



قطر QATAR

دليل معدل الرحلات و المواقع  
TRIP GENERATION & PARKING RATES MANUAL



وزارة المواصلات  
MINISTRY OF TRANSPORT

# دليل معدل الرحلات و المواقع في دولة قطر QATAR TRIP GENERATION & PARKING RATES MANUAL

Executive  
Summary

2022









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## تنويه

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وفيما يخص التغييرات أو الإصدارات المستقبلية، ستقوم الوزارة بتوفيرها ويمكن الحصول عليها من خلال الاتصال بالإدارة المخولة في الوزارة، وعليه يتوجب على المستخدمين التحقق بشكل متواصل بأن لديهم أحدث إصدار من هذا التقرير.

**ملاحظة:** ستقوم وزارة المواصلات بمواصلة تحديث وتعديل هذا التقرير مع الأخذ بعين الاعتبار النظريات الجديدة وأحدث الأساليب التكنولوجية والمواضيع المستجدة التي تتعلق بتخطيط وتحليل وتصميم أنظمة النقل والمرور. إن وزارة المواصلات تشجع المستخدمين على تقديم الملاحظات والاقتراحات والتعليقات وردود الأفعال وذلك من خلال قنوات الاتصال الخاصة بالوزارة. وسيتم مراجعة هذه الملاحظات والاقتراحات ومن ثم تقييمها للنظر في إمكانية إدراجها ضمن الإصدار القادم من التقرير.

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## Terminology Used in the QTGPRM Project

- The term “MOT” shall mean Ministry of Transport. Throughout this document, and unless otherwise stated, MOT refers specifically to the Land Transport Planning Department.
- The term “Department” shall mean the Land Transport Planning Department of the Ministry of Transport.
- The term “Section” shall mean the Land Transport Studies Section of the Land Transport Planning Department.
- The terms “PWA” or “Ashghal” shall mean equivalently Public Works Authority.
- The term “Applicant” shall mean any developer (or their representative) applying for a development permit that is subject to MOT review and approval.
- The term “Consultant” shall refer to the consultant performing a transportation study.
- The term “transportation study” shall refer to any of the four categories of study defined in the Guidelines and Procedures for Transportation Studies (GPTS), namely Areawide Transportation Study, Detailed Transportation Study, Local Transportation Study, or Special Transportation Study.
- The term “trip” shall refer to the movement of a person or vehicle from an origin to a destination. While each trip necessarily includes both an origin “trip end” and a destination “trip end”, the terms “trip generation” and “trips generated” shall refer only to the total of the trip ends associated with a given project site during a given time. Thus, 10 vehicles entering a project site and 20 vehicles exiting a project site during a one-hour period is equivalent to a trip generation of 30 trip ends per hour (10 inbound, 20 outbound). Practitioners should be aware that confusion may result from the more casual usage of the word “trips” where “trips ends” is more accurate.
- The terms “vehicle trip generation”, “vehicle trip ends”, and similar shall be construed in terms of the number of passenger car equivalent (pce) vehicles.
- The term “roadway segment” shall refer to a link and an adjacent intersection. A roadway segment is specific to a direction of travel and it is always the downstream intersection that is combined with the link.

## Abbreviations

AM	Morning
ATC	Automatic Traffic Count
ATS	Areawide Transportation Study
CBD	Central Business District
DTS	Detailed Transportation Study
GCC	Cooperation Council for the Arab States of the Gulf
GPTS	Guidelines and Procedures for Transportation Studies
HCS	Highway Capacity Software
ITE	Institute of Transportation Engineers (USA)
ITS	Intelligent Transportation Systems
LOS	Level of Service
LTPD	Land Transport Planning Department
LTS	Limited Transportation Study
LUC	Land Use Classification
MCC	Manual Classified Count
MD	Midday
MSDP	Municipal Spatial Development Plan
MM	Ministry of Municipality (Qatar)
MME	Ministry of Municipality and Environment (Qatar)
MOT	Ministry of Transport (Qatar)
MOTC	Ministry of Transport and Communications (Qatar)
NCHRP	National Cooperative Highway Research Program (USA)
PERS	Pedestrian Environment Review Software (UK)
PHF	Peak Hour Factor
PM	Afternoon
PT	Public Transit/Transport

PTAI	Public Transport Accessibility Index
QFMP	Qatar Freight Master Plan
QHDM	Qatar Highway Design Manual
QNDF	Qatar National Development Framework
QNV	Qatar National Vision 2030
QNMP	Qatar National Master Plan
QNRSS	Qatar National Road Safety Strategy
QPCM	Qatar Pedestrian Crossings Manual
QPMP	Qatar Parking Master Plan
QSTM	Qatar Strategic Transportation Model
QTCM	Qatar Traffic Controls Manual
QTGPRM	Qatar Trip Generation and Parking Rates Manual
QUDC	Qatar Urban Design Compendium
TCRP	Transit Cooperative Research Program (USA)
TDMS	Transportation Data Management System
TfL	Transport for London (UK)
TMC	Turning Movement Count
TMIP	Travel Model Improvement Program (USA)
TMPQ	Transportation Master Plan for Qatar
TPTAPQ	Transportation Planning and Traffic Analysis Parameters for Qatar (part of TMPQ)
TRB	Transportation Research Board (USA)
STS	Special Transportation Study
TOD	Transit Oriented Development
TRL	Transport Research Laboratory (UK)
TMPQ	Transportation Master Plan for Qatar
V/C	Volume-to-Capacity Ratio

## Units of Measurement

### Units of Measurement

h	hour(s)
km	kilometer(s)
km/h	kilometers per hour
m	meter(s)
min	minute(s)
pce	passenger-car-equivalent
pce-vkt	passenger-car-equivalent vehicle-kilometers of travel
sec	second(s)
vkt	vehicle-kilometers of travel
vph	vehicles per hour

## Definitions

The following technical definitions apply throughout the QTGPRM project.

**Bicycle Trip:** A trip that has been made primarily by bicycle or any other form of non-motorized wheeled vehicle.

**Central Business District (CBD):** The commercial core of a metropolitan region where major businesses, headquarters buildings, and financial services are usually concentrated. The Doha CBD is characterized by a large number of high-rise buildings, particularly office buildings and hotels, and some mixed-use developments.

**Coefficient of Determination ( $R^2$ ):** A measure of the extent to which two variables are statistically correlated. It can take any value between 0 (no correlation) and 1 (perfect correlation). An  $R^2$  of 0.75 implies that an incremental change in the independent variable (e.g., number of employees) accounts for 75 percent of the resulting change in the dependent variable (e.g., person-trips).

**Coefficient of Variation (CV):** The standard deviation of a trip generation or parking demand rate divided by the mean trip generation or parking demand rate, often expressed as a percentage. By scaling the standard deviation in this way, it is possible to compare the relative precision of regression models that have been derived using independent variables that have been measured in different units or on different scales.

**Cordon Count:** The number of persons or vehicles counted crossing a collection of survey points (e.g., all site access connections) which together define a notional boundary or cordon around the survey site.

**Development Unit of Measurement:** A defined quantity (e.g., employee, 100 m<sup>2</sup> GFA) used as the standard for determining the magnitude of an independent variable used to describe a land use listed in the QTGPRM.

## Definitions

**Directional Count:** A count of persons or vehicles, tallied by direction.

**Directional Distribution:** The relative proportion of person-trips or vehicle-trips entering a study site compared to those exiting it.

**Door Count:** A count of persons entering or leaving a building through a specific door or access point.

**Diverted Trip:** A vehicle trip that involves an intermediate stop *en route* to the location where the primary trip purpose will be satisfied and for which the distance from the primary trip route to the intermediate destination is less than half the distance from the primary trip origin to the primary trip destination.

**Expansion Factor:** A factor by which a sample measurement is multiplied to match the population total from which it was drawn.

**GCC:** Cooperation Council for the Arab States of the Gulf (known colloquially as the Gulf Cooperation Council), a political and economic alliance of six Middle East countries comprising: Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates.

**Guidelines and Procedures for Transportation Studies (GPTS):** A guidebook to be used by consultants and practitioners when undertaking transportation studies in Qatar.

**Gross Floor Area (GFA):** The total floor area of a building, measured from the outside faces of the external walls and from the centerlines of any party walls shared with other developments or units.

**Heavy Goods Vehicle (HGV):** A commercial road vehicle as defined within classes 6-13 of the Qatar Highway Design Manual (QHDM).

**Inbound Trip:** A vehicle trip or person trip that arrives at a destination.

**Independent Variable:** A characteristic that is measurable, subject to random variation, and that can be demonstrated to have a measurable effect on another feature of interest (the dependent or response variable). In the context of trip generation study sites, a typical independent variable would be a measure of the study site size or scale (GFA, number of employees, etc.) and a typical dependent variable would be the number of person-trips or vehicle-trips generated.

**Intercept Interview:** A face-to-face survey (usually administered through a questionnaire) for which the subjects are chosen from among persons *en route* to or from the survey site.

**Internally Captured Trip:** A trip made between two distinct land uses within the same site, and which has been made entirely within the site boundary.

**Land Use Class (LUC):** A defined land use published in the QTGPRM and for which locally derived trip generation and parking demand rates are provided.

**Light Goods Vehicle (LGV):** A commercial road vehicle as defined within class 3 or 5 of the Qatar Highway Design Manual (QHDM).

**Mixed-Use Development:** An integrated development, usually master planned, consisting of at least two complementary and interactive land uses.

**Mode Share:** The relative share of total site trips made by a particular travel mode.

**Off-Site:** Land outside the site boundary.

**Outbound Trip:** A vehicle trip or person trip that departs from an origin.

**Pass-By Trip:** A vehicle trip that involves an intermediate stop *en route* to the location where the primary trip purpose will be satisfied and that will result in zero additional vehicle-kilometers of travel on the public roadway network.

## Definitions

**Peak Hour of Adjacent Street Traffic:** The four consecutive 15-minute intervals that exhibit the greatest traffic volume during a given peak period within the general vicinity of a study site (known colloquially as “rush hour”).

**Person Trip:** A trip made by a person, regardless of mode. For example, four persons leaving a study site in a single vehicle are counted as four person-trips.

**Primary Trip:** A vehicle trip made for the specific purpose of visiting a given land use destination. Primary trips are thus distinct from diverted trips and pass-by trips, which involve intermediate stops *en route* to the primary destination.

**PT:** Known variously as public transport, public transportation, public transit, or transit. The term refers to any open access transportation service following a fixed route with pre-determined stops, and which is designed to carry multiple passengers. Examples include bus, metro, tram, and long-distance rail. taxi, paratransit, and vanpool (including airport shuttle) are not included in this category and are usually classified as cars.

**Public Transport Accessibility Index (PTAI):** A standardized measure of a study site’s accessibility to public transport.

**PT Trip:** A trip that is made primarily using PT.

**QA/QC:** Comprises quality assurance (**QA**, the set of processes used to ensure the quality of a product as it is being developed) and quality control (**QC**, the set of processes used to identify and correct product defects).

**Rural:** Land outside an urban or suburban area that is either put to agricultural use or is largely undeveloped, although it might include scattered parcels of land developed at very low densities.

**Site workbook:** Is a set of spreadsheets used to document and analyze the site-specific data collected at a study site.

**Standard Error:** The standard error of a linear regression model. Standard error provides an indication of a model's precision, expressed in the same units as the dependent variable, and is used to help choose between candidate regression models.

**Study Site:** A parcel of land, plot, or block that has an assigned land use type (including land reserved for future development) and for which trip generation is to be estimated.

**Survey Site:** An existing developed site of a particular land use class that is used to derive trip generation or parking demand rates for QTGPRM.

**Suburban:** An area of low-density development located outside an urban area and generally dominated by residential land uses and neighborhood facilities such as schools and local shops.

**Transportation Study:** An investigation of the effects of a proposed development in terms of travel demand and impact on the transportation system, as defined in GPTS.

**Trip Generation:** The number of vehicle- or person-trips entering and exiting a site during a specified time interval.

**Urban:** An area of medium- to high-density development, located outside the CBD and with a mix of land uses (residential, commercial, institutional, educational, etc.) of a higher density than suburban areas.

**Valid Interview:** An interview survey record that has passed quality control checks.

**Vehicle:** Any motorized conveyance that is legally permitted for use on public roadways in Qatar (e.g., motorcycles, cars, trucks, taxis, buses, coaches).

**Vehicle Count:** The total number of vehicles counted entering/leaving a study/survey site during a pre-defined time interval.

**Vehicle Occupancy:** The total number of persons in a vehicle, including the driver.

## Definitions

**Walk Trip:** A trip that is made primarily on foot or using a mobility aid such as a wheelchair, walker, or crutches.

## Project Background and Objectives

The State of Qatar has experienced rapid economic and population growth driven by increasing gas and oil revenues and guided by the Qatar National Vision for 2030, “Qatar is an advanced society capable of sustaining its own development and providing for a high standard of living for all its people for generations to come”. To sustain this growth, the State of Qatar is investing in the construction of a network of expressways and freeways, in the improvement of the existing road network, in a country-wide rail network, and in a comprehensive public transport system that includes Doha Metro, Lusail Tram, and bus rapid transit.

The primary objectives of the QTGPRM project were the publication of the Qatar Trip Generation and Parking Rates Manual (QTGPRM) and the updating of the Guidelines and Procedures for Transport Studies (GPTS), both of which are established milestones on the way toward the ambitious goals of the Qatar National Vision 2030 and Qatar National Master Plan.

Previously, trip generation and parking demand rates were obtained from international and regional sources. Although fundamental to growth and land development in Qatar, that approach did not consider local travel behavior and local land uses. The availability of robust, locally derived trip generation and parking demand rates will allow decision-makers, developers, engineers, and transportation professionals to plan with greater confidence and to deliver a more balanced and sustainable transport system.

The updated GPTS, referred to as GPTS (2022), describes the processes and procedures to be followed for transportation studies required by the Ministry of Transport (MOT), Land Transport Planning Department (LTPD). By establishing the evidence to be provided in a transportation study and the format in which that evidence should be presented, GPTS (2022) provides the legal basis upon which MOT will rely in assessing development permit applications.

## **Project Background and Objectives**

The overall outcomes of the QTGPRM project study included:

1. Development of a trip generation and parking demand rates manual based on:
  - Collection of land use, trip generation, and parking demand data across all types of land use.
  - Statistical analysis of the collected data to refine trip generation and parking demand rates and their confidence intervals.
2. Development of a geodatabase of the collected survey data, and its integration with the Transportation Data Management System (TDMS) developed as part of the Transportation Master Plan for Qatar (TMPQ) update.
3. Development of specialist software for estimating trip generation and parking demand in Qatar.
4. Updating the 2011 Guidelines and Procedures for Transportation Studies (GPTS).

The QTGPRM project was undertaken in five stages as represented in **Figure 1**.



*Figure 1: QTGPRM Project Stages*



# Stage 1

Review and Assessment of  
Existing Documents, Literature,  
and Policies



# Stage 1    Review and Assessment of Existing Documents, Literature, and Policies

## 1.1 Overview

The objective of Stage 1 was to undertake a comprehensive review both of current conditions in the State of Qatar and of the trip generation and parking rates, guidelines, and related documents currently being used by various agencies here. In addition, Stage 1 reviewed international best practices and carried out detailed analyses of trip generation and parking demand rates manuals and transportation studies guidelines used in various regions, including the GCC, to identify the significance, exceptional features, and applicability of those manuals and guidelines to the state of Qatar. Input and feedback from stakeholders were also gathered and used to in support of this project.

Stage 1 resulted in four deliverables:

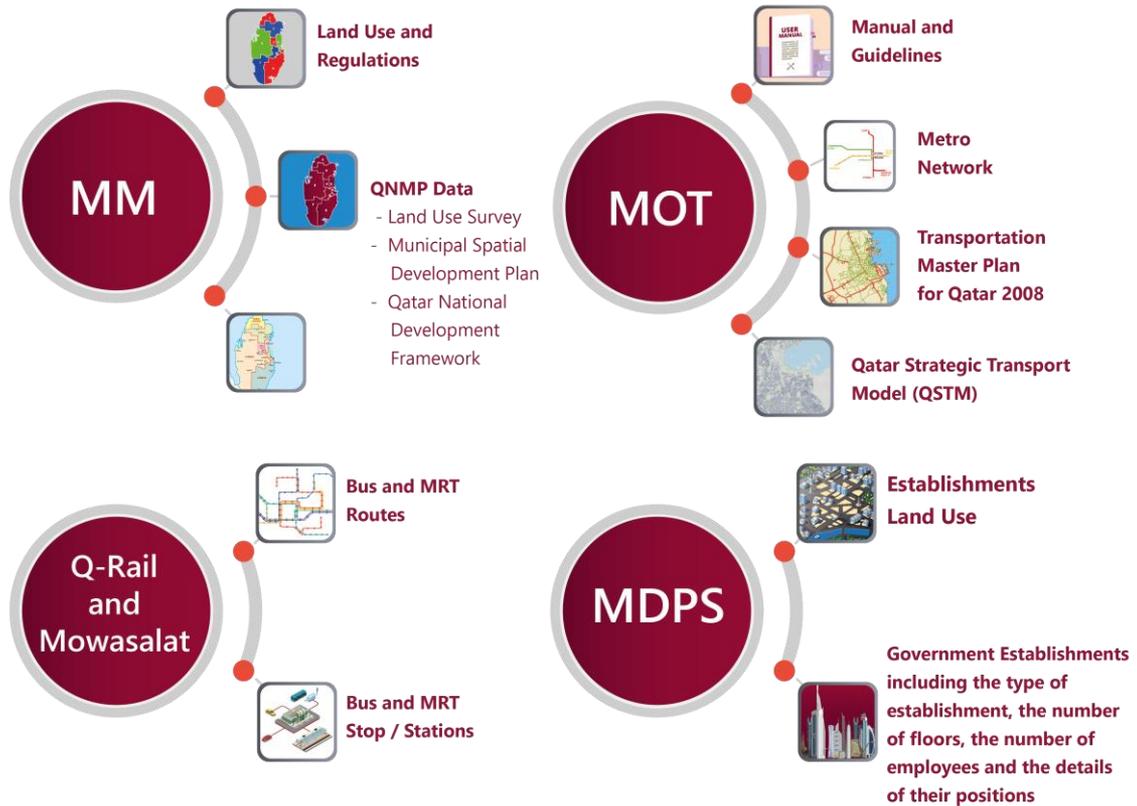
- Review of Existing Documents in the State of Qatar
- Review of Existing Conditions in the State of Qatar
- Assessment of Current Regulations and Policies
- International Best Practices Literature Review

## 1.2 Review of Existing Documents in the State of Qatar

A comprehensive review was carried out covering current and existing guidelines, studies, and other related documents being used by various agencies in Qatar, including MOT, Ministry of Municipality, Ashghal, and other agencies concerned with the development process. This involved compilation of the available information, a qualitative comparison of that information against current needs, and the identification of any shortcomings.

Stakeholder input was sought during workshops and through various meetings, during which stakeholders were presented with the scope of the project along with its significance. Their concerns and any issues they may have had regarding the project were listed and considered throughout the course of the project. The aim of the workshops and meeting were to achieve buy-in and wide support for the development of the project, first in the form of obtaining required data and information as necessary, and subsequently, in terms of local adoption of the QTGPRM and GPTS (2022).

Project stakeholders (**Figure 1-1**) included representatives from the Ministry of Municipality (MM), the Public Works Authority (Ashghal), the Ministry of Development Planning and Statistics (MDPS), the Ministry of Education and Higher Education, the Ministry of Health, the National Committee for Traffic Safety, the Ministry of Interior, Qatar Rail, Mowasalat, Qatar University, Qatar Centre for GIS, and representatives from private engineering offices, transportation consultants and real estate developers.



**Figure 1-1: QTGPRM Key Stakeholder Input**

## 1.3 Review of Existing Conditions in the State of Qatar

The Review of Existing Conditions in the State of Qatar documents covers a wide range of relevant factors including climate, built environment, land supply, urban planning, economy, and local travel habits. Travel modal share is especially relevant to trip generation and transportation studies. The report summarizes the main findings and their applicability to the QTGPRM and GPTS (2022). It also provides a detailed commentary on any significant limitations or shortcomings identified.

## 1.4 Assessment of Current Regulations and Policies

It is essential that the QTGPRM and GPTS (2022) be applied in ways that both meet the requirements of MOT and are consistent with national spatial planning and development policies. Therefore, a review of current regulations and policies relevant to MOT land use transport planning practices was undertaken. The Assessment of Current Regulations and Policies report was produced after reviewing existing national policies, municipal plans, and current legislation and regulation in Qatar.

### 1.4.1 *National Policies and Plans*

International best practices in the field of transportation studies and assessments typically support the prevailing policy model adopted at the corresponding administrative level. However, the general trend is toward the adoption of more effective demand management measures, in part stimulated by a need to meet international agreements linked to the United Nations Sustainable Development Goals, and also in response to a broadening of the scope of transportation assessments, typically to reflect environmental impacts. For example, Transport for London (UK) now requires applicants to demonstrate compliance with the London Plan (the spatial structure plan for Greater London) and with low- or zero-emissions zoning and healthy streets policies.

The Qatar National Vision 2030 (QNV 2030) defines the strategic policy direction for the State of Qatar. All guidance, legislation, and regulation relating to the transportation sector must be consistent both with the QNV 2030 and with the elements of the National Strategic Planning Framework that will be instrumental in delivering it.

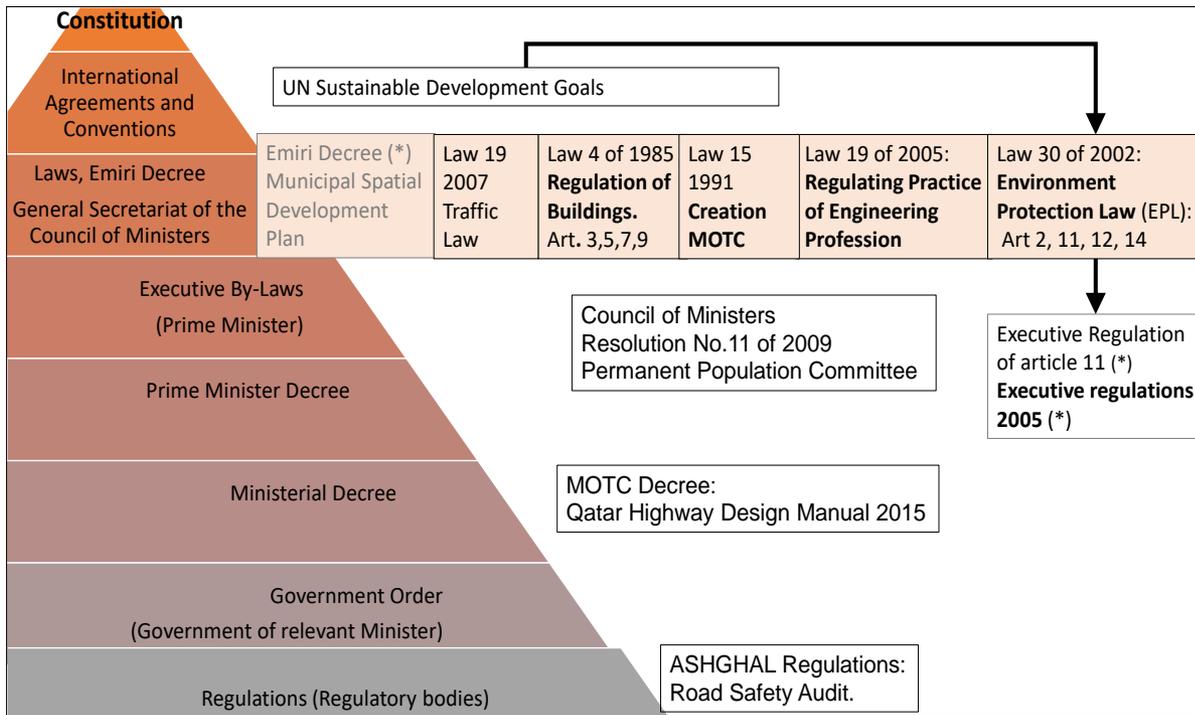
Relevant spatial planning instruments that were reviewed for this report, include:

- The Qatar Second National Development Strategy 2018-2022 (QNDS-2), which identifies around 349 projects and programs grouped under each of the four pillars of QNV 2030.
- The Qatar National Spatial Strategy 2032 (QNSS), which provides a roadmap to direct future investment in Qatar from both the public and the private sectors.
- The Qatar National Master Plan (QNMP), which comprises the Qatar National Development Framework 2032 (QNDF) and Strategic Plans and Projects.
- The Municipal Spatial Development Plans (MSDP), which elaborate upon the QNDF and QNDS-2 at the municipality level and include key documents such as zoning plans, zoning regulations, structure plans, and area action plans to provide consistent direction regarding the appropriate use of individual land parcels by developers and government stakeholders.

Collectively, these documents bridge the gap between national aspirations and local development responses at the individual site level. Some of the spatial planning instruments identify the strategic planning objectives that have a direct bearing on the activities of the MOT-LTPD and imply a need for stronger integration between spatial and transportation planning activities and practices.

### 1.4.2 Current Legal Framework

The report also identifies the main legal instruments currently in place to control spatial and transportation planning in Qatar. Critical gaps in the legal framework and the issues that arise from those gaps are also highlighted. The State of Qatar legislative framework is illustrated in **Figure 1-2**.



Note: (\*) not found on Al Meezan (Qatar Legal Portal)

**Figure 1-2: State of Qatar Legislative Framework**

Current legislation related to the transportation sector in the State of Qatar is summarized in **Table 1-1** and the public bodies responsible for executing that legislation in **Table 1-2**.

**Table 1-1: State of Qatar Legislation Related to Development Control**

Primary Legislation	Focus
<p><b>Law by Decree No. 30 of the Year 2002 Promulgating the Environmental Protection Law (2003).</b>  <b>April 17, 2005 Executive By-Law for the Environmental Protection Law No. 11 of 2000 and Law No. 30 of 2002.</b></p>	<p>Environmental protection and sustainable development. Mandates Environmental Impact Assessments for defined development projects.</p>
<p><b>Law No. 4 of 1985 Organization of Buildings, and its amendments.</b></p>	<p>Building design and construction standards.</p>
<p><b>Resolution of the Minister of Interior No. 6 of 2010 on the Issuance of the Executive Bylaw of the Traffic Law Promulgated by Decree-Law No. 19 of 2007.</b>  <b>Law No. 5 of 2010 Amending Certain Provisions of the Traffic Law as Promulgated by Decree-Law No. 19 of 2007.</b>  <b>Law No. 19 of 2007 Regarding the Traffic Law.</b></p>	<p>Regulates the licensing of vehicles and drivers, driver training, and driving rules.</p>
<p><b>Law No. 10 of 1987 with regard to Public and Private State Property.</b></p>	<p>Defining roads, streets, lanes, and right of way as public property and the associated rights and responsibilities.</p>
<p><b>Emiri Decree No. 4 of 2016.</b></p>	<p>Establishment of Ministry of Transport and Communications (now Ministry of Transport).</p>
<p><b>Qatar Decree Law No. 37 of 2004.</b></p>	<p>Awarding of a 20-year franchise to Mowasalat for operating public bus and taxi services, including school buses, and driver training.</p>
<p><b>Law No. 19 of 2005 Regulating the Practice of Engineering Professions.</b></p>	<p>Establishing a registration council and setting criteria for registration of engineering related professions and consultancy firms.</p>

**Table 1-2: State of Qatar Entities Related to Transportation**

<b>Organization</b>	<b>Main Responsibilities</b>
<b>Ministry of Development Planning and Statistics</b>	Monitoring implementation of QNV 2030.
<b>Ministry of Interior</b>	Through the General Directorate of Traffic responsible for maintaining the smooth operation of the highway network, vehicle and driver licensing and traffic permits, enforcement of traffic law, investigating traffic accidents, and traffic awareness campaigns.
<b>Ministry of Municipality (incl. Urban Planning and Development Authority)</b>	Preparing urban planning policies, managing state properties, allocating lands required for the establishment of government projects, and land expropriation.
<b>Ministry of Transport</b>	Regulating land, maritime and air transport in Qatar. Developing and improving transport services, studying related projects and supervising their implementation. Overseeing and developing the information and communications technology sector.
<b>Public Works Authority (Ashghal)</b>	Planning, studying, implementing, and supervising public works projects. Highway maintenance.
<b>Qatar Railways Company (Qatar Rail)</b>	Designing and establishing Qatar’s railway network.

### 1.4.3 Current MOT Development Control Practices

The following development control activities currently fall within the scope of MOT and, by extension, within the scope of the GPTS (2011):

- Review and approval process for transportation studies arising as a condition of a land use change approval initiated by MM-Urban Planning Division.
- Review and approval process for transportation studies associated with a request for building permit approval.

- Review and approval process for transportation studies associated with large master planned developments.
- Review and approval process of transportation studies triggered by new highway projects or proposed upgrades to existing roads.
- Various in-house assessments conducted to address issues arising from existing public highways or transportation operations within major public facilities.
- Review and approval of transportation studies commissioned to support the design process of the Ashghal Local Roads and Drainage Program.

The allocation of responsibilities for development control in Qatar and the extent to which the findings of transportation studies are legally enforceable remain unclear. There does not appear to be any current legislation that either defines a suitable process for assessing development impacts on the transportation system or that mandates use of GPTS (2011).

In general, the scope of GPTS (2011) was considered too narrow to deliver the objectives of QNV 2030, QNDF, and the QNMP.

#### *1.4.4 Summary of Regulatory Gaps Identified*

The main regulatory gaps identified with respect to the planning, execution, and administration of transportation studies in Qatar are summarized in **Table 1-3**. The third column identifies the main stakeholders involved. Gaps involving other government agencies could only be partly addressed by the QTGPRM project.

**Table 1-3: Synthesis of Main Regulatory Gaps of Relevance to GPTS (2022)**

Gap No.	Issue	Stakeholders
1.	There is inconsistency between the planning regulations that apply across the country.	MM
2.	The role that development control has to play in delivering QNV 2030, QNDF and the QNMP lacks clarity, while the legal authority of MOT’s guidance, GPTS (2022), remains undefined.	MM/MOT
3.	Despite the acknowledged interdependencies between land use development and transportation provision, MOT’s input to the development of land use planning policy and regulations is limited.	MM/MOT/ Ashghal
4.	The current criteria relating to professionals deemed qualified to undertake GPTS-compliant Transportation Studies need to be expanded to reflect the interdisciplinary nature of Transportation Assessments, and to ensure that best practice evolves in line with national policies.	MOT
5.	The criteria for qualifying consultants need to be expanded to recognize relevant experience in the GCC.	MOT
6.	<p>There is a need to embed QNDF strategic planning objectives and policy actions in MOT development control practices, and vice versa, with respect to the following:</p> <ul style="list-style-type: none"> <li>• The promotion of a more sustainable transport system.</li> <li>• Improving travel choice, particularly with respect to public transport and active travel.</li> <li>• Strengthening integration between land uses and travel modes, with an emphasis on promoting compact, mixed-use development.</li> <li>• Encouraging changes in roadway design to assign higher priority to vulnerable road users.</li> <li>• Adopting a comprehensive approach toward parking, including the promotion of effective demand management measures.</li> <li>• Providing for cost sharing arrangements to help fund off-site facilities.</li> </ul>	MM/MOT

### 1.4.5 Recommended Legislative Changes

Upon thorough review of all relevant documents, it is the QTGPRM project recommendation that the authority of the GPTS (2020) be mandated by Ministerial Decree, with the approval of the Council of Ministers. This and several additional resolutions for the identified gaps and issues are summarized in **Table 1-4**.

**Table 1-4: Proposed Resolution of Identified Issues**

Gap No.	Identified Issue	Proposed Resolution
1.	Inconsistent application of planning regulations across Qatar.	Resolution of this issue is outside the scope of the QTGPRM project.
2.	Lack of legal instrument to mandate use of GPTS (2020) or to enforce transportation study findings.	Ministerial (or Emiri) Decree and amendment to Article 12 of the Environmental Protection Law to ensure parity.
3.	Limited scope for MOT to provide feedback on or input to the full gamut of spatial planning activities that impact transportation planning and development control practices.	Raise the status of GPTS (2022) to that of the MSDP Zone Development Control and Design Regulations (as above).
4.	Need to ensure competency of personnel undertaking or approving GPTS-compliant Transportation Studies.	Expand the definitions section in Law No. 19 of 2005, to include Transportation/Transport Engineering/Planning as a recognized branch of engineering practice.
5.	Lack of relevant local experience for qualified personnel.	Make renewal of registration with the Engineering Council conditional upon a minimum residency period.
6.	Need to implement QNFD Policy Actions related to cost sharing.	Include provision within GPTS (2022) for cost sharing.

## 1.5 International Best Practices Literature Review

The International Best Practices Literature Review report documents the significant and exceptional features of several well-respected trip generation and parking demand rates manuals and transportation studies guidelines, and comments on their applicability to the State of Qatar.

A formal ranking mechanism was used to identify the best performing systems. The top-ranked best practices systems are listed in **Table 1-5**.

***Table 1-5: Best Practices Systems Retained after Review***

<b>Country</b>	<b>Document</b>
<b>United States of America</b>	The Institute of Transportation Engineers Manual (ITE). Various reports from the National Cooperative Highway Research Program (NCHRP), which is part of the Transportation Research Board of the National Academies. Specific studies by various State agencies in Arizona, Texas, and California, and the counties of Miami-Dade and Maryland.
<b>United Kingdom</b>	Notably, the Trip Rate Information Computer System (TRICS) complemented by documents from the UK Department for Transport (UK DfT);
<b>Canada</b>	A report from the Ottawa Region and a second report from British Columbia.
<b>United Arab Emirates</b>	Two trip generation manuals, the first from Abu Dhabi and the second from Dubai.
<b>New Zealand</b>	The Transport Database (TDB) system, which is also used in Australia

In addition to the identification of best practices gathered from the higher ranked trip generation and parking demand rates systems, various significant and exceptional best practices were identified, as follows:

1. The Standardized Assessment Methodology (SAM) from TRICS (2018) can monitor and assess the effectiveness of travel plans using established TRICS methods of multi-data

collection supplemented by comprehensive information to produce robust travel plan survey results.

2. Rates may vary over time due to changes in the urban context.
3. Site selection criteria should include the degree of economic success of a given land use.
4. Data collection should be avoided at sites where a shared effect may result due to similar land uses being clustered together (e.g., several neighborhood restaurants).
5. Internal capture is important for multi-use sites. The ITE internal capture method is preferred by all manuals.
6. Trip generation rates can be estimated from origin-destination surveys and potentially blended (combined with) existing site-based rates.
7. The number of sites surveyed should be based on the desired statistical significance for the rates to be estimated from them.
8. Pass-by capture methods are provided in most manuals. Diverted-trip capture methods are often omitted.
9. The impact of proximity to transit on trip rates has been investigated (SANDAG 2010, MPO 2014, TRANS Committee 2009, and CALTRANS 2009), with transit mode share of up to 20 percent observed for individual land uses.
10. Truck trip generation rates for industrial land uses are necessary to enable the quantification of pavement deterioration.
11. Standards can be established to ascertain the possibility of incorporating into the QTGPRM database the results from new surveys done by private consultants as part of their transportation studies.
12. An update of the QTGPRM after 2022 would be beneficial to account for the effect of post-FIFA 2022 developments being completed and the Doha Metro becoming fully operational.

## Review and Assessment of Existing Documents, Literature, and Policies

For the update of the GPTS, various transportation assessments and traffic impact study manuals were reviewed. In addition to best practices, the following significant and exceptional features were identified:

1. The level of detail of transportation assessments varies, but at least two distinct levels are necessary: one for minor developments; and one for larger projects. Some jurisdictions also consider a third, for Development of Regional Impact (DRI), which necessitates inter-disciplinary review by multiple agencies.
2. Definition of the study area typically depends on the area within which a significant increase in travel is expected.
3. The analysis period (time of day) typically matches the peak hour of development trip generation and/or the “peak hour of adjacent street traffic” (see definitions).
4. Although most or all the international best practices documents reviewed do not specify the period for which a transportation study remains valid, it is recommended that the updated GPTS specify that transportation studies shall expire after, two or three years from the approval date of the transportation study.
5. Post-development monitoring is strongly recommended both to confirm that the development size and impacts are consistent with those reported in the transportation study and to verify the effectiveness of any mitigation measures and improvements carried out for that site.
6. Cumulative impacts need to be considered when various developments are being planned/constructed at the same time.
7. A procedure for assessing multi-modal (rather than merely motorized vehicle) impacts must be established.

# Stage 2

## Data Collection and Surveys

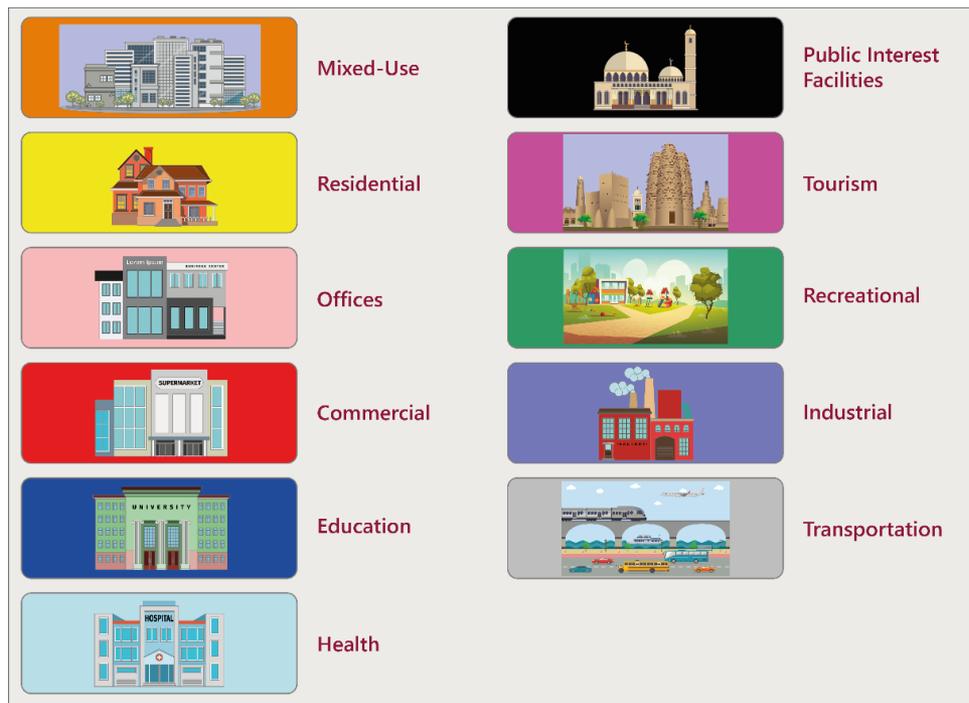


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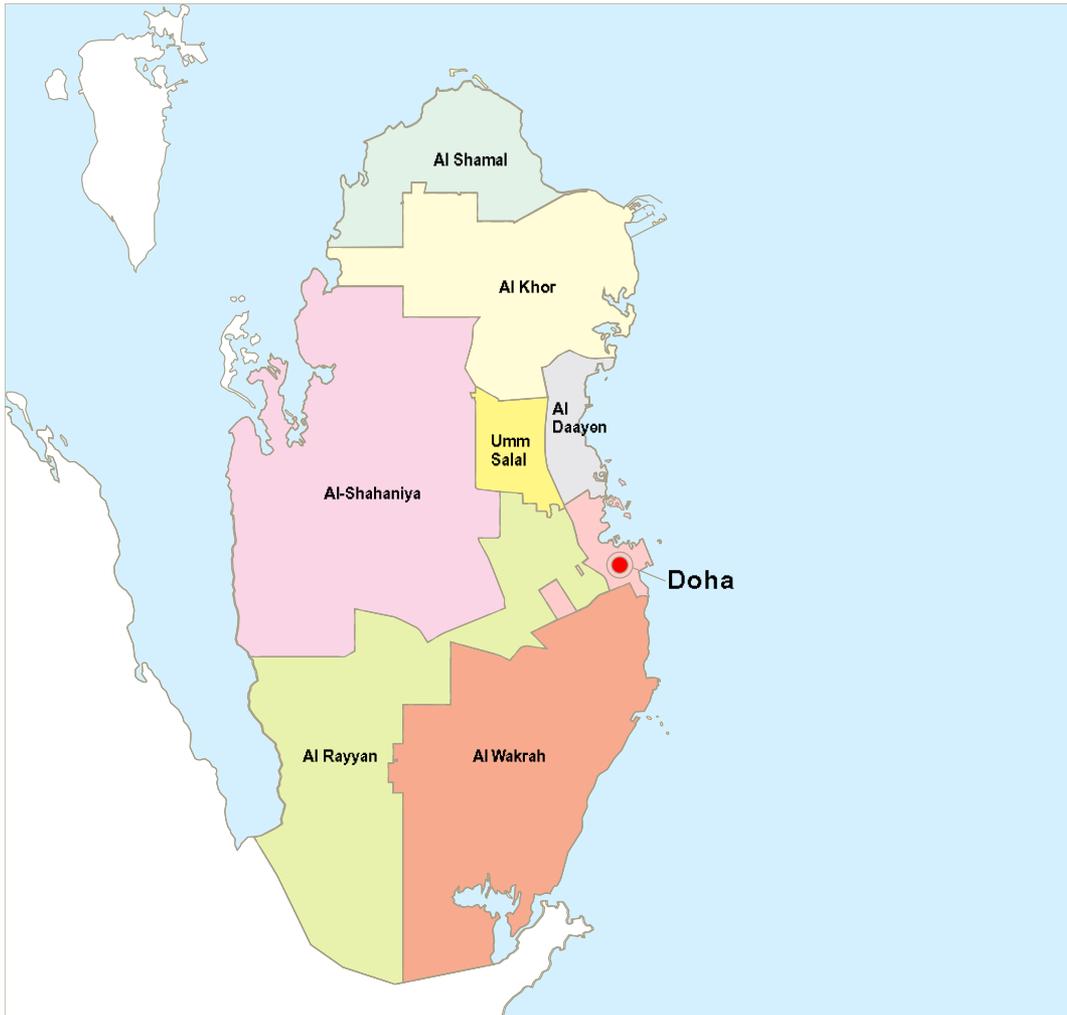
# Stage 2 Data Collection and Surveys

## 2.1 Overview

The data collection stage of the QTGPRM project was undertaken for 11 land use groups and six geographic regions, as shown in **Figure 2-1** and **Figure 2-2**, respectively.



**Figure 2-1: QTGPRM Land Use Groups**



***Figure 2-2: Survey Regions Adopted for the QTGPRM***

Five main types of survey were conducted, as presented in **Figure 2-3** below.



***Figure 2-3: Main Survey Types Used for QTGPRM***

The surveys were generally conducted during 'neutral' weekdays (Monday, Tuesday, or Wednesday) and weekends (Friday or Saturday or both). For the relatively small number of sites not operating on specific weekdays, the survey schedules were adjusted accordingly.

## Data Collection and Surveys

Holiday and typical vacation periods were avoided. Any road closures or diversions in place at the time of survey were identified and investigated to ensure that all intersections were fully open prior to beginning any survey.

Surveys were generally scheduled to cover the entire operating period for a site, provided they were scheduled within the QTGPRM survey window of 06:00 to 22:00. Although educational establishments typically operate between 06:00 and 14:00, the defined survey interval for these sites was 06:00 to 18:00 to ensure that any extracurricular activities were also captured.

For land use classes such as malls, wedding halls, and a small number of apartment buildings, surveys were extended beyond 22:00, as necessary, to ensure that the majority of visitors leaving the site could be counted.

The health and safety of survey staff were of paramount importance during all survey work.

## 2.2 Survey Workbook

The 'Survey Workbook' is a spreadsheet template developed to record all data collected on site. It contains the observed data for all the survey components for each site, each component typically being recorded in a separate worksheet, as detailed in **Table 2-1**.

After the data were processed and cleaned, an automated analysis process to adjust/uplift the final trip counts was applied. As the Survey Workbooks are also used in the Stage 3 data analysis and rate estimation process, consistency was crucial.

**Table 2-1: Workbook Template**

No.	Worksheet Title	Worksheet Data Information
1	General information	Includes the site identification details, LUC code, any additional comments recorded for the site, and the site location map.
2	Land Use Information	Includes details of all the land use data collected for the site including LUC, site code, locations, independent variables such as GFA, GLA where relevant, building occupancy, parking supply on-site and in adjacent areas, accessibility to public transport, number of employees, loading bays, operational hours, and other information pertinent to the land use type such as number of beds for hospitals, number of students for educational land uses, and number of residential units within apartment blocks.
3	Overview	This tab/worksheet includes a site layout plan showing all the vehicle and pedestrian accesses that were surveyed, along with site boundary, building boundaries, dedicated parking areas, and urban plot boundary.
4	Vehicles access diagram	This tab includes a more detailed site layout plan indicating all the vehicle accesses, plus entry and exit directions, camera locations, and sample camera snapshots.
5	Vehicles access data	Entry and exit totals by vehicle class and site accesses, recorded at 15-minute intervals followed by 15-minute accumulations.
6	Vehicles access charts	Accumulation graphs for individual vehicle classes (cars/taxis, buses, light goods vehicles, heavy goods vehicles) and total vehicles.
7	Vehicles drop off data:	Count data for observed pick up/drop off trips.

*(Continued on the next page)*

**Table 2-1: Workbook Template (Continued)**

<b>No.</b>	<b>Worksheet Title</b>	<b>Worksheet Data Information</b>
<b>8</b>	Vehicles drop off charts	Accumulation graphs for pick up/drop off trips.
<b>9</b>	Visitor access diagram	This tab includes a site layout plan showing all the pedestrian accesses with entry and exit directions, camera locations, and sample camera snapshots.
<b>10</b>	Visitor access data	Entry and exit totals for pedestrians entering and leaving the site followed by 15-minute accumulations (the basis for the graphs on the sheet following it).
<b>11</b>	Visitor access charts	Accumulation graph for pedestrians.
<b>12</b>	Visitor interview data	Visitor interview data.
<b>13</b>	Visitor interview tables	Summary tables for the interview data.
<b>14</b>	Visitor interview charts	Summary graphs/charts for the interview data.
<b>15</b>	Vehicle occupancy	This sheet is only present for sites where vehicle occupancy surveys were conducted.

## 2.3 Survey Statistics

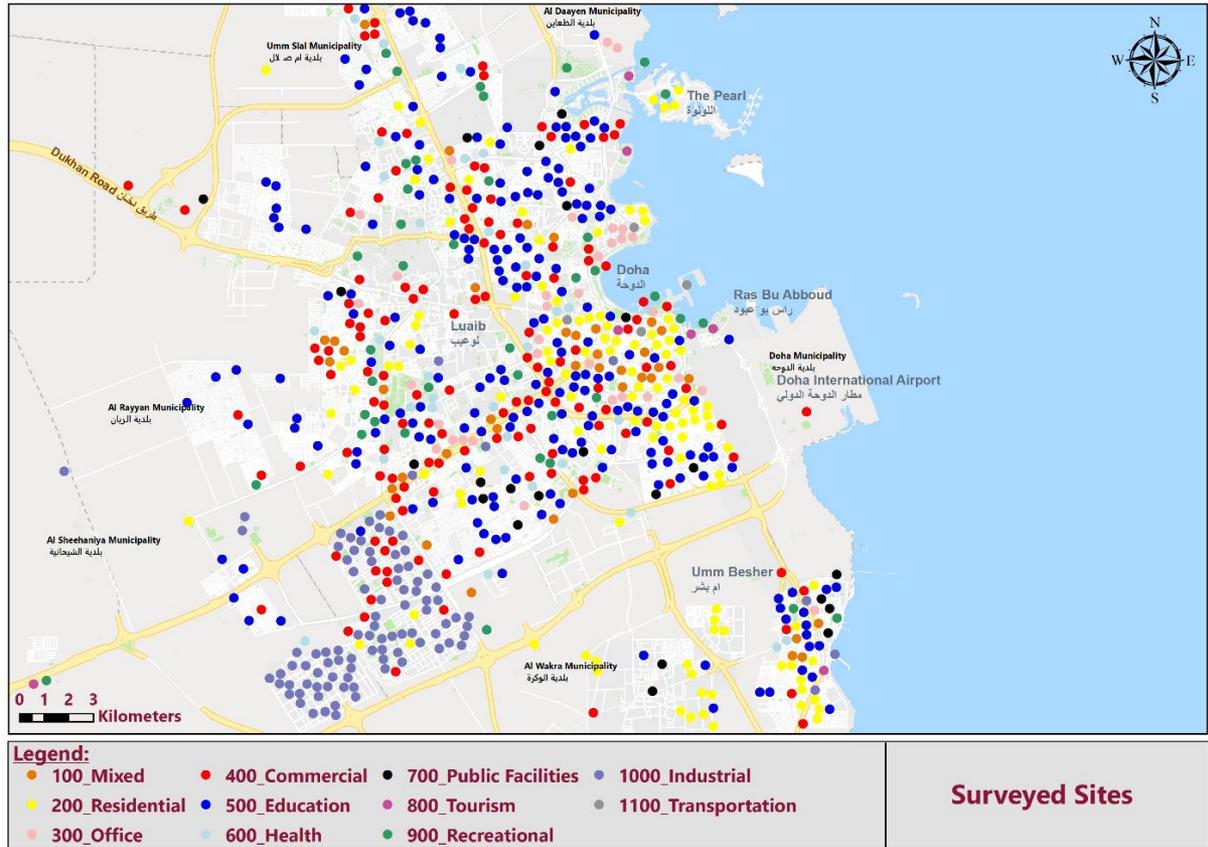
More than 5,000 sites were assessed for their suitability to host land use data collection surveys. Of those potential sites, access counts and person intercept interviews were attempted at approximately 1,830 sites. From those the data collected at a total of 1,728 sites was retained to be used for the trip generation and parking demand rate estimation process. **Figure 2-4** shows the location of sites surveyed in and around Doha.

The number of valid sites completed, by study region and Land Use Group, is shown in **Table 2-2**. The breakdown of all land use surveys completed (weekday and weekend combined) by Land Use Group is shown in **Table 2-3**.

**Table 2-2: Number of Sites Surveyed by Land Use Group and Survey Region**

Region	Land Use Group											
	Mixed-Use	Residential	Office	Commercial	Education	Health	Religious	Tourism	Recreational	Industrial	Transportation	Total
<b>Doha - CBD</b>	8	75	32	51	4	3	10	35	10	0	2	<b>230</b>
<b>Doha - Non-CBD</b>	22	31	19	181	104	28	22	2	41	173	0	<b>623</b>
<b>Doha - Outer CBD</b>	13	101	41	190	103	40	24	22	39	1	1	<b>575</b>
<b>Al Khor</b>	12	20	5	27	17	4	6	1	5	1	0	<b>98</b>
<b>Al Wakra</b>	6	26	4	34	20	3	10	2	3	0	0	<b>108</b>
<b>Rest of Qatar</b>	1	3	3	17	29	7	10	2	15	6	1	<b>94</b>
<b>Total, All Regions</b>	<b>62</b>	<b>256</b>	<b>104</b>	<b>500</b>	<b>277</b>	<b>85</b>	<b>82</b>	<b>64</b>	<b>113</b>	<b>181</b>	<b>4</b>	<b>1,728</b>

## Data Collection and Surveys



**Figure 2-4: Sample of Sites Surveyed in and around Doha**

**Table 2-3: Number of Surveys Used for Rates Estimation (Weekday & Weekend)**

	<b>Group</b>	<b>Number of Surveys</b>
<b>1.</b>	Mixed-Use	103
<b>2.</b>	Residential	314
<b>3.</b>	Offices	107
<b>4.</b>	Commercial	966
<b>5.</b>	Education	284
<b>6.</b>	Health	154
<b>7.</b>	Religious Facilities	122
<b>8.</b>	Tourism	118
<b>9.</b>	Recreational	182
<b>10.</b>	Industrial	183
<b>11.</b>	Transportation	5
	Total	2,538



# Stage 3

Existing Conditions, Surveys, and  
Data Analysis



# Stage 3 Existing Conditions, Surveys, and Data Analysis

## 3.1 Overview

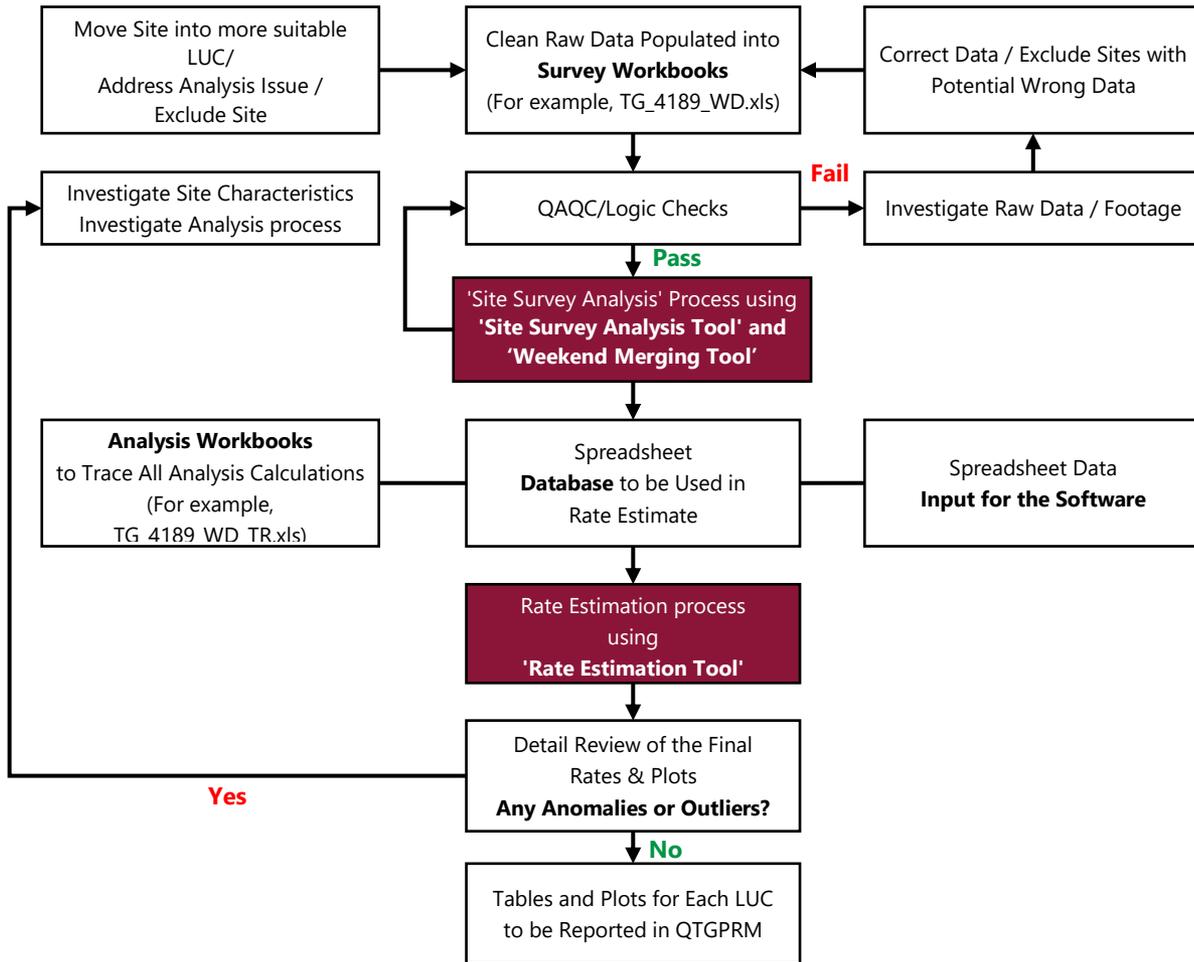
The data collected at 1,728 survey sites over a total accumulating to 2,538 survey days (including weekday, weekend, and event day surveys) were compiled into individual workbooks and then analyzed, as outlined in the following section.

## 3.2 Site Analysis and Rate Estimation Tools

An iterative process was used to analyze the data, create a trip generation and parking demand rate database, and to produce the rate tables and graphs for the QTGPRM project manual and software. Some of the steps in the process were automated using macro scripts stored in two sets of spreadsheets referred to as the 'Site Survey Analysis Tool', 'Weekend Merging Tool' and the 'Rate Estimation Tool'. The process is illustrated in **Figure 3-1**. Note that the 'Rate Estimation Tool' can be used to examine individual Land Use Classes, and to interactively include or exclude a specific site or sites to determine their impact on the rates. To permanently remove a site, that site must be manually excluded from the analysis process or from the database. The process adopted in the trip generation and parking demand rate estimation process and the template/structure of the estimation tool are described in detail in Site Survey Analysis Report.

The final step of the process, production of the tables and graphs for each land use class, is described in the next chapter, which covers Stage 4.

**Existing Conditions, Surveys, and Data Analysis**



**Figure 3-1: QTPRM Rate Estimation Process**

# Stage 4

Trip Generation and Parking  
Demand Rates



# Stage 4 Trip Generation and Parking Demand Rates

## 4.1 Development of Trip Generation and Parking Rates

Vehicle-trip and person-trip trip generation rate calculations were undertaken for the AM, MD, and PM peak hours. Each peak hour occurs within a predetermined peak period. For example, the AM peak hour is identified as the four consecutive 15-minute periods with the greatest total volume during the three hours between 06:00 and 09:00. Similarly for the MD peak period, which falls between 12:00 and 15:00, and the PM peak period which is between 16:00 and 19:00. Although peak hours can vary by geographic location, ATC counts have shown them to remain very stable across Qatar. These peak hours are known as the peak hours of adjacent street traffic.

In addition to the three peak hours of adjacent street traffic, the process defines the peak hour of the generator (PHG) for each individual land use class. The peak hour of the generator for a specific land use class may or may not coincide with the peak hour of adjacent street traffic.

For each Land Use Class, a weighted average trip generation rate is determined. For some classes, it is also statistically defensible to identify a best-fit equation. An equivalent approach was used to develop the parking demand rates, with the exception that parking demand rates are for the maximum parking accumulation during the day rather than for specific time intervals.

A set of tables and graphs summarizing the rates, equations, and statistics obtained for each Land Use Class is then produced. Examples tables and graphs from the manual are reproduced in **Figure 4-1** and **Figure 4-2**.

## Trip Generation and Parking Demand Rates

**Apartment Building - 3 Bedrooms or more  
(Outer/Non-CBD/Other)**  
per Unit

Land Use Class	02107
Land Use Category	02100
Land Use Group	02000

A residential building located within the outer CBD, beyond the CBD or within a regional area of Qatar. The building has a minimum of 3 floors offering apartments comprising of 3 or more bedroom units.

### WEEKDAY

Number of Sites Surveyed: 14

Independent Variable Range: 6.00 to 74.25 (Unit)

Person Trip Rates				
per Unit				
Peak Hour	AM	MD	PM	PHG
Wgt. Avg. Rate	1.63	1.64	2.01	2.40
Inbound %	15	60	54	52
Outbound %	85	40	46	48

Percentage Mode Share				
Peak Hour	AM	MD	PM	PHG
Car	62.8%	68.1%	48.4%	47.5%
Taxi	9.9%	7.4%	13.2%	12.5%
PT/Bus	2.9%	1.8%	1.0%	0.5%
Company/School Bus	15.1%	13.8%	23.5%	26.4%
Cycle	0.9%	2.0%	1.4%	1.1%
Walk	7.9%	6.2%	11.6%	10.9%
Other Vehicles	0.5%	0.7%	0.8%	1.2%

Vehicle Trip Rates				
per Unit				
Peak Hour	AM	MD	PM	PHG
Wgt. Avg. Rate	0.56	0.65	0.41	0.81
Inbound %	18	68	56	57
Outbound %	82	32	44	43

Percentage Vehicle Split				
Peak Hour	AM	MD	PM	PHG
Bus	2.0%	1.4%	0.4%	0.0%
Car/Taxi	89.4%	94.3%	92.7%	96.1%
LGV	8.6%	4.3%	6.9%	3.9%
HGV	0.0%	0.0%	0.0%	0.0%

Peak Parking Space Demand	
per Unit	
Cars	1.16
LGV	0.05
HGV	0.00
Buses	0.01

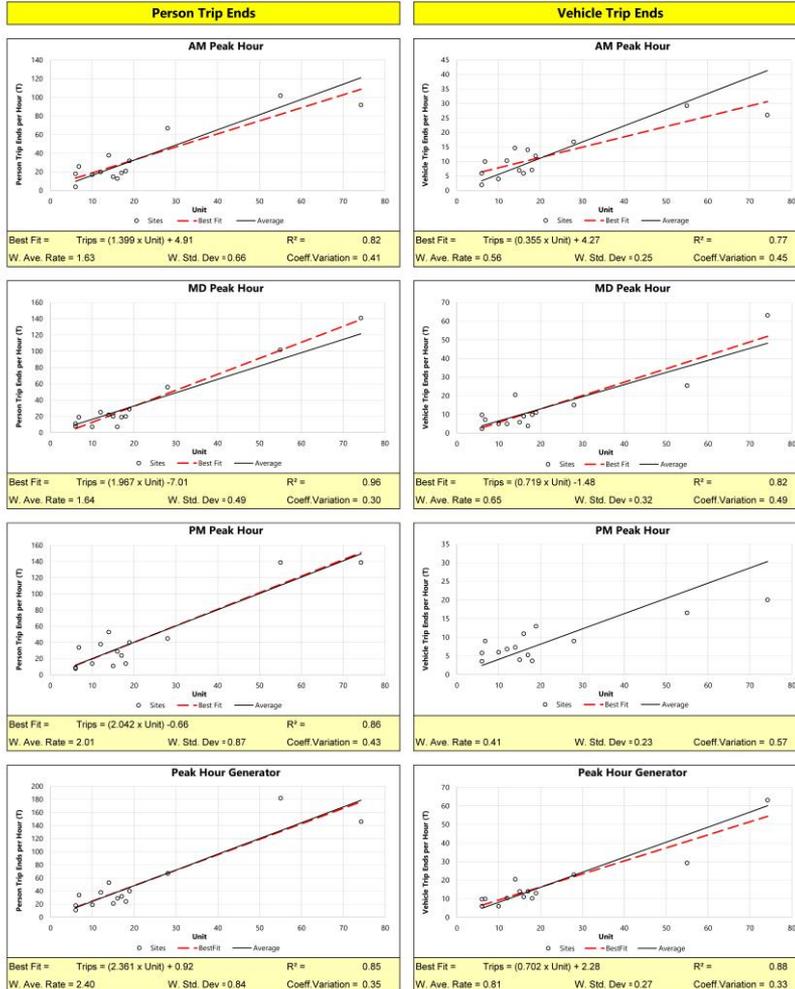
**Figure 4-1: Example Trip Generation and Parking Demand Rates from QTGPRM**

## Trip Generation and Parking Demand Rates

**Apartment Building - 3 Bedrooms or more  
(Outer/Non-CBD/Other)**  
per Unit

Land Use Class	<b>02107</b>
Land Use Category	<b>02100</b>
Land Use Group	<b>02000</b>

**WEEKDAY**

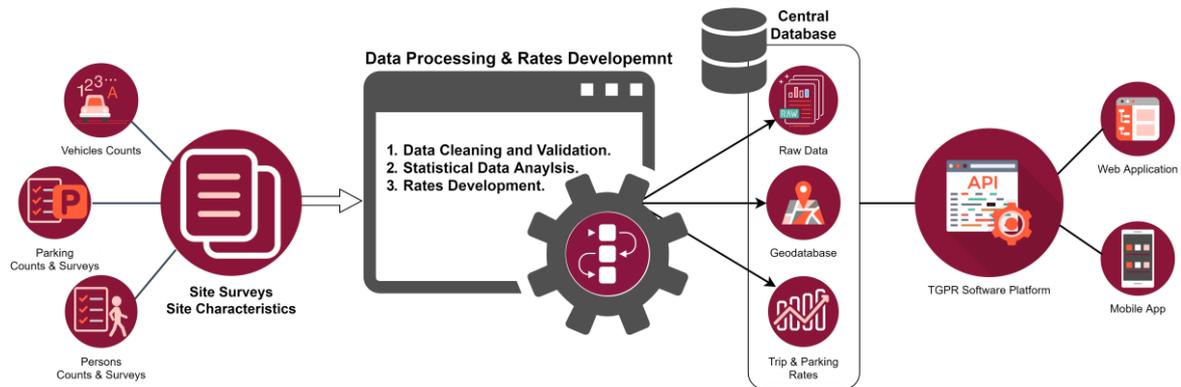


**Figure 4-2: Example Scatter Plots from QTGPRM**

## 4.2 QTGPRM Software Development

The software user interface was specifically designed to help the user in the process of estimating trip generation and parking demand.

The Qatar Trip Generation and Parking Rates Software (QTGPRS) uses the database developed in Stage, as illustrated in **Figure 4-3**. In response to the land use information entered by the user the QTGPRS displays the relevant trip generation and parking demand rates for each time interval and uses them to estimate the trip generation and parking demand for the development site in question.

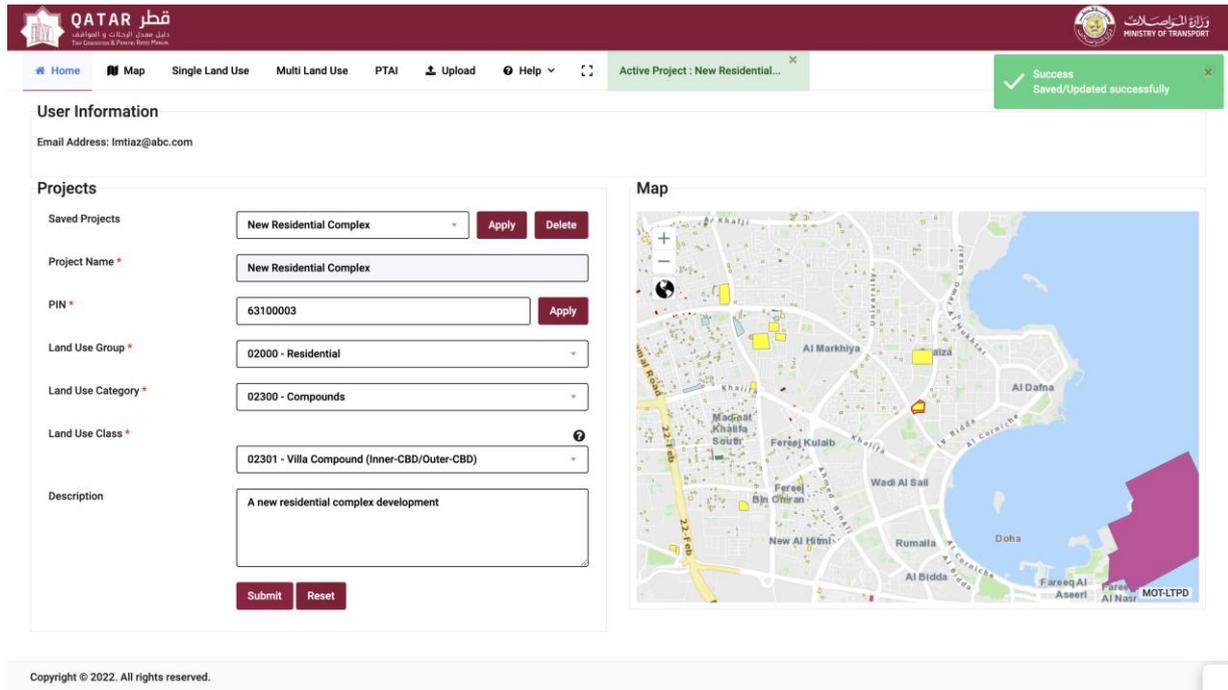


**Figure 4-3: QTGPRS Data Flow and Conceptual System Structure**

The software was developed as a web application so that it can be used from anywhere with internet access and without the need to install specialist software or to alter any settings on the user's machine.

Access to the QTGPRS is controlled by an access management module, which requires the user to be registered and have a login credential to access the software. The user registration process is embedded within the software and allows new users to register and request access.

**Figure 4-4** shows a sample screenshot from the QTGPRS.



**Figure 4-4: Sample Screenshot from the QTGPRS**



Executive Summary

# Stage 5

Trip Generation and Parking  
Demand Rates



# Stage 5 The Manual and Guidelines

## 5.1 Overview

The primary objectives of the QTGPRM project were to develop a Trip Generation and Parking Rates Manual and to update the Guidelines and Procedures for Transportation Studies based on international best practices and reflecting local data and conditions, to establish regulations and legislation concerning transportation studies, and to unify transportation study practices in Qatar through the adoption of locally derived trip generation and parking demand rates.

## 5.2 Trip Generation and Parking Rates Manual

### 5.2.1 Overview

The Qatar Trip Generation and Parking Rates Manual (QTGPRM) documents trip generation and parking demand rates derived from local data collected in the State of Qatar. It is divided into three volumes. Volume 1 is the QTGPRM user manual. Volume 2 contains the printed trip generation and parking demand rate tables and graphs. Volume 3 is the QTGPRS guide.

Government agency and private sector developers, consultants, planners, and traffic engineers are encouraged to use the QTGPRM and its associated documents to facilitate the planning, design, management, and review of transportation infrastructure and land development projects.

Estimating the trip generation and parking demand for a development project is detailed in QTGPRM Volume 1. It involves the eight steps summarized in **Table 5-1**.

**Table 5-1: Steps to Estimate Trip Generation and Parking Demand**

Step Number	Action
1. <b>Select Land Use Class</b> (Refer to Section 3.1)	Match development site land use(s) to the most suitable Land Use Class. If a suitable match is not found, consult with MOT.
2. <b>Check for Regional Variation</b> (Refer to Section 3.2)	If regional rates are available, use the Land Use Class appropriate to the region in which the site is located. If the site appears to be close to one of the regional boundaries, discuss with MOT.
3. <b>Select Appropriate Independent Variable</b> (Refer to Section 3.3)	Determine the independent variable to be used. If the desired independent variable is not found or if an alternative independent variable is desired, consult with MOT.
4. <b>Check Reported Range</b> (Refer to Section 3.4)	Check that the size of the proposed development falls within the size range of the survey sites on which the trip generation and parking demand rates have been based. If it falls outside that range consult with MOT.
5. <b>Select Analysis Periods</b> (Refer to Section 3.5)	The analysis periods for which trip generation and parking demand are to be estimated should be agreed with MOT in advance.
6. <b>Apply Rates</b> (Refer to Section 3.6)	Apply the reported trip generation and parking demand rates to the study site size using appropriate development units of measurement (e.g., 100 m <sup>2</sup> GFA, number of employees, number of residential units, etc.).
7. <b>Apply Vehicle Class and Directional Splits</b> (Refer to Section 3.7)	Disaggregate the peak hour trip generation estimates by vehicle class and travel direction using the percentages appropriate to the reporting day and analysis period of the trip generation rates used.
8. <b>Report Rates and Estimates</b> (Refer to Section 3.8)	Compile the trip generation (including person-trip, vehicle-trip, vehicle class split, and directional split) and parking demand estimates and submit them to MOT for review and approval.

### 5.2.2 Internal Capture and Pass-by Capture Adjustments

The QTGPRM includes mechanisms for adjusting the estimated trip generation to account for either internal capture or pass-by capture. An internal capture adjustment might be appropriate when there are site-generated trips between different land uses within the same study site. A pass-by capture adjustment might be appropriate when there are motorists driving past a study site *en route* to their primary destination (i.e., trips where the study site is not the primary destination).

For developments containing a mix of complementary land uses, it is likely that some trips will be made entirely within the development boundaries (e.g., from office uses to commercial uses, or from commercial uses to residential uses). To avoid overestimating the potential impact of such developments on the surrounding road network, it is important that any internally captured trips be accounted for and removed from the peak hour estimates before they are used in a transportation study. An illustration of internally captured trips is provided in **Figure 5-1**.

While an estimate of all study site inbound and outbound vehicle-trips is required to assess the suitability of the proposed site access connections, not all traffic using the site access connections will necessarily be new traffic on the adjacent roadway network. For some types of development (convenience stores, fast food outlets, drive-through restaurants, etc.) site traffic is likely to include vehicles *en route* to another destination. Such businesses will typically be sited to take advantage of such passing traffic. As such, those trips would be made regardless of whether the study site existed, and are not new to the surrounding roadway network.

For developments that meet the criteria outlined in the QTGPRM, MOT may allow an adjustment to the estimated external vehicle-trip trip generation. Pass-by capture adjustments are not applicable to study site parking demand estimates and are not applicable when assessing the operational performance of proposed site access connections.



**Figure 5-1: Illustration of Internal Trip Capture**

### 5.2.3 *Future Database Additions*

As Qatar continues to grow, and as transportation studies arise in relation to land uses not contemplated in the first edition of the QTGPRM, there will be a need to update the trip generation and parking demand database. Volume 1 of the QTGPRM includes important advice on data collection, data post-processing (data cleaning, transformation, expansion, etc.), suitable statistical techniques for developing trip generation and parking demand rates, and the formats to be used in uploading new data to the QTGPRM database.

## 5.3 Guidelines and Procedures for Transportation Studies (2022)

### 5.3.1 *Types of Transportation Study*

GPTS (2022) requires all applicants for projects expected to impact the transportation system within the State of Qatar to submit a transportation study prepared by a suitably qualified consultant. Each transportation study is required to be conducted at a level of detail consistent with the scale and complexity of the project concerned. Four types of transportation study are recognized:

**Areawide Transportation Study (ATS).** An ATS is required in support of land use developments that require planning approval/building permits and that are estimated to generate more than 300 vehicle trip ends per hour during the peak hour of the generator.

**Detailed Transportation Study (DTS).** A DTS is required in support of land use developments that require planning approval/building permits and that are estimated to generate at least 100 but not more than 300 vehicle trip ends per hour during the peak hour of the generator.

**Limited Transportation Study (LTS).** An LTS is required in support of land use developments that require planning approval/building permits and that are estimated to generate fewer than

100 vehicle trip ends per hour during the peak hour of the generator.

**Special Transportation Study (STS).** Any transportation study commissioned by or submitted to MOT, that is not classified as an ATS, DTS, or LTS, but that has a distinct transportation element (e.g., campus circulation, public transport, etc.), a defined transportation policy objective (e.g., demand management, impact fees, etc.), or that is part of a design study for large-scale transportation infrastructure, shall be referred to as an STS.

### *5.3.2 Transportation Study Validity*

GPTS (2022) stipulates that any transportation study not completed within one year may be subject to modification of the agreed scope and methodology, including the possible need to revise and resubmit previously approved deliverables. Completed transportation studies remain valid for a period of one calendar year, after which the approval shall lapse. The GPTS does, however, provide a mechanism by which MOT may grant an extension.

### *5.3.3 Certificate of Compliance*

The GPTS stipulates that MOT transportation study approvals shall include a condition stating that no public utility company within the State of Qatar (e.g., water, energy, sewage, garbage, telecommunications, or other) shall provide a permanent hook-up of services to any development/establishment that has not received an MOT Required Transportation Mitigation Certificate of Compliance (RTMCC). MOT may issue an RTMCC for proposed development or transportation projects that have demonstrated compliance with the GPTS, including the demonstration of payment or a guarantee to pay the computed transportation impact fee (see sub-section 5.3.4 below).

#### *5.3.4 Transportation Impact Fee*

The GPTS includes provisions for identifying and charging developer contributions toward the cost of off-site transport infrastructure, public transport, and community car parking facilities, as recommended by the Qatar National Development Framework Policy Action. All such transportation impact fees shall be directly proportional to the demand placed on the transportation system by the development. The transportation impact fee shall be held in escrow until the required off-site mitigation measures have been constructed and are operational, at which time the transportation impact fee funds may be used by the State of Qatar at its sole discretion. Refer to the GPTS for additional details.

#### *5.3.5 Site Travel Plan*

The GPTS requires that a site travel plan be prepared for every transportation study classified as an ATS. The site travel plan shall be legally binding on the original developer and on the developer's successors or assignees. Enforcement of the site travel plan may, at MOT's discretion, involve the imposition of incentives and/or disincentives. The site travel plan shall include post-opening monitoring of site travel plan progress and achievement and may include a mechanism for periodically adjusting the site travel plan targets. All targets included in the site travel plan shall be related to the transportation system elements documented in the transportation study report. Post-monitoring shall occur over a period of no less than three calendar years during which annual reviews shall be undertaken based on the approved site travel plan. Refer to the GPTS for additional details.







وزارة المواصلات  
MINISTRY OF TRANSPORT

ص.ب. 24455  
الدوحة، قطر  
T +974 4045 1111  
mot.gov.qa