QATAR قطر
دليل معدل الرحلات و المواقف
TRIP GENERATION & PARKING RATES MANUAL

وزارة المواصلات
MINISTRY OF TRANSPORT

دليل معدل الرحلات والمواقف في دولة قطر

QTGPRM

QATAR TRIP GENERATION & PARKING RATES MANUAL

SOFTWARE USER GUIDE 2022

Volume 3

VOLUME 3
SOFTWARE
USER GUIDE

Disclaimer

The Ministry of Transport (MOT) of Qatar has developed this document with utmost due diligence, using information, statistics, and survey data available at the time of writing and following international best practices.

Without any liability to MOT, the using of content contained herein and its supplementary data, for any work purpose, does not relieve the user from exercising due diligence and sound engineering judgment per international best practices, nor does it entitle the user to claim or receive any kind of compensation for damages or losses that might be attributed to such use.

Access to this document shall be officially requested from MOT and such request shall indicate acceptance of this Disclaimer. Except where otherwise specified, users may view, copy, and print the Document Contents only for their own use, provided that all copies and printouts of the Contents bear the copyright and other proprietary notices and disclaimers displayed on the Document. Users shall not advertise, publicize, release statements, and/or disclose any information included in this Document whatsoever without the prior written consent from MOT.

Future changes, amendments, and versions of this document will be made available by MOT and can be obtained by contacting the department authorized by the Ministry. Users are therefore advised to investigate and verify that they have the most current version.

Note: New findings, technologies, and topics related to the planning, designing, operating, and maintaining of transportation and traffic systems will be regularly used by MOT to update this document. Users are encouraged to provide feedback through MOT communication channels. Feedback will be reviewed, assessed, and possibly included in the next version.

Copyright © 2022. All rights reserved.

تنويه

قامت وزارة المواصلات بإعداد هذا التقرير ضمن اختصاصها وصلاحيتها وفقاً لأحدث الممارسات العالمية في هذا المجال وبناءً على المعلومات، والإحصائيات والبيانات المتوفرة عند إعداد هذا التقرير. لذا إن استخدام هذا التقرير لأي عمل، لا يعفي المستخدمين من استخدام أحدث الممارسات العالمية، وإتباع الأساليب الهندسية الصحيحة والمتبعة وفقاً لأحدث التقنيات العالمية المتبعة.

وعليه وجب التأكيد على أن وزارة المواصلات لا تتحمل أي مسؤولية مالية أو قانونية يمكن أن تُعزى إلى هذا الاستخدام، كما أنه لا يحق للمستخدمين المطالبة أو استلام أي نوع من التعويض عن أية أضرار أو خسائر.

وللحصول على نسخة من هذا التقرير، يجب التقدم بطلب رسمي إلى وزارة المواصلات في دولة قطر والذي يعد موافقة على ماورد في هذا التنويه. ويجوز للمستخدمين عرض محتويات التقرير ونسخها وطباعتها للاستخدام الخاص فقط، شريطة أن تحمل جميع النسخ والمطبوعات الخاصة بالمحتويات حقوق النشر وإشعارات الملكية وإخلاء المسؤولية الأخرى المعروضة على التقرير. كما لا يجوز للمستخدمين الإعلان أو النشر أو الإفصاح عن البيانات و / أو الكشف عن أي معلومات مدرجة في هذا التقرير على الإطلاق دون موافقة كتابية مسبقة من قبل وزارة المواصلات.

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 المُستجدة 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.

حقوق النشر © 2022. كل الحقوق محفوظة.

Forward

Land transportation is one of the key sectors that helps improve all aspects of life and ensures the delivery of goods and services to individuals and communities. It also underpins the growth of other sectors, such as energy, industry, mining, agriculture, and trade and drives the sustainable development of cities, societies, and the economy in step with the objectives of the Qatar National Vision 2030. It is with this understanding that the Ministry of Transport (MOT) issues this milestone, first edition Qatar Trip Generation and Parking Rates Manual (QTGPRM), Volumes 1–3.

The QTGPRM presents trip generation and parking demand rates derived from data collected in Qatar—a combined total of over 7,000 site and vehicle surveys, interviews, and traffic counts. Intended for government professionals, developers, private consultants, and researchers, the QTGPRM should be used in conjunction with the Guidelines and Procedures for Transportation Studies (GPTS), which outlines when and how the trip generation and parking demand rates published in QTGPRM should be used. Locally derived trip generation and parking demand rates, together with clear usage guidelines, will help decision makers, developers, and engineers plan and deliver a more sustainable transport system.

For each of 132 land use classes, QTGPRM documents the derived trip generation rates for persons and for vehicles, for each of four peak hours. The person-trip mode-split is estimated for car, taxi, public transit/bus, company/school bus, bicycle, walking, and other. The vehicle-trip mode-split is estimated for bus, car/taxi, light goods vehicle, and heavy goods vehicle. Peak parking space demand rates for cars, light goods vehicles, heavy goods vehicles, and buses are documented.

The QTGPRM also provides a mechanism for adjusting the estimated trip generation, in some cases, to account for trips made between different land uses on the same study site (internal capture) and to account for motorists accessing a study site en route to their primary destination (pass-by capture). A companion web-based software application has also been developed to allow the users to access QTGPRM online.

MOT encourages everyone to familiarize themself with the QTGPRM and stresses its commitment to continuously improving programs to deliver a land transportation system that satisfies the pillars of the Qatar National Vision 2030, which strives to place Qatar at the forefront of the most advanced nations, under the leadership of the Emir of Qatar, His Highness Sheikh Tamim Bin Hamad Al Thani.

مقدمة

Contents

Abbreviations ..... **v**

Chapter 1 Introduction **1**

1.1 What is the Qatar Trip Generation & Parking Rates Software? 1

1.2 QTGPRs Main Interface 1

1.3 Functionalities within the QTGPRS 2

Chapter 2 System Login and Project Information **7**

2.1 MOT system login 7

2.2 Project Information 9

2.2.1 Accessing a Previously Saved Project *12*

2.3 Finding the PIN 13

Chapter 3 Map Portal **17**

3.1 Land Use Layers 17

3.1.1 Accessing the "MCC" layer *19*

3.1.2 Accessing the "ATC" layer *20*

3.1.3 Accessing the "Sites" *22*

3.1.4 Accessing the "QTGPRM Region" layer *24*

3.1.5 Accessing the "Qatar National Master Plan" layer *25*

3.1.6 Accessing the "MM Land Use Classification" layer *27*

3.2 Map Search 29

3.3 Selection of a Parcel of Land 29

3.4 Map Print Tool 32

Chapter 4 Land Use Search Tool **37**

4.1 General Search 37

4.2 Searching by Land Use Code 38

4.3 Displaying the Land Use Definition 39

Chapter 5 Single Land Use Menu **43**

5.1 Steps to obtain trip generation rates 43

5.2 Vehicle Trip and Parking Demand 46

5.3 Pass By Trip 47

5.4 Person Trip 48

5.5 Mode Split 49

5.6 Truck Trip 50

5.7 Daily Profile 51

5.8 Scatter Plot 52

5.9 Multiple independent variables 53

Chapter 6 Multi Land Use Menu **57**

6.1 Populating the Multi Land use Table 57

6.2 Daily Profiles 58

6.3 Internal Capture 59

Chapter 7 PTAI and Peak Time Estimation 63
7.1 Public Transport Accessibility Index (PTAI) 63
7.2 Estimation of Peak Times 64
Chapter 8 Help and other functions 67
8.1 Help 67
8.2 Print Report 68
8.3 Export to Spreadsheet 70
8.4 Upload 71

Figures

Figure 1-1: QTGPRS Main Interface 2
Figure 1-2: Functionalities within the QTGPRM software 3
Figure 2-1: Login Page 7
Figure 2-2: MOT Applications Page 8
Figure 2-3: Disclaimer Pop-up Window 9
Figure 2-4: Project Information 10
Figure 2-5: Confirmation of "Success Saved/Updated Successfully" 11
Figure 2-6: Confirmation of 'Active' Saved Project 11
Figure 2-7: Project Information Pop-up 12
Figure 2-8: Finding the PIN 13
Figure 3-1: Map Portal 17
Figure 3-2: Map Layers 18
Figure 3-3: MCC Visualizer - Layer 19
Figure 3-4: MCC Visualizer - Legend 20
Figure 3-5: ATC Visualizer – Layer 21
Figure 3-6: ATC Visualizer – Legend 21
Figure 3-7: Surveyed Sites – Layer 22
Figure 3-8: Surveyed Sites – Legend 23
Figure 3-9: QTGPRM Region - Layer 24
Figure 3-10: QTGPRM Region - Legend 25
Figure 3-11: Qatar National Master Plan – Layer 26
Figure 3-12: Qatar National Master Plan – Legend 27
Figure 3-13: Qatar National Master Plan – Layer 28
Figure 3-14: Qatar National Master Plan – Legend 28
Figure 3-15: Search Tool within the Map Interface 29
Figure 3-16: Automatic Population of Land Use Classification 30
Figure 3-17: Qatar National Master plan parcel information 31
Figure 3-18: MM Land Use Classification parcel information 31
Figure 3-19: Non-matching of Land Use Groups 32
Figure 3-20: Steps to Print a Map 33
Figure 3-21: Sample of the Map Print 34
Figure 4-1: Land Use Classification search tool 37
Figure 4-2: Searching by Land Use Criteria 38
Figure 4-3: Searching by Land Use Classification code 38
Figure 4-4: Finding the Land Use Class Description 39
Figure 4-5: Single Land Use Class or Multi Land Use Class options 40
Figure 5-1: Selecting the Single Land Use Option 43
Figure 5-2: Single Land Use Interface 44
Figure 5-3: Items for selection prior to calculating trip rates 45
Figure 5-4: Example warning messages 45

Figure 5-5: Accessing the Vehicle Trip Generation and Parking Rates Tables of a Single Land Use 46
Figure 5-6: Location of Pass By Trip rates.....47
Figure 5-7: Accessing the person trip rates of a Single Land Use.....48
Figure 5-8: Accessing the Percentage Vehicle Classification and the Percentage Mode Share of a Single Land Use.....49
Figure 5-9: Daily Truck Trip Rate and Daily Truck Trip Demand Estimates 50
Figure 5-10: Daily Profile of Average Trip Rates 51
Figure 5-11: Steps to Display Scatter Plot 52
Figure 5-12: Multiple Independent Variables – comparison.....54
Figure 6-1: Multi land use module 57
Figure 6-2: Daily profile for separate land use classes that forms part of a multi land use development 59
Figure 6-3: Finding the Internal Capture rates.....60
Figure 7-1: PTAI Calculation.....63
Figure 7-2: Peak Time range estimation.....64
Figure 8-1: Help Menu 67
Figure 8-2: The Land Use Class definitions 68
Figure 8-3: Print report option.....69
Figure 8-4: Multiple tab print report.....70
Figure 8-5: Exporting to spreadsheet format.....70
Figure 8-6: Spreadsheet based report 71

Abbreviations

AM	Morning
ATC	Automatic Traffic Count
ESRI	Environmental Systems Research Institute
GIF	Graphics Interchange Format
GPTS	Guidelines and Procedures for Transportation Studies
Hvy. Gds. Veh.	Heavy Goods Vehicle
JPG	Joint Photographic Group
Lt. Gds Veh.	Light Goods Vehicle
QTGPRM	Qatar Trip Generation and Parking Rates Manual
QTGPRS	Qatar Trip Generation and Parking Rates Software
MCC	Manual Classified Count
MD	Midday
MM	Ministry of Municipality (Qatar)
MME	Ministry of Municipality and Environment (Qatar, reorganized as MM)
MOT	Ministry of Transport (Qatar)
MOTC	Ministry of Transport and Communications (Qatar, reorganized as MOT)
MSDP	Municipal Spatial Development Plans
PHG	Peak Hour of the Generator
PDF	Portable Document Format
PIN	Parcel Identification Number
PM	Afternoon
PNG	Portable Network Graphic
POI	Point of Interest
PTAI	Public Transport Accessibility Index
QID	Qatar Identification Number
QNMP	Qatar National Master Plan
TDMS	Transportation Data Management Software

CHAPTER 1

Introduction

Chapter 1 Introduction

1.1 What is the Qatar Trip Generation & Parking Rates Software?

The Qatar Trip Generation and Parking Rates Software (QTGPRS) is a web-based software application that primarily estimates vehicle trip generation, person trip generation, and parking demand for developments containing one or several land uses.

The software is managed and administered by the Ministry of Transport (MOT). The QTGPRS is the web-based software component of the hard copy Qatar Trip Generation and Parking Rates Manual (QTGPRM) that contains published trip generation rates.

The QTGPRS is a critical tool for those undertaking transportation studies, as trip generation rates are used as the basis for assessment of development impact on the surrounding transport infrastructure.

The QTGPRS provides strong visualization tools and a concise data viewing facility that supports reporting and analysis. It also allows the user to compare multiple land uses, and includes a feature that applies reduction factors associated with pass-by trips and internal capture for mixed-use developments. The QTGPRS delivers time-saving benefits for transportation modelers, analysts, and designers by providing fast and reliable trip generation estimates without the need for manual calculation.

1.2 QTGPRS Main Interface

The QTGPRS is hosted using ESRI Geographic Information System software, with the ability to retrieve data in an intuitive yet flexible way.

The QTGPRS main interface, depicted in **Figure 1-1**, includes a Menu Bar, a Search Tool and a details interface (which is the geographic information system portal in this instance) where either maps, tables, or graphic displays will appear, depending on the task being undertaken.

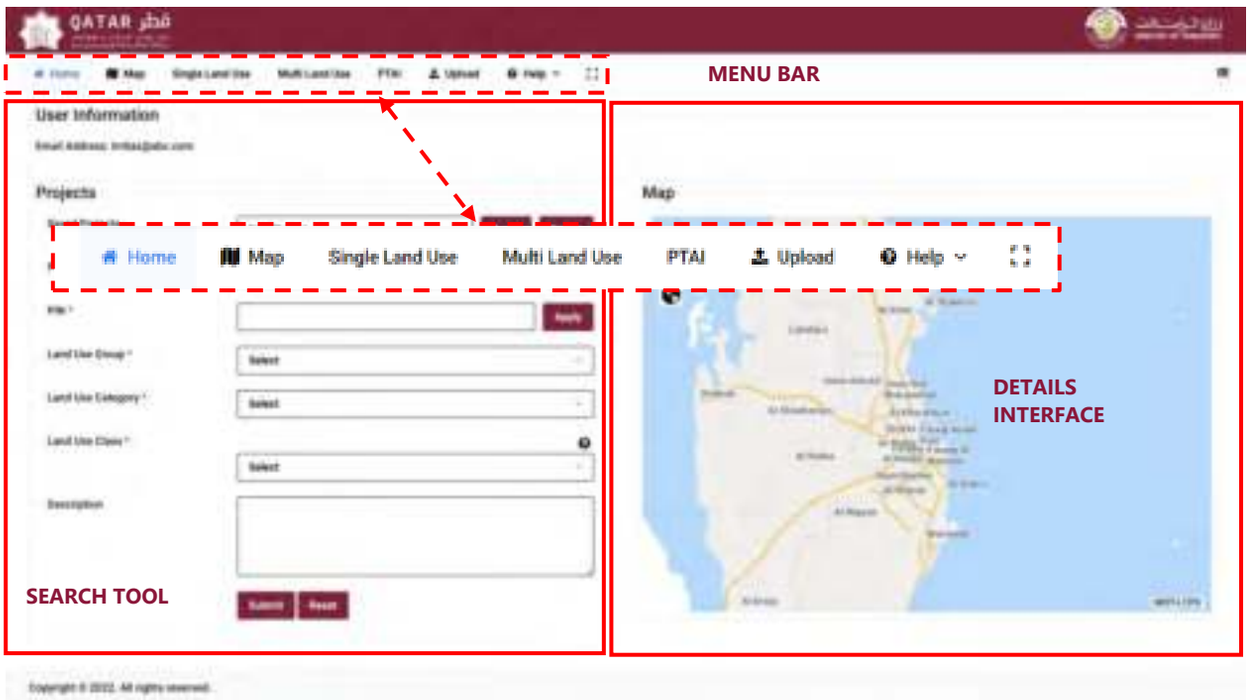

Figure 1-1: QTGPRS Main Interface

1.3 Functionalities within the QTGPRS

Figure 1-2 summarizes each of the functionalities within the QTGPRS. Each functionality is described in detail within the corresponding chapter.

Chapter 4 highlights the steps required to identify the group, category and class of each land use development. The procedure to obtain trip generation or parking demand rates for a single land use is given in **Chapter 5** . For a site with multiple land uses, users must follow **Chapter 6** .

Chapter 2: System Login and Project Information

- Accessing the QTGPRM software.
- Entering the Project Information.
- Finding the PIN number?

Chapter 3: Map Portal

- Information layers: QTGPRM regions, QTGPRM data sites, MM land use classifications.
- Printing a Map.

Chapter 4: Land Use Search Tools

- Searching by land use code, filtering by region, display definitions.

Chapter 5: Single Land Use Menu

- Steps to obtain trip generation rates.
- Mode Share information.
- Daily trip rates of Hvy. Gd. Vehs.
- Daily Profile and Scatter Plot.
- Comparison of estimates from multiple independent variables.

Chapter 6: Multiple Land Use Menu

- Populating the Multi Land Use table.
- Daily Profiles.
- Internal Capture.

Chaper 7: PTAI and Peak Times Estimation

- Public Transport Accessibility Index and Peak Time Range Estimation.

Chaper 8: Help

- Land Use Tree with definitions.
- Access to the GPTS and QTGPRM documents.

Figure 1-2: Functionalities within the QTGPRM software

CHAPTER 2

System Login and Project Information

Chapter 2 System Login and Project Information

2.1 MOT system login

Returning users may enter their Username and password. New users should click New Registration and follow the steps for registration.

After registering with MOT, users may then use the assigned username and password to access QTGPRS via the MOT webpage (**Figure 2-1**).

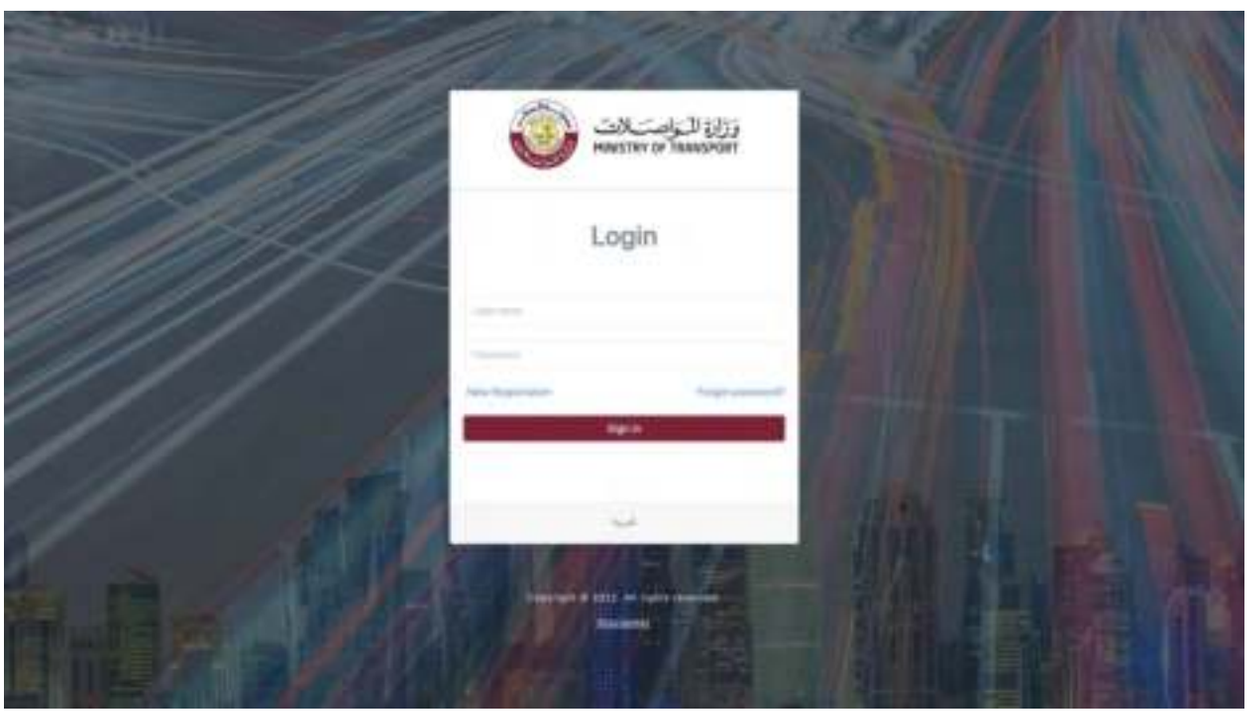

Figure 2-1: Login Page

New registration

Consultants, developers, investors, scholars, government agencies and their employees can request access to the QTGPRM software. To do this, please contact MOT in the first instance.

Forgot your password?

Should a user forget their password, the system provides a link to the 'Forgot password?' facility. This requires either the users Qatari identification number (QID) or a combination of the users email address plus telephone number (as provided during registration with MOT) to access/reset the password.

Language

The language of the login page can also be changed to English or Arabic by selecting and clicking on this icon .

After the user has entered their login details, they will be directed to the MOT applications page. From there, the user can access either the TDMS or the QTGPRS, as seen in **Figure 2-2**.

Figure 2-2: MOT Applications Page

Note: *Further applications may be added to this page in the future by MOT.*

Users must scroll and click on the QTGPRS logo or the Login button in the QTGPRS banner to access the Login Page. Successfully logged in users will land at the Project Information screen.

Upon login, a disclaimer pop-up window will appear (refer to **Figure 2-3**).

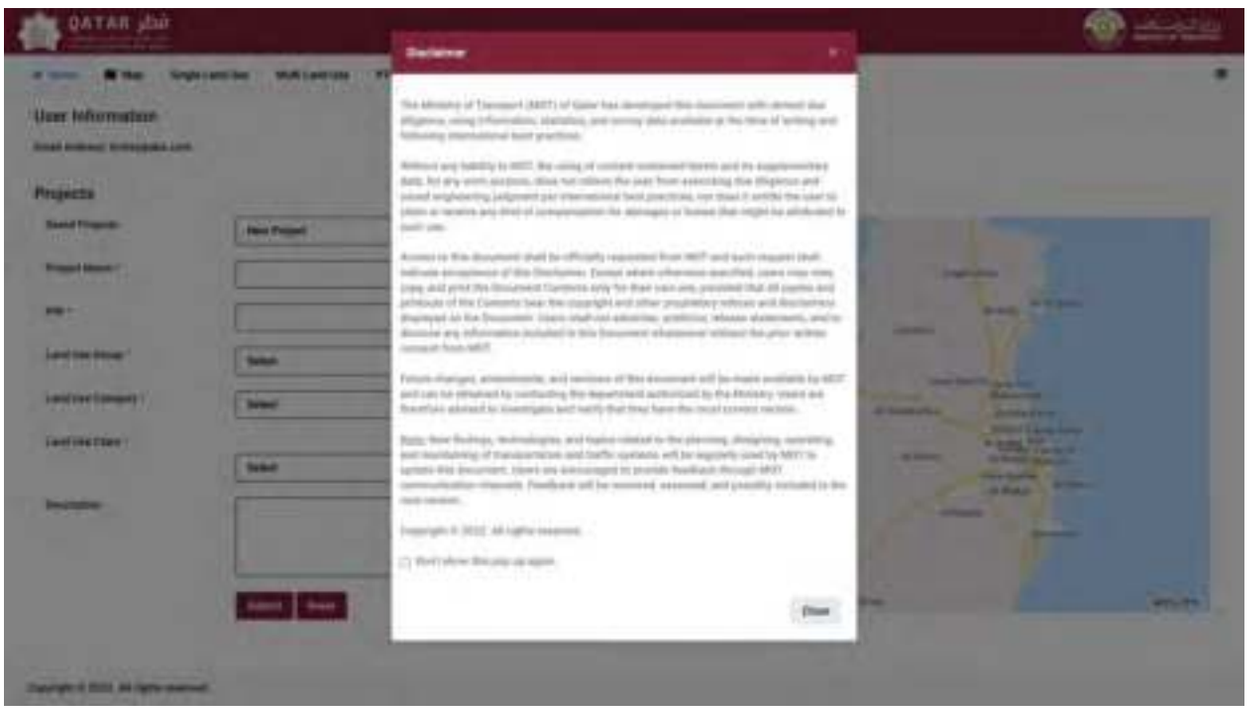

Figure 2-3: Disclaimer Pop-up Window

The user has the option to prevent the disclaimer pop-up window from appearing again.

2.2 Project Information

Users have the option to save information from multiple projects for later retrieval. The Project Information screen (**Figure 2-4**:), located on the "**HOME"** screen, records the project name, the parcel identification number (PIN), and the land use group, category, class and allows the user to provide a description. It is advisable that users specify the information required in this menu before proceeding any further, as otherwise the information will not be saved.

> ***Note:*** *If the user does not want to save projects for later retrieval, they can proceed to the land use search tool as outlined in* ***Chapter 4*** *.*

Follow these steps to save information:

Step 1: Enter the project name and the PIN (if the PIN is not available, please refer to **Section 2.3**).
Step 2: Click Apply, the land use group will automatically populate based on the permitted zoning associated with the PIN.
Step 3: To overwrite the land use group and/or to further enter the land use category and class, and click the " " symbol to activate the dropdown menu, which will list the available land use categories and classes associated with the land use group.

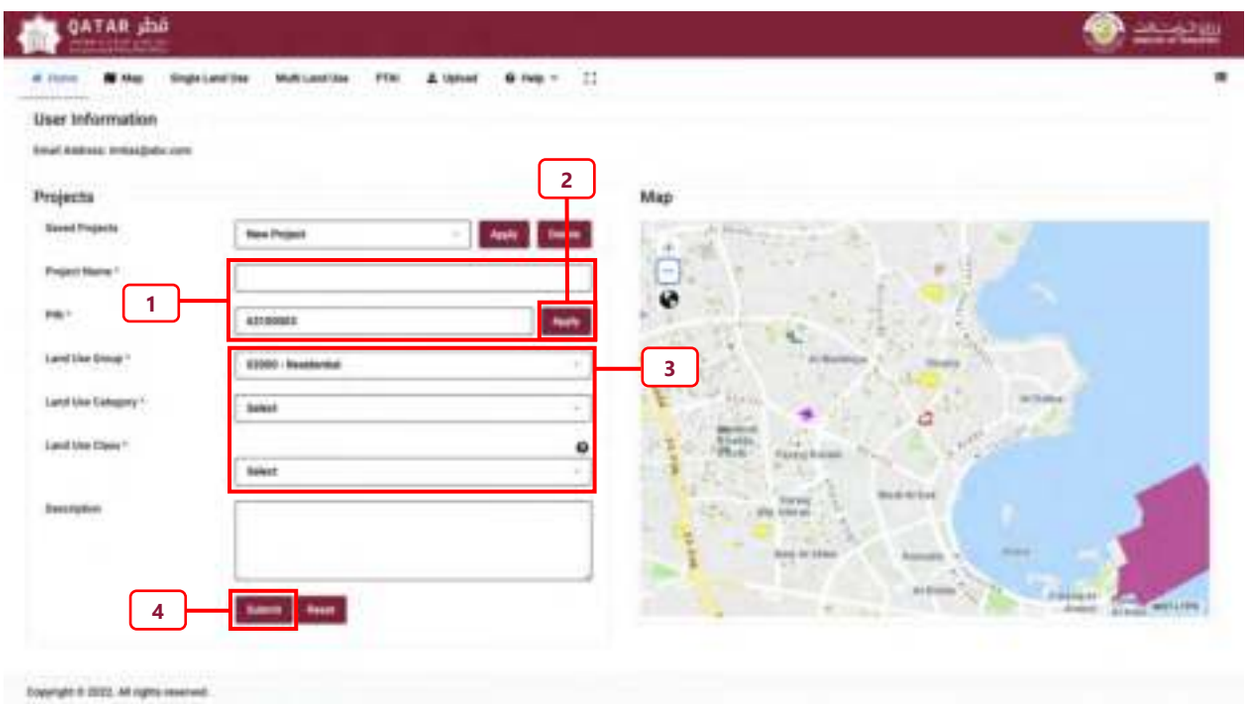

Figure 2-4: Project Information

Step 4. To save the project, click on **"Submit"**. The system will confirm by displaying **"Success Saved/Updated successfully"** at the top right of the screen (refer to **Figure 2-5**).

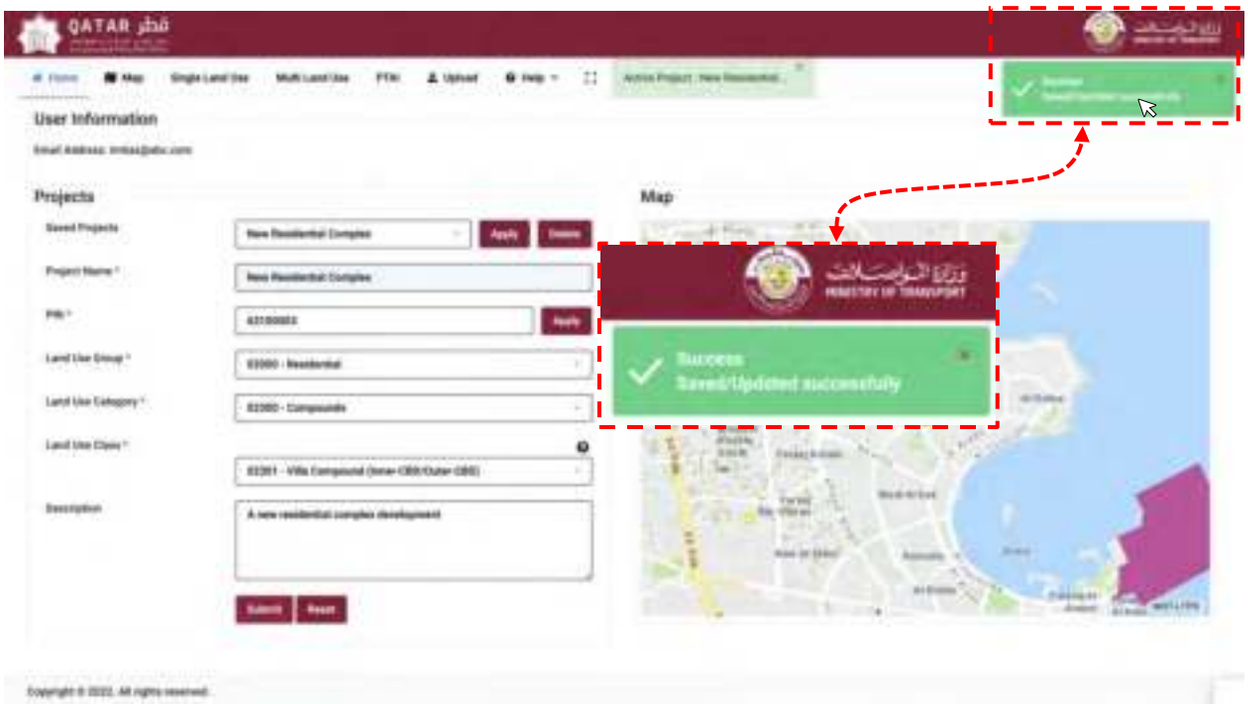

Figure 2-5: Confirmation of "Success Saved/Updated Successfully"

After several seconds, the **"Success Saved/Updated Successfully"** notification will disappear, and a green notification will appear at the top of the page to confirm the saved project is active (refer to **Figure 2-6**).

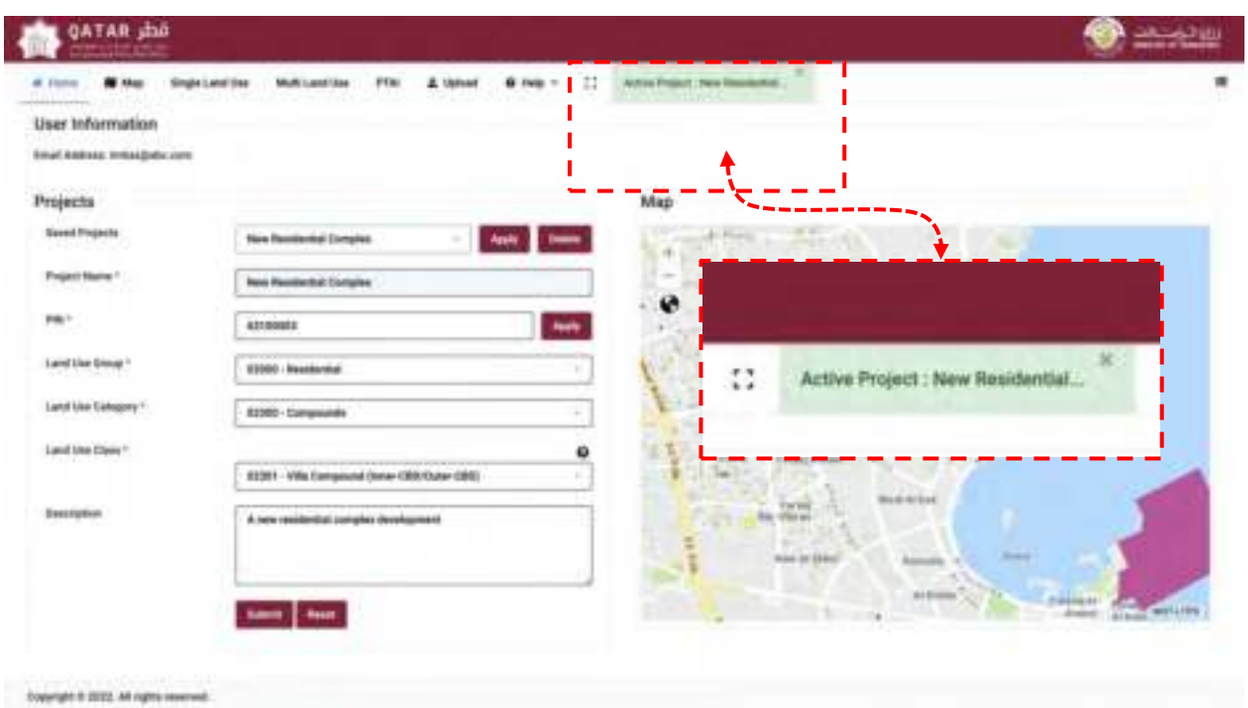

Figure 2-6: Confirmation of 'Active' Saved Project

The user can now undertake their trip generation estimate and will have the option to save throughout the process.

> ***Note:*** *Each time a user saves, the previously saved information will be overridden and cannot be accessed.*

If the user does not fill out the Project Information on **"Home"** screen and attempts to Save elsewhere in the application, the system will automatically trigger a pop-up window (**Figure 2-7**) prompting the user to provide the project name, before proceeding.

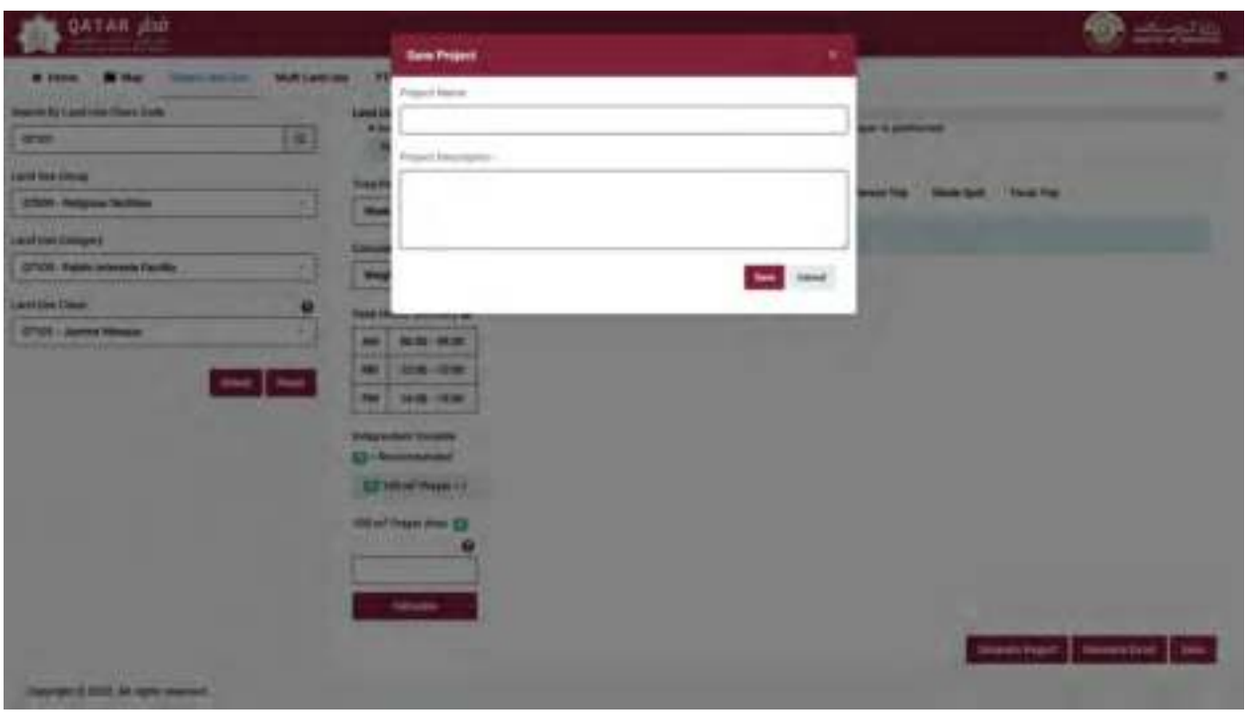

Figure 2-7: Project Information Pop-up

2.2.1 Accessing a Previously Saved Project

Step 1: To re-load a previously saved project, the user needs to start on the **"Home"** screen.

Step 2: On the **"Home"** screen, the user shall click on the " " symbol located to the right of the saved projects.

Step 3: After the user finds and selects the name of the saved project, they shall then press **"Apply"**. This will automatically populate the previously saved Project name, PIN, Land Use Group, Category, Class, and any descriptions provided. It will also load all previously saved data associated with the saved project.

2.3 Finding the PIN

Entering a valid PIN on the **"Home"** screen will allow the system to identify the parcel of land and will allow the user to visually confirm its location on the map (**Figure 2-8**). However, if the user does not know the PIN, the user is provided with an opportunity to find the PIN by searching for and selecting the parcel of land on the map interface. Selecting the parcel of land on the map will automatically populate the PIN data field.

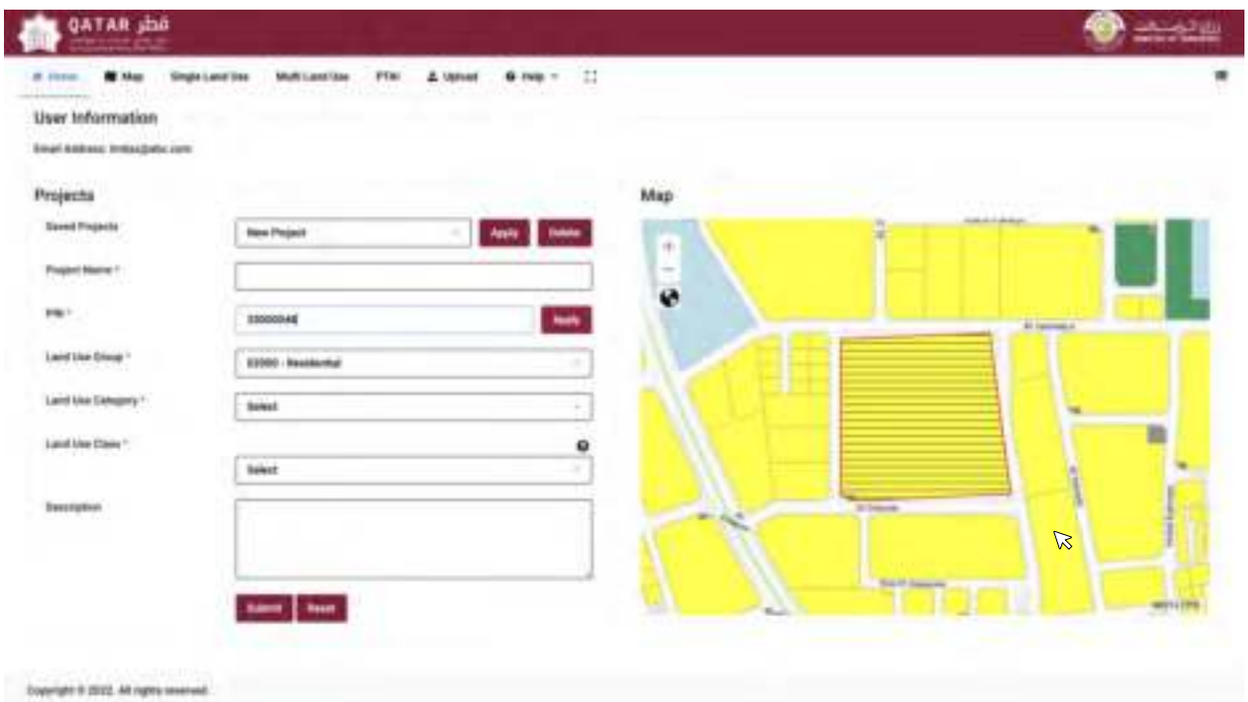

Figure 2-8: Finding the PIN

CHAPTER 3

Map Portal

Chapter 3 Map Portal

The map portal (**Figure 3-1**) offers access to spatial information available for parcels of land and land uses in the State of Qatar. The map portal can be accessed using the **"Map"** tab via the main menu.

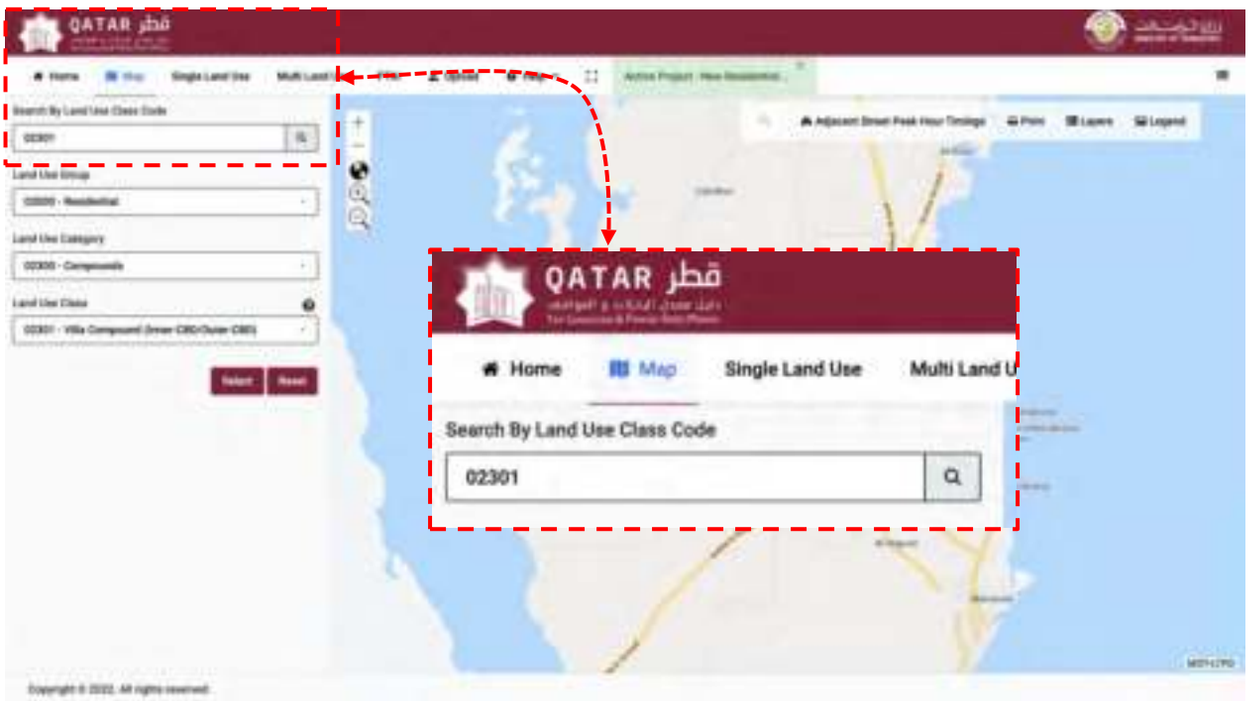

Figure 3-1: Map Portal

3.1 Land Use Layers

The map portal offers a map environment to access six possible layers of information (refer to **Figure 3-2**):

1. Manual Classified Count (MCC) locations.
2. Automatic Traffic Count (ATC) locations.
3. Sites surveyed as part of the QTGPRM.
4. QTGPRM Regional Boundaries.
5. Qatar National Master Plan (QNMP).
6. MM Land Use Classification.

To visualize the different layers of information (as per **Figure 3-2**), the user shall undertake the following steps:

Step 1: To change the map layers, the user shall click on **"Layers"**.
Step 2: The user shall click the box adjacent to the layer the user wishes to visualize.
Step 3: The user shall zoom into the area of choice by clicking the "🔍" symbol (or by double clicking on the map).

> ***Note:*** *The Qatar National Master Plan Layer and the MM Land Use Classification Layer is only activated when the map is zoomed in closer to the site.*

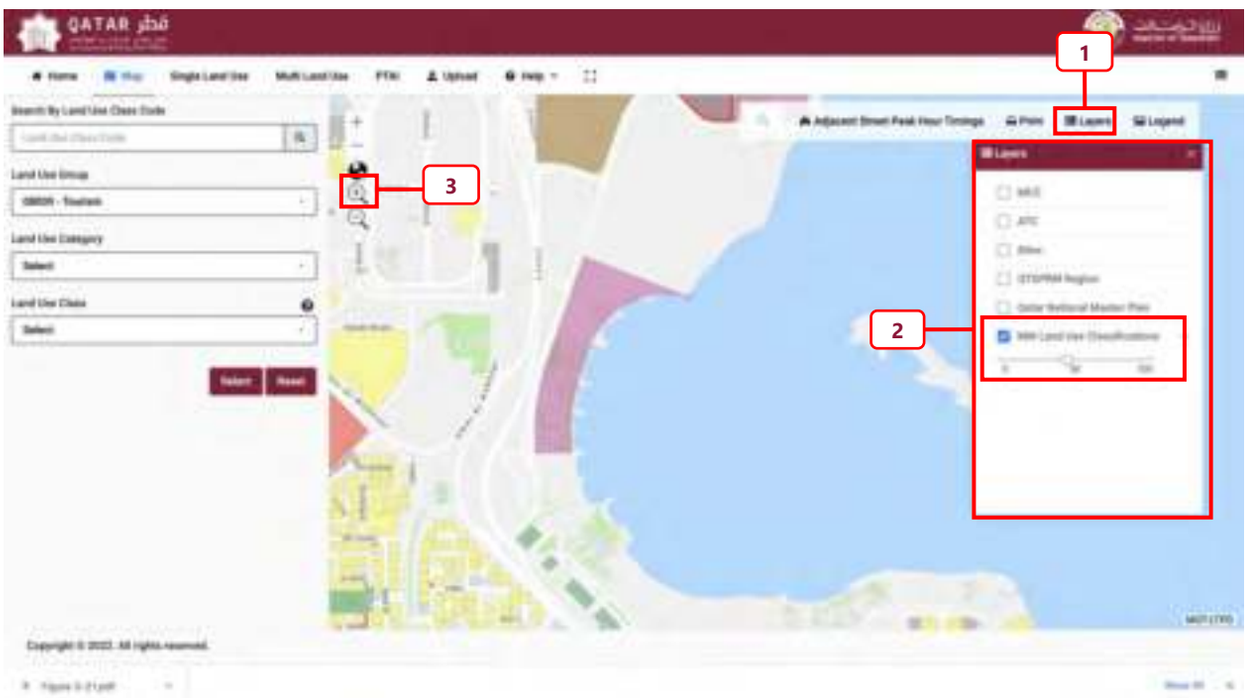

Figure 3-2: Map Layers

> ***Note:*** *The portal provides the option to adjust the color density of the map layer by scrolling and adjusting the "▭" symbol located below each map layer option.*

3.1.1 Accessing the "MCC" layer

The **"MCC"** layer provides a visualization of the locations where MCCs have been undertaken. To visualize the **"MCC"** locations (refer to **Figure 3-3**), the user shall undertake the following steps:

Step 1: The user may zoom into the map by clicking on the "🔍" symbol.
Step 2: The user shall ensure the **"MCC"** layer is selected.
Step 3: The user can click on any given site to visualize the **"MCC"** information.

The option to view the legend of the **"MCC"** is also available. To do this, the user shall close the **"Layer"** pop-up window and click on **"Legend"**. Here, a new pop-up window will appear with the legend of the chosen layer, as shown in **Figure 3-4**.

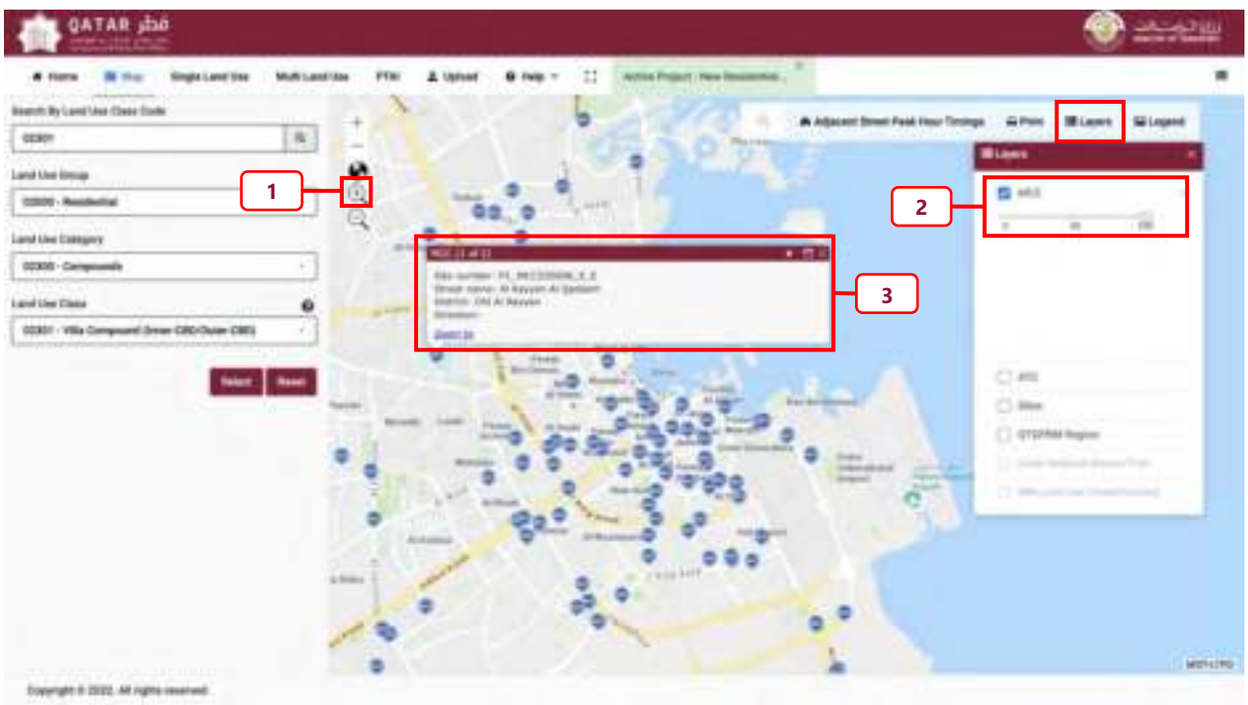

Figure 3-3: MCC Visualizer - Layer

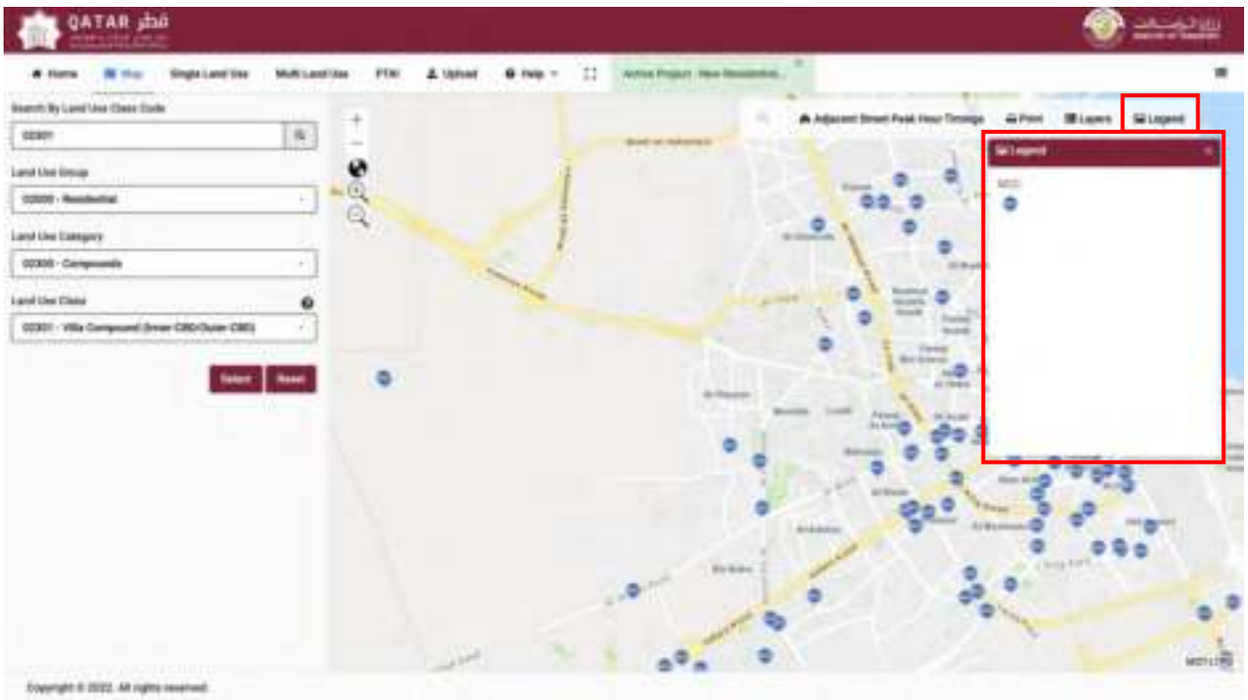

Figure 3-4: MCC Visualizer - Legend

3.1.2 Accessing the "ATC" layer

The **"ATC"** layer provides a visualization of the locations where ATC's have been undertaken. To visualize the **"ATC"** locations (refer **Figure 3-5**), the user shall undertake the following steps:

Step 1: The user may zoom into the map by clicking on the "🔍" symbol.
Step 2: The user shall ensure the **"ATC"** layer is selected.
Step 3: The user can click on any given site to visualize the **"ATC"** information.

The option to view the legend of the **"ATC"** is also available. To do this, the user shall close the layer pop-up window and click on **"Legend"**. Here, a new pop-up window will appear with the legend of the chosen layer, as shown in **Figure 3-6**.

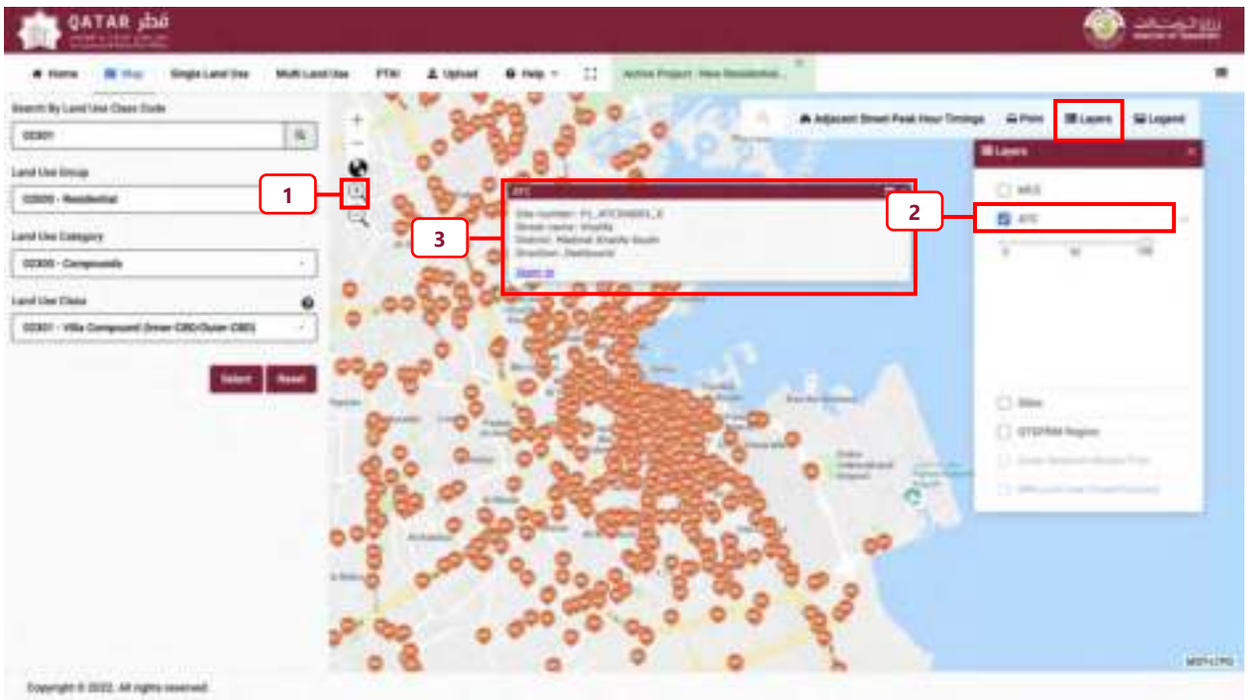

Figure 3-5: ATC Visualizer – Layer

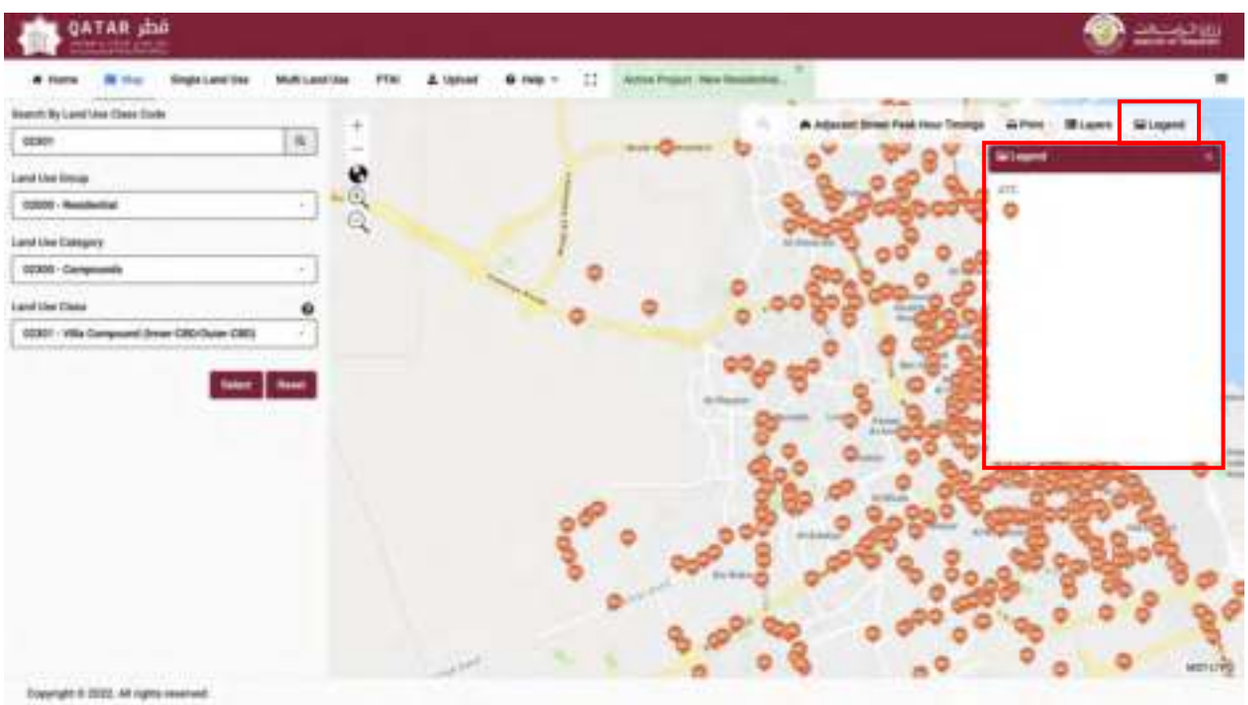

Figure 3-6: ATC Visualizer – Legend

3.1.3 Accessing the "Sites"

The **"Sites"** layer provides a visualization of the sites surveyed to estimate the trip generation and parking rates of the QTGPRM. To visualize the **"Sites"** (refer to **Figure 3-7**) the user shall undertake the following steps:

Step 1: The user may zoom into the map by clicking on the "🔍" symbol.
Step 2: The user shall ensure the **"Sites"** layer is selected.
Step 3: The user can click on any given site to visualize the **"Sites"** information.

The option to view the legend of the **"Sites"** is also available. To do this, the user shall close the layer pop-up window and click on **"Legend"**. Here, a new pop-up window will appear with the legend of the chosen layer, as shown in **Figure 3-8**.

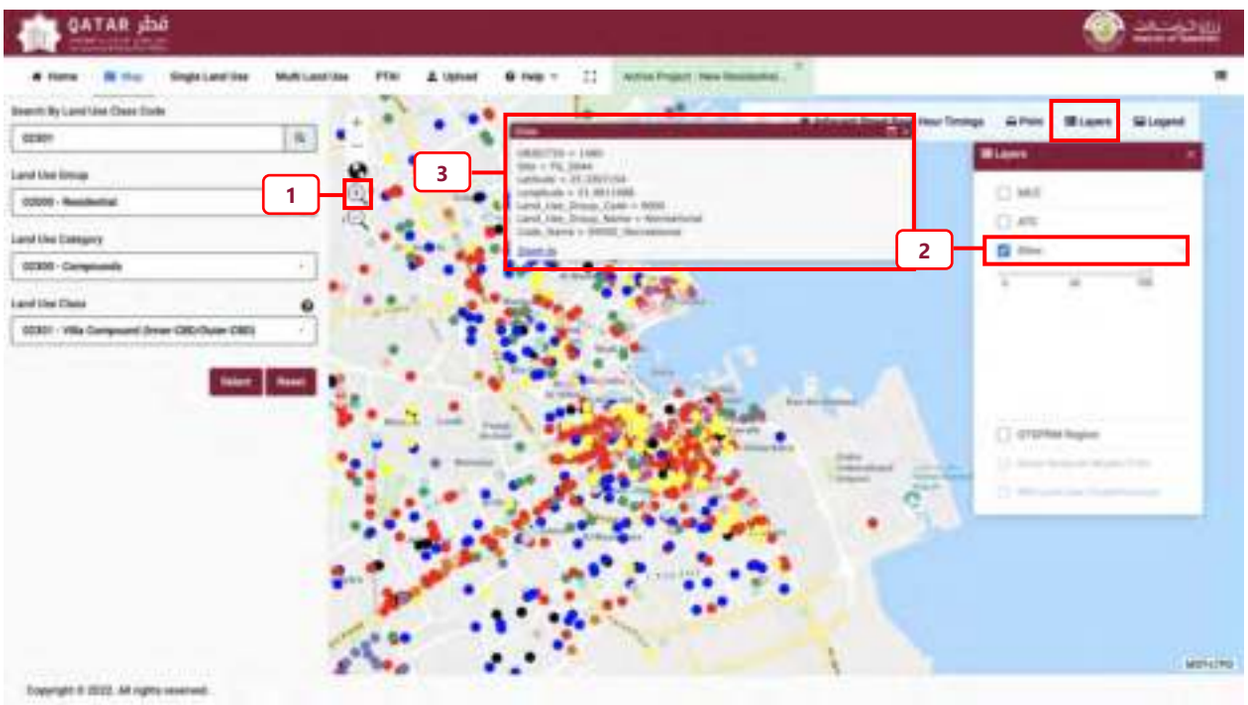

Figure 3-7: Surveyed Sites – Layer

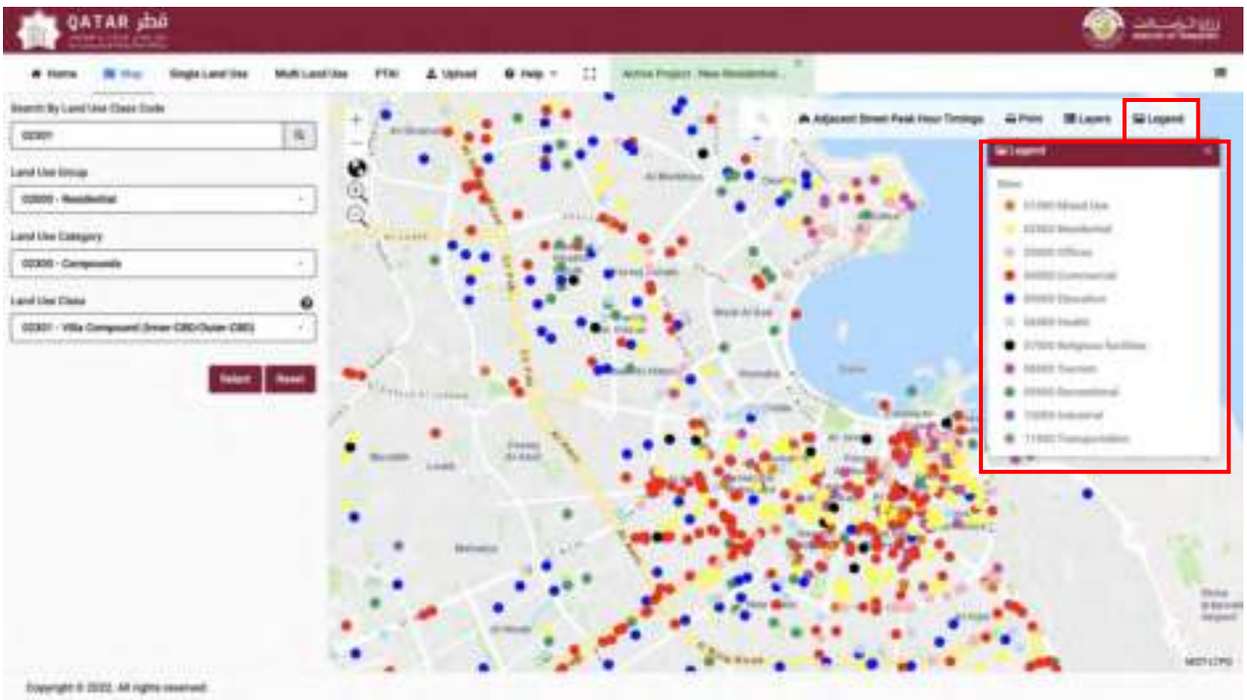

Figure 3-8: Surveyed Sites – Legend

3.1.4 Accessing the "QTGPRM Region" layer

The **"QTGPRM Region"** layer provides further details on the regions used in which the State of Qatar was divided into for estimating the trip rates. To visualize the **"QTGPRM Region"** (refer to **Figure 3-9**) the user shall undertake the following steps:

Step 1: The user may zoom out of the map by clicking on the "🔍" symbol.
Step 2: The user shall ensure the **"QTGPRM Region"** layer is selected.
Step 3: The user can scroll across and click on any given region to visualize the **"QTGPRM Region"** information. A window will appear to the bottom right of the screen, identifying the regional area of selection.

The option to view the legend of the **"QTGPRM Region"** is also available. To do this, the user shall close the layer pop-up window and click on **"QTGPRM Region"**. Here, a new pop-up window will appear with the legend of the chosen layer, as shown in **Figure 3-10**.

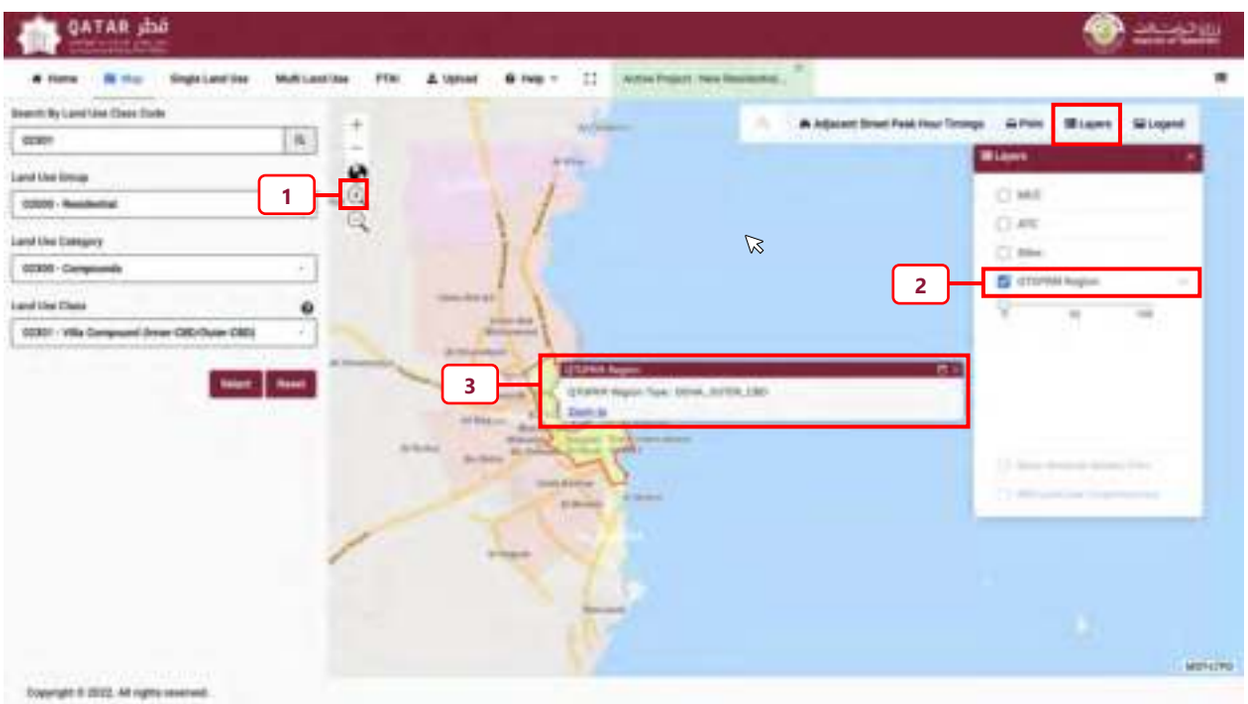

Figure 3-9: QTGPRM Region - Layer

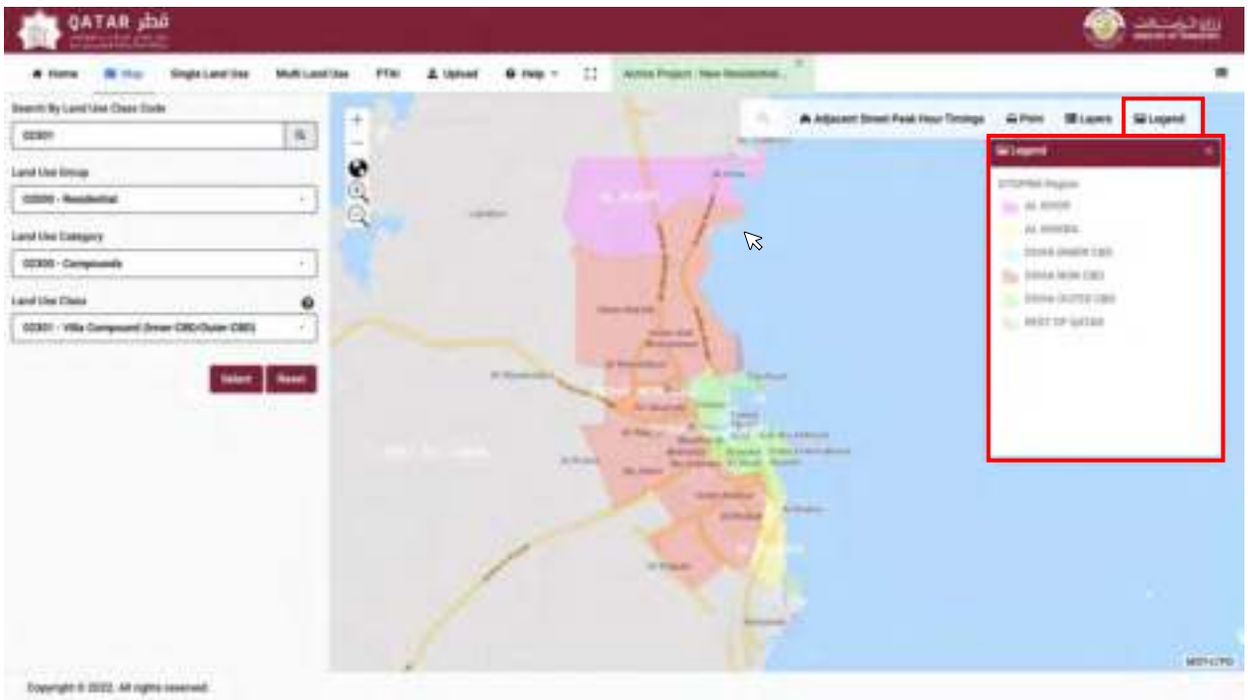

Figure 3-10: QTGPRM Region - Legend

3.1.5 Accessing the "Qatar National Master Plan" layer

The **"Qatar National Master Plan"** layer provides further details on QNMP land use data. To visualize the **"Qatar National Master Plan"** (refer to **Figure 3-11**), the user shall undertake the following steps:

Step 1: To activate the **"Qatar National Master Plan"** layer, the user shall need to zoom in closer to the map by clicking on the "🔍" symbol.
Step 2: The user shall ensure the **"Qatar National Master Plan"** layer is selected.
Step 3: The user can scroll across and click on any given site parcel. A popup will appear, identifying the following information of the parcel:

- Land Use
- Area
- PIN
- Zoning
- Zoning Description
- Max Height
- Permit Use
- Max B Cov

The option to view the legend of the **"Qatar National Master Plan"** is also available. To do this, the user shall close the layer pop-up window and click on **"Qatar National Master Plan"**. Here, a new pop-up window will appear with the legend of the chosen layer, as shown in **Figure 3-12**.

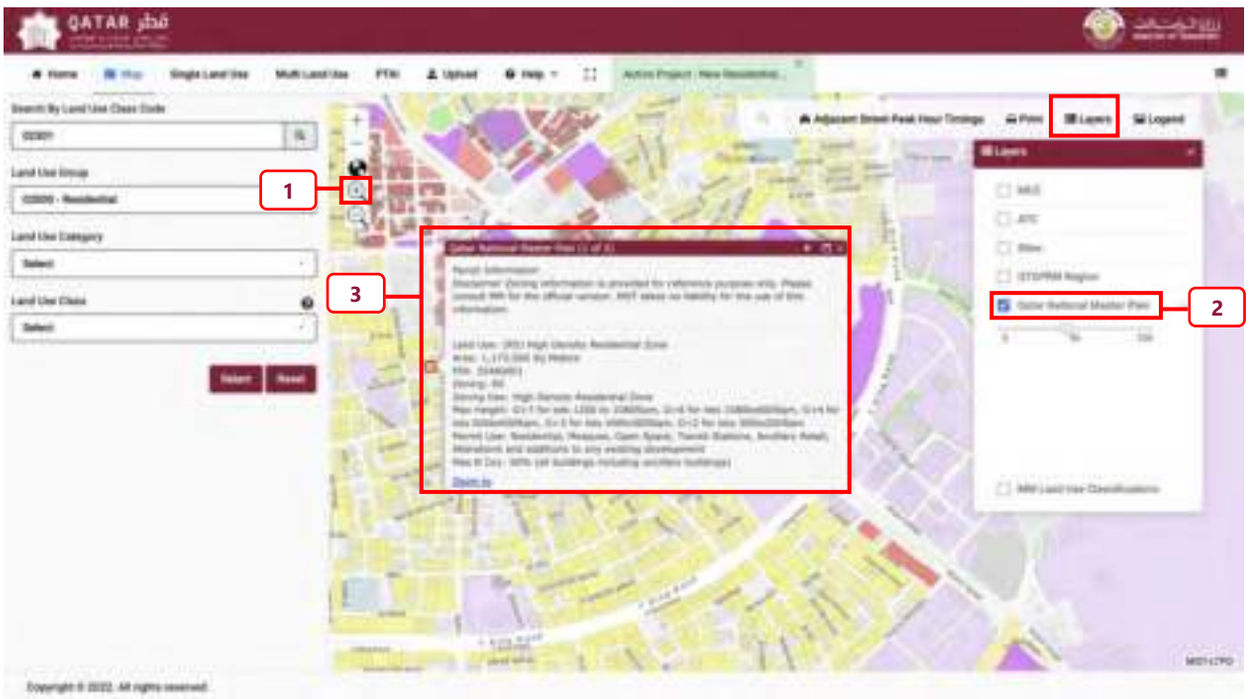

Figure 3-11: Qatar National Master Plan – Layer

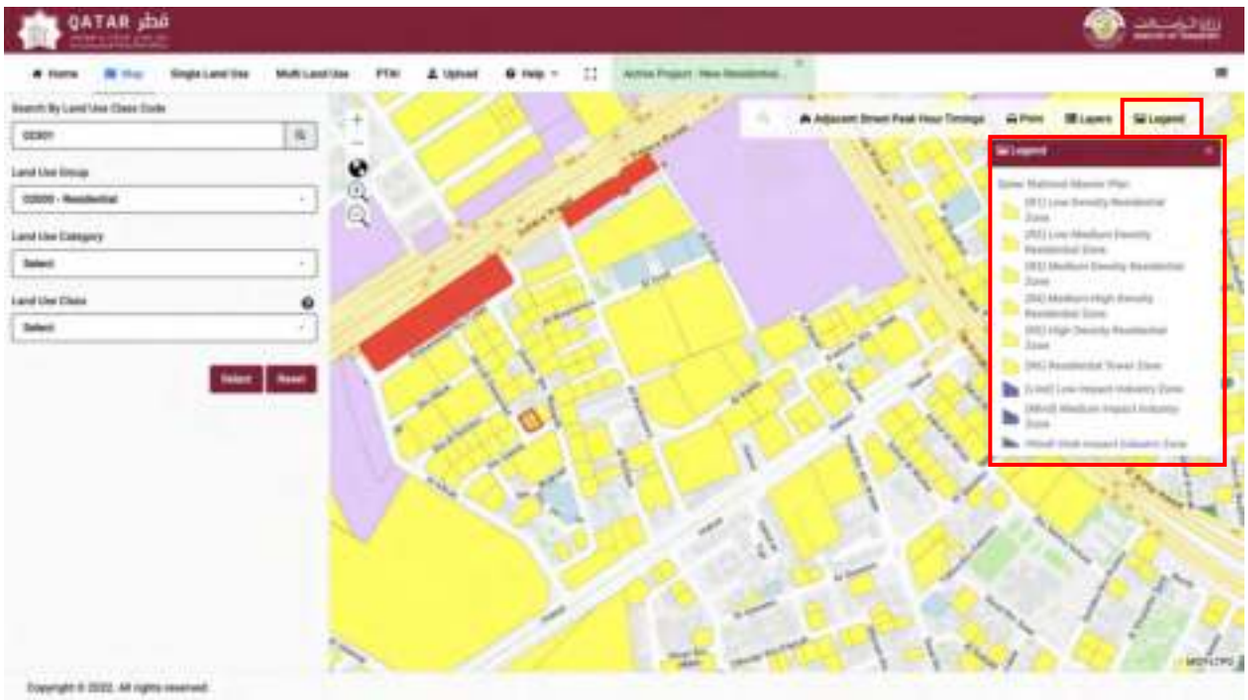

Figure 3-12: Qatar National Master Plan – Legend

3.1.6 Accessing the "MM Land Use Classification" layer

The **"MM Land Use Classifications"** layer (refer to **Figure 3-13**) provides access to Parcel Information. To visualize the **"MM Land Use Classifications"** the user shall undertake the following steps:

Step 1: To activate the **"MM Land Use Classifications"** layer, the user shall need to zoom in closer to the map by clicking on the "🔍" symbol.
Step 2: The user shall ensure the **"MM Land Use Classifications"** layer is selected.
Step 3: The user can scroll across and click on any given site parcel. A window will appear to the bottom right of the screen, identifying the following information of the parcel:

- Land Use
- The area of the parcel
- The zone number
- The land ID

The option to view the legend of the **"MM Land Use Classifications"** is also available. To do this, the user shall close the layer pop-up window and click on **"MM Land Use Classifications"**. Here, a new pop-up window will appear with the legend of the chosen layer, as shown in **Figure 3-14**.

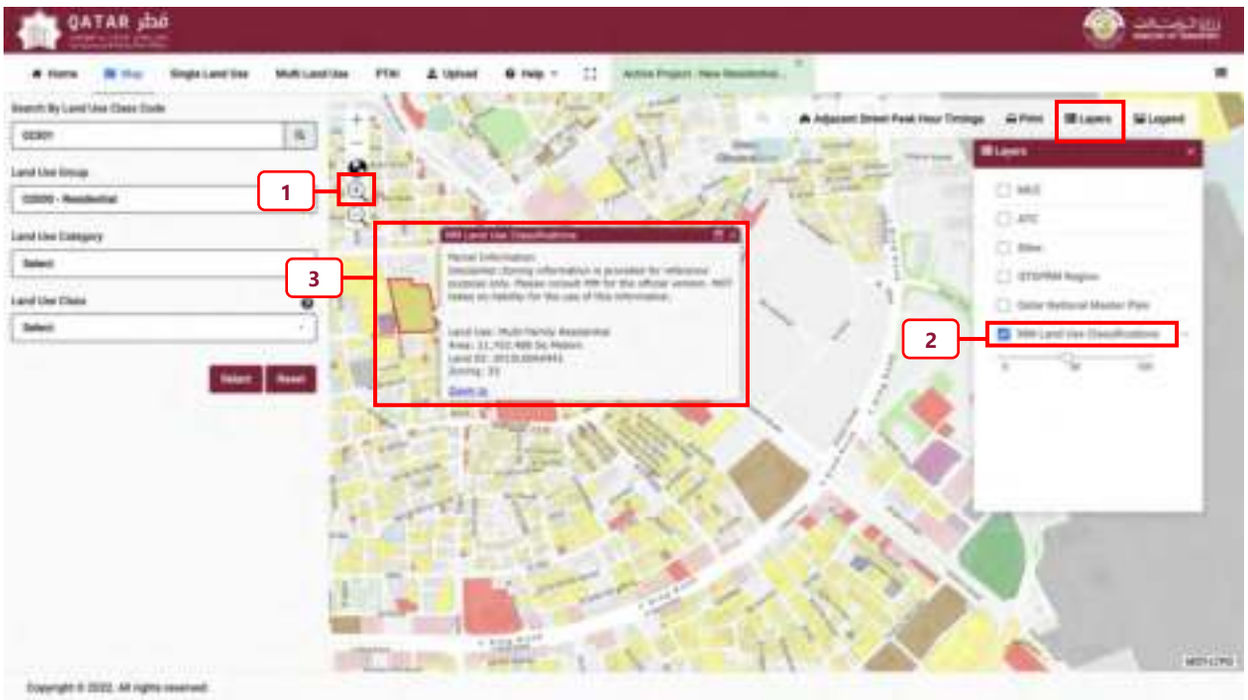

Figure 3-13: Qatar National Master Plan – Layer

Figure 3-14: Qatar National Master Plan – Legend

3.2 Map Search

The Map interface provides the ability to search for a parcel of land using the PIN details (**Figure 3-15**). To find a PIN based upon a map search, the user shall undertake the following steps:

Step 1: Close any map layers window and click on the magnify symbol "".
Step 2: After the magnify symbol is selected, a data field entry box will appear. The user shall enter the PIN details into the data field box.
Step 3: Press **"Enter"** and the parcel of land associated with the PIN will be highlighted.
Step 4: To the left of the data field entry box, there is a " ". Here the user can select whether to search through MM Land Use Classifications data, Municipal Spatial Development Plan data, or both simultaneously.

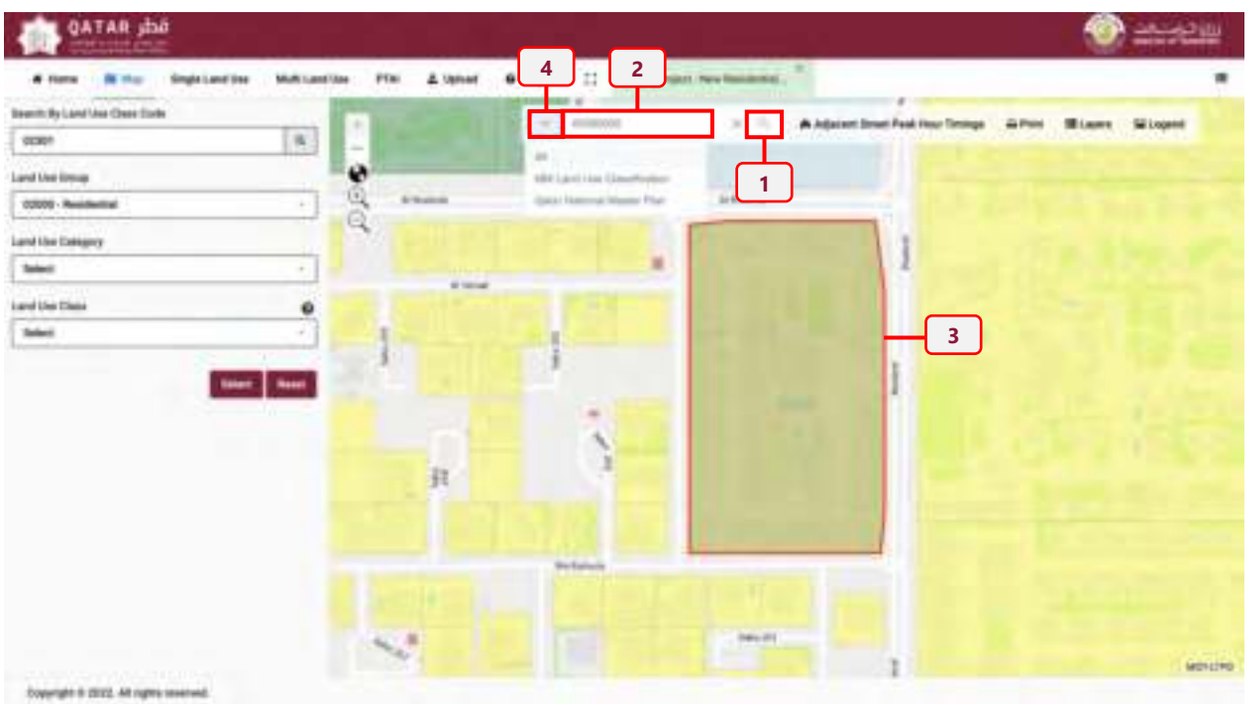

Figure 3-15: Search Tool within the Map Interface

3.3 Selection of a Parcel of Land

The user may also select the parcel of land by directly scrolling and selecting the land parcel on the map. When this is done, data associated with the parcel automatically populates the search panel (discussed further in **Chapter 4**) with the most relevant land use group based upon matching done between MOT and MM Land Use Classifications/Qatar National Master Plan (**Figure 3-16**).

The user shall undertake the following steps:

Step 1: Ensure the map is zoomed in by selecting and clicking on the "🔍" symbol.
Step 2: Ensure the **"Qatar National Master Plan"** or the "**MM Land Use Classifications"** layers are activated.
Step 3: Scroll and click on a parcel of land.
Step 4: The Land Use Group of the selected parcel of land will populate automatically.

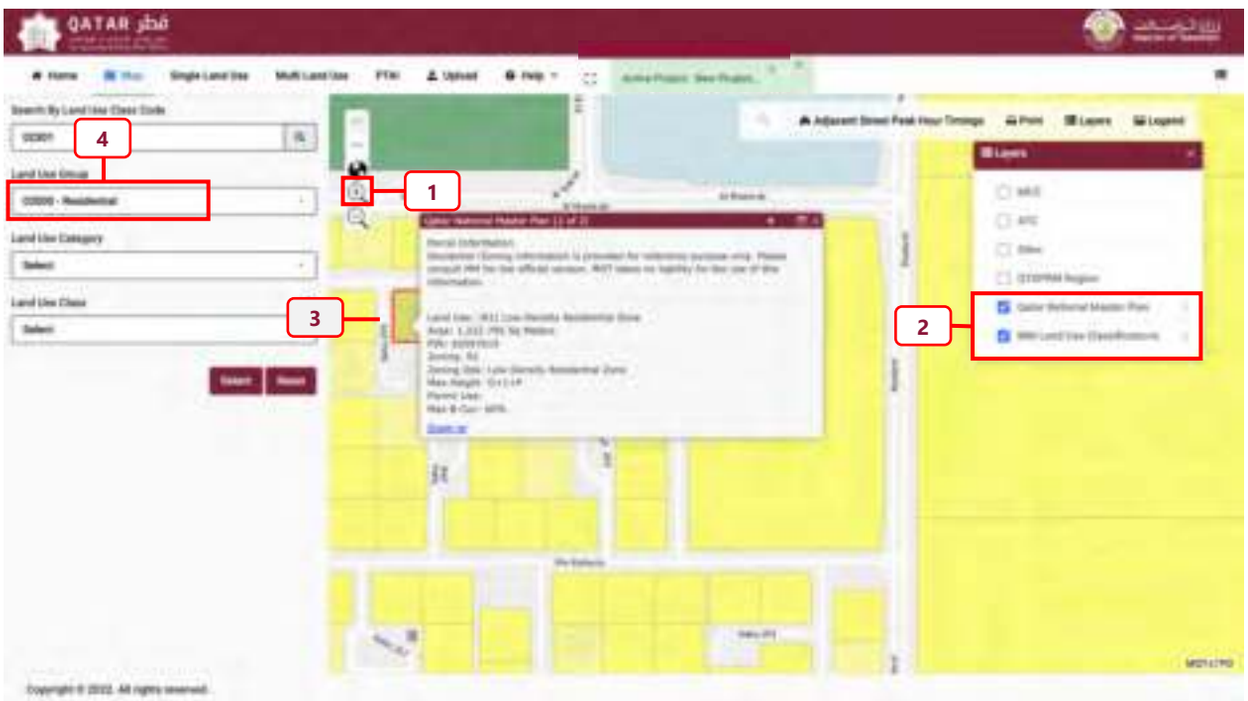

Figure 3-16: Automatic Population of Land Use Classification

When the user clicks on a parcel, information from the **"Qatar National Master Plan"** and "**MM Land Use Classifications"** layers will be displayed in a pop-up window. This pop-up window shows zoning details for the parcel of land for each parcel location the user scrolls over (refer to **Figure 3-17** and **Figure 3-18**).

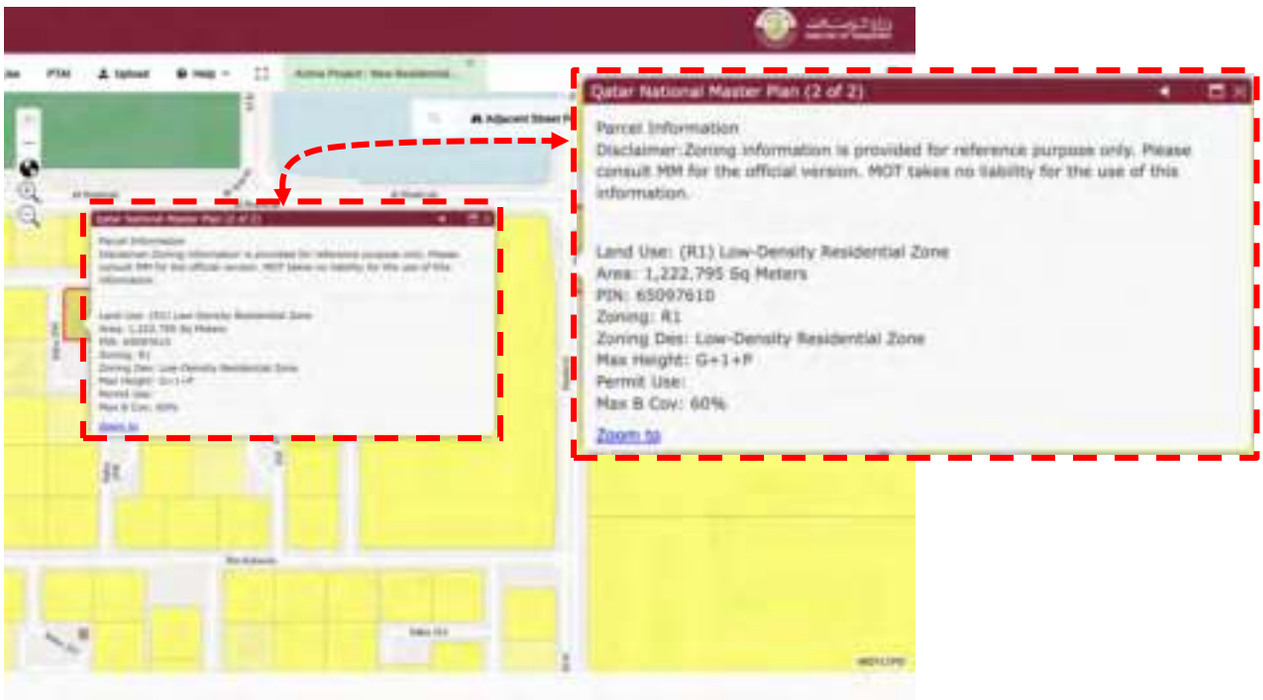

Figure 3-17: Qatar National Master plan parcel information

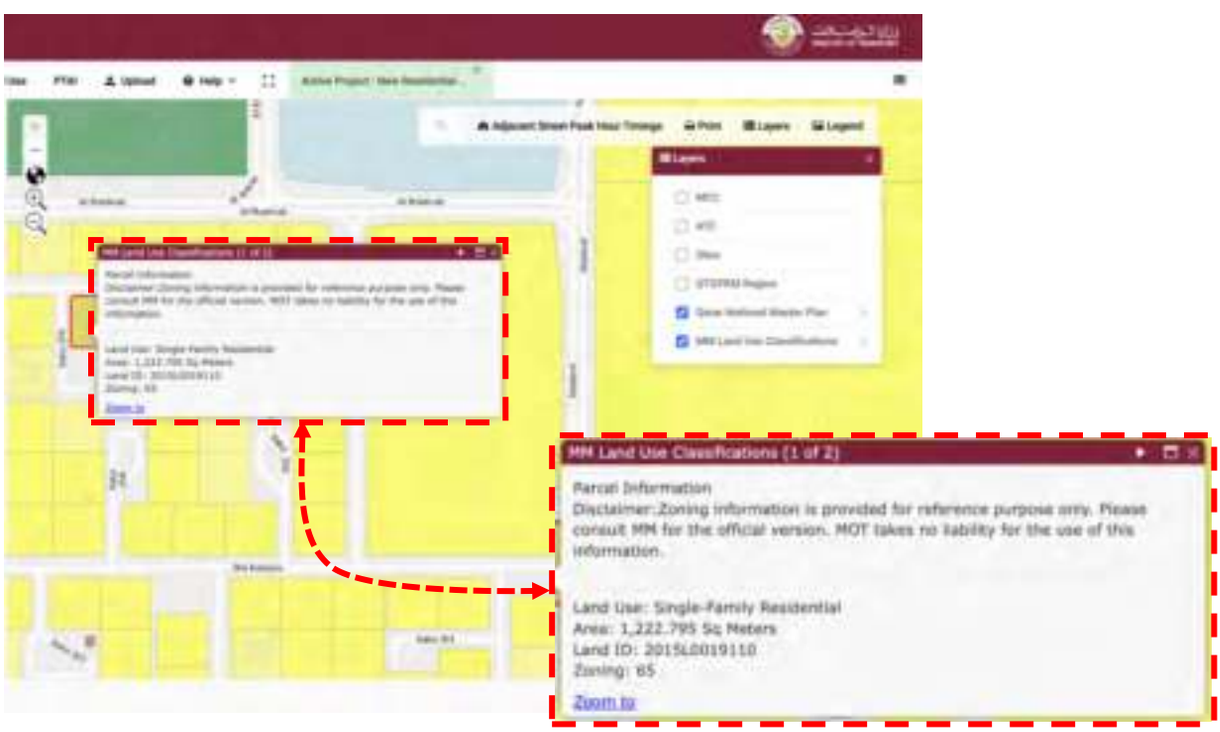

Figure 3-18: MM Land Use Classification parcel information

There will be some instances when the user selects a parcel of land and a warning will appear in the top right of the screen. This warning highlights to the user that no matching has occurred

between the "**Qatar National Master Plan"** or **"MM Land Use Classification"** data and the MOT QTGPRM Land Use Groups.

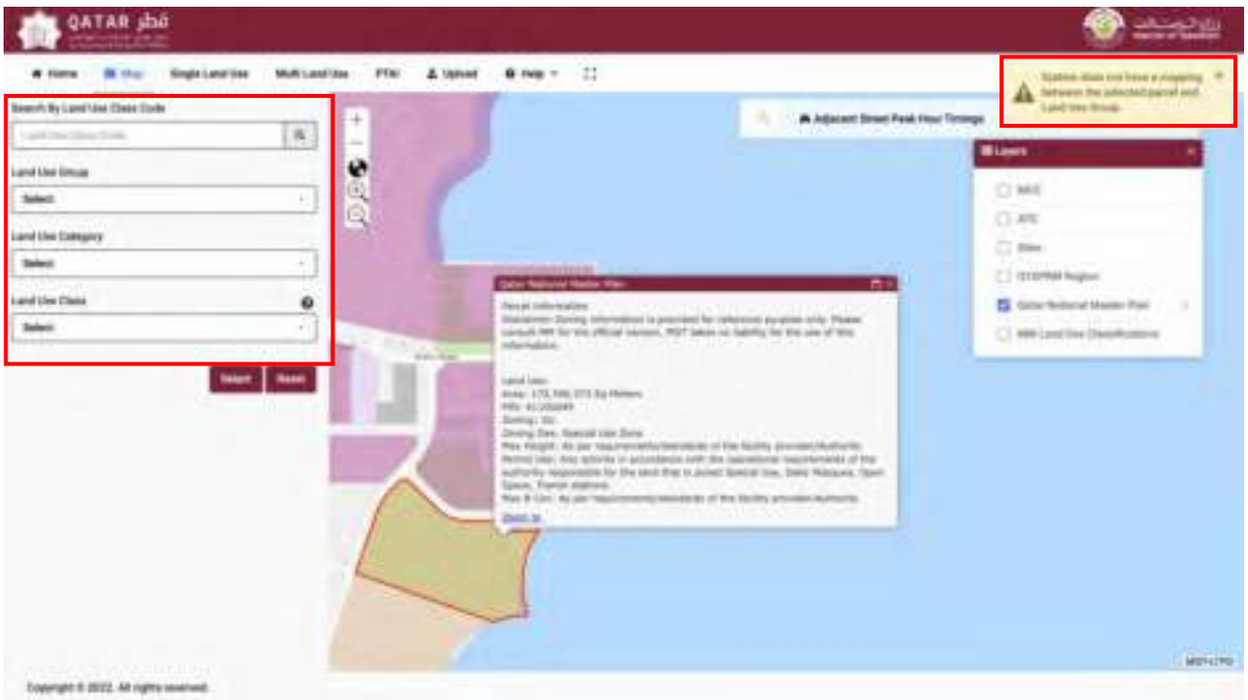

Figure 3-19: Non-matching of Land Use Groups

3.4 Map Print Tool

The map provides the user with a **"Print"** function to obtain a Map print out in either PDF or image format (PNG, JPG, GIF) (refer to **Figure 3-20**). The print template includes all label information from the active layer and the home screen. To print a map, the user needs to undertake the following steps:

Step 1: Scroll and select the **"Print"** option.
Step 2: A **"Print"** window shall appear, prompting the user to fill out the **"Map Title"**, and choose the orientation of the paper. The user may select the "" symbol to reveal the paper orientation options, detailed below:

- A4 Landscape
- A4 Portrait
- A3 Landscape
- A3 Portrait
- A2 Landscape
- A2 Portrait
- A1 Landscape

- A1 Portrait
- A0 Landscape
- A0 Portrait

Step 3: The user can select the file format from the following options, and specify the print quality level in dots per inch (dpi); the default is 200 dpi.

- PDF
- PNG32
- PNG8
- JPG
- GIF

Step 4: The user shall click on the **"Print"** box, after which a message will appear stating the print is **"Loading…"** . When loading has finished, the message will change to **"Show Report"** .

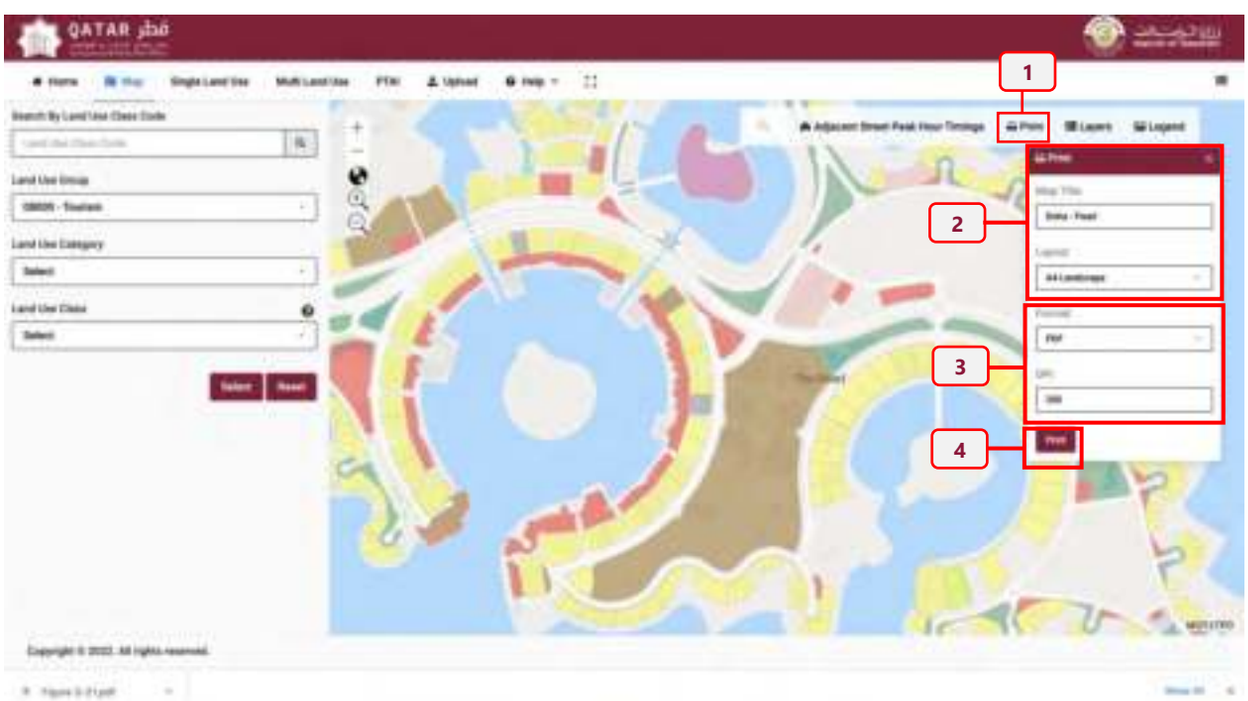

Figure 3-20: Steps to Print a Map

A sample of the map print is given in **Figure 3-21**

Figure 3-21: Sample of the Map Print

CHAPTER 4

Land Use Search Tool

Chapter 4 Land Use Search Tool

Remaining in the **"Map"** portal, the **"Search By Land Use Class Code"** located to the left side of the screen (highlighted in **Figure 4-1**) provides a query functionality that allows a user to search across all land use classifications.

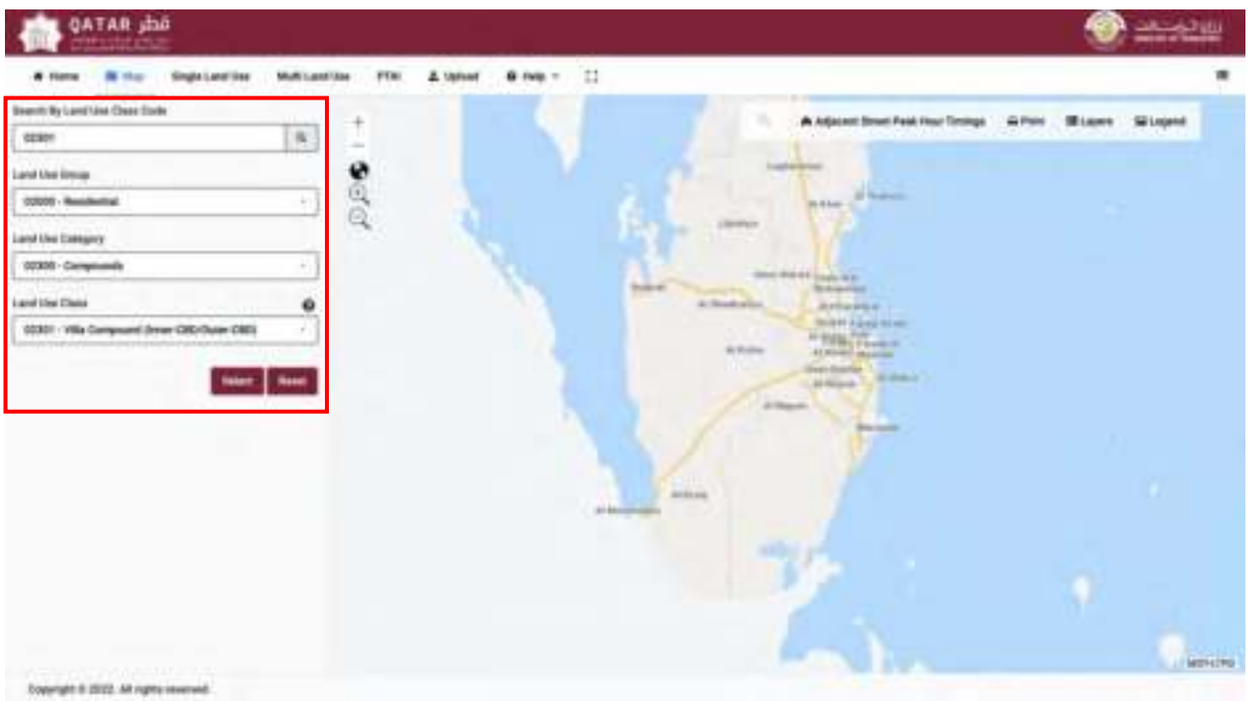

Figure 4-1: Land Use Classification search tool

4.1 General Search

The user can specify the search criteria by selecting the **"Land Use Group"**, **"Land Use Category"**, and **"Land Use Class"** (**Figure 4-2**:).

To search for a land use, the user shall undertake the following steps:

Step 1: Click the "▫" symbol, enabling a drop down menu to appear under the **"Land Use Group"**. Click on the preferred **"Land Use Group"**.
Step 2: Click on the "▫" symbol, enabling a drop down menu to appear under the **"Land Use Category"**. Click on the preferred **"Land Use Category"**.
Step 3: Click on the"▫" symbol, enabling a drop down menu to appear under the **"Land Use Class"**. Click on the preferred **"Land Use Class"**.

Figure 4-2: Searching by Land Use Criteria

4.2 Searching by Land Use Code

In instances where the user knows the land use classification code, the user does not need to use the drop down menu options. Instead, they can enter the land use classification number and directly search for it. The steps to undertake this option are outlined below:

Step 1: Enter the land use classification code into the **"Search By Land Use Class Code"** search tool.
Step 2: Select the "" symbol.

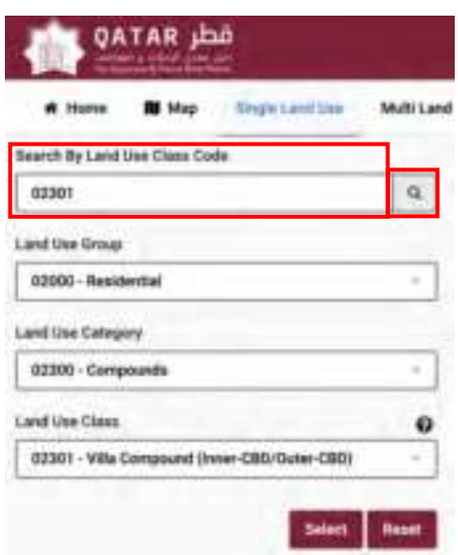

Figure 4-3: Searching by Land Use Classification code

When the user enters the land use classification code, the **"Land Use Group"**, **"Land Use Category"**, and **"Land Use Class"** data fields automatically populate.

4.3 Displaying the Land Use Definition

After the user has populated the data fields by undertaking a general search or by using the land use classification code, the user can check the description of the Land Use Class for further clarification that they have found the best fitting land use classification. To do this, the user may scroll over the question mark symbol " " and a land use class description pop-up box will appear, as shown in **Figure 4-4**.

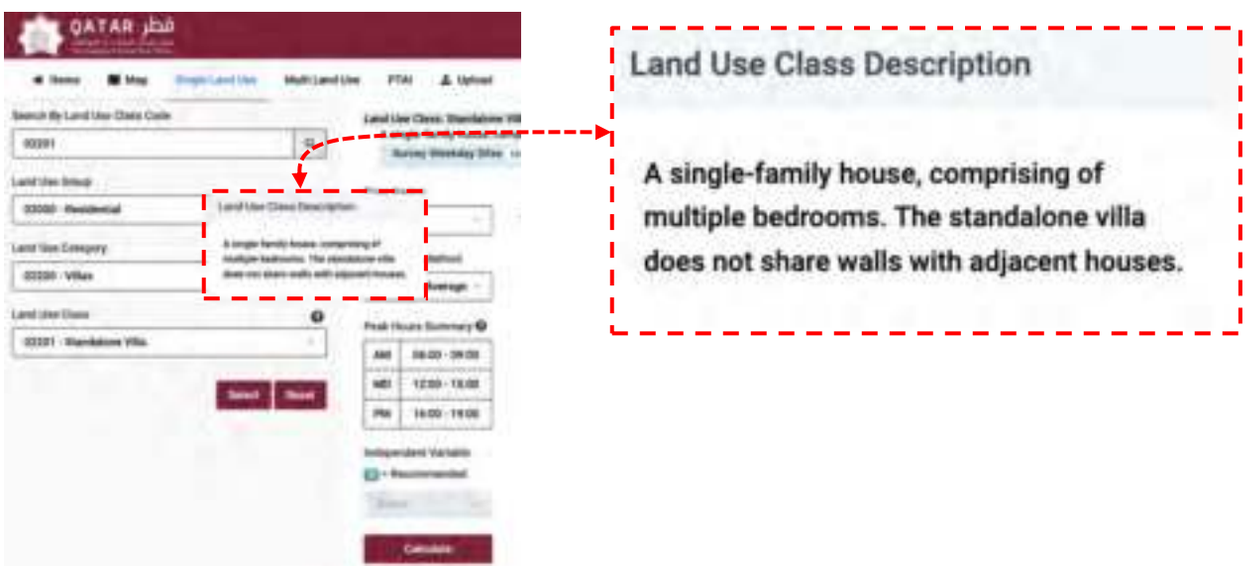

Figure 4-4: Finding the Land Use Class Description

When the user is confident with their chosen land use classification, they shall click the **"Select"** symbol "Select"and a pop-up window named **"Choose Land Use Class"** will appear prompting the user to select **"Single Land Use Class"** or **"Multi Land Use Class"**, as shown in **Figure 4-5**.

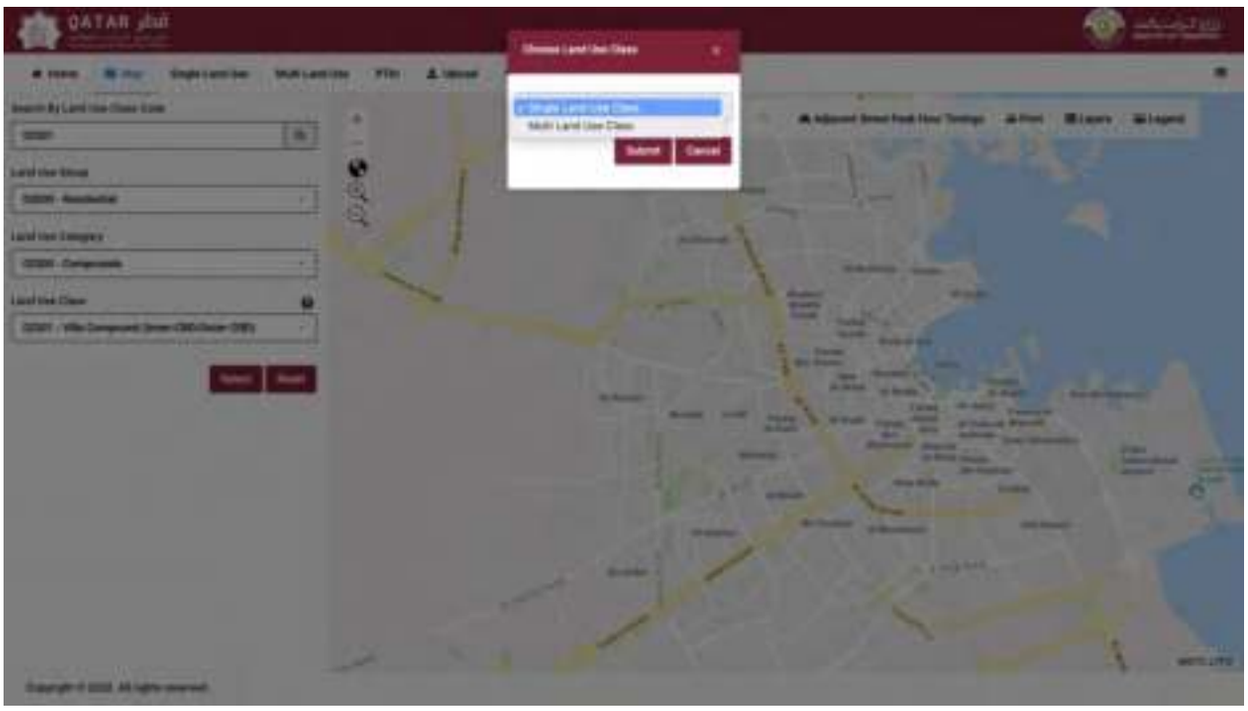

Figure 4-5: Single Land Use Class or Multi Land Use Class options

The **"Single Land Use Class"** is described further in **Chapter 5** . **"Multi Land Use Class"** is described further in **Chapter 6** .

CHAPTER 5

Single Land Use Menu

Chapter 5 Single Land Use Menu

5.1 Steps to obtain trip generation rates

The Single Land Use option provides the user with an opportunity to query, view, and export trip generation and parking demand estimates for a single land use. Following on from the steps outlined in **Chapter 4** , the user shall select the **"Single Land Use Class"** option, then select the " Submit " symbol, as shown in **Figure 5-1**.

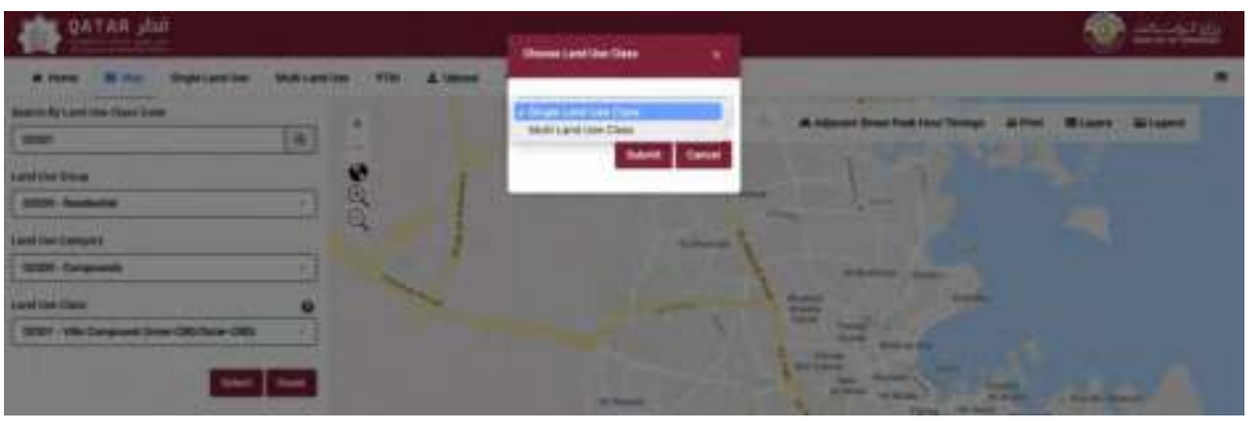

Figure 5-1: Selecting the Single Land Use Option

After the Single Land Use option has been selected, the user is presented with a new screen, as shown in **Figure 5-2**. The user shall note the **"Single Land Use"** tab in the main menu has also been highlighted blue.

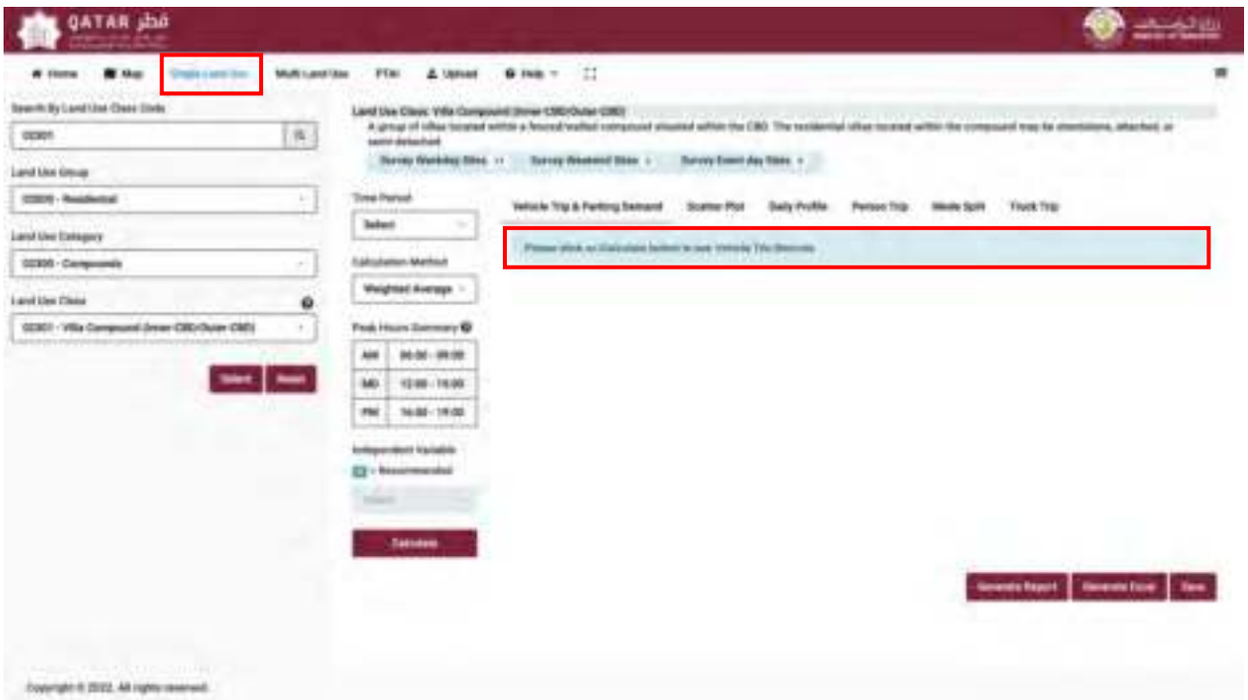

Figure 5-2: Single Land Use Interface

The user is prompted to select the **"Calculate"** button to see **"Vehicle Trip Records"**. However, before this can be actioned, there are several items the user needs to check, confirm, and input data for. These items are highlighted in **Figure 5-3** and outlined in the following steps.

Step 1: The user shall select **"Weekday"**, **"Weekend"**, or **"Event Day"**.
Step 2: The user shall select the **"Calculation Method"**, which comprises **"Weighted Average Rate"**, **"Best Fit"**, and/or **"Recommended"**.
Step 3: The user is provided with the typical peak time periods associated with the chosen land use class.
Step 4: The user shall select the recommended independent variable, denoted with the "R" symbol. For land use classes that have multiple independent variables, refer to **Section 5.9**).
Step 5: Enter the scale of the development appropriate to the recommended independent variable and select "**Calculate**".
Step 6: The user is provided with the definition of the selected independent variable and its range.

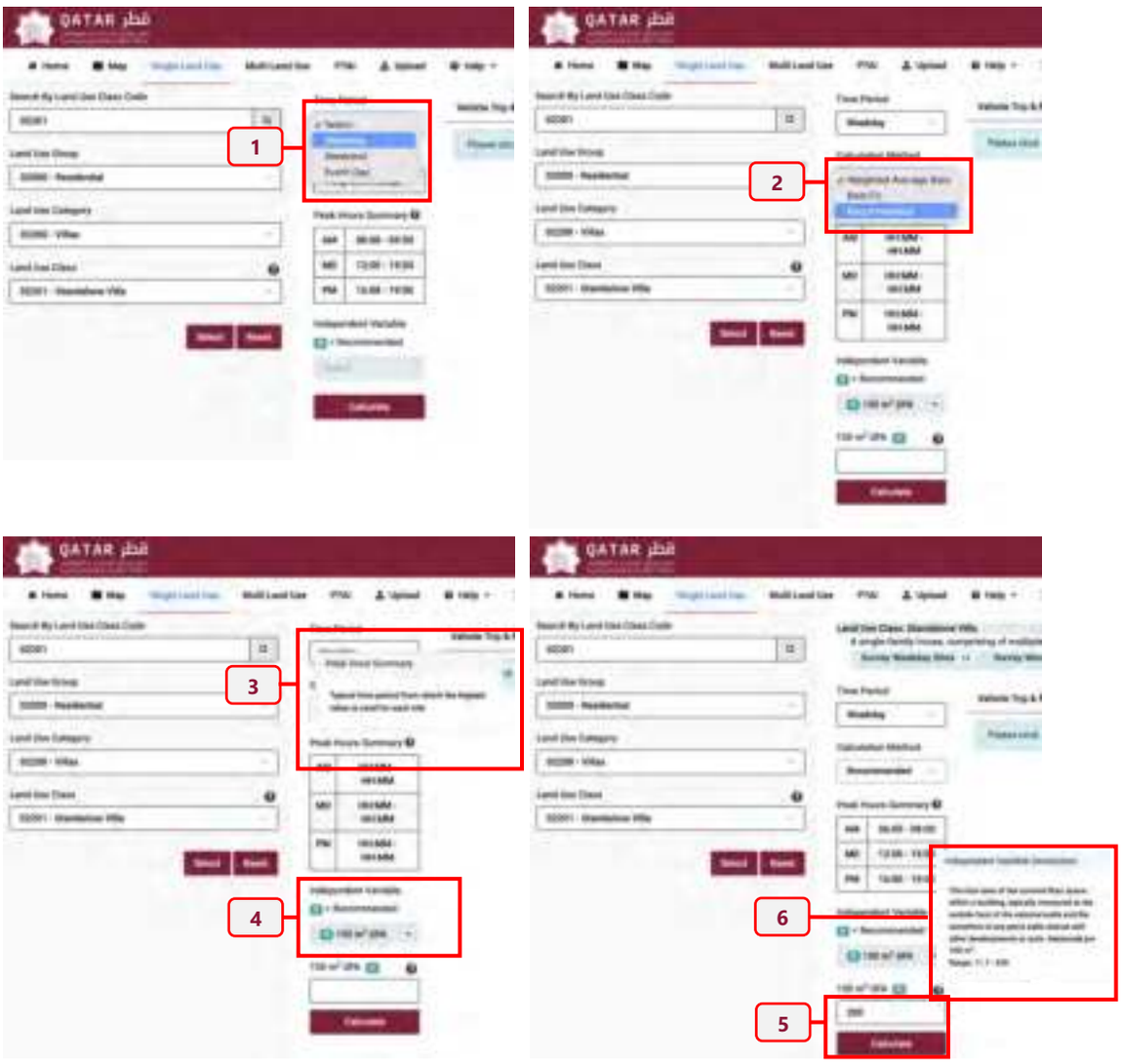

Figure 5-3: Items for selection prior to calculating trip rates

Note: *In some instances, the user may not have the correct information or may have not selected an item. In such cases, the following warning messages will appear in the top right corner of the screen, as shown in* ***Figure 5-4.***

Figure 5-4: Example warning messages

5.2 Vehicle Trip and Parking Demand

After **"Calculate"** is selected, four tables associated with the **"Vehicle Trip & Parking Demand"** tab are automatically generated (as shown in **Figure 5-5**). These tables comprise the following information:

Table 1: Provides the Vehicle Trip Rates and their inbound/outbound distribution.
Table 2: Provides the Trip Generation Estimates based on the provided scale of the Independent Variable.
Table 3: Provides the Parking Rate.
Table 4: Provides the Parking Demand Estimates based on the provided scale of the independent variable.

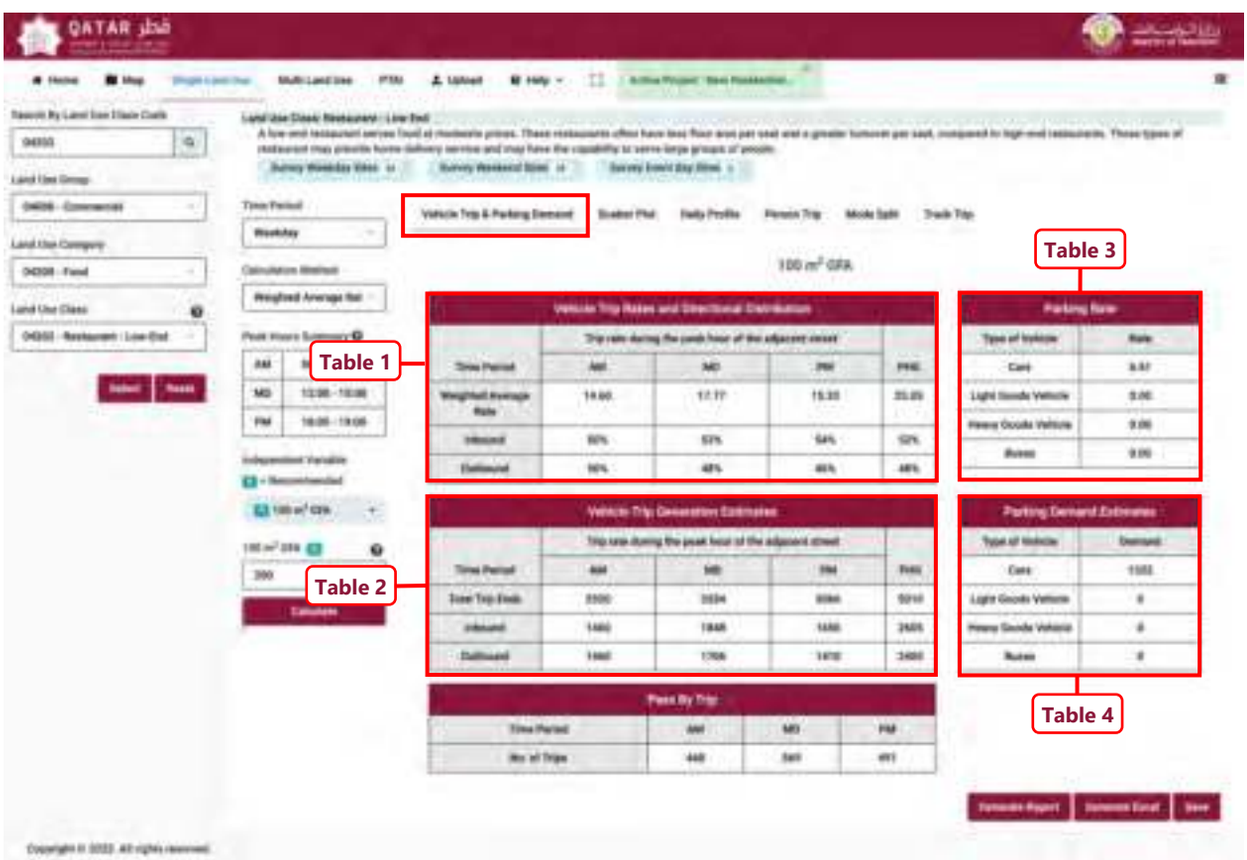

Figure 5-5: Accessing the Vehicle Trip Generation and Parking Rates Tables of a Single Land Use

5.3 Pass By Trip

For several commercial land uses, the QTGPRS will provide a fifth table within the **"Vehicle Trip & Parking Demand"** tab, showing a rate for **"Pass By Trip"**. The pass by trips contained in this table (denoted as **Table 1** in **Figure 5-6**) shall be deducted from the trip generation estimate (denoted as **Table 2** in **Figure 5-6**).

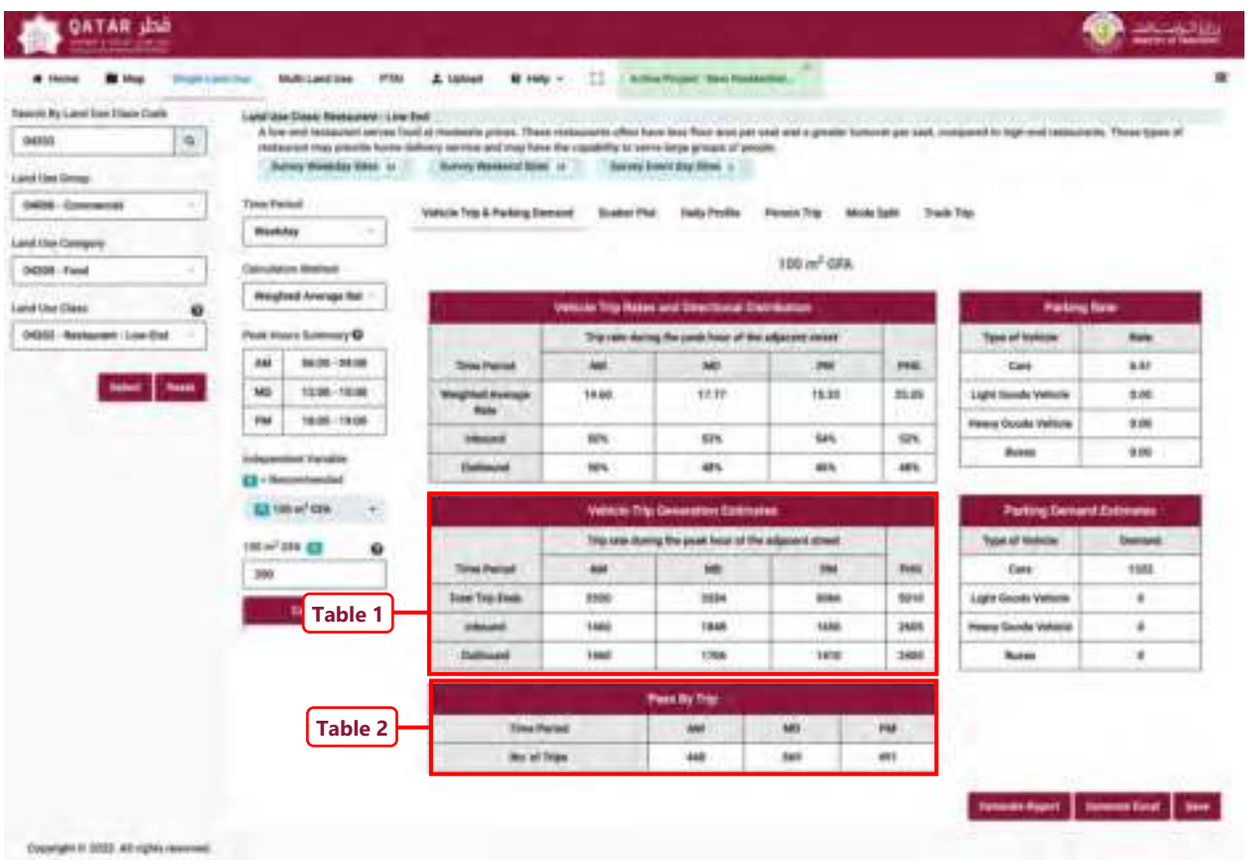

Figure 5-6: Location of Pass By Trip rates

5.4 Person Trip

To obtain the person trip rates and inbound/outbound directional distribution, as well as the person trip generation estimates, the user shall undertake the following steps:

Step 1: Repeat the steps provided in **Section 5.1**.
Step 2. Scroll and select the **Person trips** menu, as highlighted in **Figure 5-7**. This automatically provides the "Person Trip Rates and Directional Distribution" (denoted as **Table 1**) and the "Person Trip Generation Estimates" (denoted as **Table 2**).

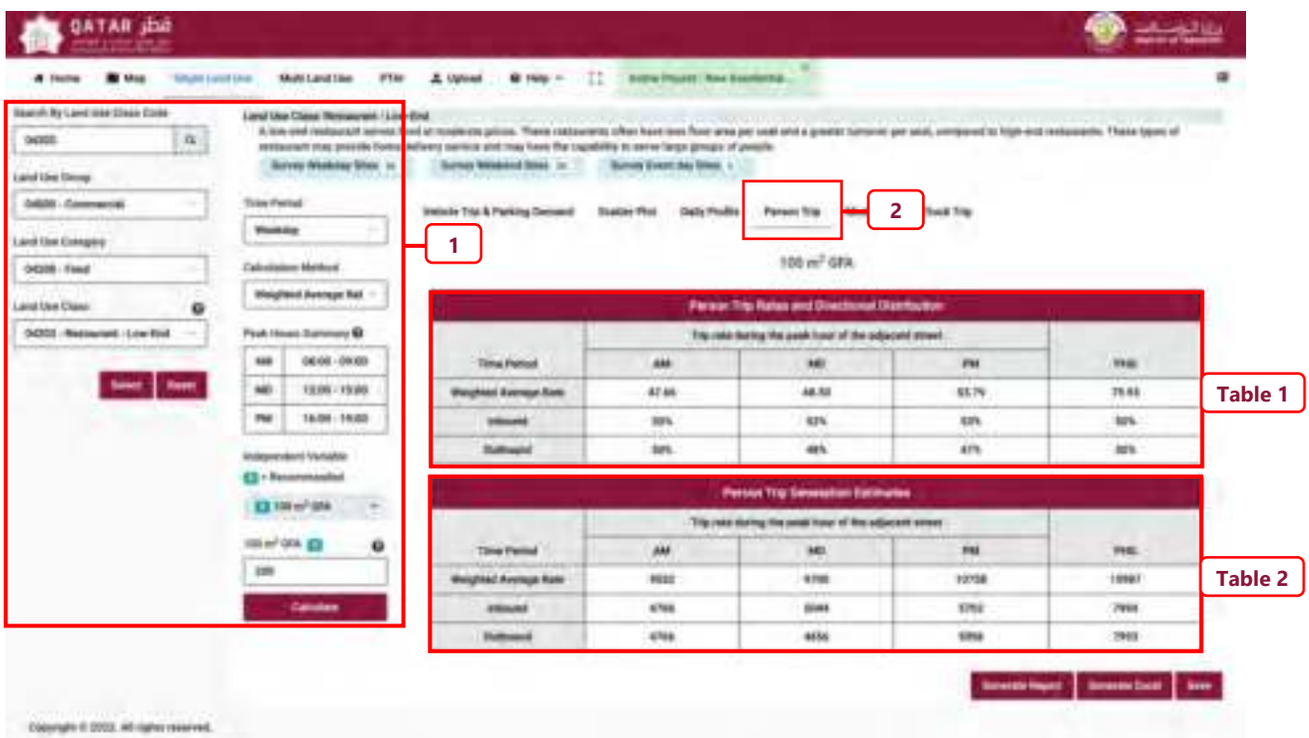

Figure 5-7: Accessing the person trip rates of a Single Land Use

5.5 Mode Split

To determine the vehicle classification split of the vehicle trips and to understand the modal split of the person trips, the software user can access the Mode Share and Percentage Vehicle Classification information, via the **"Mode Split"** tab (refer to **Figure 5-8**) by undertaking the following steps:

Step 1: Repeat the steps provided in **Section 5.1**.
Step 2: In this instance, the user shall select the "**Mode Split**" tab.
Step 3: After the **"Mode Split"** tab is selected, the user can visualize the **"Percentage Vehicle Classification"** and the "**Percentage Mode Share"** information on the screen.

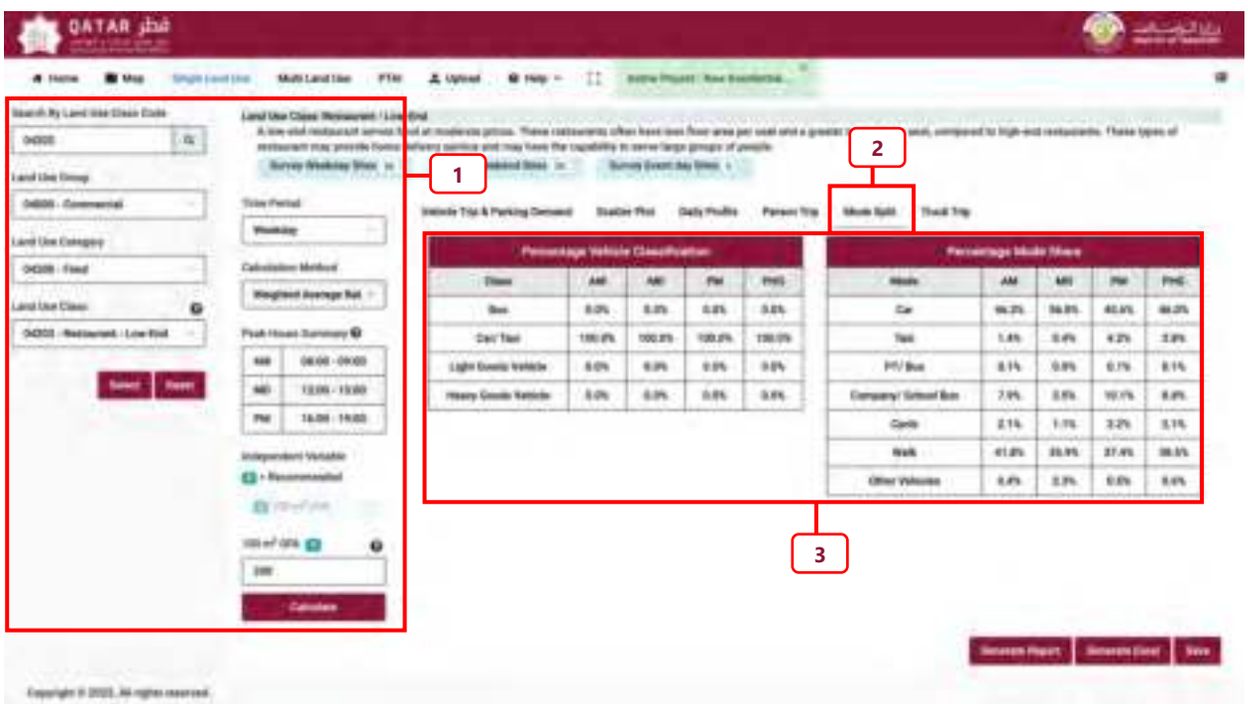

Figure 5-8: Accessing the Percentage Vehicle Classification and the Percentage Mode Share of a Single Land Use

5.6 Truck Trip

The **"Truck Trip"** tab provides information on the daily truck trip rate for Light Goods Vehicle (Lt. Gds. Veh.), Heavy Goods Vehicle (Hvy. Gds. Veh.), and Buses (refer to **Figure 5-9**). To access this information, the user shall undertake the following steps:

Step 1: Repeat the steps provided in **Section 5.1**.
Step 2: In this instance, the user shall select the "**Truck Trip**" tab.
Step 3: After the **"Truck Trip"** tab is selected, the user can see the **"Daily Truck Trip Rate**" and the "**Daily Truck Trip Demand Estimates"** information on the screen.

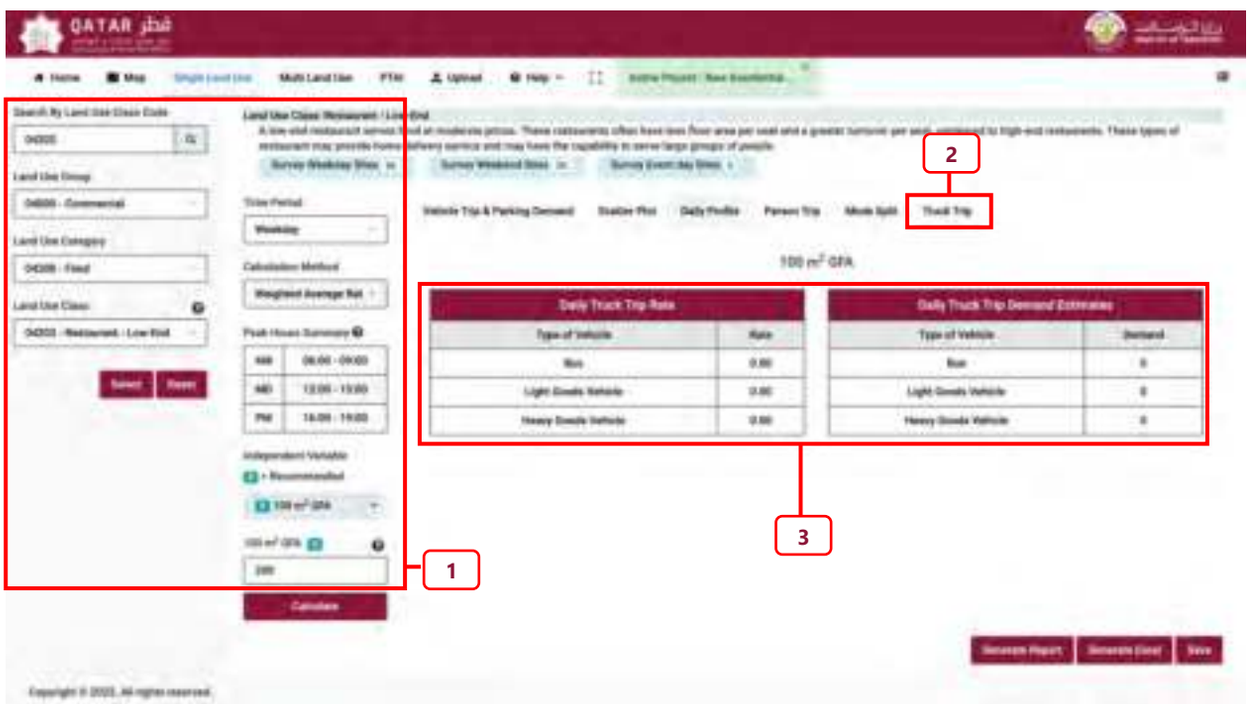

Figure 5-9: Daily Truck Trip Rate and Daily Truck Trip Demand Estimates

5.7 Daily Profile

The **"Daily Profile"** tab provides a daily profile graph of the weighted average rates (**Figure 5-10**). To display the profile and select alternate views of the profile, the user shall undertake the following steps:

Step 1: Repeat the steps provided in **Section 5.1**.
Step 2: Select the **"Daily Profile"** tab to automatically.
Step 3: The user may switch the display of the profile, by selecting the **"Horizontal Bar"** or **"Vertical Bar"**.
Step 4: The user may switch the profile to display **"Person Trip Rates"**, **"Vehicle Trip Rates"**, or **"Parking Rates (all vehicles)"**.

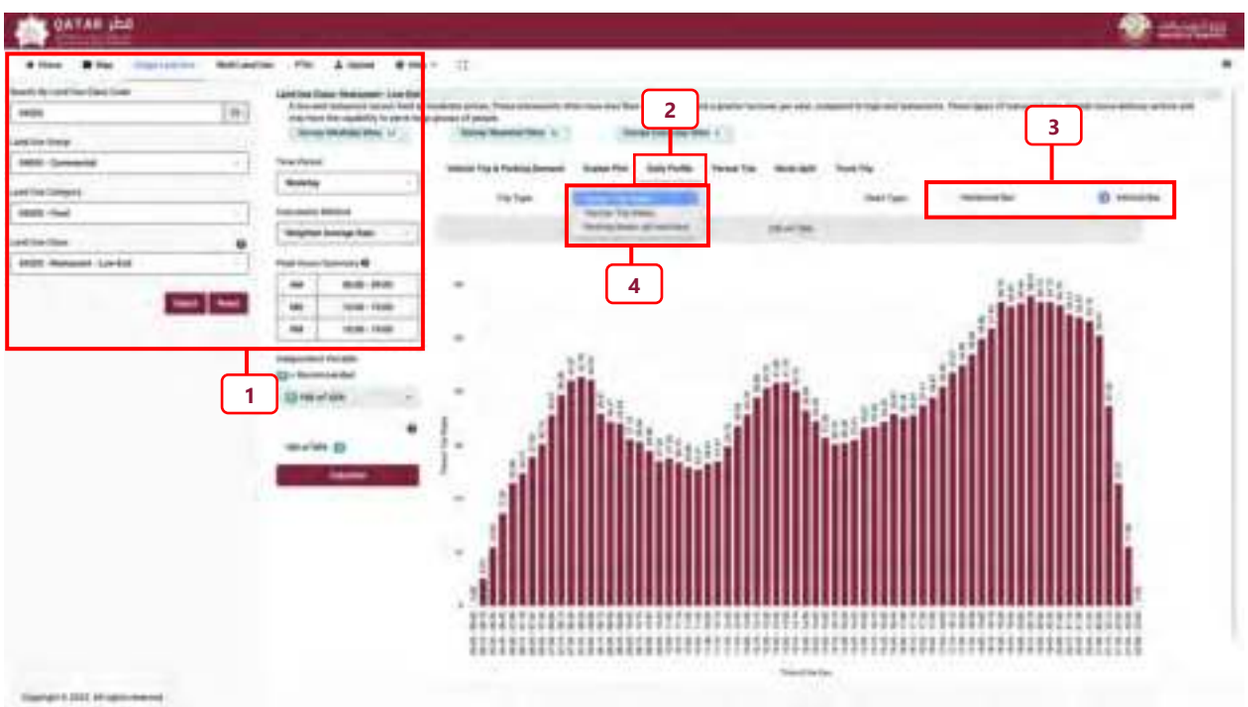

Figure 5-10: Daily Profile of Average Trip Rates

5.8 Scatter Plot

The **"Scatter Plot"** tab provides a tool that displays the data points and best fit equation line for any of the peak periods (AM, MD, PM, or PHG) as seen in **Figure 5-11**:. To view, the user shall undertake the following steps:

Step 1: Repeat the steps provided in **Section 5.1**.
Step 2: Select the **"Scatter Plot"** tab, to automatically populate a scatter plot on the screen.
Step 3: Select the trip type, this can be **"Person Trip"** or **"Vehicle Trip"**.
Step 4: Select the time period, this can be **"AM"**, **"MD"**, **"PM"**, **"PHG"**, or **"All"**.

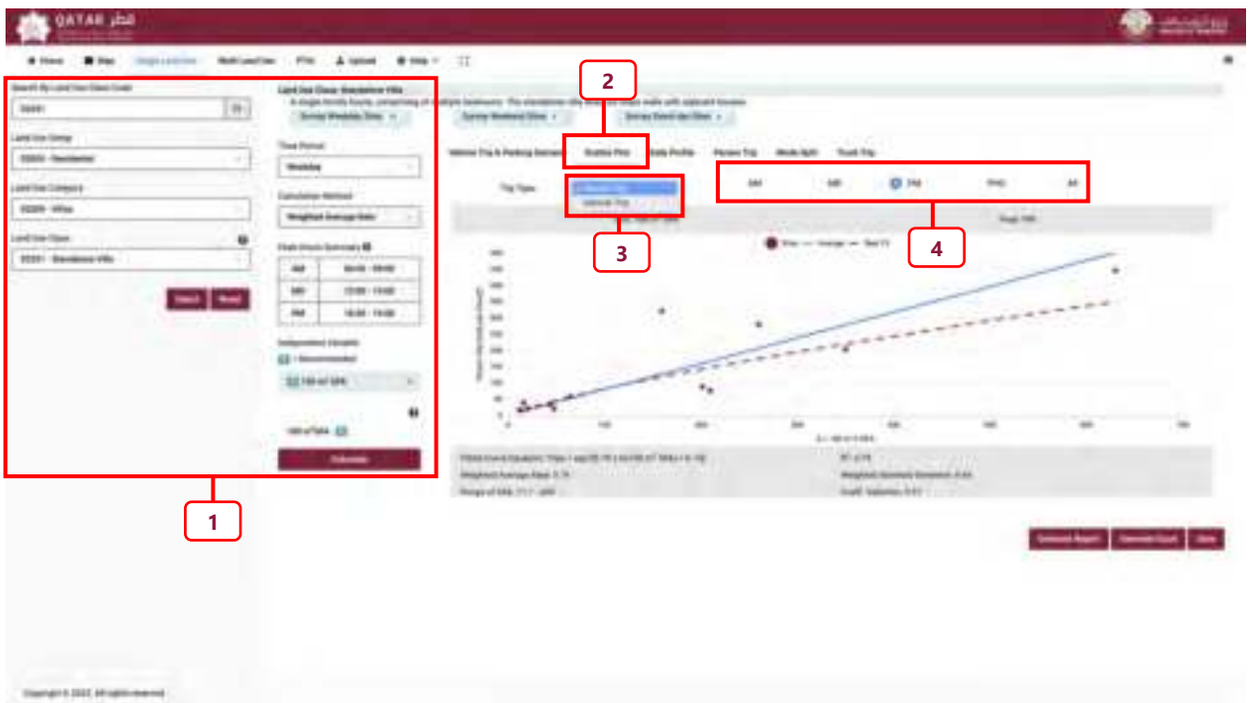

Figure 5-11: Steps to Display Scatter Plot

5.9 Multiple independent variables

For some land use classifications, it is possible to compare different independent variables for the vehicle and person trip generation estimates (refer to **Figure 5-12**). To do this, the user shall undertake the following steps:

Step 1: Repeat the steps provided in **Section 5.1**, But prior to clicking **"Calculate"**, the user shall click on the "" symbol to expand the independent variable list and shall select the independent variables to be compared.

Step 2: The user shall add the unit of measurement for each independent variable.

Step 3: After the unit of measurement has been added for each independent variable, the user shall click **"Calculate"**.

Step 4: The user will be presented with the **"Vehicle Trip & Parking Demand"** rates for the selected independent variables.

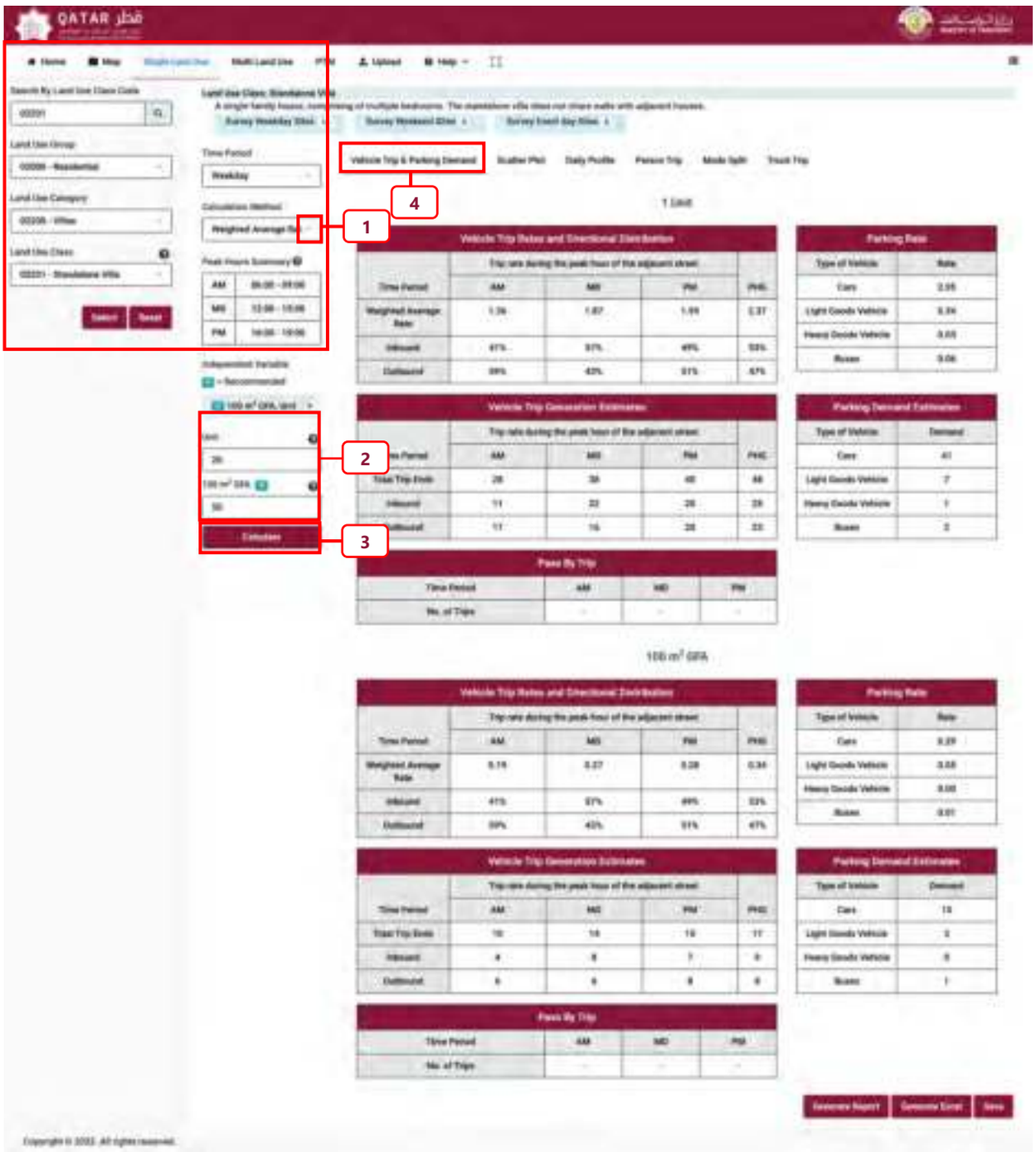

Figure 5-12: Multiple Independent Variables – comparison

The selected independent variables can also be compared under the remaining five

- **"Scatter Plot"**
- **"Daily Profile"**
- **"Person Trip"**
- **"Mode Split"**
- **"Truck Trip"**

CHAPTER 6

Multi Land Use Menu

Chapter 6 Multi Land Use Menu

The **"Multi Land Use"** view provides the user with the opportunity to estimate vehicle trip generation and person trip generation for a land use development that comprises more than one land use classification. Such developments behave differently in the sense that some trips between the individual land uses contained on a single site are made via internal connections.

6.1 Populating the Multi Land use Table

Within the **"Multi Land Use"** view, the **"Search"** function (refer to steps outlined in **Chapter 4** and highlighted in **Figure 6-1**) must be used to populate each individual land use class component of the multi land use development. The development size for each land use class, according to the independent variable selected, must be entered. From the example provided in **Figure 6-1**, three individual land use classes are included and the steps required to add them are as follows:

Step 1: The user shall select the land use group, category, and class.
Step 2: The user shall select the time period and calculation method.
Step 3: The user shall select the independent variable and enter the development size.
Step 4: After all land use information is entered for an individual land use, the user shall select **"Add"**. This will populate the table of rates. Should the user want to add another land use, they shall repeat **Steps 1-4**. Should the user want to remove a land use class, they shall select the " " symbol and the land use will be removed.

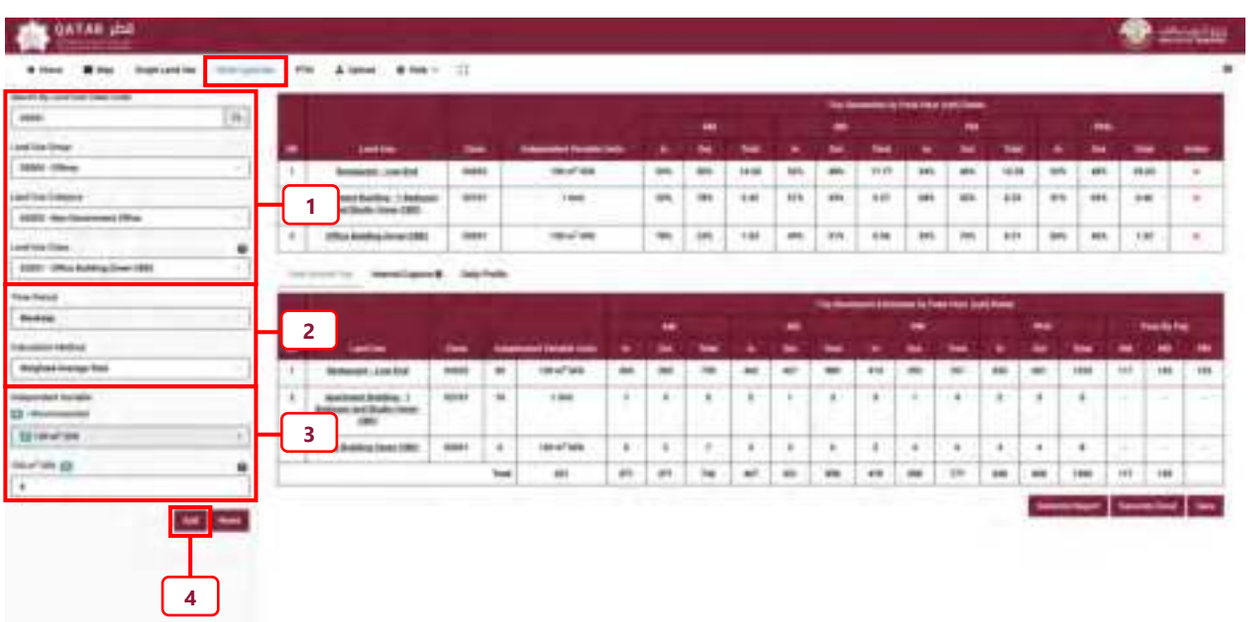

Figure 6-1: Multi land use module

6.2 Daily Profiles

Daily profiles for each of the individual land use classes that are part of the site development, are accessible via the daily profile menu. To display the daily profiles, the user shall undertake the following steps:

Step 1: Follow the steps of **Section 6.1**
Step 2: The user can select either "**Vehicle Trip Rates**" or "**Person Trip Rates**" or "**Parking rates**"
Step 3: Select the Chart Type—either "**Horizontal Bar**" or "**Vertical Bar**" (see **Figure 6-2**:)

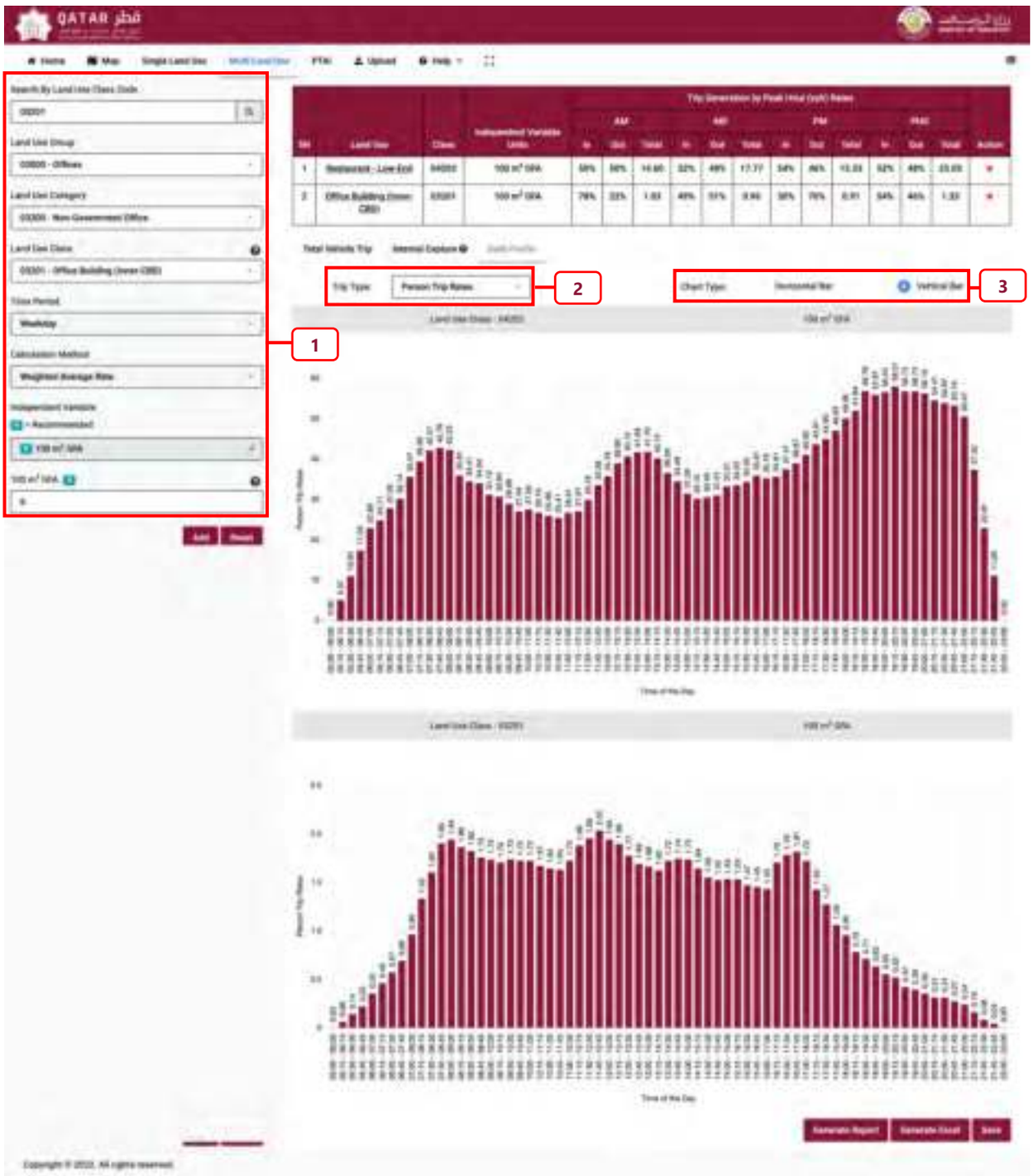

Figure 6-2: Daily profile for separate land use classes that forms part of a multi land use development

6.3 Internal Capture

The **"Internal Capture"** tab provides estimated internal capture trip reductions. These reductions shall be applied to the estimated gross vehicle trip generation. As seen in **Figure 6-3**, internal

capture rates are not provided for the Dental land use class. This is because internal capture has not been observed for some land use classes.

> ***Note:*** *Several land use classes belonging to the Offices, Residential, Commercial, Food, Entertainment, and Hotels land use categories have internal capture rates associated with them.*

To access the internal capture rates, the user shall undertake the following:

Step 1: Complete the steps of **Section 6.1**
Step 2: Select the **"Internal Capture"** tab.
Step 3: Visualize the Internal and External Trips.

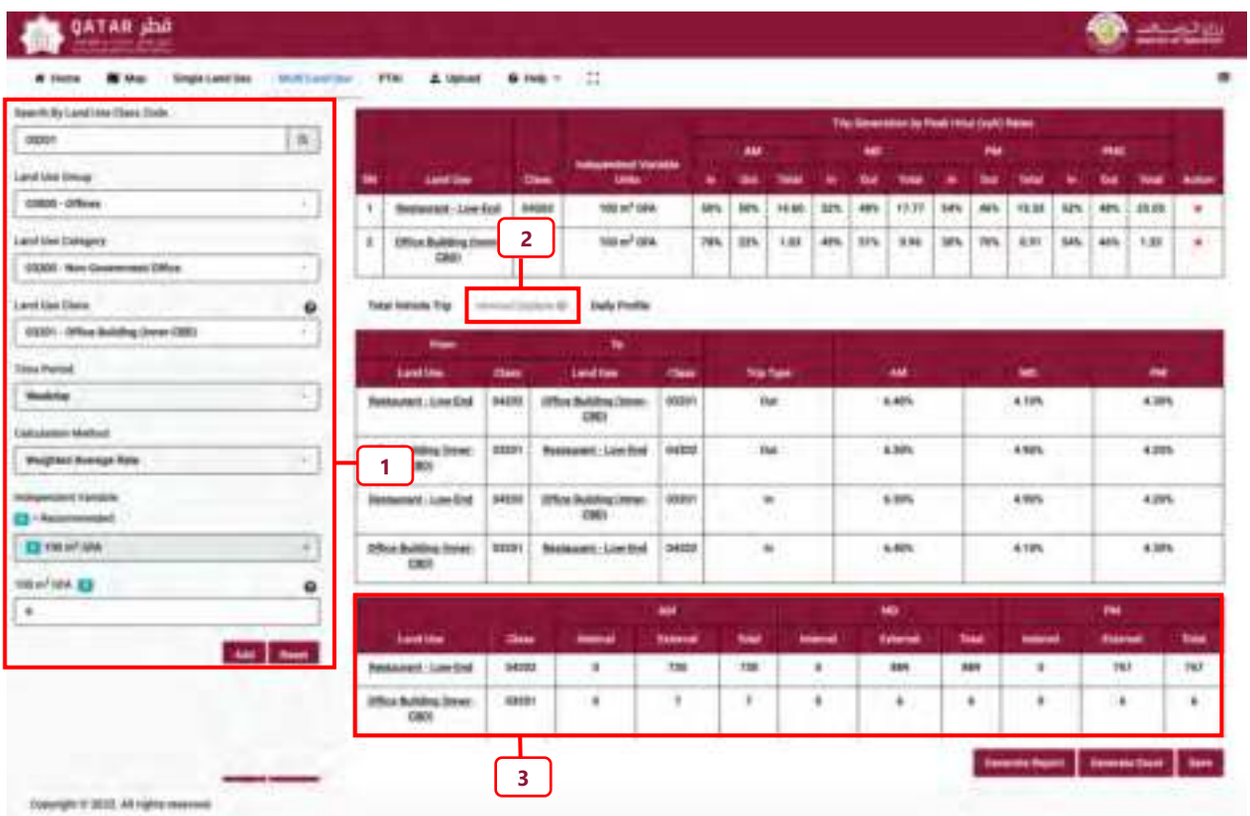

Figure 6-3: Finding the Internal Capture rates

> ***Note:*** *The mixed land use development reports the estimated person trip generation for each individual land use component of the mixed use development. External vehicle trips are provided with supplementary information on the internal capture reduction factors. These reduction factors may be applied to the gross vehicle trip generation estimate.*

CHAPTER 7

PTAI and Peak Time Estimation

Chapter 7 PTAI and Peak Time Estimation

This section presents two additional viewing tools that are useful when conducting transportation studies: the Public Transport Accessibility Index (PTAI) and the estimation of the adjacent street peak hour timings.

7.1 Public Transport Accessibility Index (PTAI)

The PTAI reflects how well-served a development is by public transportation. The PTAI calculation uses the information from all available bus stops and metro stations within a given walking distance. It considers the frequency of service and applies a penalty depending on the type of service. For example, the use of a bus may be less attractive than light rail if the bus service is not as frequent as light rail service.

To estimate the PTAI, the user must undertake the following:

Step 1: Click the "**PTAI**" button.
Step 2: Click on the parcel of land where the **PTAI** calculation is required.
Step 3: If authorized by MOT, the user may adjust the penalties for each bus stop or metro station. If no authorization from MOT is received, the default penalty values shall be used.
Step 4: Click **"Calculate"** and obtain the PTAI value.

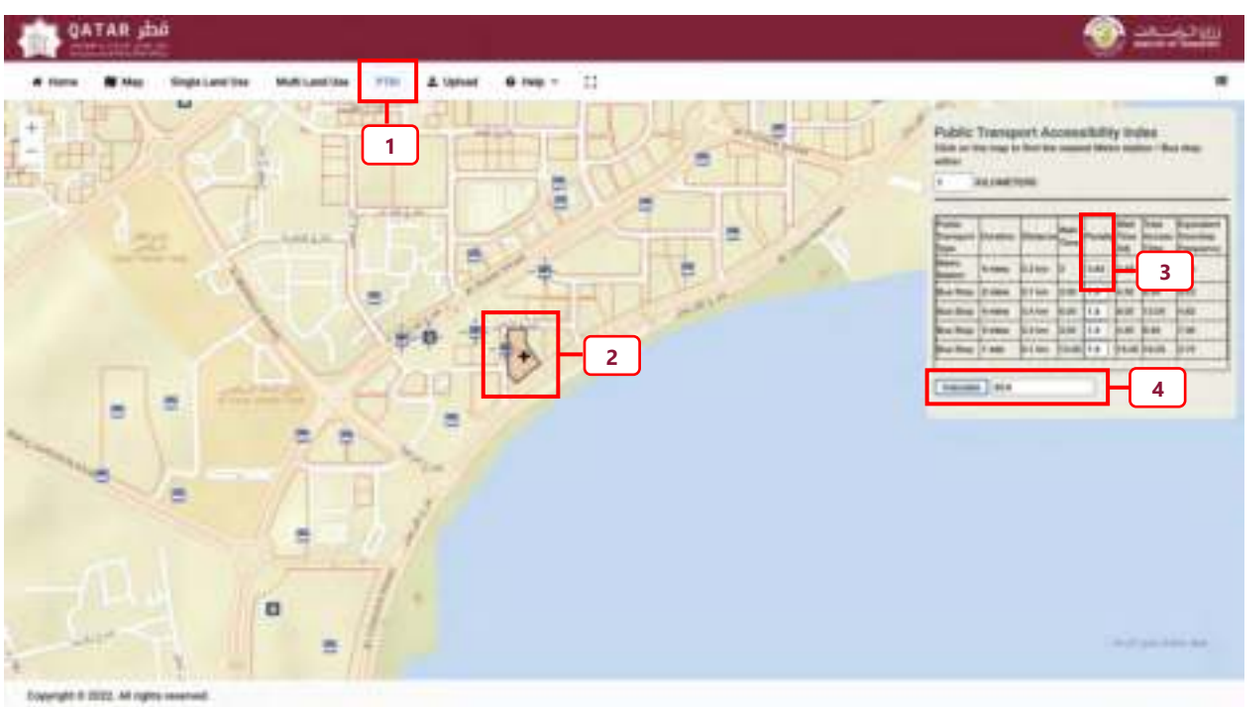

Figure 7-1: PTAI Calculation

7.2 Estimation of Peak Times

The adjacent street peak hour timing for a selected location/parcel can be estimated from the traffic count observations from nearby sites as contained in the TDMS. To obtain the peak hour within the AM (06:00-09:00), MD (12:00-15:00), and PM (16:00-19:00) peak periods for a selected parcel, the user must do the following:

Step 1: Click on Adjacent Street Peak Hour Timings map option.
Step 2: Specify the Buffer Parameters, by entering desired buffer distance and unit of measurement (i.e., meters or kilometers).
Step 3: Click the **Point** button.
Step 4: Click the desired location on the map. This will draw a buffer with the specified parameters and will display peak hour information based on the available counts within the buffer.

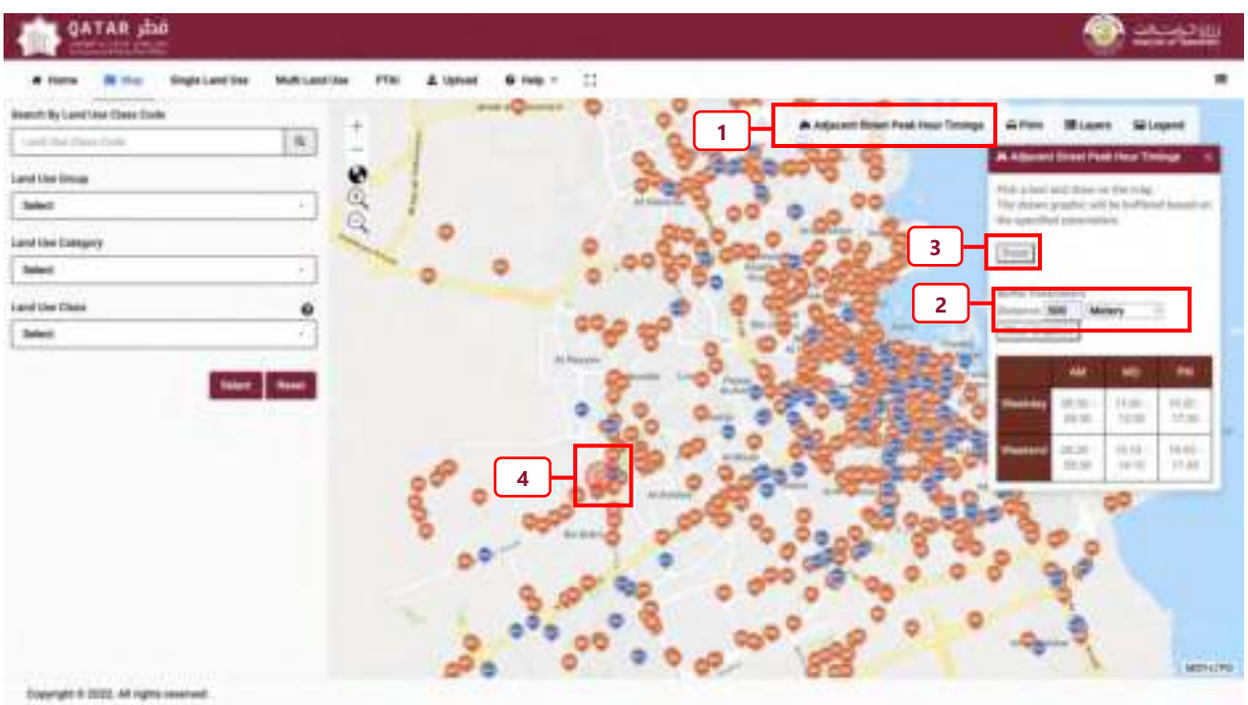

Figure 7-2: Peak Time range estimation

CHAPTER 8

Help and other functions

Chapter 8 Help and other functions

8.1 Help

The **"Help"** tab can be accessed via the main menu (**Figure 8-1**). This feature provides the user with the ability to access and download a PDF version of the Software User Guide (i.e., this Volume), the GPTS, and the QTGPRM Volumes. It also provides a web link to the land use class definitions, that may be consulted when the user is trying to find the best-matched land use classification to their development site.

To access the Help function, click the **"Help"** tab, as highlighted in **Figure 8-1**. This produces a drop down menu for the user to select from among several items.

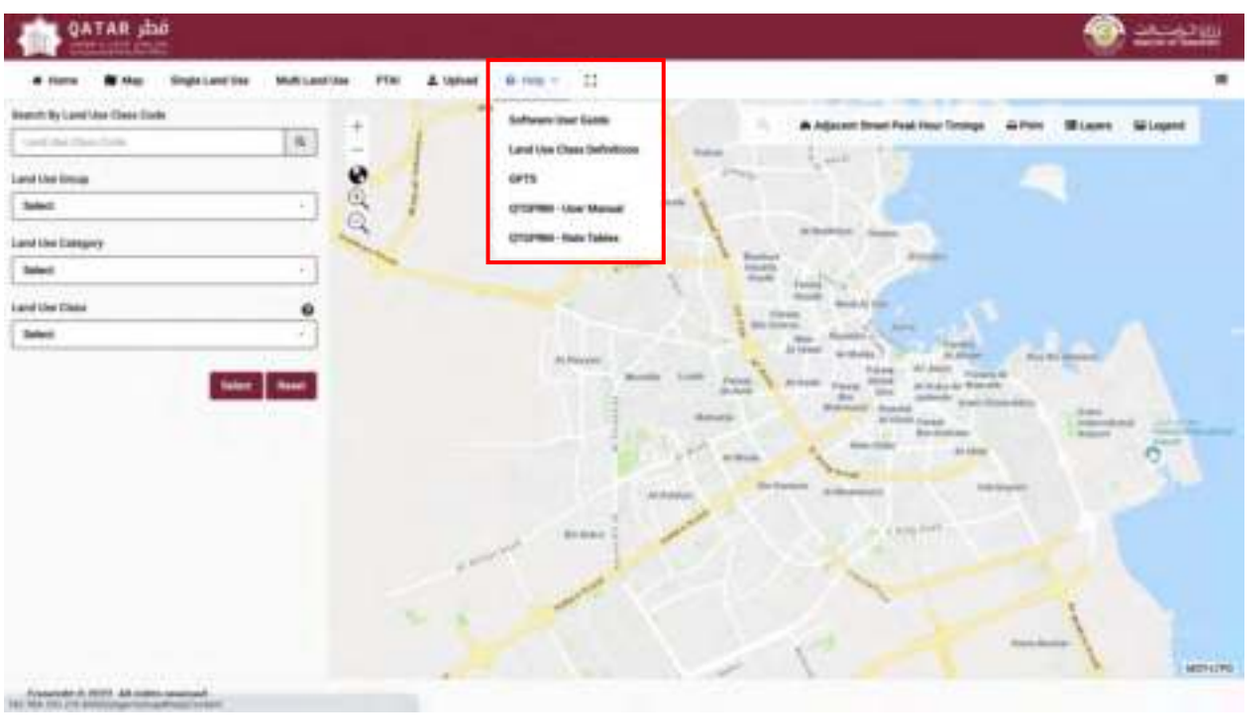

Figure 8-1: Help Menu

Software User Manual: The user manual is linked to the software.

Land Use Class Definitions: The land use class definitions are provided (**Figure 8-2**:).

GPTS: The GPTS is linked to the software. The GPTS provides the guidelines for transportation studies in the State of Qatar.

QTGPRM – User Manual: Provides details on how the trip generation and parking demand rates were estimated.

QTGPRM – Rates Tables: Provides the person trip generation, vehicle trip generation, and parking demand rates for the chosen land use class for a given independent variable. The tables of rates form the basis of the QTGPRS.

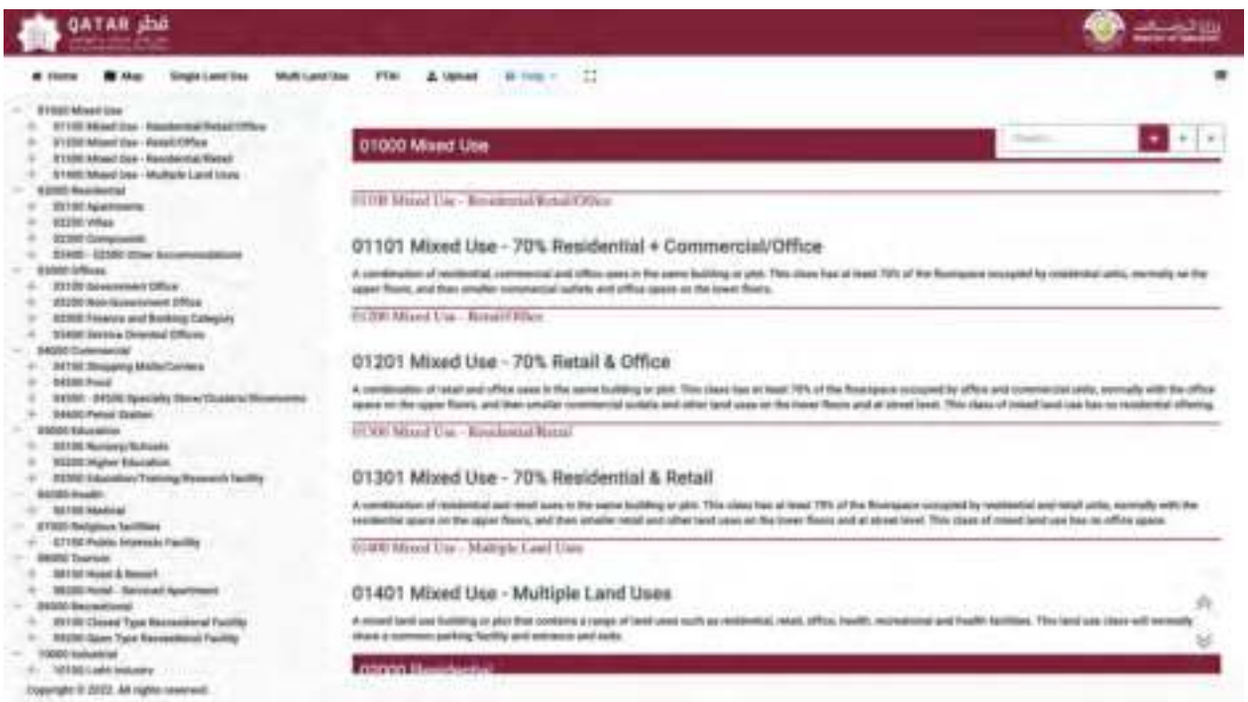

Figure 8-2: The Land Use Class definitions

8.2 Print Report

In all instances, when estimating person trip generation and vehicle trip generation, the user can print out a report. To do this, the user shall select and click on the " " button as shown in **Figure 8-3**.

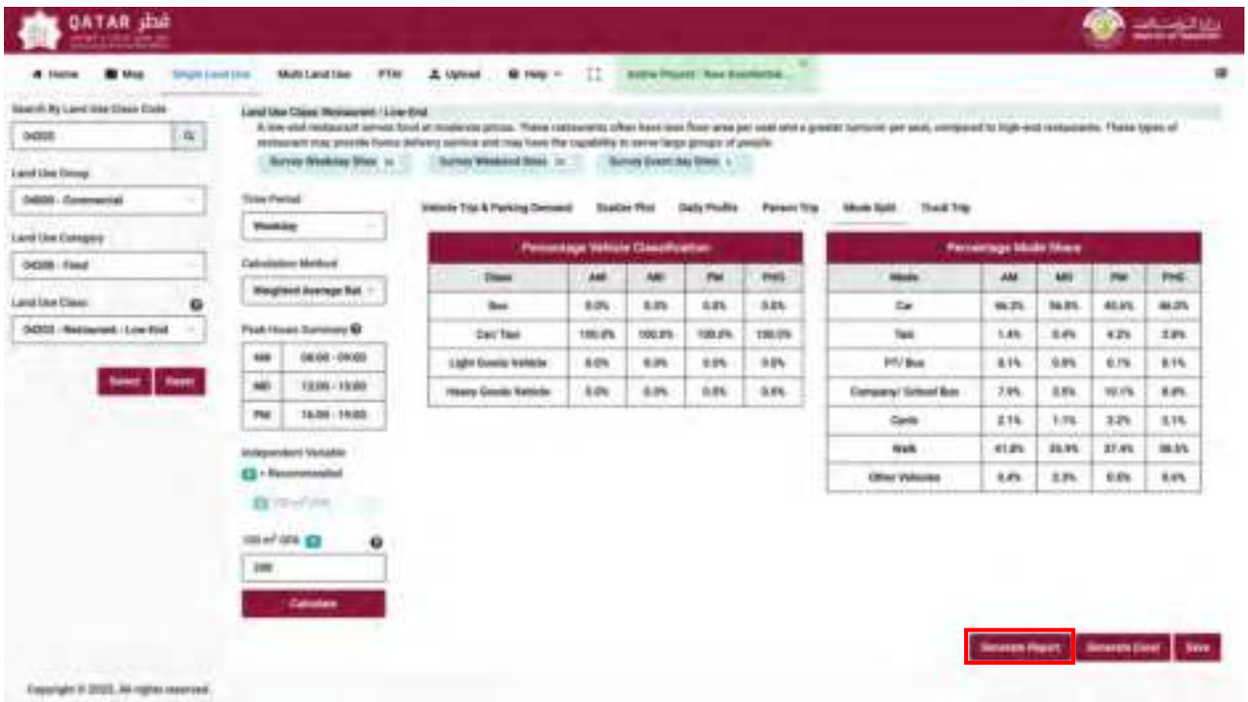

Figure 8-3: Print report option

Clicking the "Generate Report" button will prompt the user with a list of visited tabs and the user may specify which tabs to include in the printed report (**Figure 8-4)**.

> ***Note:*** *Should the user access more than one tab, each tab will be included in the printed report, as shown in* ***Figure 8-4****.*

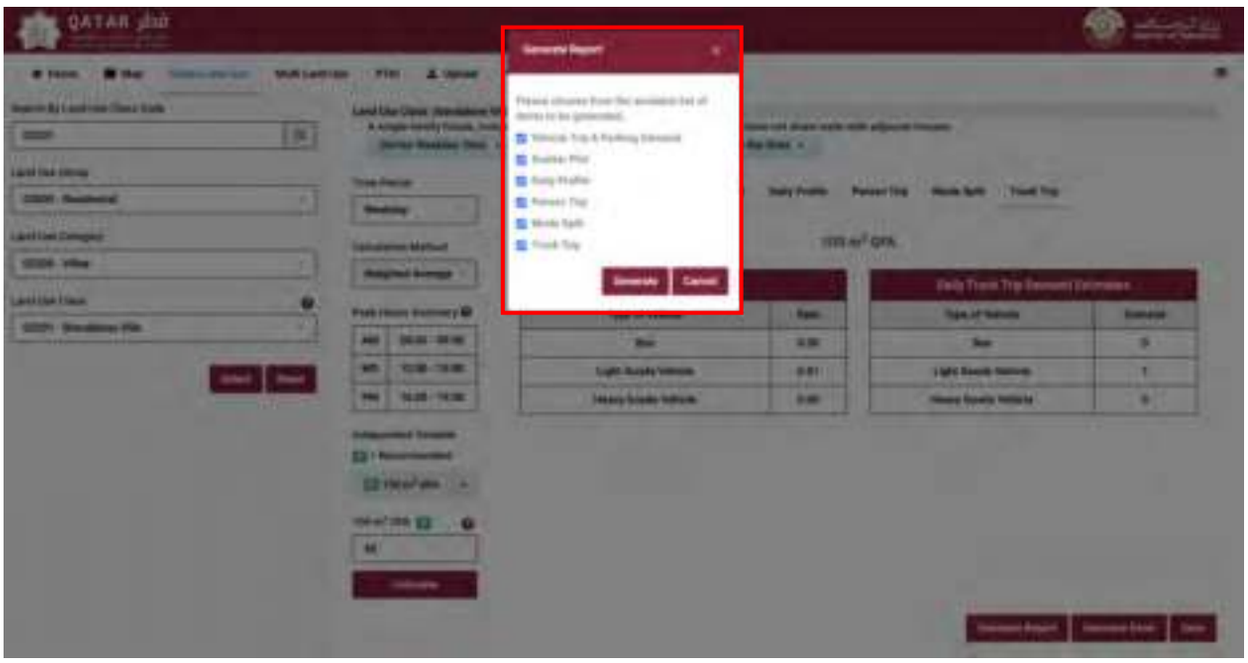

Figure 8-4: Multiple tab print report

8.3 Export to Spreadsheet

The user also has the option to export the tables in spreadsheet format. To do this, the user shall click on the "[redacted]" button, after which a pop-up window will appear prompting the user to select what to include in the export (see **Figure 8-5**).

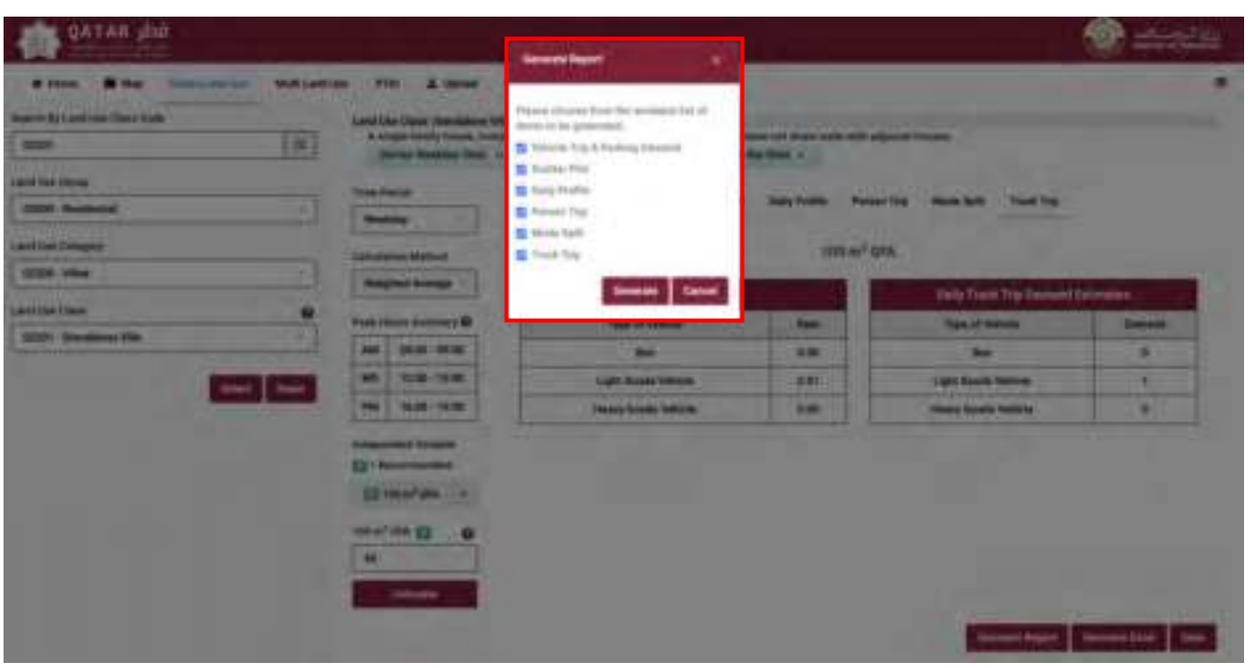

Figure 8-5: Exporting to spreadsheet format

Sample output is shown in **Figure 8-6**.

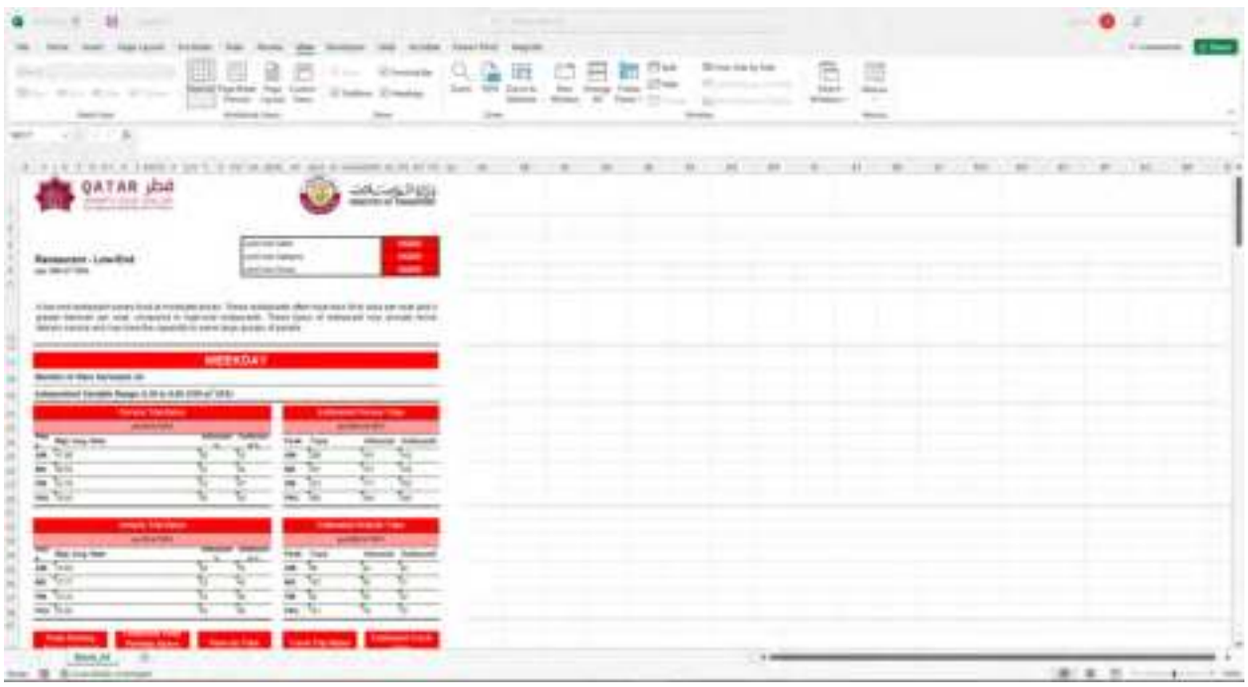

Figure 8-6: Spreadsheet based report

8.4 Upload

The upload function is available to MOT staff users only. This function allows MOT to upload survey data to the system to update the rates. When the rates are updated, the version of the software will be changed to reflect this.

It is important for the user to ensure they are working with the latest version of the software and rates.

وزارة المواصلات

MINISTRY OF TRANSPORT

ص.ب. 24455 P.O. Box
الدوحة، قطر Doha, Qatar
ت 1111 4045 974+ T
mot.gov.qa