible) and can be a simple locality plan with trip distribution estimates annotated on the plan (direction wise). The traffic distribution could be described based on existing information such as current DTCA Current Transport Project / RAJUK’s Dhaka Structure Plan. The distribution patterns are intended to be indicative only and based on the applicant’s knowledge of the expected use of the site.

A plan of traffic distribution is required to demonstrate how traffic generated due to the development will travel to and from the development via the proposed or existing access point. If the applicant is aware of elements of the development proposal that will encourage use of modes other than private vehicles, these should be highlighted too especially the non motorized transport viz. pedestrians/ cycle rickshaws. The use of traffic models or advanced trip distribution / modal split estimation techniques to complete the TEF is not required.

## Steps in a Traffic Impact Assessment

This section outlines the items to be assessed in preparing a Traffic Assessment Report (TAR). These items are presented in a manner that is closely aligned with the steps for a Traffic Impact Assessment (TIA). These guidelines are not intended to instruct traffic/ transport engineering professionals on how to conduct a transport assessment, but to define what should be assessed and presentation of outcomes. In general, all site impact analysis and reviews can be followed using this set of basic procedures as given in the flow chart below Figure 4.5. The scope and detail of the assessment may vary with the scale of development, but the process and general matters for assessment will be the same for all.

**Yes** No

**No**

**Figure: 4.5Steps of Traffic Impact Assessment.**

## Other Relevant Plans

While a Traffic Assessment Report is a planning document, it is more detailed and based on more specific information than a Strategic Transport Plan. Strategic Transport Plans prepared for the area encompassing the proposed development should be used as the basis for the TAR. The TAR will build upon strategic planning and is expected to demonstrate how the proposed development, along with impact mitigation, will support strategic and other relevant plans. Similarly, previous urban planning such as Concept Plans or other related plans should also be referenced.

In some cases previous planning documents may include much of the information required for the TAR, in which case the TAR may use this planning document for reference and provide context relevant to the proposed development. If two or more developments within an area are being assessed simultaneously, it would be beneficial for those completing each assessment to discuss these assumptions, approaches and respective findings to provide a level of consistency. The Transport policy for Dhaka named as RSTP must specifically be referred in the TAR.

The TAR shall demonstrate how the proposed development supports the objectives of the policy and implementation of the Transport under RSTP. TAR shall also demonstrate clearly as to how the proposed development supports usage of sustainable transport modes (public transport, walking and cycling) over and above the use of private vehicles for the trips generated due to the development.

## Proposed Development Description

The proposed development should be fully described with a focus on access, site circulation and parking issues for all modes of travel. The nature of all activities proposed on the site should be described in terms of the scale (retail floor area, number of dwelling units, etc.). For sites that are currently occupied, the difference between the existing use and proposed use should be highlighted. Access points should be described and characterized as general access/egress points or for delivery or service vehicles. Access and egress for pedestrians and cyclists should be described with some discussion on how the development will encourage travel by means other than single occupant private vehicles. A site plan is to be provided, showing all elements of the proposed development at a scale that clearly illustrates access, circulation and parking dimensions clearly legible.

### Site Layout Considerations

On-site circulation needs to be described in detail, outlining:

* Facilities for public transport (interchanges if appropriate, bus stop locations, pedestrian connections to bus stops, safe pedestrian routes between bus stops and key destinations on-site, appropriately designed internal roads to support buses, bus priority routes, provisions for buses at access points to the site);
* Delivery and service vehicles (off-street loading bays, provisions to prevent trucks from reversing onto road, on-site routing to minimize interactions with other traffic, pedestrians and cyclists, demonstration showing that trucks can adequately maneuver); Vehicle tracking and Swept Path analysis for trucks and trailers shall be preferred.
* Pedestrian and cyclist facilities (on site bicycle parking facilities, end-of-trip active travel facilities, locations for secure bicycle parking, pedestrian crossings on internal roads, illustration of key on-site pedestrian destinations, signage and delineation of pedestrian and cycling routes on-site, specific provisions for pedestrian and cyclist safety, consideration of pedestrian safety through car parking areas);
* Vehicle movements (hierarchy of on-site circulation routes, methods to promote low-speed travel, safety at site-access points, demonstration that vehicles can properly maneuver on-site).

### Parking

The consultant shall need to document the analysis for parking provisions to ensure that parking requirements for the development have been adequately catered for. The number of parking spaces and access arrangement of new developments shall comply with the requirements stipulated as per building bylaws/code of practice. The total number of car parks should be identified and bays to be shown on the plan. The consultants shall need to assess whether there is a need to provide pick-up/drop-off bays at the site.

The development description should explain how the on–street parking layout will facilitate safe pedestrian and cyclist movements.

### Travel Demand Management (TDM)

The proposed site elements and activities intended to reduce reliance on single occupant vehicles are to be described. These possible measures could include shared vehicle use, shared parking opportunities, behavioral measures and site layout to support walking, cycling and public transport as appropriate. Inclusion of TDM will be a critical element of the development and an important factor in the development approval process.

### Study Area Definition

The extents of the study area are to include:

* **Road Links** – all road links within 1km travel distance from any of the access points of the development or/and any arterial/collector road on which the development will increase traffic by more than 10 vehicles per hour in any lane.
* **Intersections** – all signalized intersections and other intersections linked with an arterial road connecting to road links to the study area. In town/city centers, the intersections to be considered will be only extended to the first intersection with an arterial roadway.
* **Public Transport** – Access to public transport with stops within 500m of the proposed development.
* **Walking and Cycling Routes** – facilities, services and infrastructure within 600m of the proposed development.

Although the study area may encompass several roads and intersections, the developers’ Traffic/ Transport Engineer should apply professional technical expertise in determining the level and type of assessment for each component of the study area.

For roads with high capacity, but low existing volumes, a case can be made for reducing the detail of the assessment beyond 1Km. There will rarely be a need to study beyond 5Km from the site, regardless of the increase in traffic, except for very large developments.

Vacant parcels of land within the in the study area shall also be analyzed in order to consider the proposed project in the context of previously approved or anticipated development. The DTCA and RAJUK shall identify these vacant parcels and provide land use projections for them.

For larger developments the extent of the study area will depend on several factors and should be discussed with DTCA Traffic Related staff during the pre-application meeting. Rationale for the selection of the extent of the study area should be documented in these cases.

For High Traffic Impact Areas, DTCA and RAJUK should designate and maintain maps of High Traffic Impact Areas (HTIA) within their jurisdiction. HTIAs are those that have “special sensitivity to traffic condition changes due to existing congestion, problematic circulation patterns, burgeoning traffic operations problems, or other traffic conditions of special concern.” Development proposals within HTIAs should include an analysis of the entire HTIA in addition to the normally defined study area. This is in order to assess the cumulative impact of the proposal within the HTIA. Considering the enormity of the task that may be required to prepare non-site traffic estimates within HTIAs, the DTCA and RAJUK should provide this information to project proponents to include those projected for remaining vacant parcels of land.

The study areas for public transport, walking and cycling are intended to capture existing and future facilities and connections that are close to the site. Facilities beyond 500m, representing approximately 6-7 minute walking time, are too far to reasonably influence travel patterns.

It is recognized that the study area selection will in fact occur after some assessment has been completed. Thus, the selection process is somewhat iterative as an initial study area may need to be expanded (or potentially reduced) as the analysis proceeds.

The study area needs to be shown on a key plan.

## Existing and Design Year Conditions

### Existing Conditions

**Site Location and Environs -** The description of site location and environs should provide local context. In addition to describing the current location and conditions of the site, the report should describe existing road network connections to adjacent properties, how people and vehicles currently access the site and the existing on-site circulation.

**Land Use -** The description of existing land use will include:

* Current Activity – describe what the site is currently used for;
* Land Use Currently Approved in the RAJUK Plan – indicate the uses that would be permitted on the site under existing planning controls;
* Adjacent Land Use – describe the land use for the surrounding area within approximately 800m of the site boundaries.

The land use description should describe the current activity and the types of uses that would be permitted with existing consents. This recognizes that some sites may currently be underutilized based on existing rules. The description of adjacent land uses should also indicate existing and potential uses in the area under current regulations. The land use description should reference the appropriate sections of the RAJUK Plan.

**Existing Transport infrastructure and condition-** The physical elements of the existing transport network are to be described as well as the role and function of each element within the overall transportation system. Table 4.7 summarizes the information that should be described.

**Table 4.7:Existing Transport Network Descriptions**

|  |  |
| --- | --- |
| **Element** | **Descriptors to be Included** |
| **Road** | * Functional classification * Strategic importance * Existing lanes and traffic control * Access management * On-street parking * Design and Posted speed limits * Location of speed limit changes * Intersection type with traffic control type (i.e. two-way or all-way stop control, etc.) * Traffic operation signage (i.e. no left-turns, no parking) * Intersection Sight Distance * Signal timings * Major developments currently using intersection if any * Designated routes if any (e.g., heavy vehicle routes) |
| **Walking** | * Footpaths * Pedestrian crossings and controls * Other pedestrian facilities of note * Lighting |
| **Cycling** | * Cycling lanes, paths * End of trip facilities |
| **Public Transport** | * Transit Routes * Frequencies * Transport interchanges * Bus lanes * Location of transit stops * Passenger facilities at stops * Path access and distance to stops * Park and ride facilities * Bike and ride facilities |
| **Taxis** | * Taxi stands |

The above information should be provided on detailed maps and diagrams.

**Parking –** For sites that are currently developed, and for expansions to existing developments, the existing parking conditions should be described. Adjacent on-street parking as well as nearby off – site parking should be identified along with parking restrictions, fees and known issues.

**Existing Traffic Flows** – Intersection peak hour turning movements should be collected for all intersections within the study area. Existing flows may be determined from primary surveys or past studies. If previous survey data is used, count data should be no more than three years old, and then only if there have been no significant land use or transportation network improvements since the turning movement count data was collected. A suitable growth factor to be adopted and base year traffic flows to be updated if taken from earlier studies. The existing traffic flows includes existing AADT on the adjacent highway/road, historical growth rate of traffic on this highway/road and vehicle composition (% vehicle type) on the highway, road and intersections.

Existing turning movement and peak hour volumes, including proportions of heavy vehicles, should be summarized in a table and shown in a diagram. Existing base traffic should include counts or estimates of traffic currently generated on the site if not a green field site. It is important to establish the background traffic volumes and turning movements within the study area, before projecting background traffic into the future horizons. Historical counts should also be referred to illustrate growth rate wherever appropriate, seasonal variations and other traffic characteristics which are not apparent from a single traffic count. Any known traffic operational issues should also be noted.

**Road Safety –** The safety performance on the existing network should be reviewed. If a previous safety assessment has been conducted in the study area, black spots should be noted. If no assessment has been completed, collision data for past five-year period should be collected from DMP and reviewed to identify accident prone locations within the study area that may be of concern. It may be appropriate to consult with police and road safety expert to identify known safety problem locations.

### Study Period

The traffic Impacts on the transportation network should be evaluated for A.M. and P.M. peak hours and the site peak generation hour. Depending upon the study area and proposed land or building uses, there may be a need to consider specific seasons, days of week, or non-typical peak periods.

The traffic assessment should consider as follows:

* Residential, Office, Industrial, Institutional Uses – weekday AM and PM peak hours of adjacent road traffic.
* Retail, Restaurant, Entertainment.
* Surveys are to be carried out so as to be representative.
* Specific season change effect.

For all land uses, the peak hour of the proposed development, if different than the peak hour of adjacent street traffic, should also be included.

If both the generated traffic and adjacent road traffic volumes are lower in one peak hour than the other, a lower level of detail may be appropriate for the lower-volume peak hour. Seasonal variation in traffic should also be considered, such as for tourism-oriented businesses that may be busier during school holidays.

The appropriate study period for larger, mixed use developments will need to be determined based on the land uses within the development, the interactions between the activities and the surrounding adjacent land uses.

The following is a sample of how to lay out traffic projections in a logical manner, which will assist the department in the review process. This is not intended to represent all TIAs, and depending on the complexity of the study, may require more or less traffic projections. The traffic projections process need to follow a logical sequence. Suggested below is an effective way of conveying the necessary traffic data for the base and horizon years.

**A) Existing/ Background Traffic**

1) A.M. Peak

2) P.M. Peak

**B) Build Year**

1) Projected Background Traffic

i) A.M. Peak

ii) P.M. Peak

2) Projected Development Traffic

i) A.M. Peak

• Site Generated

• Pass by &/or Internal Trips

• Total Trips

ii) P.M. Peak

• Site Generated

• Passby &/or Internal Trips

• Total Trips

3) Combined (Background + Development) Traffic

i) A.M. Peak

ii) P.M. Peak

**C) 10-Year Horizon**

1) Projected Background Traffic

i) A.M. Peak

ii) P.M. Peak

2) Projected Development Traffic

i) A.M. Peak

• Site Generated

• Passby &/or Internal Trips

• Total Trips

ii) P.M. Peak

• Site Generated

• Passby &/or Internal Trips

• Total Trips

3) Combined (Background + Development) Traffic

i) A.M. Peak

ii) P.M. Peak

### Design /Horizon Year

In most cases, the assessment should be conducted for the proposed opening day and opening day plus 10 years. For larger developments, it is important that assessments be completed for each phase of the development, as phasing will often include temporary mitigation measures. For most developments however, a 10-year horizon is generally sufficient.If the proposed development is complex and may affect the strategic road network then the horizon year may be increased to 20 years. The DTCA/RAJUK may request, at its sole discretion, that a 20-year horizon also be examined for any size development in addition to the 10 year horizon scenario.This needs to be discussed with the DA officials during the pre-app meeting.

### Future Base Conditions

**Future Land Use -** Consented future land use within the study area should be identified and quantified. Other land use changes identified at the strategic level should also be identified. It is not necessary to consider potential developments that are “rumored” or are not yet in the development approval process, although it may be worthwhile to note other potential developments.

**Future Transportation Facilities –** Future transportation network changes that will significantly affect traffic flows within the study area should be noted. There should be differentiation between those improvements that have been included in the capital works program and those that only referred to in long-term strategic plans.

**Future Base Traffic Flows –** If a previously completed approved transport assessment is available within the study areas, it should be used for the future base traffic flows (without the development). Please note, the assessment study not be older than 3 years. Use of a previously approved assessment provides a degree of consistency among transport assessment reports. If no appropriate report is available, the future base traffic flows for the design year must be forecast. An industry standard transport model should be used as a basis for the forecast. The design year volumes may need to be interpolated between the modeled years. The model should also be checked for consistency with consented land use and future transport facilities. The local zone structure of the model will need to be closely investigated and adjustments to the assignment made as appropriate to reflect the actual transport network.

It is good practice to perform a check of forecast volumes using a second method such as application of historical growth factors. The second method does not need to provide an exact replication of results, but should demonstrate reasonableness. Where limited data is available, sensitivity tests of growth rates may be appropriate.

The future base traffic flows should be shown on a plan for each of the critical AM and PM peak hours.

### Provision of Data

Government supports proponents by providing transport data from actual surveys and strategic transport model outputs held by the DTCA. The proponents are encouraged to send the request for data through this guideline, Government officer responsible for this. This could be an item of discussion during the pre-application meeting.

The proponent may need to undertake further transport modeling including micro – simulation and intersection modeling to meet the desired requirements to support the proposed development in the project scenario.

## Traffic Generation and Modal Split

### Traffic Generation

Trip generation describes source and details of trip generation rates or equations used for all modes of transportation. Local data collection may be acceptable provided that conditions are similar to those for the proposed development or that differences are accounted for.

For residential traffic generation, rates are to be sourced from the RAJUK. In all cases, the estimate should be provided as a range of potential traffic generation. It is expected that assessment will be conducted for a most probable and for a high trip generation estimate within the range. In addition to the peak period traffic generation manual of DTCA, the daily traffic generation should also be provided. A comparisonof total site traffic generation with and without the development should be provided.

In most cases, trip generation will only need to be estimated for the full build out of the development. For larger, phased developments, the estimated generation for each phase will be provided.

For each city, traffic generation rates are determined after carry out detail survey. For Dhaka city traffic / trip generation rates have not yet been determined, since it needs detail study on it, which needs time. In the absence of this study as an interim measure ITE trip generation manual can be used (Reference – Appendix C).

### Modal Split

Adjustments in trip generation for modal split will be directly related to the activities, programs and facilities provided on-site to encourage travel by means other than single occupancy vehicles. Outside of the Central Business District (CBD), the assessment will need to demonstrate that the development will feature significant changes from normal practices to encourage modal shift in order to apply reductions to the traffic generation estimate.

The assessment will also need to demonstrate that there is sufficient facility and capacity within the public transport, pedestrian or cycling network to support the proposed modal shift.

The report should also include a description of any initiatives proposed to provide alternatives to single occupancy vehicle use and any steps that will be taken to support transit use, walking, cycling or other forms of Transportation Demand Management (TDM).

## Approach and Departure Directions

This describes methods and assumptions for distribution of all the generated trips by all modes of traffic.Assumptions for trip distribution should be supported by one or more of the following:

* Origin-destination Surveys;
* Comprehensive Travel Surveys;
* Planning models;
* Market studies; or
* Any other recognized trip distribution methodology.

The trip distribution assumption should be based on existing travel patterns and expected future travel patterns.

For most developments, trip distribution can be determined based on the above mentioned assumptions but for larger developments, more details may be required. If a marketing assessment has been completed for the proposed development, trip distribution estimates should be consistent with the marketing study results. An origin-destination table should be generated for large developments.

Trip generation estimates should differentiate between primary trips and pass-by trips. In most cases, diverted link trips will come from outside the study area and can be treated as primary trips. Pass-by trips should however be considered.

For large developments, estimated pass-by traffic should be compared with the existing flows on the street from which the pass-by traffic will be drawn to ensure the pass-by estimate is reasonable. This is particularly important where the existing adjacent street traffic volume is low. If internal trips have been estimated, the internal origins and destination trip ends need to be clearly identified.

It may be appropriate to generate separate trip distribution tables for primary and pass-by trips. Delivery and service vehicles will also need to be separately distributed and shown on the plan.

## Traffic Assignment

This describes methods and assumptions for route assignment of the generated trips by all modes of traffic. Traffic should be assigned to the network within the study area using manual methods or preferably with the assistance of a traffic model.

A strategic transport model can be used here, but it will not be appropriate for assignment of localized traffic. If a manual method is used, shortest time paths are most appropriate. This means traffic may need to be reassigned if high delays are predicted along the preferred route. If a micro simulation model is used, assignment may be based on shortest generalized cost or shortest time paths. The use of micro simulation models is highly recommended for large developments on complex or congested signalized networks.

## Sustainable Transportation-(Non-motorized Transport and Public Transport)

If TDM reductions are being applied to trip generation as explained in section 4.9.1 above, a TDM plan should be prepared that identifies existing and future (proposed) sustainable forms of transportation, routes and infrastructure within the study area. Plan should describe and evaluate the potential impacts and changes to pedestrian, cycling and transit modal split associated with the development / redevelopment.

The routes for cycling, pedestrians and public transport need to be identified, with broad base estimates of travel demand. The trip generation, distribution and assignment estimates do not need to be as rigorously defined as vehicle traffic. Where public transport routes will not enter the site, the walking paths between development and appropriate public transport stops should be identified and discussed.

## Evaluation of Impacts

The evaluation of the impacts from the proposed development is a critical task. Evaluation is done under the following subheads-

### Operational Analysis

The operational analysis is a critical phase of the TIA that should not be overlooked. Under this an assessment of the service levels needs to be undertaken. The Operational analysis needs to cover the following:

* Street segments and/or intersections located in an area exhibiting congestion and/or high rate of growth and/or if as part of the new development a new traffic control signal or roundabout is proposed to be constructed on a Regional road.
* All signalized and major un-signalized intersections in the study area network shall be evaluated.
* The following shall be included as part of the reporting for operational analysis - v/c ratios, Delay, Level of Service (LOS) and queue lengths. These are further discussed in detail.
* The results of the operational analysis and /or warrants shall be used to determine the need for left-turn and right-turn auxiliary lanes.
* All traffic volumes should be shown as separate Appendix/exhibits

Intersection Capacity Analysis (Including Site Accesses):-

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” 2015 methodology.

The need for geometric improvements should be reviewed at all locations in the study area and for each proposed development stage(s). The TIA should clearly identify transportation impacts by movement (left, through, right, merge, other) at each of the intersection within the defined study area. 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. Also, the 95th percentile queue lengths should not extend beyond the storage length available for right turn slot (the parallel length of the turn slot excluding the taper) or beyond the next adjacent intersection for any lane. As mentioned earlier the impact threshold for intersections is Level of Service (LOS) that also needs to be determined.

‘Sidra Intersection’ software is recommended for assessment of intersection performance which assess all the above said intersection performance parameters. If other methods are used, compliance with the Guideline for Sidra Analysis should be applied to the greatest degree practical.

All geometric improvements should be shown on a functional plan identifying lane arrangements and intersection improvements for each horizon year. All geometric improvements and design standards used must be in accordance with Highway Capacity Manual (HCM)-2015.

Once the traffic analysis has been completed and the recommended intersection improvements have been determined, it is necessary to ensure that the design vehicle is capable of safely maneuvering the intersection without interfering with other traffic movements.

Intersection plans should be provided illustrating that the design vehicle can safely maneuver the intersection. This can be shown by Swept Path analysis diagram. If the design vehicle is unable to properly make a specific turning movement with respect to the development, recommended revisions to the intersection layout are required or alternately design changes in the proposed development may be needed.

### Road Links

All the road links falling under the study area should operate at the minimum LOS D or less using “Highway Capacity Manual” methodology.Links having level of service above LOS D shall not be acceptable as part of the TIA submission. Mitigation measures may be required to be revised to achieve the desired LOS on the affected links due to the development.

### Public Transport

Additional traffic generated from the development should not cause bus reduction in average travel speeds of public transport to drop below 40 Km/h for Rapid Services (including traffic control delays and dwell time at bus stops) and 20 Km/h for Frequent Local Service. Existing bus shelter facilities and bus bays should be reviewed to determine adequacy for increased public transport access to meet the increase in public transport demand.

### Pedestrians and Cyclists

To maintain sustainable environment in Dhaka region it is imperative to promote maximum use of non-motorized transport i.e. Cyclists and pedestrians. Direct road links to access the public transit stations needs to be developed from the proposed development. This will enhance the modal share of sustainable modes over usage of private vehicles. There should be no decline in travel time or distance for pedestrians or cyclists as a result of the proposed development. Where vehicular access is proposed across an existing or proposed main community route or main on-road route, priority will be given to the main route. But while designing the main route (road facility), it needs to be borne in mind that this road if required may be accessed by pedestrians/cyclists.

### Parking and Pick-up/Drop-off Provision

The consultant shall document the analysis for parking provisions to ensure that parking requirements for the development have been adequately catered for. The number of parking spaces and access arrangement of new developments shall comply with the requirements stipulated in Code of Practice of RAJUK, and bicycle parking code requirements for the appropriate zone.

Notwithstanding the RAJUK Plan requirements, if a development will depend on off-site parking to meet their parking demand, an assessment of off-site parking supply and occupancy within relevant distances specified within the CBD will be required. Where off-site parking is to be relied upon, the traffic assignment should be adjusted to reflect the movement of vehicles to/from site to the parking lot. In the CBD and some centers, this may not be practical. In these cases the traffic engineer should provide an assessment that demonstrates that parking demand from the proposed development shall be adequately met by the off-site parking and can accommodate having regard to the requirements of RAJUK.

Also the consultant shall also consider the potential traffic impacts and externalities that may arise as a result of car parking operations, and provide appropriate mitigation measures as necessary. Consultants shall assess whether there is a need to provide pick-up/drop-off bays and to estimate the number of bays required and to propose suitable location(s). If the development design is carried out as the TIA is in progress, the consultant is to comment on the layout, identify potential traffic problems associated with the proposed pick-up/drop-off bays and recommends necessary improvements to the plan.

### Road Safety

An assessment of potential road safety issues associated with the development is to be provided. Road Safety Audit (RSA) is not normally required to support a traffic impact assessment (TIA) report. However, it is important and a good practice to examine traffic and infrastructure data associated with a development to identify: the effects of the development on the collision risk of the site and the adjacent road system, recommended modifications to the site plan and the street system to deliver the maximum level of safety within the constraints of design.

The function of assessing road safety is not to put up barriers that discourage development but to work towards making the development as safe as possible for all road users. The safety review is a benefit to the developer in delivering a safer project, and to the community in addressing local safety concerns.

An assessment of the existing safety performance in the study area, and a review of safety issues arising from the proposed development in a qualitative manner will be required. The analysis should (at a minimum) include new pedestrian desire lines, parking layout, and vehicular accesses, sight distances, auxiliary lane requirements and design, and traffic/intersection control devices.

If the new development will likely add complexity to the surrounding road network and there are black spots in the vicinity of the proposed developments and within the defined study area a Road Safety Audit may be required. The potential need for a Road Safety Audit should be addressed in the Scope Development Report, including a proposed site-specific threshold for a RSA.

For large area structure plans, the internal road network should be assessed in the same manner as off-site roads and intersections in all respects.

### Environmental Capacity

Estimates of noise and air quality effects are to be provided. The TIA is not intended to replace the Environmental Impact Statement review of noise and air quality effects. As such, the estimates do not need to be exhaustive. For air quality estimates, most traffic models can generate reasonable estimates. For noise, a general review of noise generators based on expected traffic mix, locations of critical receptors and potential noise mitigation factors.

## Site Access and Traffic Circulation

Provision of good site access and circulation for all users whether for motorists, public transport commuters or pedestrians help towards the success of a development. The ease with, which users move to/from the development and nearby areas, roads and public transport facility, isimportant to the long-term success of the development.

Proposed development shall not create conflicts of traffic. Access points shall not be located opposite to each other, near bus stops or traffic junctions. Generally, the proposal to locate the development access at major arterial roads will not be supported when there are alternative feasible option(s) available.

Sight distance and other geometric design elements of accesses and parking layout are to be evaluated in accordance with Parking Guideline. The assessment should provide commentary on the efficiency and safety of the circulation and access beyond a simple comparison against Guideline requirements.

Provisions for delivery and service vehicles should be assessed. The number of service vehicles and the nature of activities should be considered. For example, for garbage collection, on-site and adjacent kerb side collection options should be reviewed, including the applicability of kerb side waste collection facilities and their effect on site access and visibility. Internal road layouts should facilitate service vehicles entering and leaving the site, without the need to reverse. Vehicles maneuvering into the access(es) shall not obstruct traffic along the road carriageway.

In general, all vehicles should travel to and from the development site in a forward direction. Where relevant, there should be provisions for pick-up and drop-off areas and for short-term “parking”, such as for couriers/visitors.

The assessment will include compliance review of parking guideline, vehicular access as well as a comparison with current plans and best practices relative to pedestrians, cyclists and travel demand management.

## Reporting of Impacts

A summary table should be provided that shows all impacts as defined above, with comparisons against existing and future conditions with and without the development. In some cases, impact thresholds may only be reached when a high estimate of traffic generation is used, but not the most probable traffic generation estimate. These impacts should be specifically noted. Also, it is useful to note conditions where impact thresholds have not been met, but could be met with minor changes to assumptions.

## Impact-Mitigating Treatments

The potential impacts resulting from the development should be carefully reviewed. Not all impacts require mitigation. However, in most cases, it should be an objective of the traffic assessment report to recommend mitigation that will improve conditions so that there are no residual impacts. In doing so, the overall performance within the study area needs to be considered. For example, improving performance of a minor movement at the expense of the major flows within the network may not represent the best overall solution.

Pedestrian, cycling and public transport impacts should receive precedence over general vehicle impacts to develop sustainable transportation system in Bangladesh. This means that it may be appropriate for general traffic to incur reasonable delays to improve the efficiency and safety of more sustainable modes such as pedestrian, cycling and public transport operations. For large developments which will attract public transport buses onto the site, the traffic impact assessment report will identify the works required to minimize delays to buses entering and leaving the site, or interchanges associate with the site.

If off-street parking impacts are identified, alternate parking facilities and/or mitigation to discourage off-site parking will need to be proposed.

Although, not strictly related to impact mitigation, the need for temporary traffic management and possible approaches should be noted, particularly for those developments with new vehicle accesses for arterial / primary roads.

## Who shall Prepare and Evaluate Traffic Impact Assessments?

A Transportation Engineer or Planner certified by the Institution of Engineers, Bangladesh (IEB), and Bangladesh Institute of Planners (BIP), shall be qualified to prepare TIA to undertake impact assessment and Dhaka Transport Coordination Authority (DTCA) shall evaluate the TIA. Certification requires that the person or persons undertaking the TIA will have the adequate background to conduct the study. Adequate background is defined as a person holding at least a Master’s degree (M.Sc.) in transportation or (MURP) urban planning, or its equivalent in terms of training and professional experience.

Similarly, the same minimum qualifications must be true for the officers from DTCA as TIA evaluators. These evaluators may comprise a committee formed by the local government and one representative from DTCA and RAJUK to review and / or evaluate the traffic impact of development proposals.

The DTCA will evaluate and approve the proposed scope of work for a TIA. After the pre-application meeting with DTCA on approval of scope of work, the consultant may proceed with the work and prepare a TIA report. During the work, the consultant should discuss any new issue with the DNCC / DSCC Traffic Engineer or his equivalent.

DTCA and RAJUK should undertake impact study of proposed large scale development projects on their roads and provide mitigation measures for the development. RAJUK will ensure that developers after getting project approval will implement the recommendations of TIA.

The implementing agencies DNCC and DSCC should issue the completion certificate for the completed project only after all the recommendations of the TIA have been implemented to mitigate all the impacts in totality.

## TIA Report Format and Contents

For the purpose of consistency in all the TIA Reports an outline for the report (but not limited to) is given below. In general, the content and extent of the TIA will depend on the location, nature and size of the proposed development and the prevailing transportation network and conditions in the surrounding area. The DTCA and RAJUK shall check this report in the given requisite format.

An outline of TIA report should include (but not limited to) the following sections:

1.Executive Summary

* Contains key findings, conclusions and recommendations of the TIS and should be located at the front of the TIA.

2. Introduction

* Includes the name of the applicant, nature of the application and purpose for submitting the TIA;
* Contains a brief description of the project;
* Includes a summary of the pre-consultation meeting with DTCA/RAJUK staff; and
* contains description of the components of TIA

3. Study Area and Existing Conditions

* Contains a description and a map of the study area including, but not limited to, the site location, land use type(s) of the surrounding and subject development lands

4. Proposed Development & Site Plan

* Contains a drawing and a written description of the type of land uses proposed and a detailed site plan showing structures, parking, access, site circulation for all modes of transportation

5. Planned Transportation Network Improvements and Study Horizon

* Identifies other developments in the study area that are under construction, approved or in the approval process that will impact the transportation network or proposed access
* Study horizon period to be identified.

6. Transportation Analysis

* Impacts on the transportation network to be identified and analyzed

7.Trip Generation & Distribution and Transportation Demand Management

* Describes source and details of trip generation rates or equations used for all modes of transportation;
* Describes methods and assumptions for distribution and route assignment of all modes of traffic
* If TDM reductions are being applied to trip generation, a TDM plan should be prepared that identifies existing and future (proposed) sustainable forms of transportation, routes and infrastructure within the study area

8. Evaluation of Impacts

* Should indicate existing traffic, transit, pedestrian/cyclist traffic volumes for roadways and intersections, heavy truck movements;
* OperationalAnalysis
* Sight Distance Analysis
* Access management Issues
* Safety Review

9. Geometric Improvements (Intersection/Road section)

* The transportation system improvements that are needed to mitigate these impacts and the timing of these improvements must be specifically noted;
* All geometric improvements should be shown on a functional plan identifying lane arrangements and intersection improvements for each horizon year

10. Conclusions and Recommendations

* Summary of recommended improvements should include, but not limited to, type of access, entrance design, roadway improvement including right/left turn lanes, tapers, visibility triangles, signalization and signage, bike lanes, sidewalks, transit improvements, trails, etc.

11. Maps, Diagrams, Drawings and Figures

* All diagrams, drawings and figures contained in the TIA shall be of a sufficient scale to be legible. All drawings, tables, and exhibits/figures included in the TIA shall be appropriately labeled and listed at the front of the TIA (after the Table of Contents) under the appropriate headings. Unless otherwise noted in these Guidelines or in the pre-application meeting, any maps or study/development/redevelopment area diagrams submitted as part of the TIA shall identify:
* All adjacent and nearby roads, indicating road names, the number and width of lanes, jurisdiction, and posted speed – for both sides of the road;
* All adjacent, opposing and affected accesses, driveways and intersections, indicating type of control, lane configurations, lane widths, and any turning or similar restrictions;
* If appropriate, on-street parking spaces/standing/stopping restrictions in the vicinity of the development site and those which would affect the operation of key intersections being analyzed;
* Transit routes and service frequency;
* On and off-road cycling facilities;and
* Sidewalks and trails, including crosswalks

## Disclaimer

Notwithstanding the above, the DTCA/RAJUK may require additional information and analysis depending on the complexity of the proposal and the anticipated transportation impacts.

## Data and References

Data for use in the TIA must be current (within a one-year period). However, in the necessity of forecasting data for the horizon year, historical data such as that for the last 5 to 10 years may be required. Data for street traffic volumes, intersection traffic volumes, speed surveys, traffic signal timing plans, and traffic collisions are available from the Dhaka Transport Coordination Authority (DTCA), Dhaka North City Corporation (DNCC) and Dhaka South City Corporation (DSCC). Past transportation impact analyses, approved development traffic plans, transportation improvement project plans, specifications, and estimates are available for review with the DTCA, DNCC and DSCC.

There is non-availability of any existing standard Trip Generation rates or Parking Generation rates with RAJUK that could be used by all the developers/consultants in the region for the preparation of traffic assessment study. In such case as an interim measure it is suggested that RAJUK can do appropriate surveys to establish trip rates and parking generation rates. Also the developers/consultants can conduct primary surveys for similar developments in the region for the preparation of TIA. RAJUK may approve local Trip generation rates and Parking generation rates for similar developments in the region. These existing “trip generation rates” from surveys would be considered adequate and at par with the current development scenario in the region and should represent reasonably fair figures regarding the expected trips that may be generated from the proposed development.

In due course of time, a list of trip rates and parking rates will need to be compiled for different land use categories and different sizes (area in square feet) of development by RAJUK. These complied rates by RAJUK could then be added as annexure and the guideline document could be updated. These trip rates and parking generation rates could then be used as standards in the industry to prepare any TIA in Dhaka City.

In case of the absence of similar development in the region to conduct surveys, it is recommended that the current edition of the Institute of Transportation Engineers (ITE) “Trip Generation” and Parking generation rates could be referred and shall be considered valid for the purpose of TIA.

**APPENDIX –A**

**Transport Effects Form (TEF)**

Provide the Proposal Number to which this application relates:

**20XXXXXX**

------------------------------------

|  |
| --- |
| **Development/Site Location Details** |

If more than one lease/site, attach the following detailed for each lease/site

**Block**

**Section** **Unit *(if applicable)***

**Suburb**

**District**

**Street Number**

**Street name**

**Postcode**

*Attach a detailed site plan that includes the following as a minimum (if site plan has previously been submitted for the development application that includes all necessary information, attach that plan).*

* Access / egress points for private vehicles,

pedestrians, cyclists, service / delivery vehicles;

* Location of the building(s);
* Parking lot layout including dimensions of

parking stalls and widths of aisles;

* Widths of vehicle access / egress

points; and

* Adjacent streets (labeled)

Fully describe the proposed development *(or reference the Development Application)*

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|  |
| --- |
| **Scale of Development** |

**Proposed Land**

**Use or Activity**

**Scale/Size**

If appropriate, further describe the scale/size of the development:

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Describe the operating hours

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Existing Use of the Site (pre-development):

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Expected proposed development completion or occupancy:

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| --- |
| **Surrounding Road Network** |

Complete for each road adjoining the development site:

|  |  |  |  |
| --- | --- | --- | --- |
| **Road Name** |  | | |
|  | Through Lanes | Right Turn Lanes | Left Turn Lanes |
| **Number of Lanes** |  |  |  |
|  |  | **Distance to Nearest Intersection** |  |
| **Distance to**  **Nearest Access** |  |  |
|  |  |  |  |
| **Road Name** |  |  |  |
|  | Through Lanes | Right Turn Lanes | Left Turn Lanes |
| **Number of Lanes** |  |  |  |
|  |  | **Distance to Nearest Intersection** |  |
| **Distance to**  **Nearest Access** |  |  |
|  |  |  |  |
| **Road Name** |  |  |  |
|  | Through Lanes | Right Turn Lanes | Left Turn Lanes |
| **Number of Lanes** |  |  |  |
|  |  | **Distance to Nearest Intersection** |  |
| **Distance to**  **Nearest Access** |  |  |
|  |  |  |  |
| **Road Name** |  |  |  |
|  | Through Lanes | Right Turn Lanes | Left Turn Lanes |
| **Number of Lanes** |  |  |  |
|  |  | **Distance to Nearest Intersection** |  |
| **Distance to**  **Nearest Access** |  |  |

**Traffic Distribution** (see TIA Guide, Section 4.4)

Please attach a locality plan with trip distribution estimates annotated on the plan.

Please describe how the trip distributed estimates were derived:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**APPENDIX –B**

**Trip Generation Data Form**

| Land Use / Building Type: |  |
| --- | --- |
| Name of Development: |  |
| Location (address) |  |
| Day of Week: |  |
| Date (dd/mm/yyyy) |  |
| Description of the Development |  |

Independent Variable (include as many as possible) Actual Estimated Actual Estimated

------ (1) Employees (number) ------ (9) Parking Spaces (% occupied \_\_\_\_\_\_)

------ (2) Persons (number) ------ (10) Beds (% occupied \_\_\_\_\_\_\_)

------ (3) Total Units (number) ------ (11) Seats (number)

------ (4) Occupied Units (number) ------ (12) Vehicle Fuelling Positions/Servicing Positions

------ (5) Gross Floor Area (m2) ------ (13) A.M Peak Hour Volume of Adjacent Street Traffic

(% of development occupied \_\_\_\_\_)

------ (6) Net Rentable Area (m2) ------ (14) P.M Peak Hour Volume of Adjacent Street Traffic

------ (7) Gross Leasable Area (m2) ------ (15) Other

------ (8) Total Hectares (% developed \_\_\_\_\_) ------ (16) Other

**Other Data (complete as much information as is known)**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Vehicle Occupancy** | **AM Average** |  | **PM Average** |  | **Other Peak Average** |  |
| Public Transit Proportion | AM Peak % |  | PM Peak % |  | Other Peak % |  |
| Carpool/Vanpool Proportion | AM Peak % |  | PM Peak % |  | Other Peak % |  |
| Employees by Shift  (if applicable) | First Shift Start Time |  | First Shift End Time |  | Number of Employees |  |
| Second Shift Star Time |  | Second Shift End Time |  | Number of Employees |  |
| Third Shift Start Time |  | Third Shift End Time |  | Number of Employees |  |
| Parking Cost On-Site | Hourly |  | Daily |  |  |  |

**Transportation demand Management Information:**

At the time of the study, was there a TDM program at this site that may have impacted the trip generation characteristics?

Yes

No

If yes, please check the appropriate boxes and attach any additional information that may help quantify the impact of the TDM program

on trip generation at this site.

Public Transit Service Employer Support Measures Public Transit and Ridesharing Incentives Variable Work Hours

Carpool Program Preferential HOV Treatments Tolls and Congestion Pricing Telecommuting

Vanpool Program Bicycle/Pedestrian Facilities and Site Parking Supply and Pricing Management Other

Improvements

**Summary of Driveway Volumes**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Average Weekday | | | | | | Saturday | | | | | | Sunday | | | | | |
|  | Enter | | Exit | | Total | | Enter | | Exit | | Total | | Enter | | Exit | | Total | |
|  | All | Trucks | All | Trucks | All | Trucks | All | Trucks | All | Trucks | All | Trucks | All | Trucks | All | Trucks | All | Trucks |
| 24-Hour Volume |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| AM Peak Hour of  adjacent street traffic  Time: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| PM Peak Hour of adjacent street traffic  Time: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| AM Peak Hour of generator  Time: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| PM Peak Hour of generator  Time: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Weekend Peak Hour of generator  Time: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

**APPENDIX –C**





**APPENDIX – D**

Appendix – D: Flow Diagram of TIA

Application to DTCA

Condition of Project

TIACC needs to be renewed every year in case of project delay

Within 60 days

Issuance of TIA Clearance Certificate (TIACC)

TIACC needs to be renewed every year

Issuance of TIA Clearance Certificate (TIACC)

Issuance of Location Clearance Certificate (LCC)

Application for TIA Clearance Certificate (TIACC)

Document necessary to be attached with application:

1. Site location and General Information
2. Description of Transport network at adjacent areas
3. TOR for TIA report
4. Traffic Management Plan (TMP) report
5. No objection certificate (NOC) from the local authority/RAJUK
6. Outline of traffic diversion plan during construction (if applicable)
7. Other necessary information (if applicable)

TIA requiring TEF

Within 15 days

Document necessary to be attached with application:

1. Site location and General Information
2. Description of Transport network at adjacent areas
3. No objection certificate (NOC) from the local authority/RAJUK.

TIA requiring TAR

**APPENDIX – E**

Appendix – E: Institutional Framework

**IMPLEMENTATION OF TRAFFIC IMPACT ASSESSMENT (TIA)**

DTCA Board is responsible for the approval of policy. Act and guideline related to TIA

DTCA is responsible for

* preparing TIA policy, and TIA guidelines and its updating if required
* review TIA reports prepared by stakeholder agencies through quality check
* provide approval to TIA report
* overall monitoring of TIA process
* carry out post construction site visit and recommend remedy or punishment as needed
* maintain data base of TIA reports
* provide clarification on TIA guideline to stakeholder agencies and TIA consultant

The developers of private commercial building and real estate will prepare TIA report through enlisted TIA consultant (based on TIA guideline) under guidance of RAJUK and submit the TIA the report to RAJUK who will carry out initial review and subsequently submit for DTCA approval.

For public buildings RAJUK will be responsible for preparing TIA report (by shortlisted consultant) and submit it to DTCA for approval

Respective transport agencies responsible for the implementation of transport projects (DTCA, RHD, LGED, BBA, DMTC, BRTC municipalities under DTCA jurisdiction) will be in charge for the preparation of TIA reports (by employing enlisted TIA consultants) and submit it to DTCA for approval

**APPENDIX – F**

Appendix – F: Rollout Plan

*STEP 1: Form TIA unit at DTCA*

*STEP 2: Obtain approval of TIA guideline from DTCA BOARD/MINISTRY OF TRANSPORT*

*STEP 3: Discuss with stakeholder respective agencies (BBA, RAJUK, RHD, LGED, DSCC, DNCC DMP and MUNICIPALITIES under greater Dhaka), and create ownership*

*STEP 4: identify TIA focal point for stakeholder agencies*

*STEP 5: Provide training to TIA unit of DTCA and focal point of stakeholder4 agencies*

*STEP 6: Prepare shortlist of TIA consultant (individual or firms) based on agreed qualification and expertise (transport planning, traffic engineering, and road safety) and update the list annually*

*STEP 7: Provide intensive training to TIA unit of DTCA for ensuring quality check on TIA reports prepared by shortlisted consultant and submitted through stakeholder agencies for approval of DTCA*

*STEP 8: Carry out post construction site visit with the stakeholder agencies to find out any violation of agreed recommendation and provide punishment (corrective measures, fines or demolition)*

*STEP 9: Carry out study for Trip Generation Rate of Bangladesh (present TIA guideline uses USA trip generation rates)*