Qatar 2050 قطر
الخطة الشاملة للنقل
Transportation Master Plan

وزارة المواصلات
MINISTRY OF TRANSPORT

# TDMS

## TRANSPORTATION DATA MANAGEMENT SYSTEM

## Book Five: The Intelligence - Data Collection

# User Manual

VERSION 1.0

Integrated & Sustainable Transport for All

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يرجى العلم أن أي إشارة أو ذكر لـ "وزارة المواصلات والاتصالات" واختصارها "MOTC" في هذا التقرير، أصبحت تشير حالياً إلى "وزارة المواصلات" و اختصارها "MOT".

## Note:

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# تنويه

قامت وزارة المواصلات والاتصالات بإعداد هذا التقرير وفقاً لأحدث الممارسات العالمية في هذا المجال وبناءً على المعلومات والإحصائيات والبيانات المتوفرة عند كتابة هذا التقرير. وعليه وجب التأكيد على أن وزارة المواصلات والاتصالات، وتحت أي ظرف من الظروف، لا تجيز أو تتعهد أو تُصادق على أن تكون المعلومات المتضمنة في هذا التقرير خالية من أي نوع من الأخطاء أو العيوب.

إن استخدام هذا التقرير لأي عمل، لا يعفي المستخدم من اتباع أحدث الممارسات العالمية، والأساليب الهندسية الصحيحة والمتبعة وفقاً لأحدث التقنيات العالمية، كما أنه لا يخول للمستخدم المطالبة أو استلام أي نوع من التعويض عن الأضرار أو الخسائر التي يمكن أن تُعزى إلى هذا الاستخدام.

قامت وزارة المواصلات والاتصالات في دولة قطر بتوفير النسخة الأولى من هذا التقرير كنسخة مطبوعة وعلى الموقع الرسمي لوزارة المواصلات والاتصالات.

بالنسبة إلى التغييرات أو التعديلات المستقبلية، فسوف تقوم الوزارة بتوفيرها على الموقع الرسمي للوزارة. وعليه يتوجب على المستخدمين التحقق بشكل متواصل بأن لديهم أحدث إصدار من هذا التقرير.

**ملاحظة:** ستقوم وزارة المواصلات والاتصالات 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 والاتصالات تشجع المستخدمين على تقديم الملاحظات والاقتراحات والتعليقات وردود الأفعال وذلك من خلال الموقع الرسمي للوزارة حيث سوف يتم مراجعة هذه الملاحظات والاقتراحات ومن ثم تقييمها وإمكانية إدراجها ضمن الإصدار القادم من التقرير.

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# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| AM | Ante Meridiem |
| ATC | Automatic Traffic Count |
| CBD | Central Business District |
| CSV | Comma Separated Values |
| ESRI | Environmental Systems Research Institute |
| GIS | Geographic Information System |
| HHI | Household Interview Interviews |
| LTPD | Land Transport Planning Department |
| MCC | Manual Classified Count |
| MD | Mid-Day |
| MOTC | Ministry of Transport and Communications (Qatar) |
| MS | Microsoft |
| PDF | Portable Document Format |
| PM | Post Meridiem |
| POI | Point of Interest |
| PTI | Planning time Index |
| QID | Qatar Identification Number |
| QTGPRM | Qatar Trip Generation and Parking Rates Manual |
| ROW | Right of Way |
| RSI | Roadside Interview |
| TAZ | Transportation Analysis Zone |
| TDMS | Transportation Data Management Software |
| TMC | Turning Movement Count |
| TTI | Travel Time Index |
| SSO | Single sign-on |
| DPI | Dots Per Inch |

# GLOSSARY

**TDMS Administrator -** TDMS administrator can define system (site) settings for an entire application instance. They can add, edit and delete user accounts and have access to all content even in private user areas as they can log in as any user, e.g. to assist with troubleshooting issues.

**Single sign-on -** Single sign-on (SSO) describes the process to log in to one application and switch to another connected application without having to log in again. TDMS and QTGPRS are often connected via SSO.

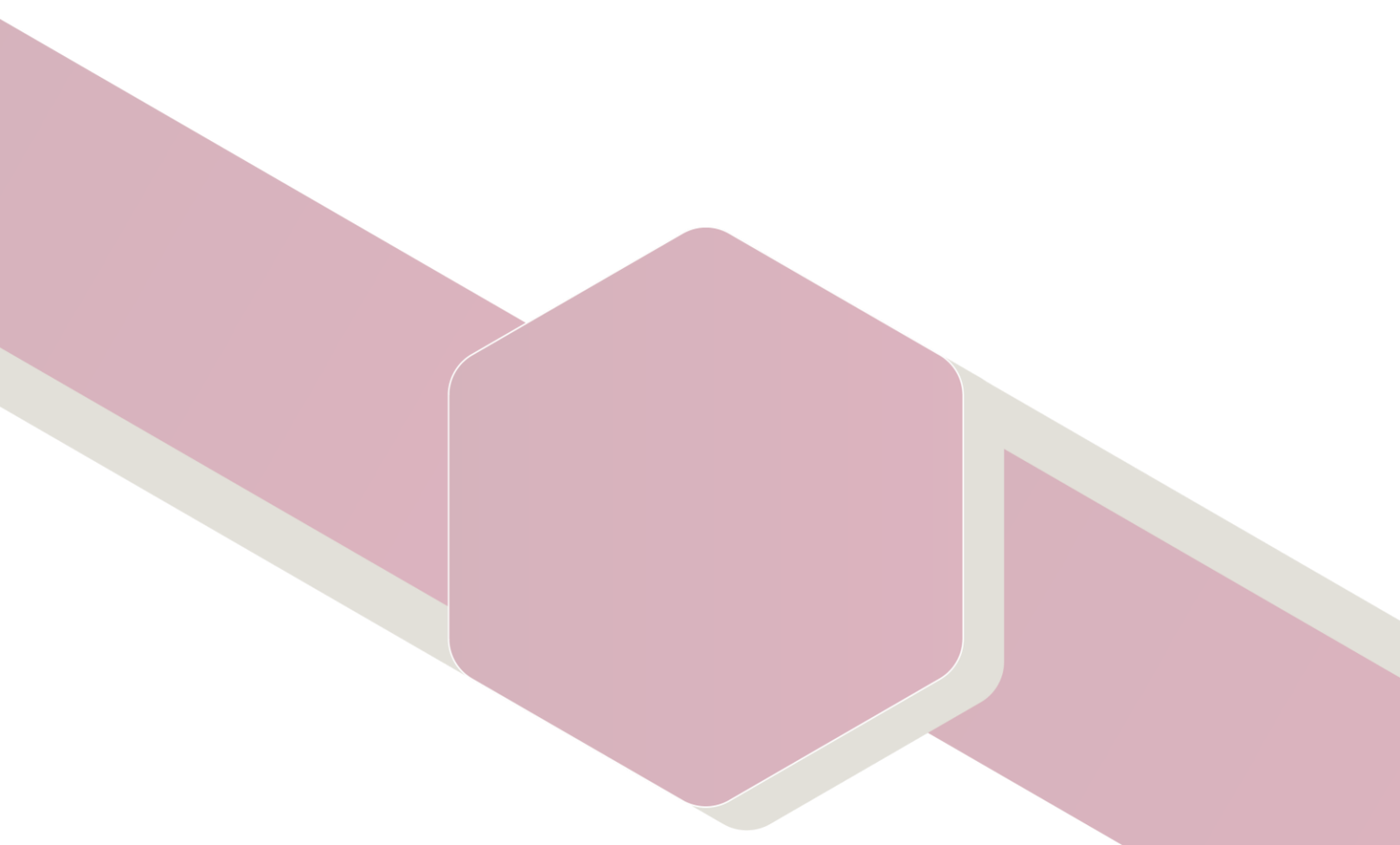
**Heatmap -** A heatmap is a graphical representation of data that uses a system of color-coding to represent different values.

**Scatter plot (scatterplot, scatter graph, scatter chart) -** A scatter plot is a graphical tool that shows a set of points plotted on a horizontal and vertical axis whether or not there is a correlation between two variables.

**Pivot table -** A pivot table is a table of statistics that summarizes the data of a more extensive table. This summary might include sums, averages, or other statistics, which the pivot table groups together in a meaningful way.

# CHAPTER 1

Introduction



# CHAPTER 1 INTRODUCTION

## 1.1 WHAT IS A TRANSPORTATION DATA MANAGEMENT SYSTEM?

The Transportation Data Management System (TDMS) is a web-based software application that hosts transportation and traffic data. It is a critical tool for those engaged in planning, design, analysis and management of transportation systems, including their networks and facilities.

For decision makers and managers to be able to make timely and well-informed decisions, a TDMS provides strong visualization tools and supports high-level analysis and reporting. It provides the user with the facilities to undertake more bespoke analysis, and to interrogate, select and export data subsets from a single repository, that yields major benefits for transportation modelers, analysts and designers.

## 1.2 TDMS INTERFACE AND MAIN MODULES

The TDMS is a web-based information portal for transportation and traffic professionals requiring fast and reliable access to spatially referenced data. The TDMS is hosted using ESRI Geographic Information System (GIS) software, with the ability to retrieve data and analyze information in an intuitive yet flexible way.

The TDMS Main Interface can be seen in **(Figure 1-1),** it includes a Search tool (**chapter 3**), GIS Portal (**chapter 4**) and main menu (**Section 0**).

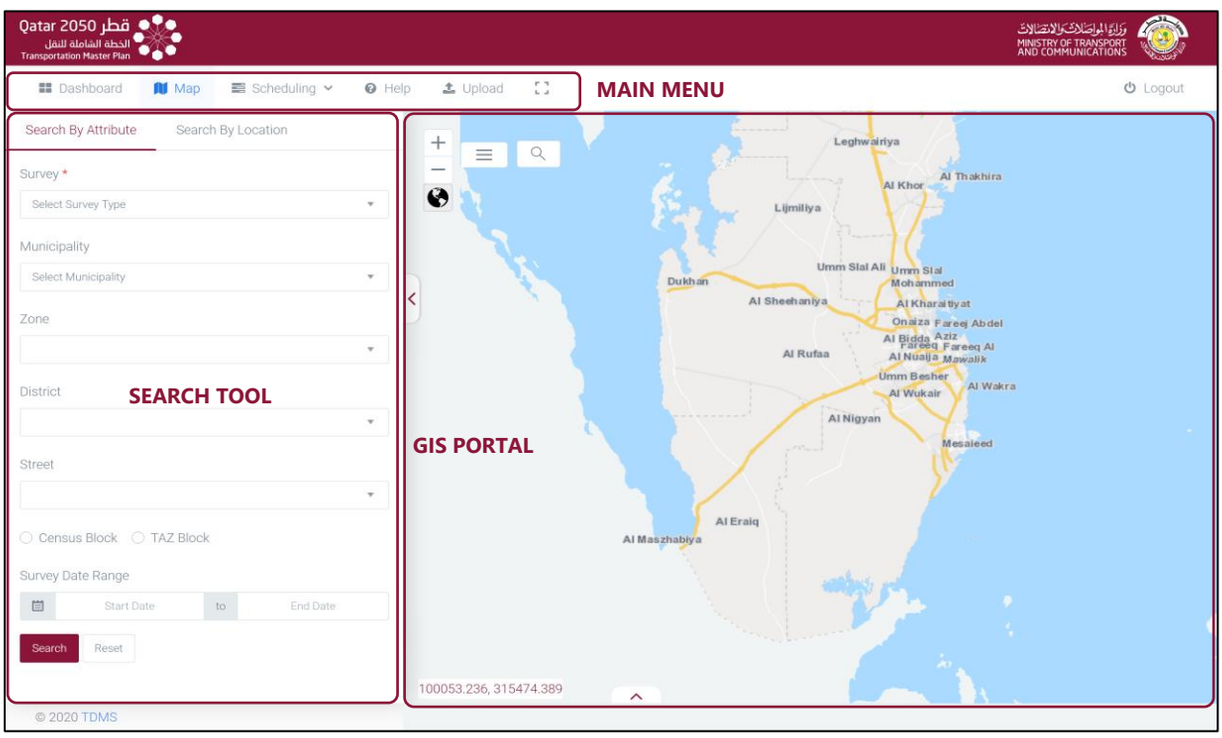



Figure 1-1: TDMS Main Interface

The TDMS consists of three main modules:

1. A Dashboard module (**Figure 1-2**) which provides a high-level view of the available information for each survey type per year.

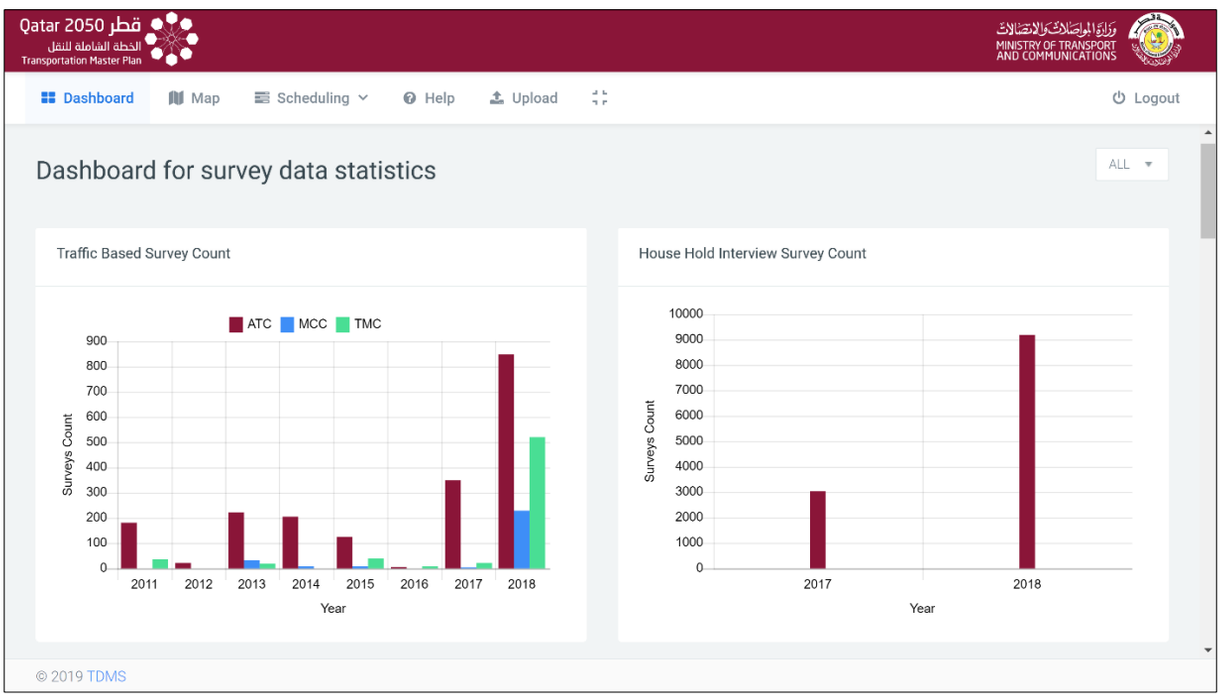



Figure 1-2: Dashboard Module

2. An Interview-based Data Analysis module (**Figure 1-3**) which provides a pivot table tool, from which attributes are selected and tabular or graphical analysis is produced.

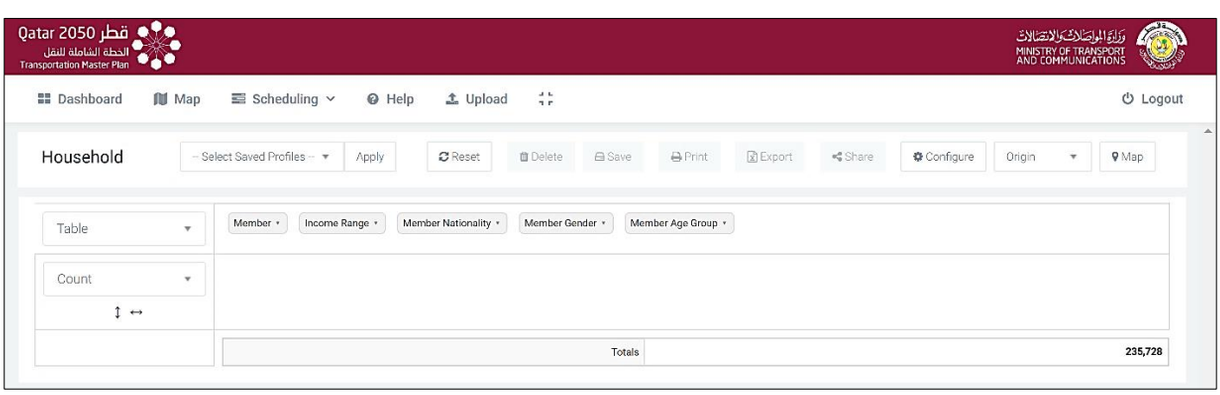



Figure 1-3: Interview- Based Data Analysis Module

3. Traffic Count Data Information module (**Figure 1-4**) from which peak hour summaries and detailed count data are accessible.

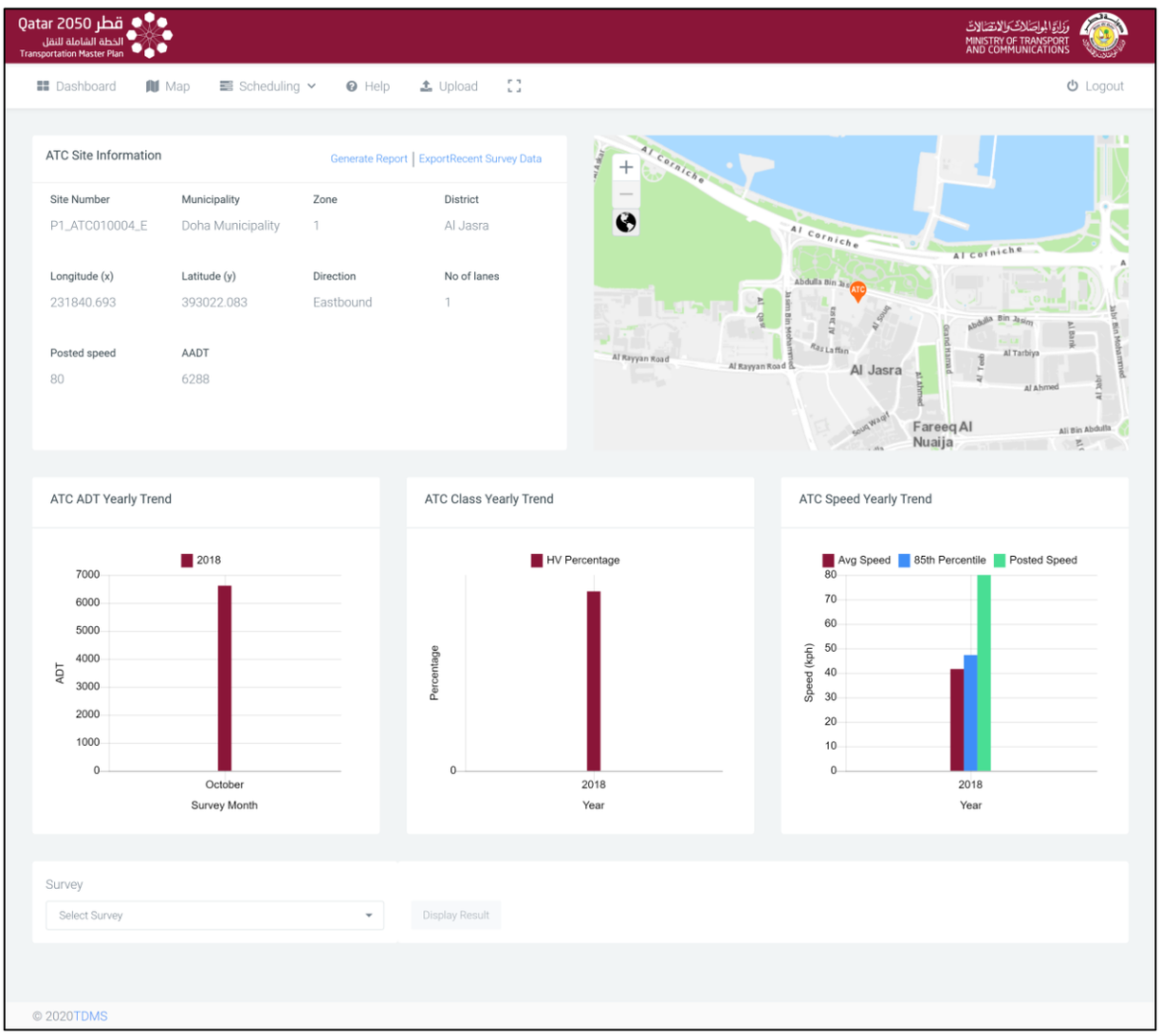



Figure 1-4: Traffic Count Data Information Module

The three modules are further described in detail in the remaining chapters of this manual.

## 1.3 DATA CONTAINED IN THE SYSTEM

At the heart of the system is a centralized database containing a wide range of survey datasets which can be roughly divided in Traffic Survey (items 1 through 4), Interview-based surveys (items 4 through 19) as follow:

1. Automatic Traffic Counts (ATCs).
2. Manual Classified Counts (MCCs).
3. Turning Movements Counts (TMCs).
4. Travel Time Surveys.

5. Airport: Arriving Passenger Surveys.
6. Airport: Departing Passenger Surveys.
7. Cyclist Surveys.
8. Hotel Visitor Surveys.
9. Household Interview (HHI) Surveys.
10. Laborer surveys
11. Parking Interview Surveys.
12. Pedestrian Surveys.
13. Public Transport On-board Surveys.
14. Roadside Interview Surveys - Commercial.
15. Roadside Interview Surveys - Private.
16. Port Crossing Surveys (Arrivals).
17. Port Crossing Surveys (Departures).
18. Port Crossing Surveys (Commercial).
19. Stated Preference Surveys.
20. Rail/Bus Routes Inventory.
21. Accidents Data Inventory.

The following data layers can also be visualized directly using the GIS interface:

1. Road Network.
2. Public Transportation: Rail network alignment and stations.
3. Public Transportation: Buses and type of stops.
4. Points of Interest (POI).
5. Land Uses.
6. Boundaries (Municipality, Zones, Census blocks, Districts, TAZ, etc).
7. Right of Way (ROW).
8. Central Business District (CBD).
9. ATC Counts: AM, MD, PM.
10. MCC Counts: AM, MD, PM.
11. TMC Counts: AM, MD, PM.
12. Traffic Collisions (Sample Data).
13. Travel Time Data.

To provide spatial context for the data, the following background mapping is also available:

1. Basemap.
2. CGIS Satellite Imagery Layer.
3. Hybrid Map.

## 1.4 FUNCTIONALITIES WITHIN THE TDMS SYSTEM

The following is a summary of each of the functionalities within the TDMS system. Each functionality is reviewed in detail in the corresponding chapter.

**Chapter 2: System Login and Landing Page**

- User registration.
- Visualization of summary for all years, and summary for a given year.

**Chapter 3: Search Tool**

- Search by Attribute.
- Search by location.

**Chapter 4: GIS Portal**

- Change Basemap type, Draw, Edit, Print Map.

**Chapter 5: Interview-based Tools**

- Pivot Table, Filters, Print Report, Save.

**Chapter 6: Traffic Counts Tools**

- Summary of annual data.
- Peak hour tabular and graphical summary.
- Export raw counts.

**Chapter 7: Accidents' Data and Heatmap**

- Visualize accident pointers.
- Visualize heatmap.

**Chaper 8: Scheduling for Upcoming Surveys**

- Define type of survey, define location to be surveyed.

Figure 1-5: Functionalities within the TDMS system

# CHAPTER 2

## System Login and Dashboard

# CHAPTER 2 SYSTEM LOGIN AND DASHBOARD

## 2.1 SYSTEM LOGIN

Consultants, developers, investors, scholars, government agencies and their employees can request access to the TDMS. To do this, they must first register with MOTC.

Once registered, users may then use the assigned username and password to access TDMS via the Ministry of Transport and Communications (MOTC) webpage by using a single sign-on (SSO).

## 2.2 LANDING PAGE

After successful sign-in using SSO log in (using the information provided by MOTC), the user will be directed to log in again (as per **Figure 2-1**).

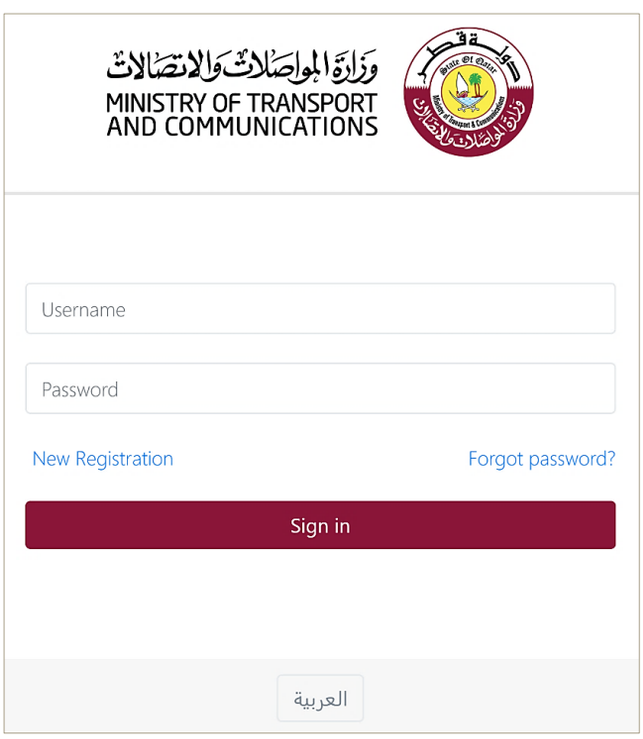



Figure 2-1: Login Page

**New registration**

Consultants, developers, investors, scholars, government agencies and their employees can request access to the TDMS software. To do this, please contact MOTC to register.

**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 MOTC) to access/reset the password.

**Language**

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

.

Once the user has entered their log in details, the user will be directed to the MOTC applications page. From here, the user can access either the TDMS or the Qatar Trip Generation and Parking Rates Software (QTGPRS) as seen in **Figure 2-2**

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

Again, the user also has the option to switch the language between English and Arabic (located in the top right corner of the landing page).

For the purposes of this manual, the user needs to select the TDMS application icon or login button (both will work).

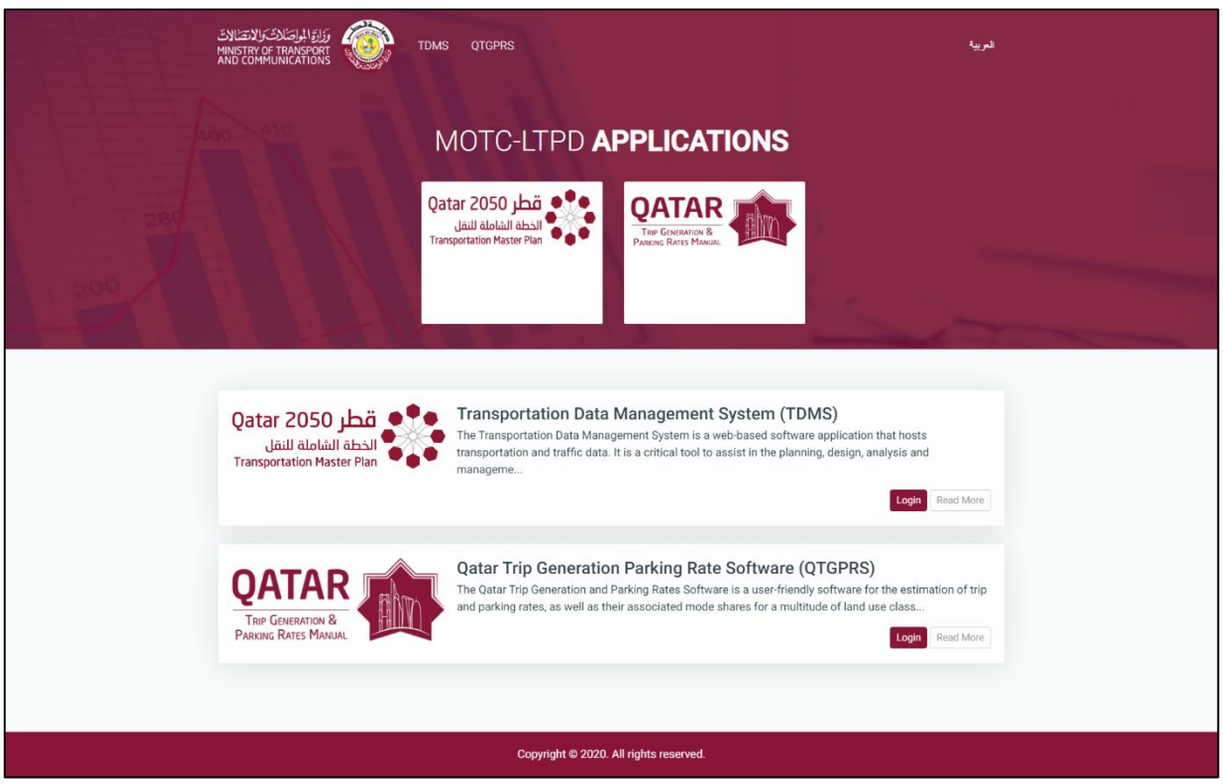



Figure 2-2: MOTC Applications Page

**User level functionalities**

The user level will be set automatically, this will determine the functions applied to the username and password combination. The TDMS administrator located at the MOTC can grant and/or revoke permissions to/from a specific user.

A list of the functions that may or may not be included in the user's profile is given as follows:

- Dashboard
- View Traffic Survey Data
- View Interview Survey Data
- Export Traffic Survey Data
- Upload Traffic Survey Data (Only available to System Administrators)
- Upload Interview Survey Data (Only available to System Administrators)
- Create a New Survey Schedule
- View Survey Schedule
- Modify Survey Schedule
- Configure Pivot Tables

Should the user notice a missing functionality that they would like to have access to, then they are advised to contact MOTC.

***Note:*** *For the purposes of this user guide, all functionalities are described.*

## 2.3 DASHBOARD AND MAIN MENU

Once the user has selected the TDMS application (or log in button), the user will see the following (default) "**Map**" view **(Figure 2-3)**.

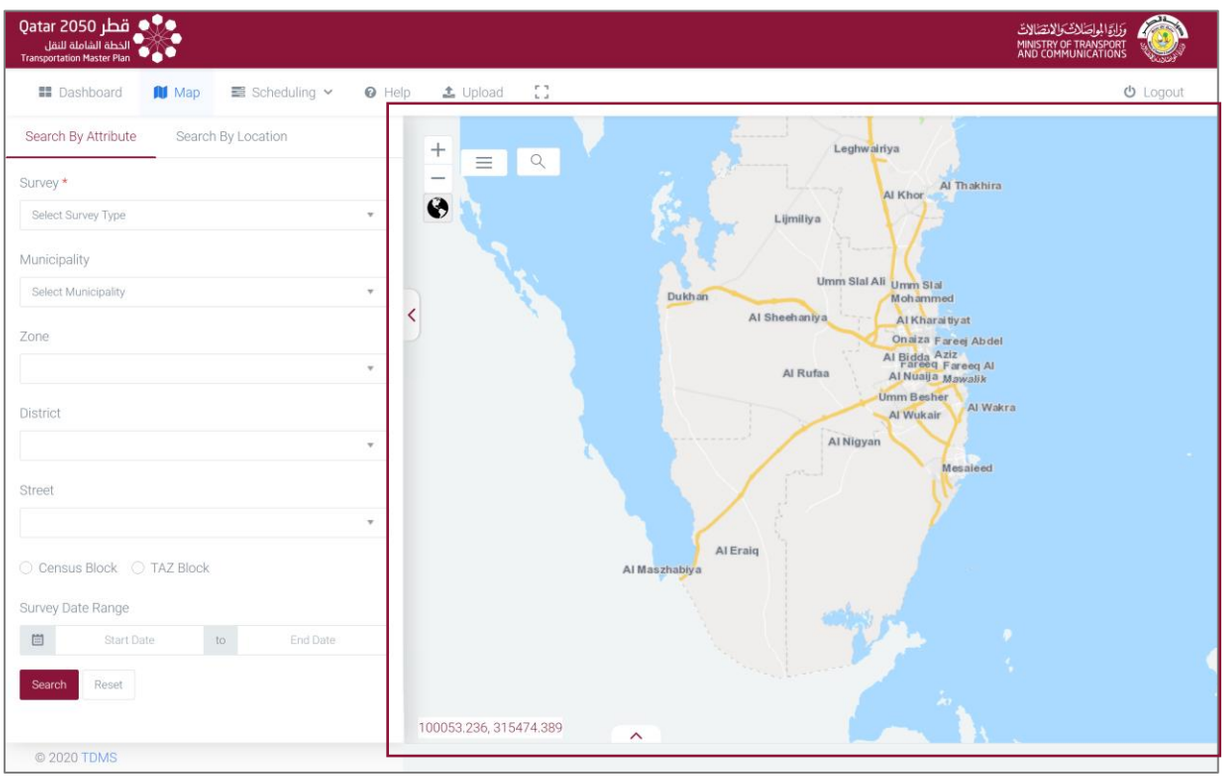



Figure 2-3: Map view

> To reset the map and cancel any survey searches, the user can select the map icon Map and it will take the user back to the default "**Map**" view.

The dashboard can be accessed from the top left corner of the TDMS main menu (**Figure 2-4**), the main menu also gives access to the following functions:

- "**Map**", (refer to **chapter 3**and **chapter 4**)
- "**Scheduling**" (refer to **chapter 8**),
- "**Help**" (refer to **Section 2.4**),
- "**Upload**" (refer to **Section 2.4**),
- "**Expand**" (refer to **Section 2.4**).

The aim of the dashboard is to offer the users with a general statistical summary of the historical datasets. The data is organized according to the type of survey or traffic count from which they

were derived. Further details on accessing and interrogating the data are provided from **chapter 3**to **chapter 7**.

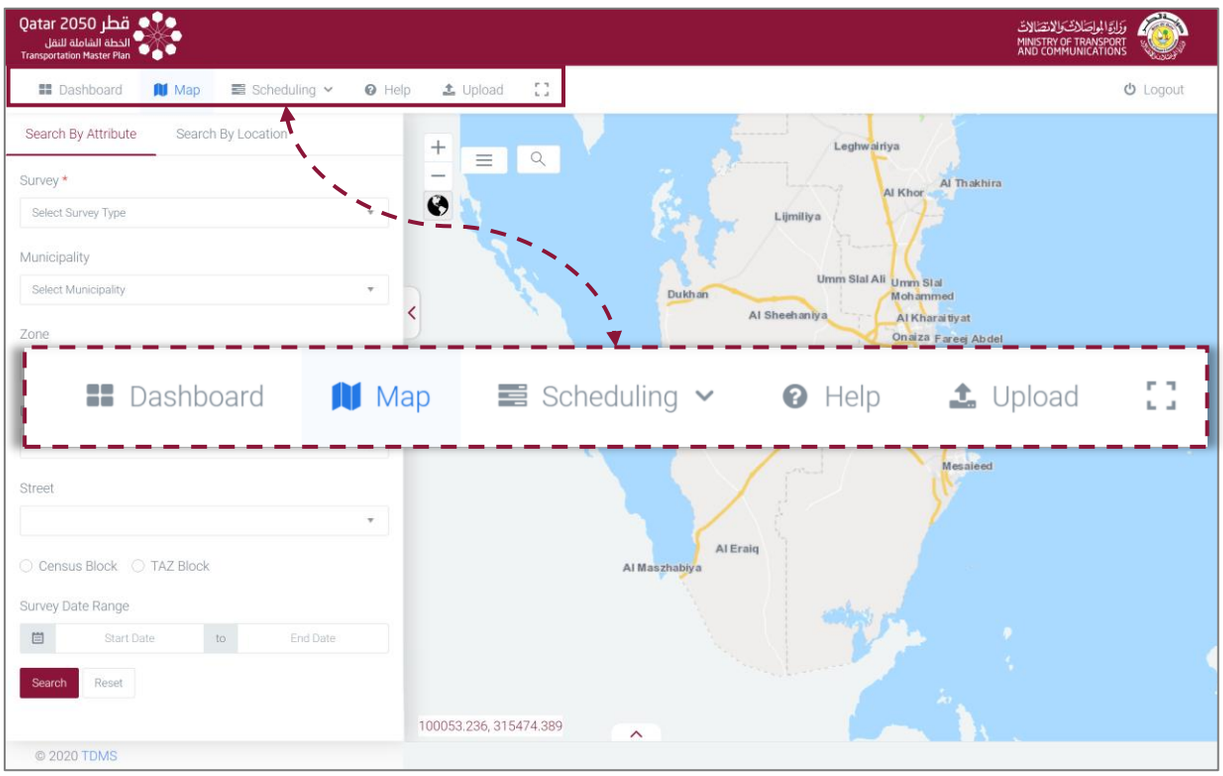



Figure 2-4: Dashboard Layout

Once the user has selected the dashboard icon, the Dashboard will appear providing survey data statistic bar charts (**Figure 2-5)**. The heights of the bars within the chart relate to the number of surveys available for multiple years and provides the user with an overview of the available survey data.

For more detailed summaries of any given year, the user can click on the drop-down menu (located to the right of the screen) to see which years are available and to see specific information for a given year.

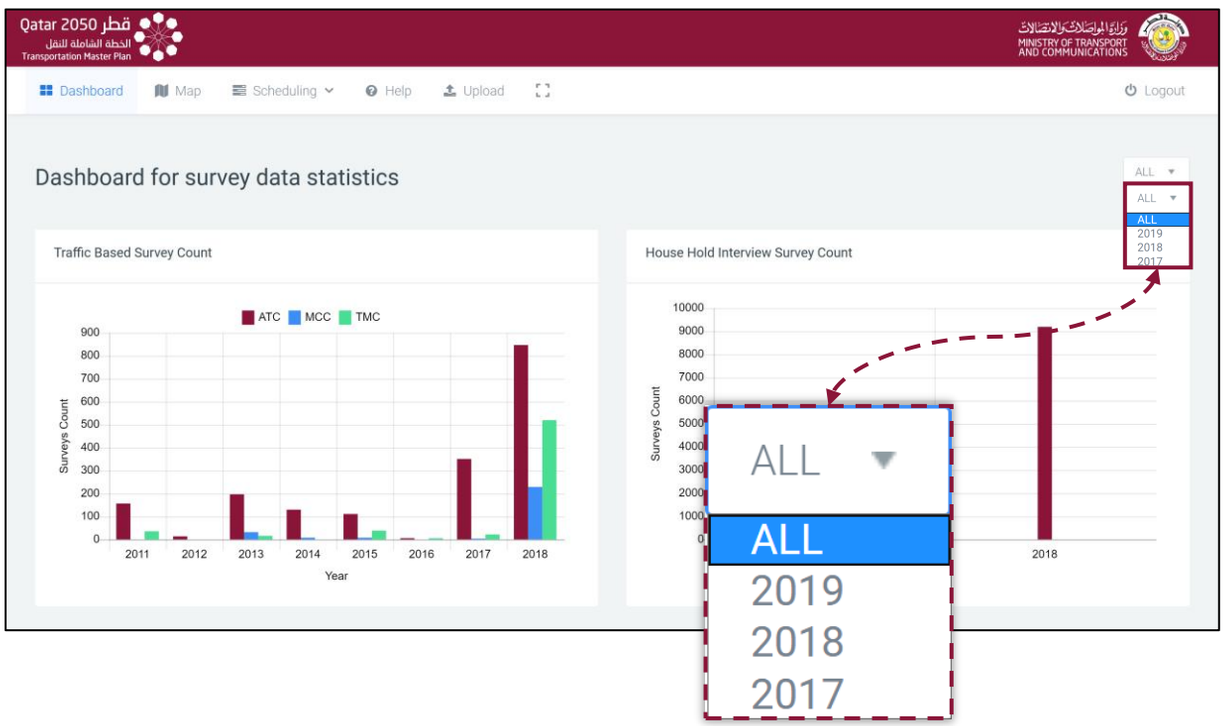



Figure 2-5: Dashboard Module: Multi-Year Summary

After selecting a single year, the user will gain access to pie charts showing the proportion of each survey type for that chosen year (**Figure 2-6**).

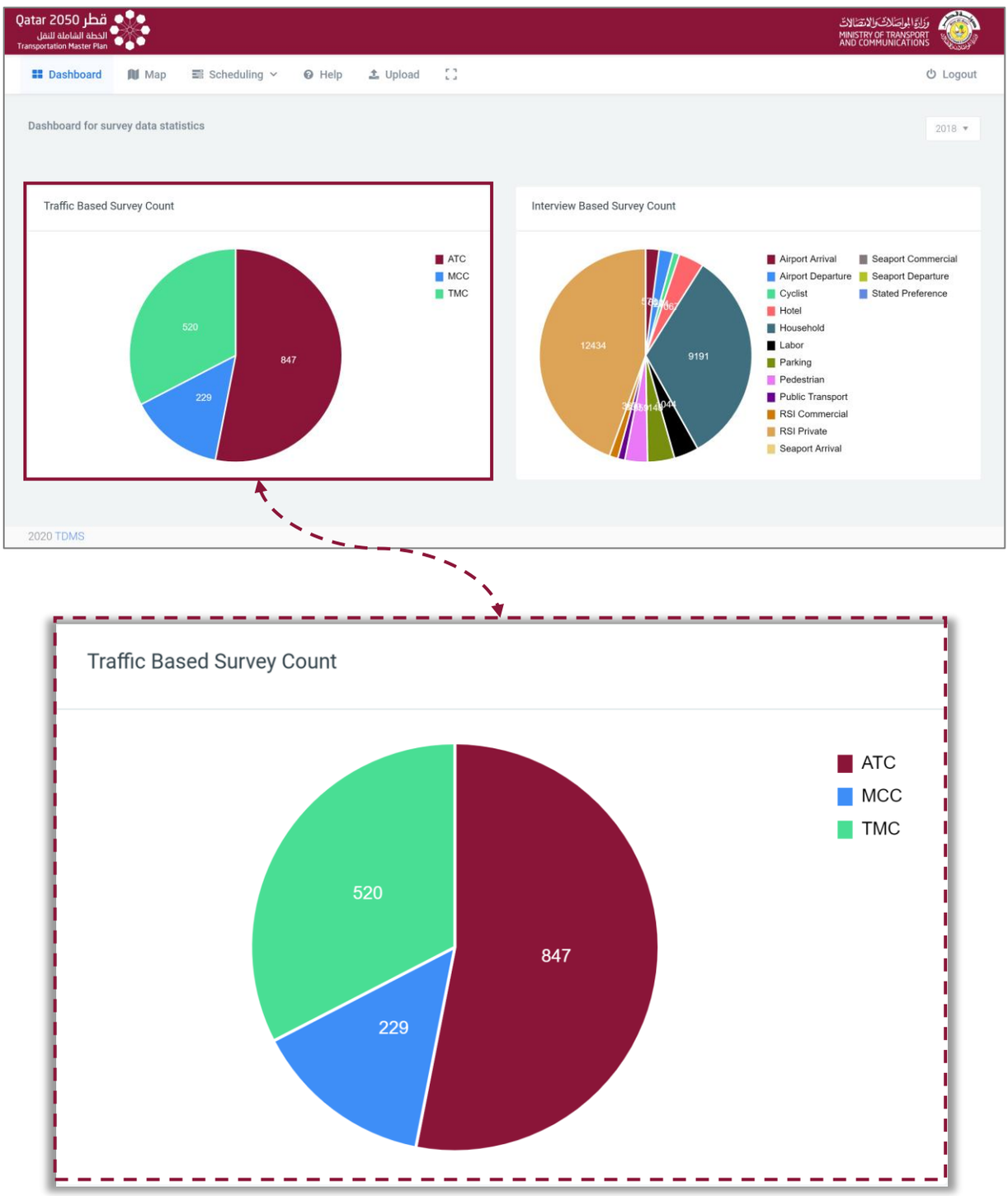



Figure 2-6: Dashboard Module: Single Year Summary

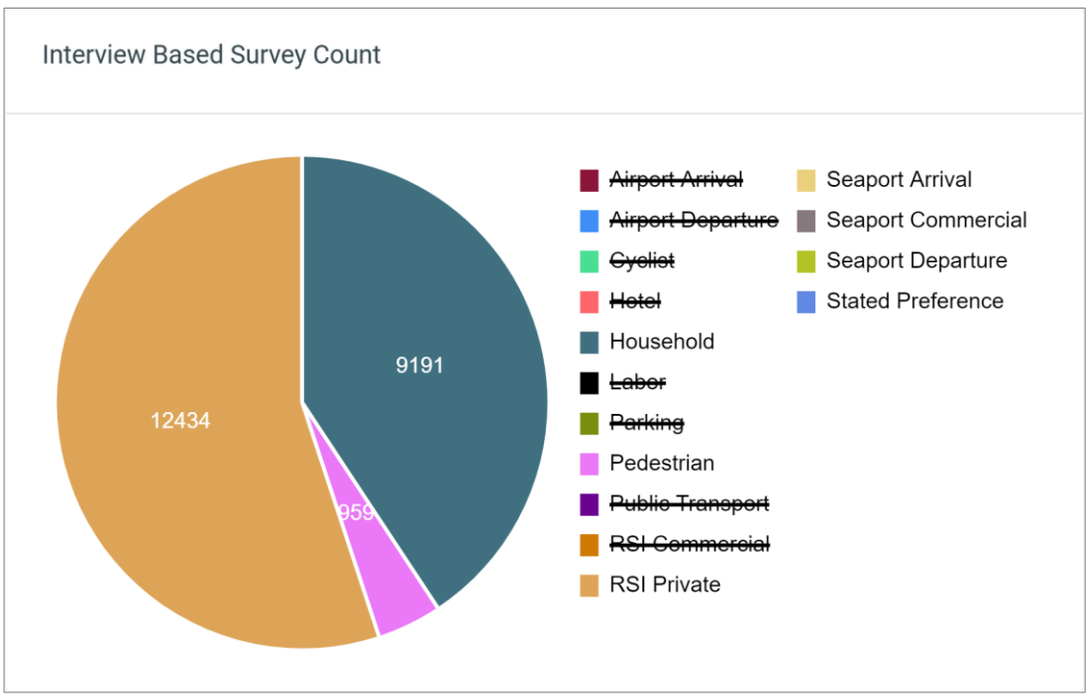



Figure 2-7: Dashboard Module: Single Year Summary (Interview Based Survey Count)

It should be noted that clicking on the type of survey shown in the legend, this will include or exclude its data as shown in **Figure 2-7**. This figure demonstrates the same graph contained in **Figure 2-6**; however, with some of the data excluded.

## 2.4 HELP, UPLOAD AND EXPAND

The remaining features on the Dashboard are the help, upload and expand buttons. The following provides a brief description of these:

- "**Help**", clicking on this will take the user to this TDMS User Manual. The Table of Content is displayed in the left panel which is collapsible for ease of use.
- "**Upload**", is a function that is only available to the system administrators and will not
- **Expand**, by clicking on this button ⛶ on the Dashboard, the user chooses to expand the screen to full screen view. To go back or restore the normal view the user can either click on this button ⛶ or press "**Esc**" (Escape) on the keyboard.

# CHAPTER 3

Search Tool

# CHAPTER 3 SEARCH TOOL

## 3.1 OVERVIEW

The Search Tool offers the user a unified querying environment which can be used to interrogate any of the survey types. A search can be based on data attributes (**Section 3.2**) or on location (**Section 3.5**). For this task, the user shall first select the map icon as shown in **Figure 3-1.**

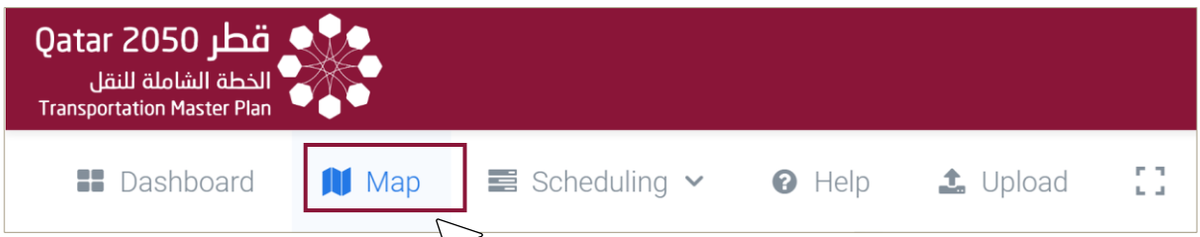



Figure 3-1: Main menu options

## 3.2 SEARCH BY ATTRIBUTE

Looking to the left of the map display (**Figure 3-2)**, the "**Search by Attribute**" function requires the selection of the survey type, the municipality and the unit of spatial analysis (district, census zone, or Transportation Analysis Zone (TAZ)) as shown in **Figure 3-3**. The "Search by Attribute" requires the user to click the search button for the results to be displayed, this is not the case with the "Search by Location" which automatically displays the results upon selection of the type of survey. A date range may also be chosen; however, this is optional.

***Note:*** *The municipalities available to choose are as follows:*

- Doha,
- Al Rayyan,
- Al Wakra,
- Umm Slal,
- Al Daayen,
- Al Khor and Al Thakira,
- Al Shamal,
- Al Sheehaniya

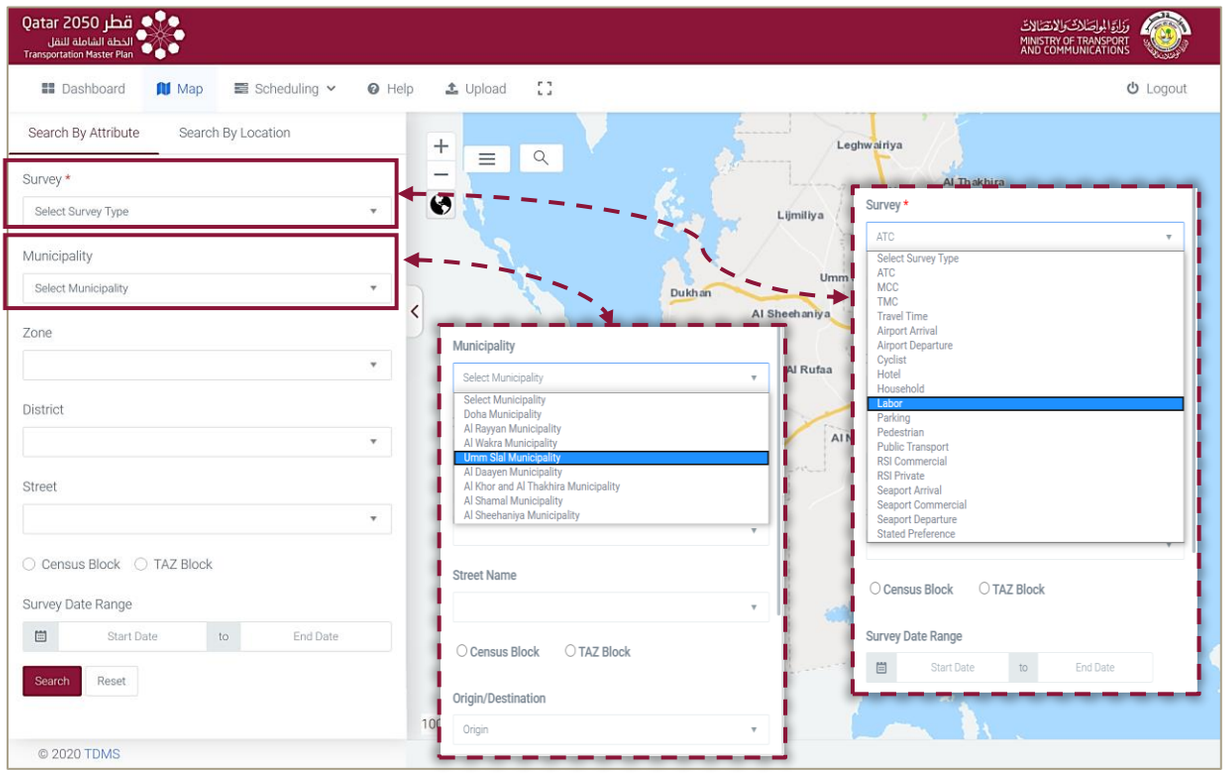
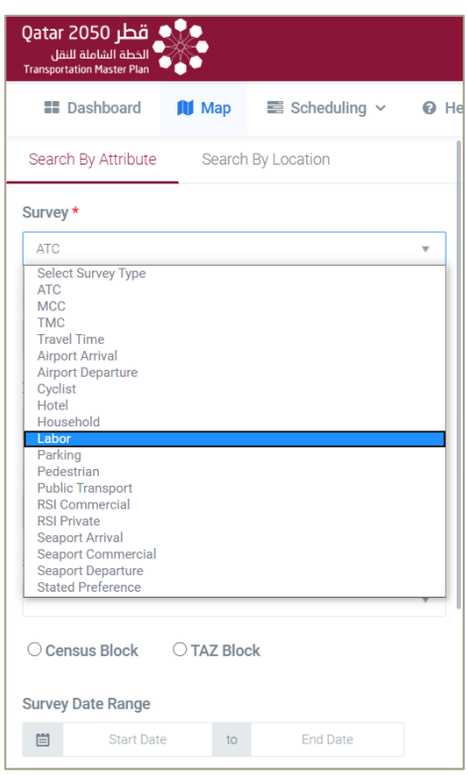
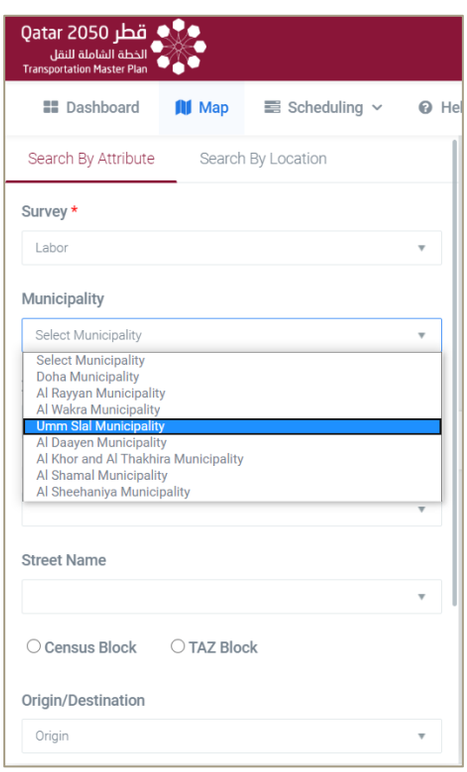



Figure 3-2: Accessing the Search by Attribute function




Select Survey Type




Select Municipality

Figure 3-3: Search by Attribute Survey and Municipality Drop Down Menus

A summary of the attributes available for each survey type is shown in **Table 3-1**.

Table 3-1: Attribute availability for each survey type for the 'Search by Attribute' function

| Survey type | Attribute Availability | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Municipality | Zone | District | Street Name | Census Block | Taz Block | Date range | Origin/ Destination |
| **ATC** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A |
| **MCC** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | N/A |
| **TMC** | Yes | Yes | Yes | N/A | Yes | Yes | Yes | N/A |
| **Travel time** | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| **Airport arrival** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Airport departure** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Cyclist** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Hotel** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Household** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Labor** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Parking** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Pedestrian** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Public Transport** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **RSI Commercial** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **RSI Private** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Seaport Arrival** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Seaport Commercial** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Seaport Departure** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| **Stated Preference** | Yes | Yes | Yes | Yes | Yes | Yes | Yes | Yes |

## Search by Attribute: Interview-based survey data example

In this example, the user can investigate the socioeconomic characteristics of households from the household interview data (refer to **Figure 3-4**).

Starting in the "**Map**" view

**Step 1.** Select the "**Search by Attribute**" function.

**Step 2.** Select "**Household**" from the surveys drop down menu.

**Step 3.** Select "**Doha Municipality**" from the Municipalities drop down menu.

**Step 4.** Select the zones of interest by selecting the boxes contained within the "**Zone**" drop-down menu.

> ***Note:*** *The user should notice the same zones are highlighted on the map.*

**Step 5.** Select Search

> ***Note:*** *To erase the selection and start again select* ***"Reset"****.*

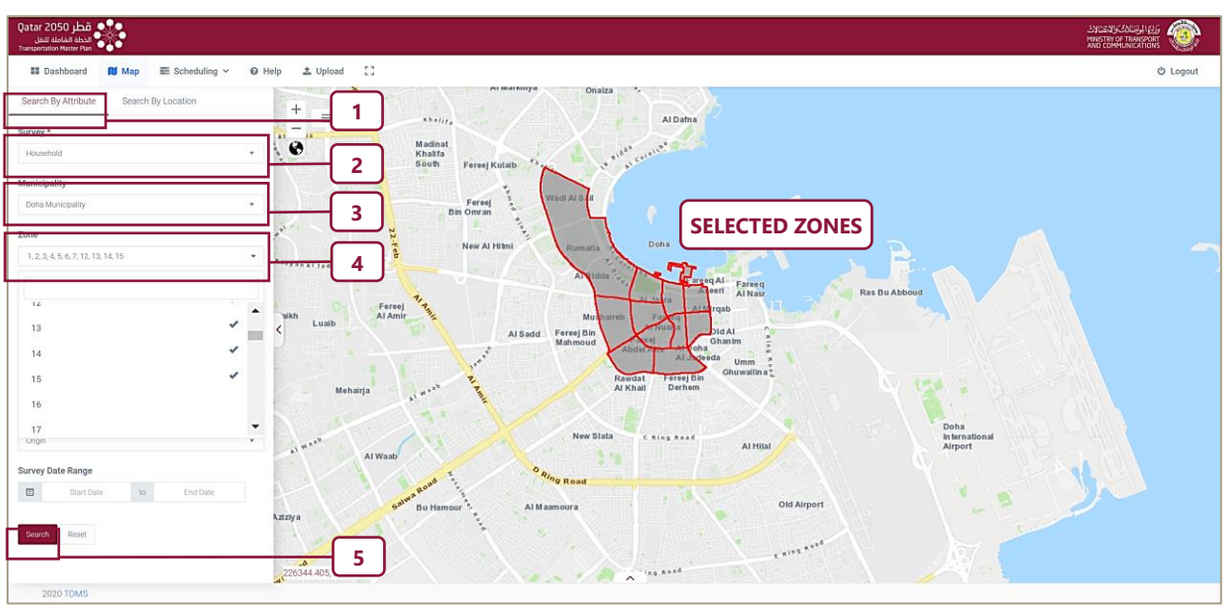



Figure 3-4: Search by Attribute - Interview-Based Example

After selecting search, the system will take the user to the interview-based menu which is explained further in **chapter 5**

## 3.3 SEARCH BY LOCATION

The "**Search by Location**" function has context sensitive query criteria which varies according to the type of survey and is map based (refer to **Table 3-2**).

Table 3-2: Criteria Availability for Each Survey Type for the "Search by Location" Function

| Survey type | Query Criteria Availability | | |
|---|---|---|---|
| | Shape selection (Buffer, rectangle, circle, ellipse, polygon, freehand polygon) | Layer (municipality, zone, district, census block, TAZ block) | Origin/Destination |
| **ATC** | Yes | N/A | N/A |
| **MCC** | Yes | N/A | N/A |
| **TMC** | Yes | N/A | N/A |
| **Airport Arrival** | N/A | Yes | Yes |
| **Airport Departure** | N/A | Yes | Yes |
| **Cyclist** | N/A | Yes | Yes |
| **Hotel** | N/A | Yes | Yes |
| **Household** | N/A | Yes | Yes |
| **Labor** | N/A | Yes | Yes |
| **Parking** | N/A | Yes | Yes |
| **Pedestrian** | N/A | Yes | Yes |
| **Public Transport** | N/A | Yes | Yes |
| **RSI Commercial** | N/A | Yes | Yes |
| **RSI Private** | N/A | Yes | Yes |
| **Seaport Arrival** | N/A | Yes | Yes |
| **Seaport Commercial** | N/A | Yes | Yes |
| **Seaport Departure** | N/A | Yes | Yes |
| **Stated Preference** | N/A | Yes | Yes |

### Interview Surveys

For the interview-based surveys, the user should use the 'TAZ Block' layer.

The user can select the zone(s) of interest (i.e. TAZ) by hovering the mouse over the area of interest (located on the map) and selecting it, to obtain access to the available information as shown in **Figure 3-5**.

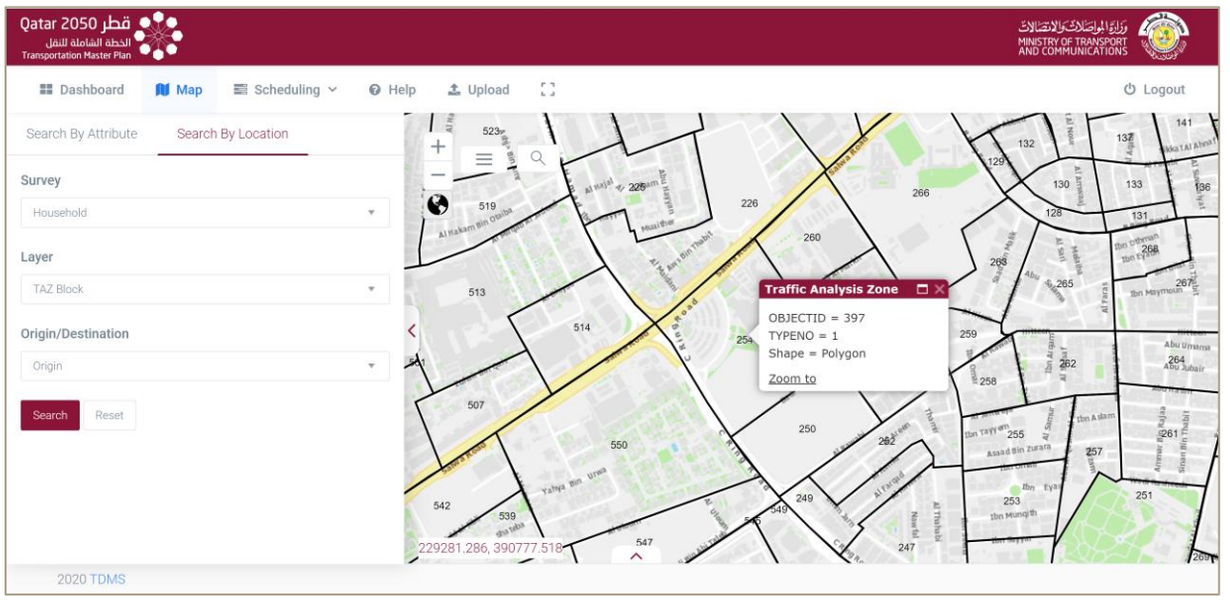



Figure 3-5: Search by Location for TAZ Areas (Selection on the Map)

The user can alternatively type the desired zone(s) in the search tool directly or select from the drop-down menu (**Figure 3-6**).

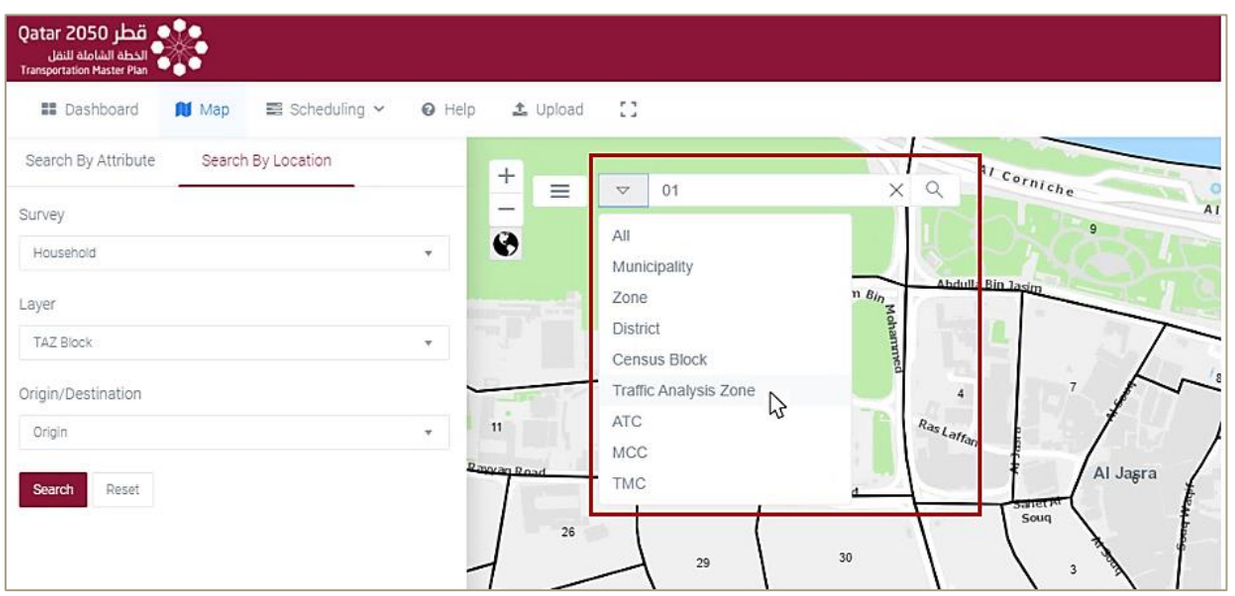



Figure 3-6: Search by Location for TAZ area (using search tool)

## Traffic Count Surveys

For the traffic count searches, the user will need to choose the type of survey (ATC, TMC, MCC). The available survey locations are indicated by pins on the map (**Figure 3-7**).

> ***Note:*** *the travel time surveys are not available in the* ***"Search by Location" function.***

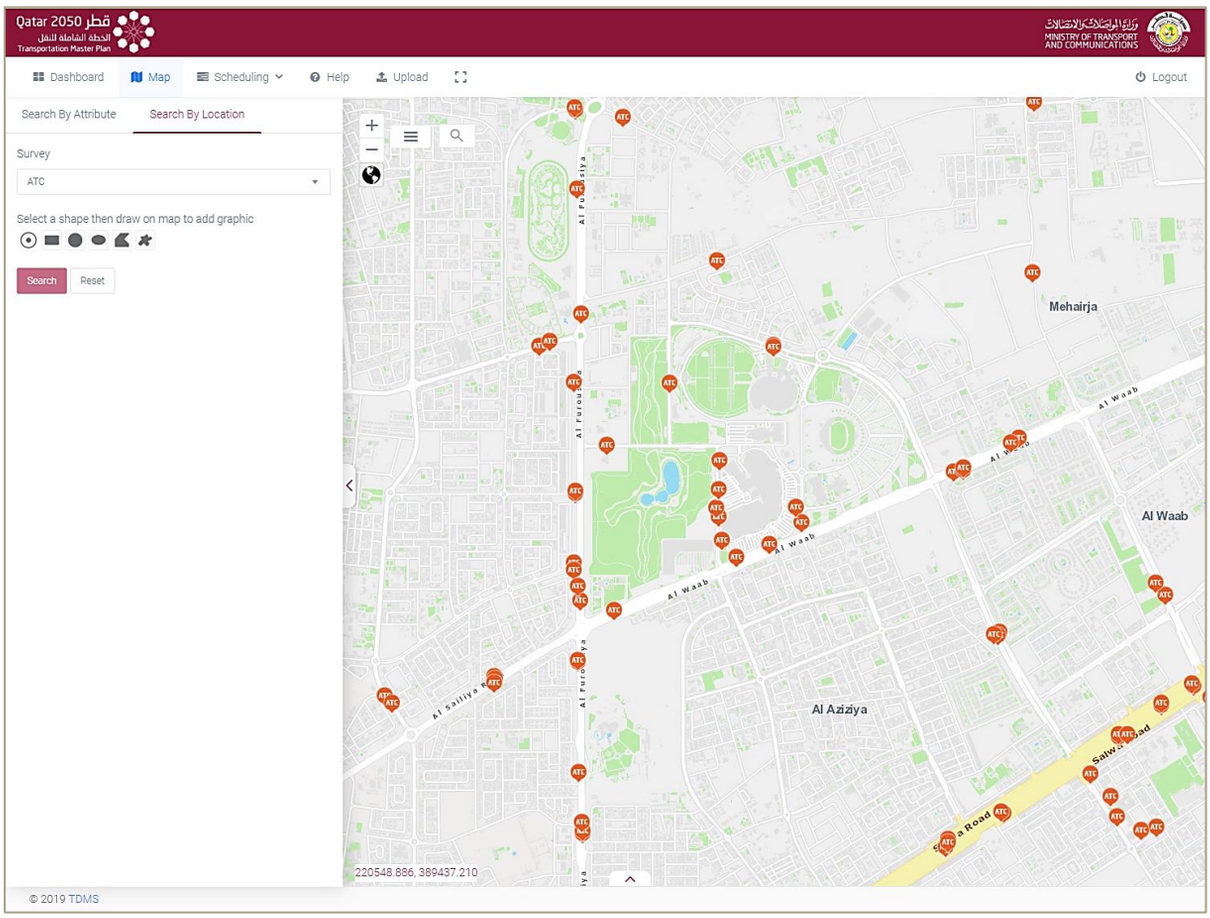



Figure 3-7: Search by Location: Traffic Count Data

*(Note the pins indicate the location of the traffic count)*

The site(s) of interest can be selected using one of the six shape select tools provided in the query window as shown in **Figure 3-8**.


Figure 3-8: Shape Select Tools

Further information on the site(s) of interest (i.e. the pins) can be provided. To obtain this information, the user shall first select one of the six shape select tools (as shown in **Figure 3-8**). Once the select shape tool is chosen, the user shall hover their mouse over the area of interest.

The user will be prompted to 'press down to start and let go to finish' as they drag the mouse over the area of interest. This will highlight the number of survey sites within the area of interest.

> ***Note:*** *When using the buffer shape select tool, the user will be prompted to enter a buffer distance. This can be in kilometers or meters. The user just will be prompted to click once on the map and the buffer area will generate itself* ***Figure 3-9.***

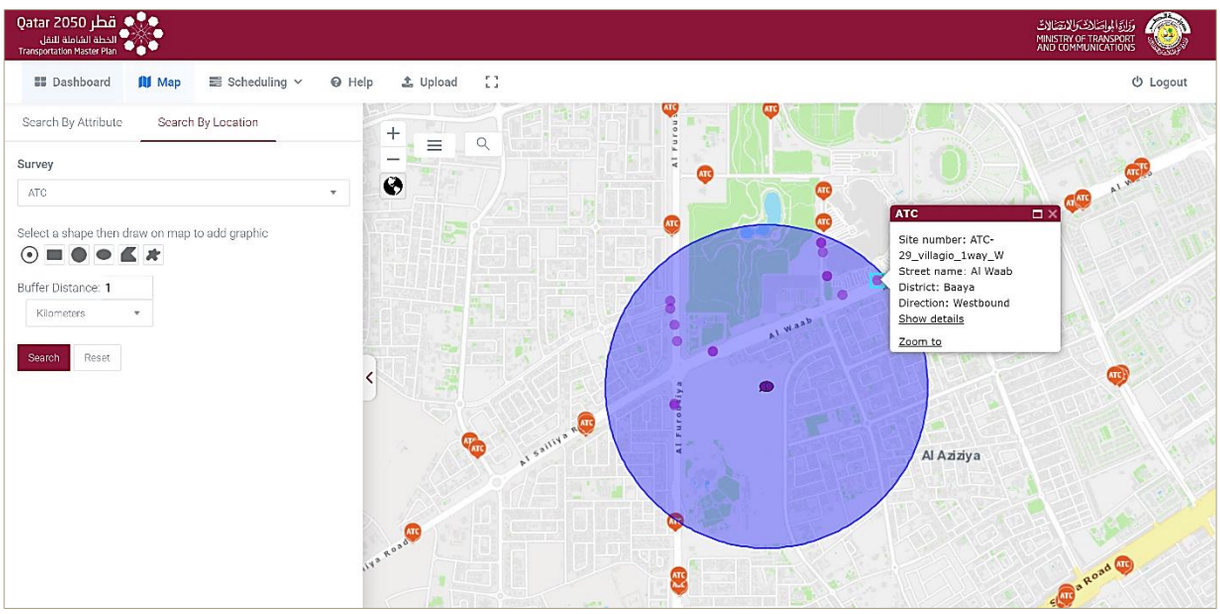



Figure 3-9: Search by Location: Traffic Count Data (using the Buffer Select Tool)

The traffic count pins that lie within the shape select tool area will change color and shape. The user can also click on the traffic count pin to obtain more details on the site.

> ***Note:*** *information on the pins located out of the chosen area can also be clicked on for this information.*

## Search by Location: Interview-Based Example

For this example (refer to **Figure 3-10,** let us assume the user wants to select the household interviews in TAZ number 21.

Starting in the "Map" view

**Step 1.** Select the "Search By Location" function.

**Step 2.** Select "Household" for Survey

**Step 3.** Select "TAZ Block" as the Layer and keep "Origin" for Surveys originating in the TAZ zone of interest.

**Step 4.** Click on the zone of interest in the following map (**Figure 3-10**)

**Step 5.** Select Search, and the system will go to the interview-based tools.

> ***Note:*** *To erase the selection and start again, select* ***"Reset"***

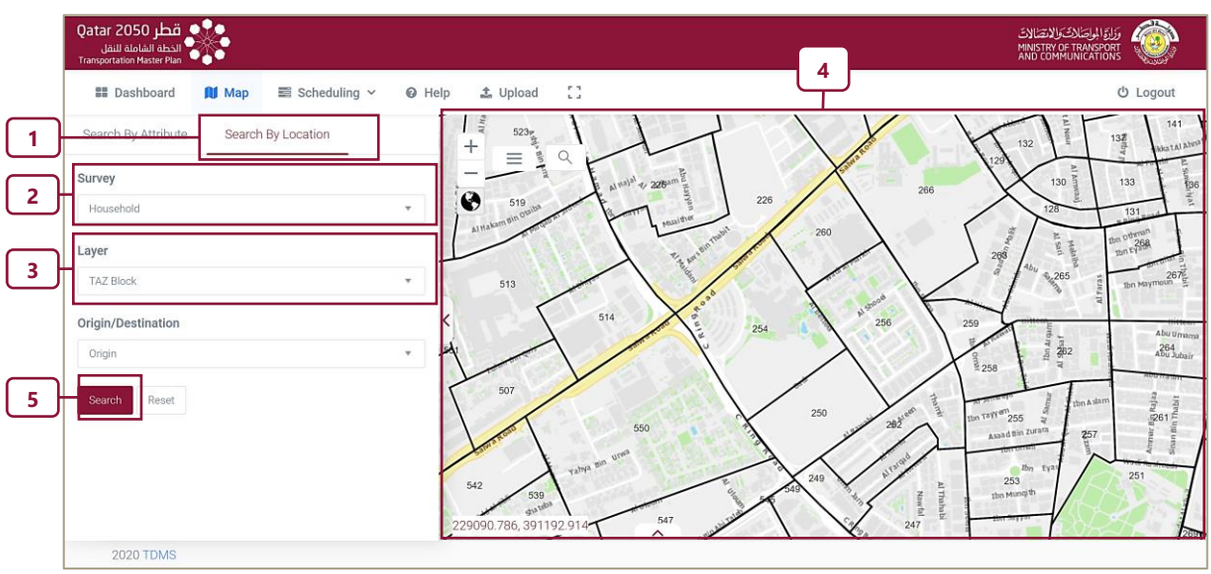



Figure 3-10: Search by Location: Interview-Based Example Destination

## 3.4 SEARCH BY ATTRIBUTE: TRAFFIC COUNT SURVEYS

In the case of traffic count surveys, the "**Search by Attribute"** function works in a similar way to the "**Search by Location"** function. The following examples illustrate three search cases for the different types of traffic counts surveys, that can all be applied to the same traffic count survey if required.

> ***Note:*** *Remember to reset the search before trying a new example.*

**Example 1:** ATC's for the whole of Qatar.

Starting in the "**Map**" view.

**Step 1.** Select the "**Search by Attribute**" function.

**Step 2.** Select "**ATC**" from the surveys drop down menu.

**Step 3.** Ignore the Municipality, Zones, District, Census/TAZ Block and Date range etc. and directly go and select the "**Search"** button.

The user should find that all of the ATC 'pins' are shown on the whole of Qatar map, as shown in **Figure 3-11**.

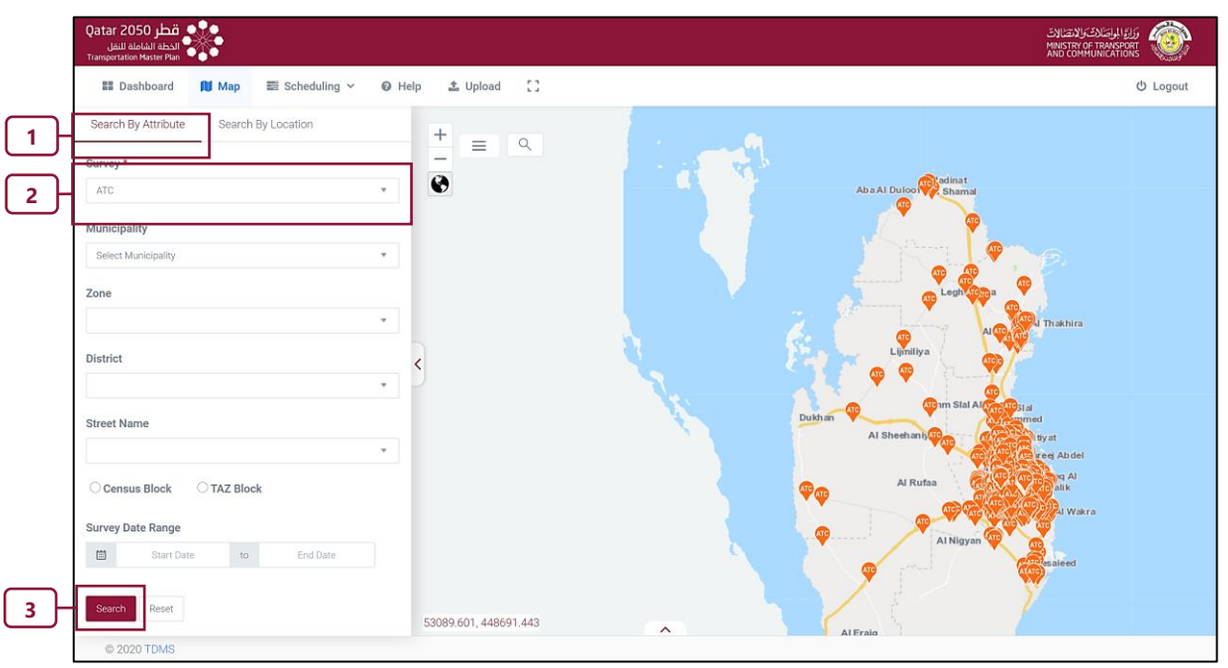



Figure 3-11: Search by Attribute: Traffic Count Surveys – Example 1

**Example 2**: MCC's for the Doha Municipality.

Starting in the "**Map**" view.

**Step 1.** Select the "**Search by Attribute**" function.

**Step 2.** Select "**MCC**" from the surveys drop down menu.

**Step 3.** Select "**Doha Municipality**" from the drop-down menu of Municipalities.

**Step 4.** Ignore the Zones, District, Census/TAZ Block and Date range etc. and select the "**Search"** button.

The user should find that all of the MCC 'pins' are shown for the Doha Municipality, as shown in **Figure 3-12**.

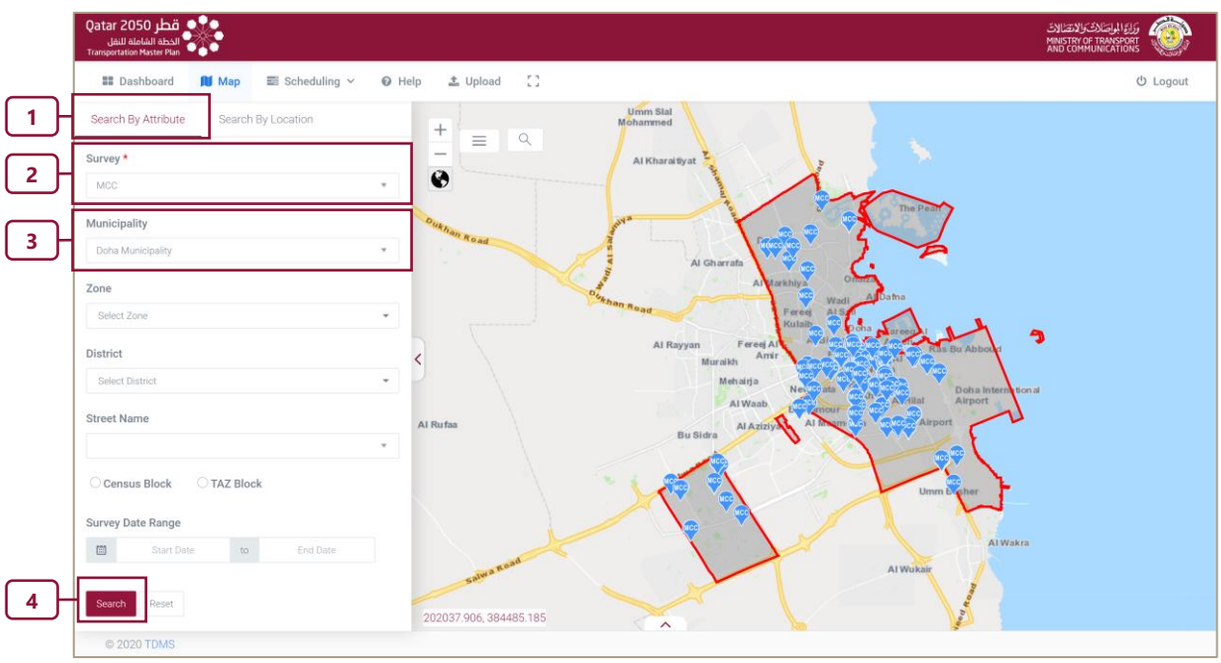



Figure 3-12: Search by Attribute: Traffic Count Surveys – Example 2

**Example 3:** TMC's in Zone 2 of the Doha Municipality.

Referring to **Figure 3-13** and starting in the "Map" view.

**Step 1**. Select the "Search by Attribute" function.

**Step 2**. Select "TMC" from the surveys drop down menu.

**Step 3**. Select "Doha Municipality" from the drop-down menu of Municipalities.

**Step 4**. Select or type "7" in the "Select Zone" drop down menu.

**Step 5**. Ignore the Census/TAZ Block and Date range and select "Search".

> ***Note:*** *The user should notice a generated tabled list of* ***"TMC Sites"*** *and a* ***"Map Polygon"*** *highlighting the area of Zone 2 on the map.*

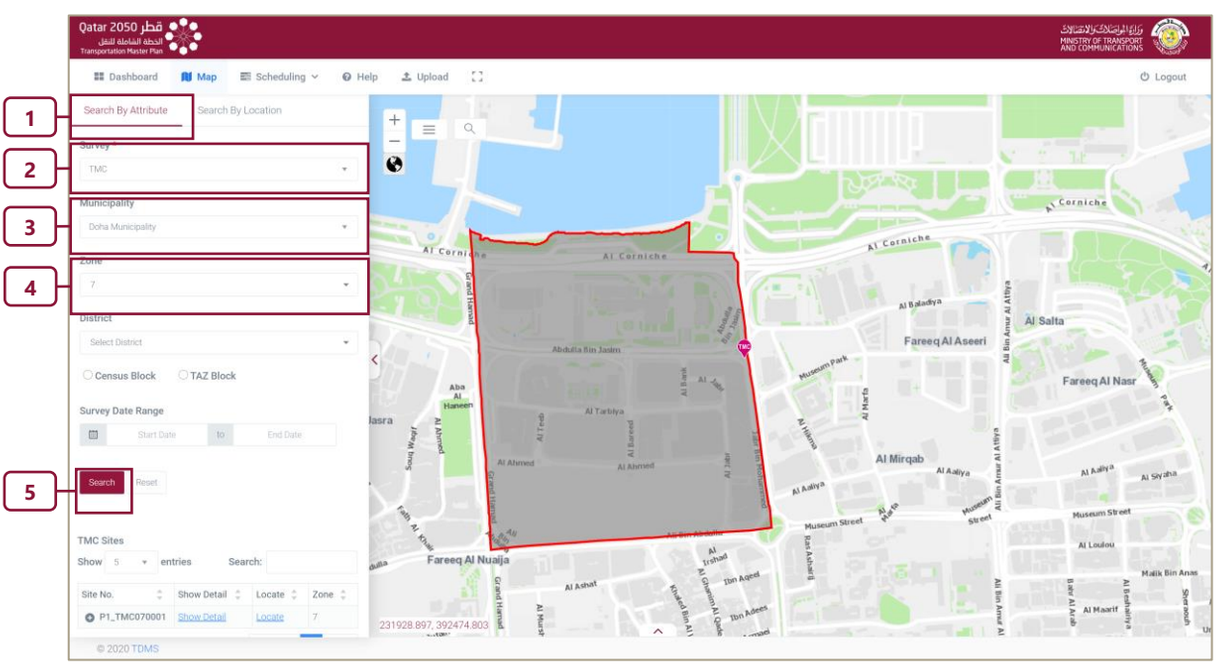



Figure 3-13: Search by Attribute: Traffic Count Surveys – Example 3

## 3.5 SEARCH BY LOCATION

### 3.5.1 SEARCH BY LOCATION: TRAFFIC COUNT SURVEYS

To search for any Traffic Count survey data based on location, the user first needs to ensure they are in the "**Map**". The user then has to select the "**Search by Location**" function and select the survey type from the survey dropdown menu e.g. ATC, MCC or TMC.

Once a traffic count survey is selected (e.g. ATC), all the respective ATC survey sites are automatically plotted on the map

***(Note:** the user does not need to select the **"Search" button),** as seen in **Figure 3-14.***

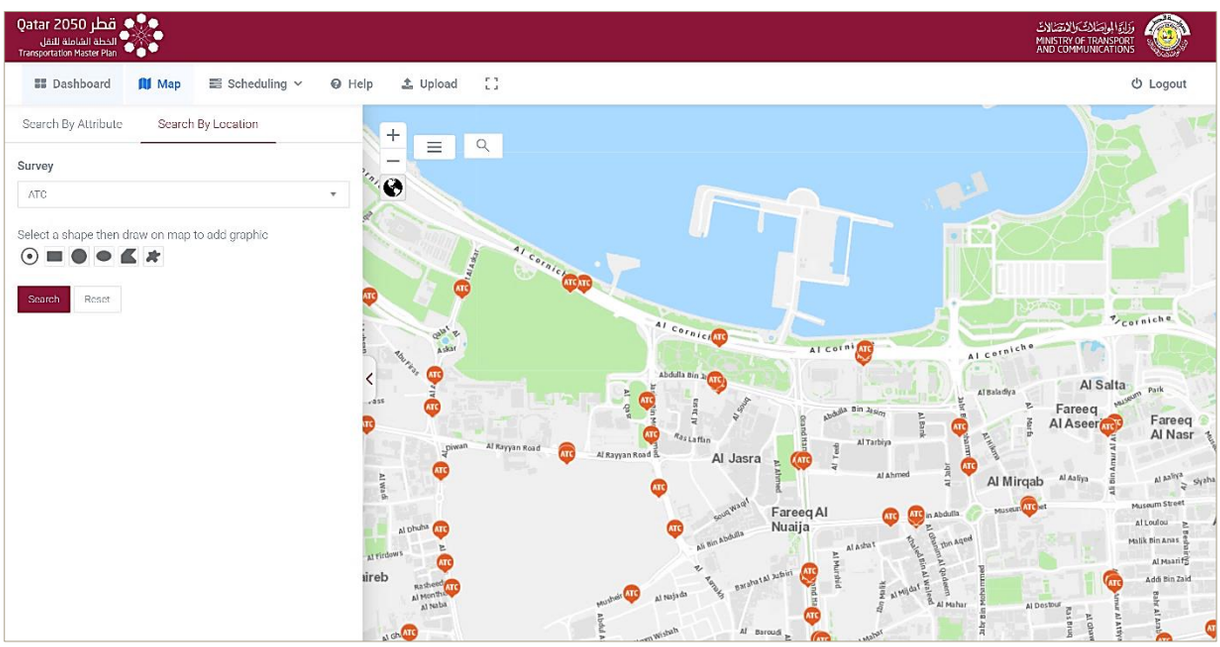



Figure 3-14: Search by Location: Traffic Count Surveys - Plotted Sites

The map also highlights a sites geolocation and provides the user with several shape selection tools (i.e. Buffer, Rectangle, Circle, Ellipse, Polygon and Freehand Polygon) available for the user select a region of interest on the map (**Figure 3-15**).

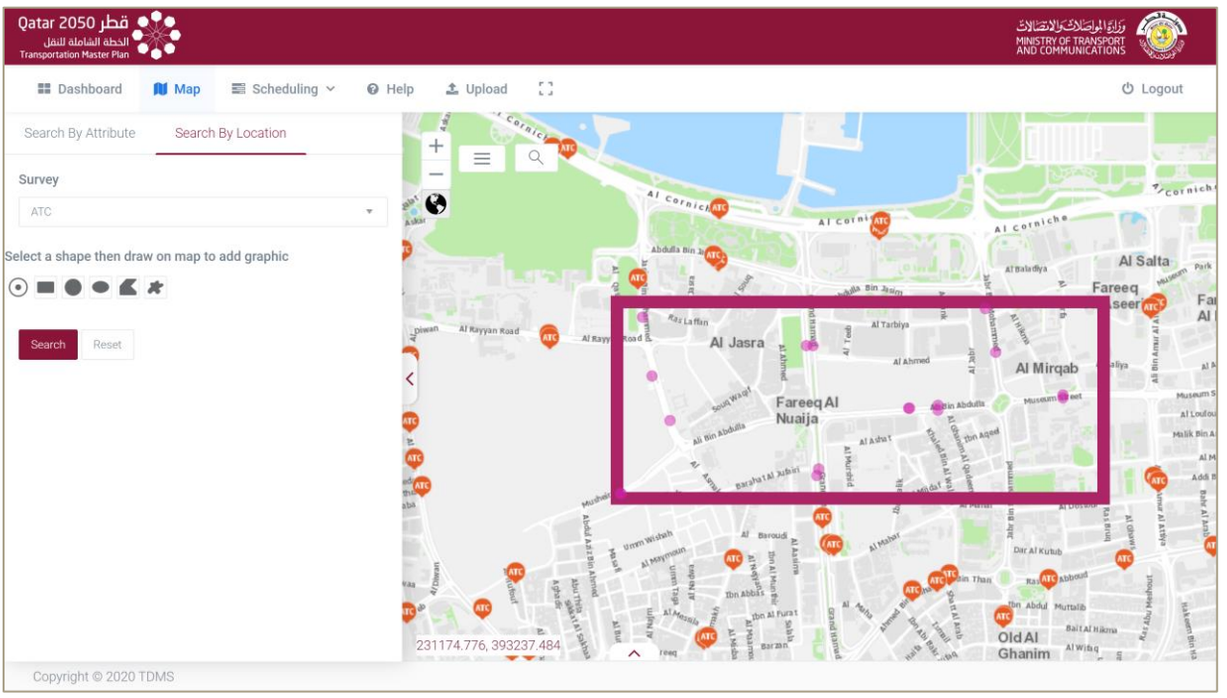



Figure 3-15: Search by Location: Traffic Count Surveys – Drawing a Region of Interest

The user can select a survey sites "pin" marker which displays a popup label (refer to **Figure 3-16**) containing the following information:

- Site Number,
- Street Name,
- District; and,
- Direction

***Note:*** *This is excluded in the TMCs label.*

The label also displays a hyperlink named "**Show Details**". Selecting this link, opens up a new webpage tab, which contains comprehensive details for the selected site (this is discussed further in **chapter 6**).

There is also a "**Zoom to**" hyperlink. When the user selects this hyperlink, the current view of the map will zoom in closer to the site's location.

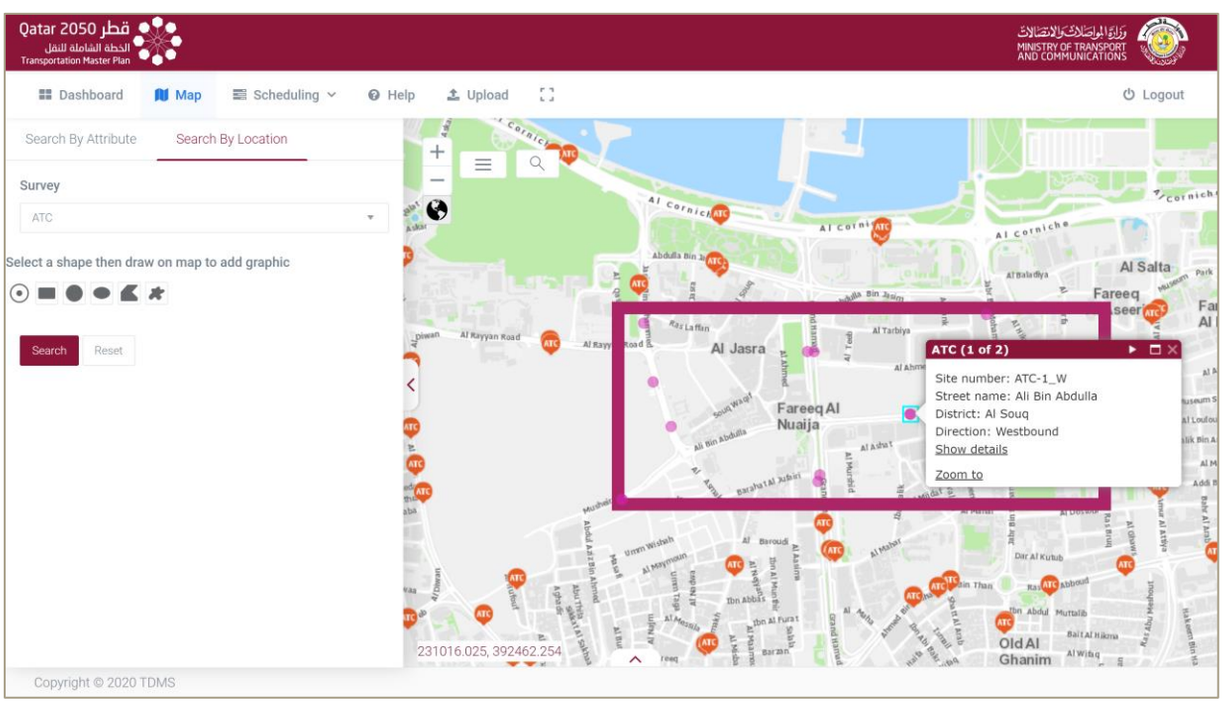



Figure 3-16: Search by Location: Traffic Count Surveys – Site Details

The following example (**Figure 3-17**) illustrates the approach for selecting MCCs, however, the same can be repeated for ATC or TMC surveys.

**Example:** Search for MCC's within a Zone

Starting in the "**Map"** view.

**Step 1.** Select the "**Search by Location**" function.

**Step 2.** Select "**MCC**" from the surveys drop down menu.

**Step 3.** Select **Search.**

***Note:*** *Notice how the Surveys appear on the map.*

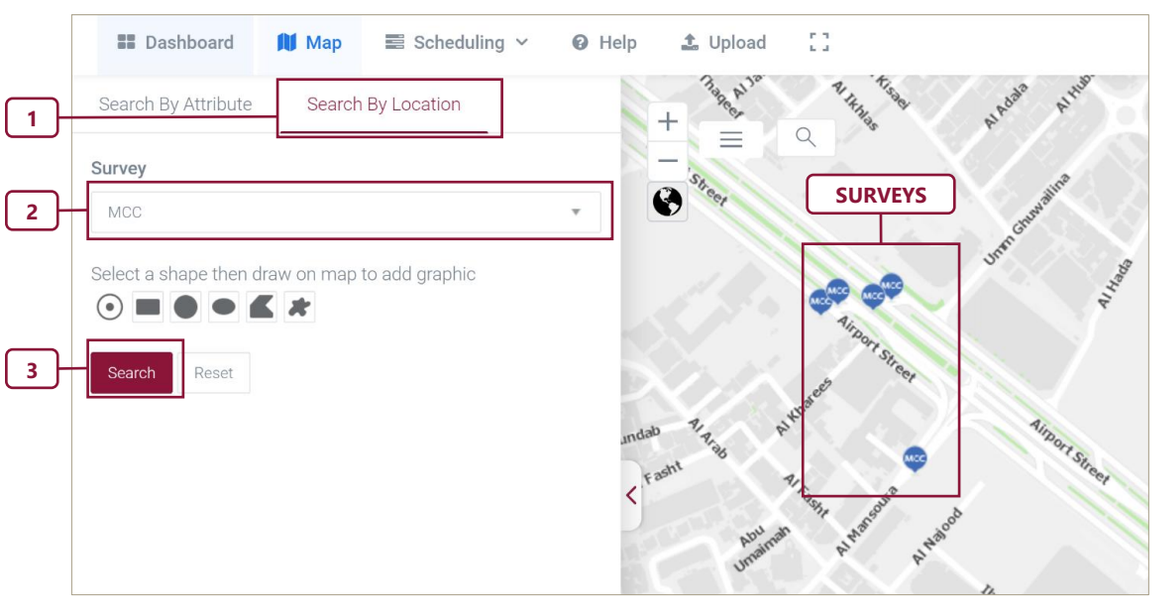



Figure 3-17: Search by Location - Traffic Count Surveys – Search in a Zone

### 3.5.2 SEARCH BY LOCATION - INTERVIEW-BASED

When searching any Interview based data, the user is required to select the survey type from the Survey dropdown menu e.g. Household, Hotel, Parking etc. The user can then select the Layer and select the Origin or Destination search criteria.

> ***Note:*** *Each layer has its own boundary plots located on the map. This aids the user in choosing their area(s) of interest (by clicking on the area plot(s)). To facilitate the user, the individual plots change color when they have been selected, as shown in* ***Figure 3-18.***

The user must select either Origin or Destination from the Origin/Destination drop down menu. This selection represents whether the end user is interested in analyzing interview-based trips that are originating from or ending at the selected area(s).

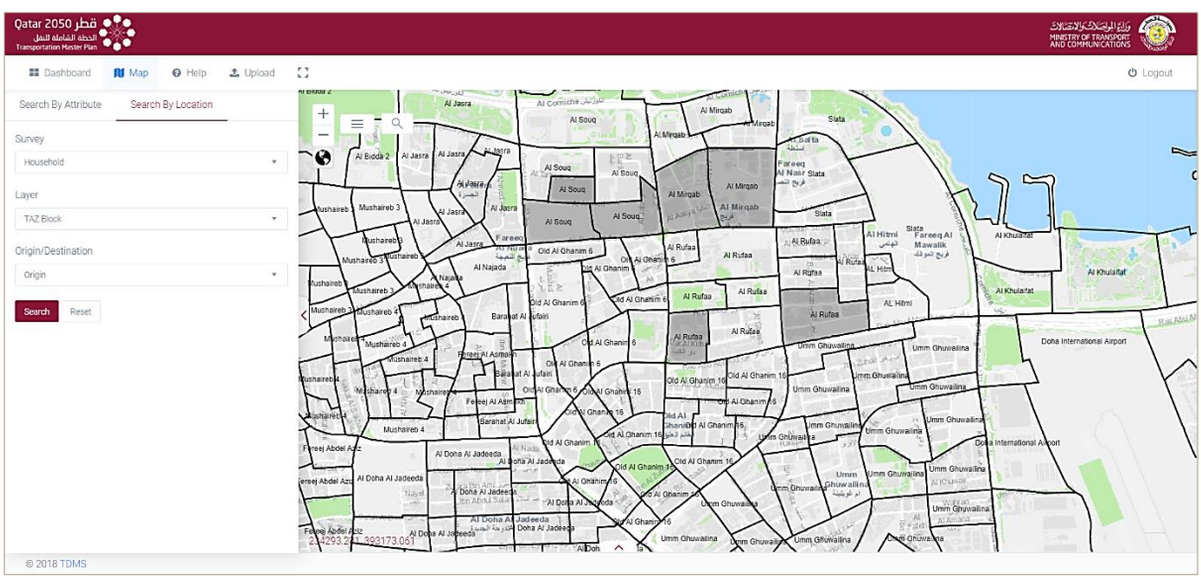



Figure 3-18: Search by Location and Selection from Origin - Interview-Based Surveys

After specifying the search criteria and selecting the "**Search**" button, the user will be presented with a separate webpage tab (**Figure 3-19**). This webpage tab contains comprehensive details for the selected plots and the chosen interview-based surveys for analysis purposes.

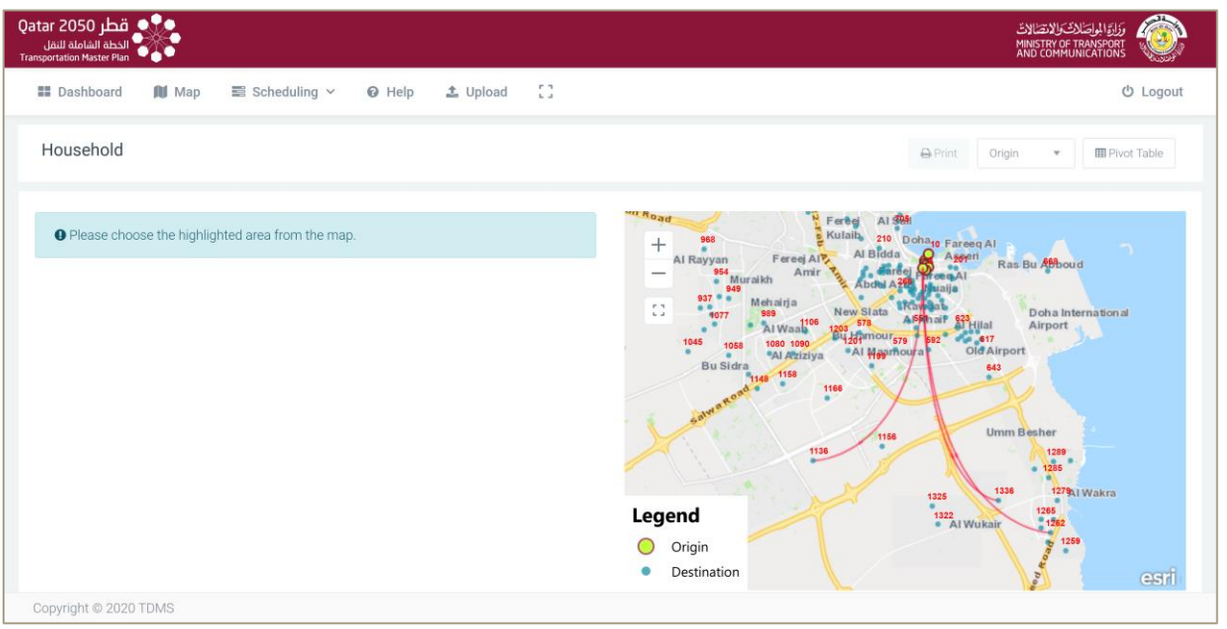



Figure 3-19: Origin/Destination Plots for Household Interview-Based Surveys

The following example illustrates the approach for selecting the Hotel, the same can be repeated for all Interview-based surveys.

**Example:** Search for Hotel in a traffic analysis zone layer

Starting in the "**Map**"

**Step 1**. Select the "Search by Location" function.

**Step 2.** Select "Hotel" from the surveys drop down menu.

**Step 3**. Select "TAZ Block" from Layer drop down menu.

**Step 4.** Select "Origin" from the Origin/Destination drop down menu.

**Step 5**. Click on the map to select area(s) of interest (ensuring the plot(s) changes color).

> ***Note:*** *The user can select multiple plot areas, except in the Municipality layer, here only one Municipality can be selected at a time).*

**Step 6.** Click "**Search**". This will generate the new webpage tab (similar to the example shown in **Figure 3-19)**.

# CHAPTER 4

GIS Portal

# CHAPTER 4 GIS PORTAL

## 4.1 OVERVIEW

The GIS Portal offers a map-based environment through which users can access all the stored transportation layers and survey data. To provide context, the user can choose between three types of background mapping: Base map; Satellite Imagery; or a combination of the two (namely the hybrid), using the "**Map**" view and by clicking on the **Globe** Icon (**Figure 4-1**).

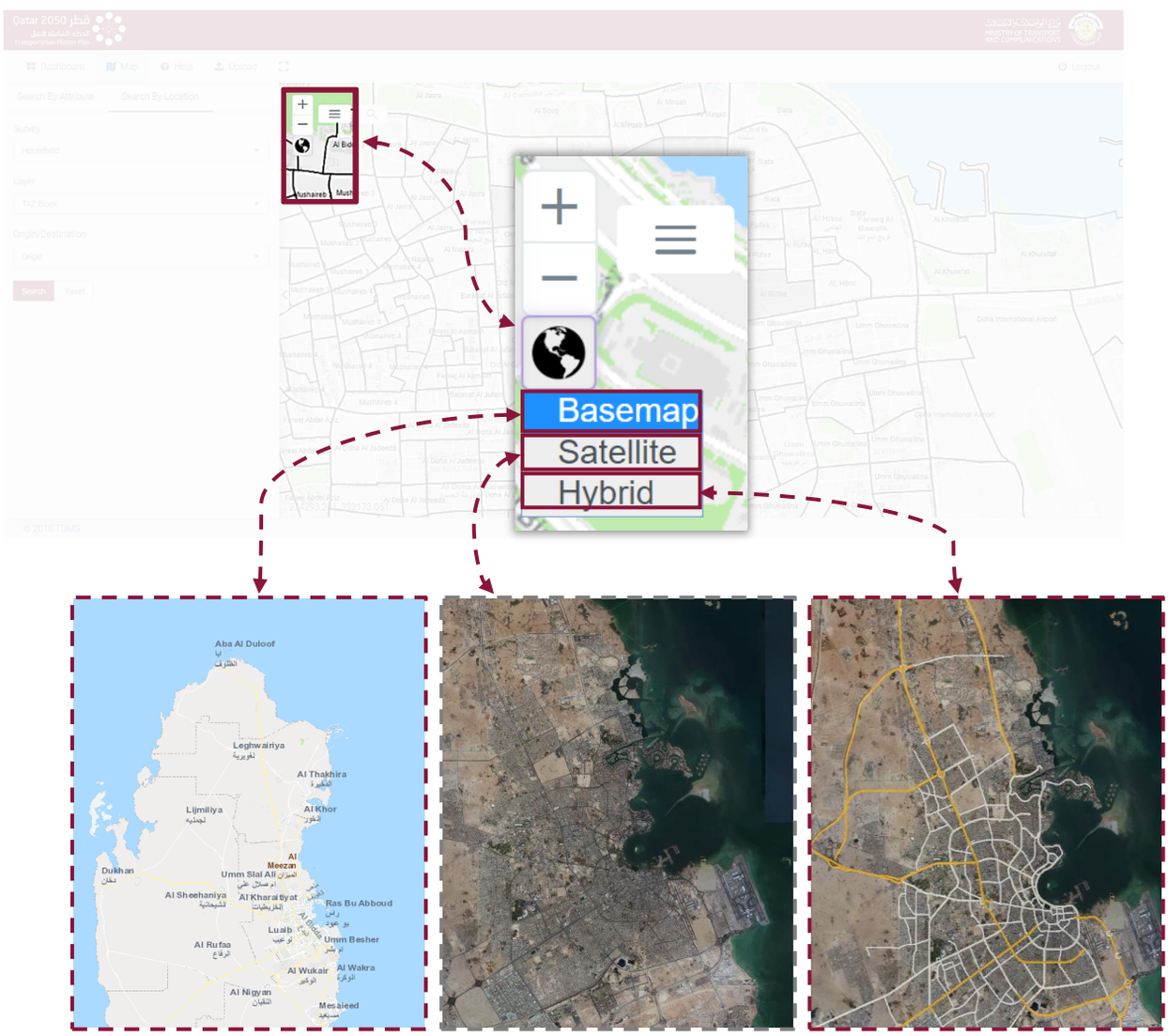



Figure 4-1: Map Interface

## 4.2 MAP MENU

The "**Map menu**" indicated by the lined icon ≡ (located to the right of the globe icon) gives the user access to several mapping tools comprising: measurement, bookmark, print, draw, legend, layers, identify and heatmap, as shown in **Figure 4-2**.

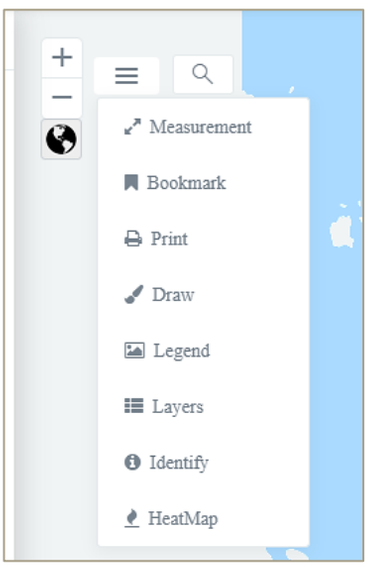



Figure 4-2: Mapping tools

Examples using each item are detailed as follows:

**Example 1:** Measurement tool

Starting in the **"Map"** view.

**Step 1.** Click on the "**Map menu**" ≡ icon. This should open the map menu.

**Step 2.** Select the **Measurement** icon Measurement . This should open a measurement popup box (refer to **Figure 4-3**).

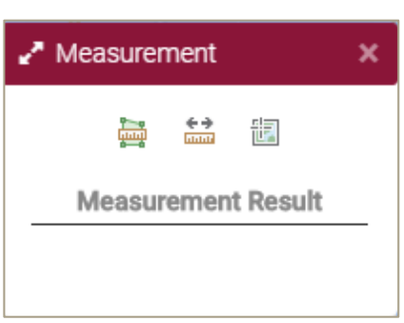



Figure 4-3: Measurement popup box

**Step 3.** The popup box contains three icons, the first icon is "**Area**" , the second for "**Distance**" and the third for "**Location**" .

**Step 3a. Area** :

If the "**Area**" icon is selected, the user will click on the map and an area will be drawn by dragging the mouse. The measurement result for the area will be shown in the measurement popup box. To stop the measurement of the area, the user must double click the mouse.

> ***Note:*** *the measurement is in square kilometers* ***(Figure 4-4).***

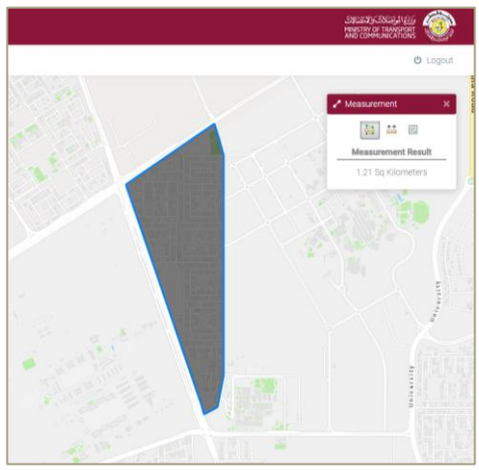



Figure 4-4: Using the Area measurement tool

**Step 3b. Distance :**

If the **"Distance"** icon is selected, the measurement between point to point can be derived and will be shown in the measurement popup box. The point to point measurement can be stopped, by double clicking on the map (**Figure 4-5**).

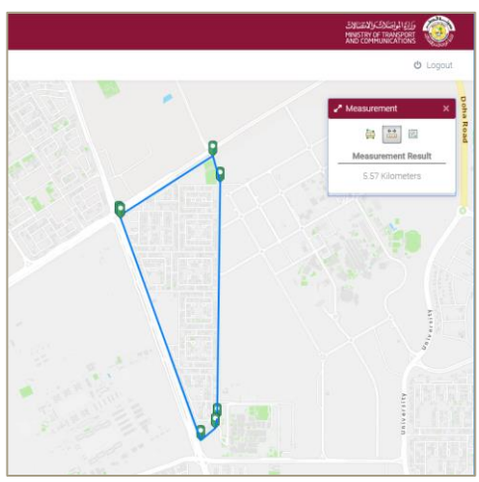



Figure 4-5: Using the Distance measurement tool

**Step 3c. Location :**

If the **"Location"** icon is selected, the user can click once on the map and the measurement popup box will display the X:Y coordinates of the chosen location (**Figure 4-6**)

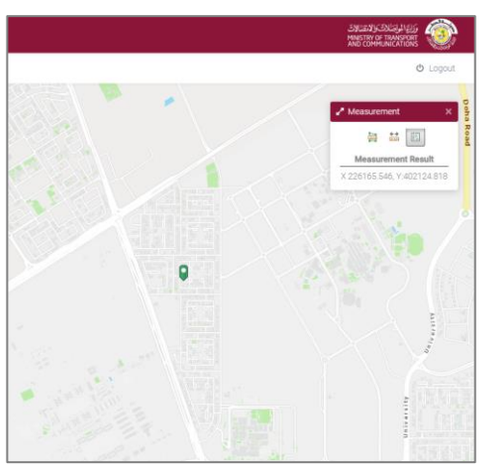



Figure 4-6: Using the Location tool

***Note:*** *The measurement popup box can be closed, by clicking on the X*

**Example 2:** Bookmark tool

The second tool on the map menu is the "Bookmark" 

which saves a specific location and zoom level (**Figure 4-8**).

Starting in the **"Map"** view.

**Step 1.** Zoom and Pan to the desired location.

**Step 2.** Click on the "**Bookmark**" icon located in the "**Map menu**", a "**Bookmark**" popup box will appear (**Figure 4-7**).

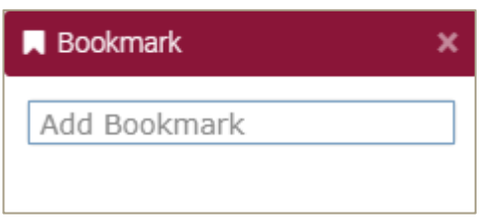



Figure 4-7: Bookmark popup box

**Step 3.** Click on "**Add Bookmark**" and an editable text box will prompt the user to add text.

**Step 4.** Enter a name for the Bookmark and click enter to save it.

**Step 5.** The user can edit the name by clicking on the with the pencil icon  (as shown in **Figure 4-8**).

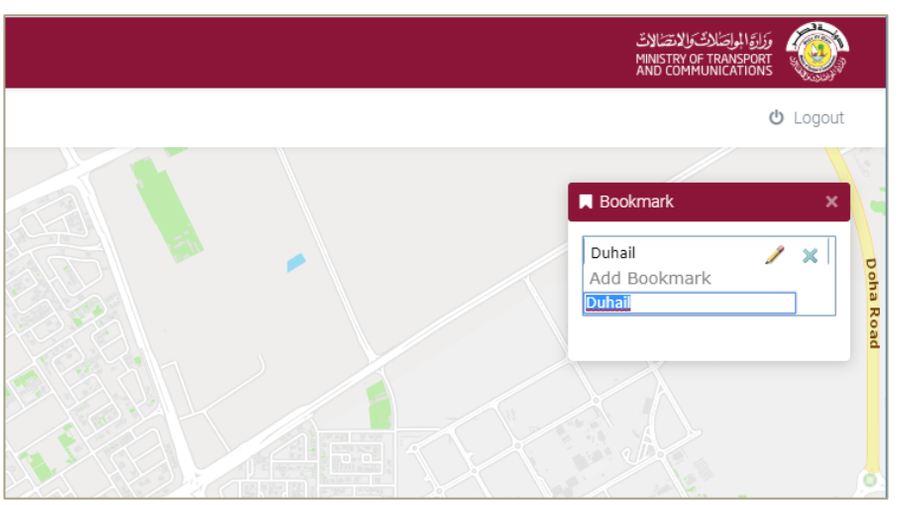



Figure 4-8: Map Menu: Bookmark

**Example 3:** Print tool

The Print tool (**Figure 4-9)** allows the user to print the map in a number of formats (including PDF) and at different resolutions. The printout file can be accessed through the same menu.

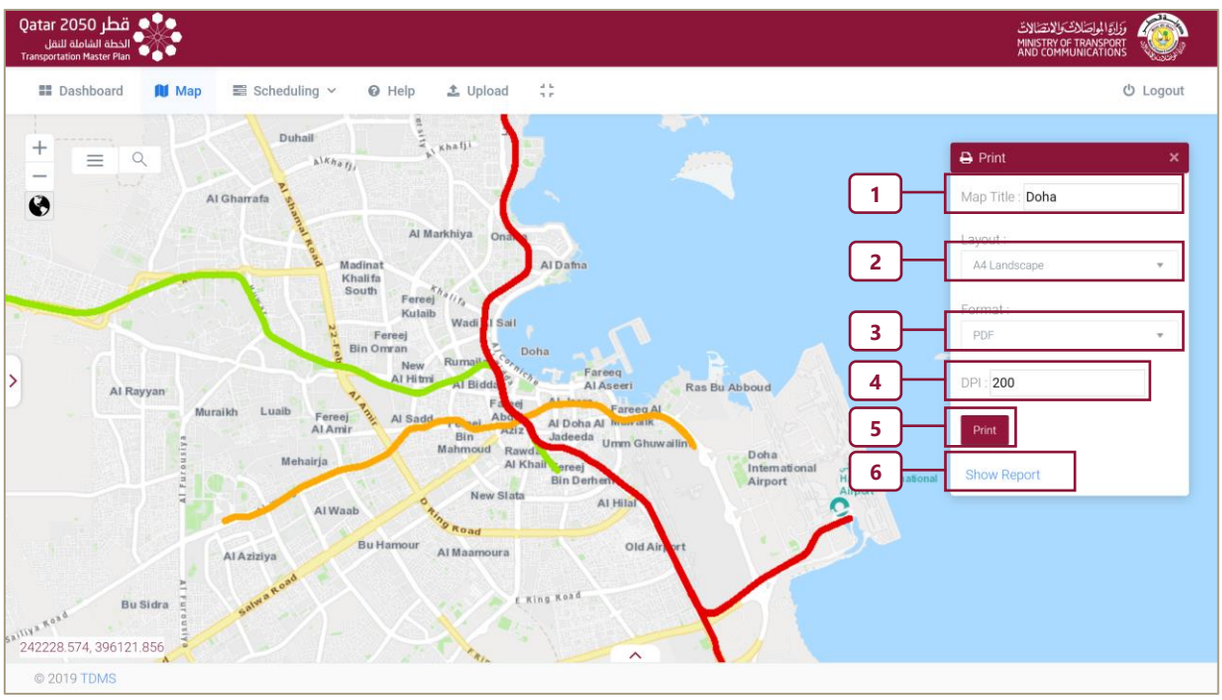



Figure 4-9: Map Menu: Printing Tool

Please note that the user should be in "**Map View**" to print out maps. Click and open the print popup box to proceed further. The following steps should be followed to print out maps:

**Step 1.** Enter Map Title/Name in the text box.

**Step 2.** The page layout can be chosen by clicking on the drop-down menu. A0 to A4 size prints are available.

**Step 3.** Select the output format. The formats are PDF and GIF.

**Step 4.** Select Print quality, user can update the resolution of the printed map. The user can specify the DPI (dots per inch) value in the text box.

**Step 5.** Click on "**Print"**.

**Step 6.** Once the above step is performed, "**Show Report**" appears. Click on this and a new page opens).

A sample of a print layout is shown in **Figure 4-10**

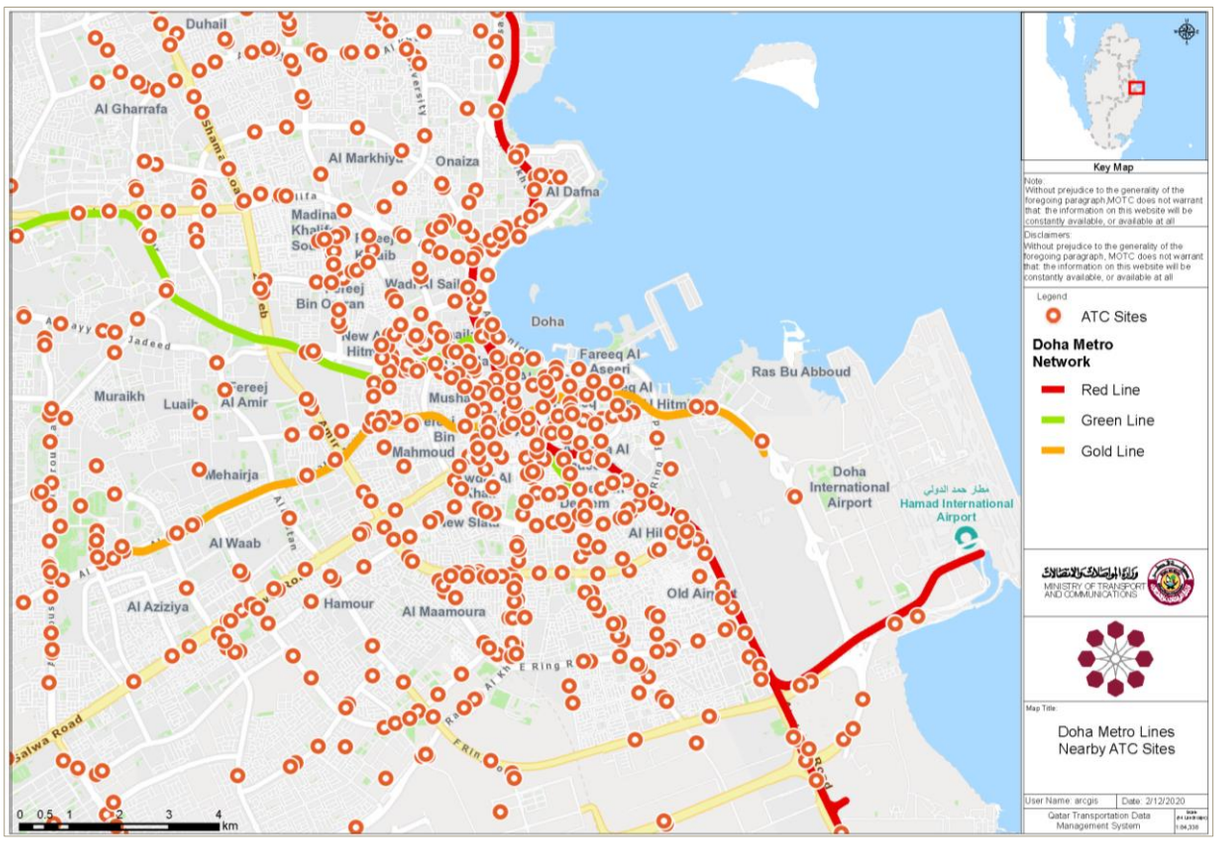



Figure 4-10: GIS Portal Printout

**Example 4:** Draw tool

Please note that the user should be in "**Map View**" to use the Draw tool.

The Draw tool enables freehand figures or predefined shapes (**Figure 4-11**) to be added to the map, this is useful to highlight elements or locations of interest for instance. The user can also select the width and color of the shape's outline.

**Step 1.** Select "**Draw**".

**Step 2.** Select the Shape. The borders of the shapes can be enlarged/decreased using the -/+ buttons.

**Step 3.** Select the Color. This can be changed once the user clicks on the color.

**Step 4.** Select the Size.

**Step 5.** Click and hold to draw, release to end.

***Note:*** *Pressing clear will reset everything and makes the shape disappear (and it cannot be saved) and the a shape cannot be undone.*

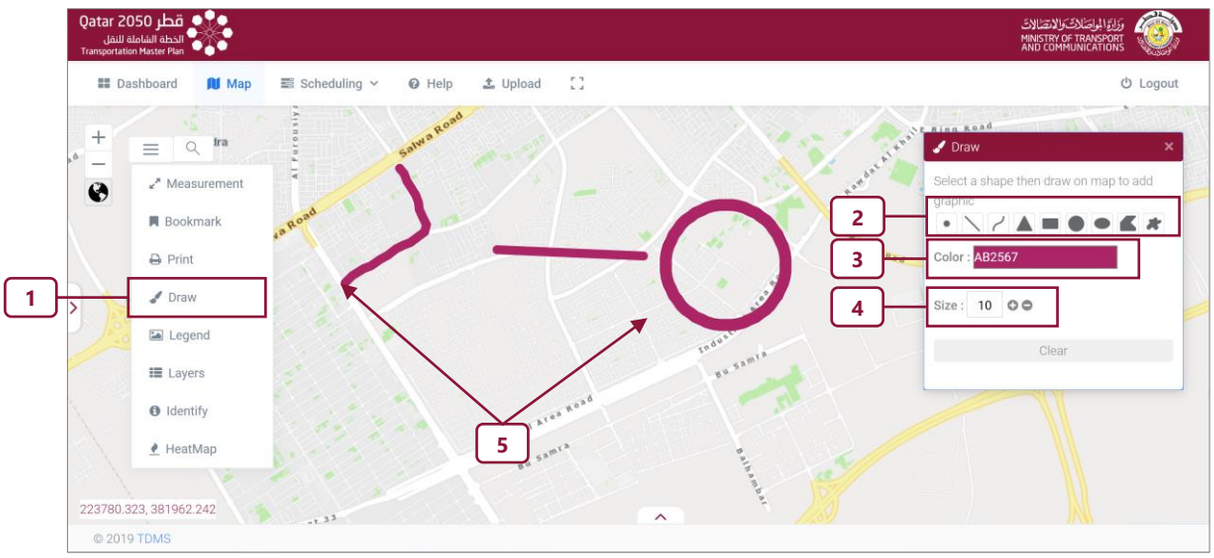



Figure 4-11: Draw Tool

The available shape types are as shown in **Figure 4-13**.

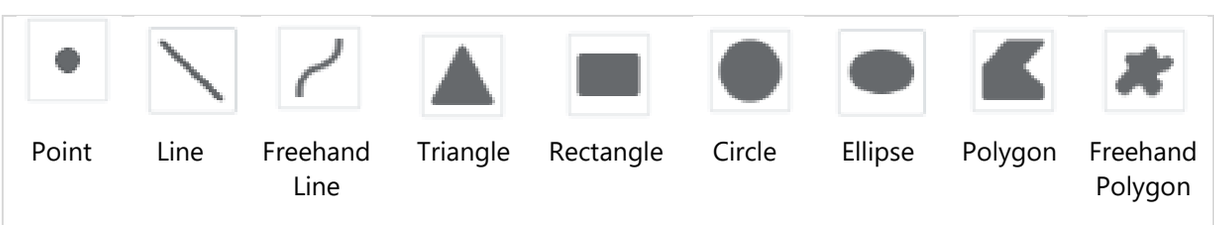



Figure 4-12: Shape Types

**Example 5:** Legend tool

Please note that the user should be in "**Map View**" to use the Legend tool and the map layers need to be selected first in order for the legend to work.

***Note:*** *When a map layer is removed, the legend automatically updates.*

The Legend tool shows the symbology being used for the active layer(s) and the meaning of each symbol. In the example shown in **Figure 4-13**, the map shows each land use parcel, classified into a group with a color code and the legend displays each group with its associated color code.

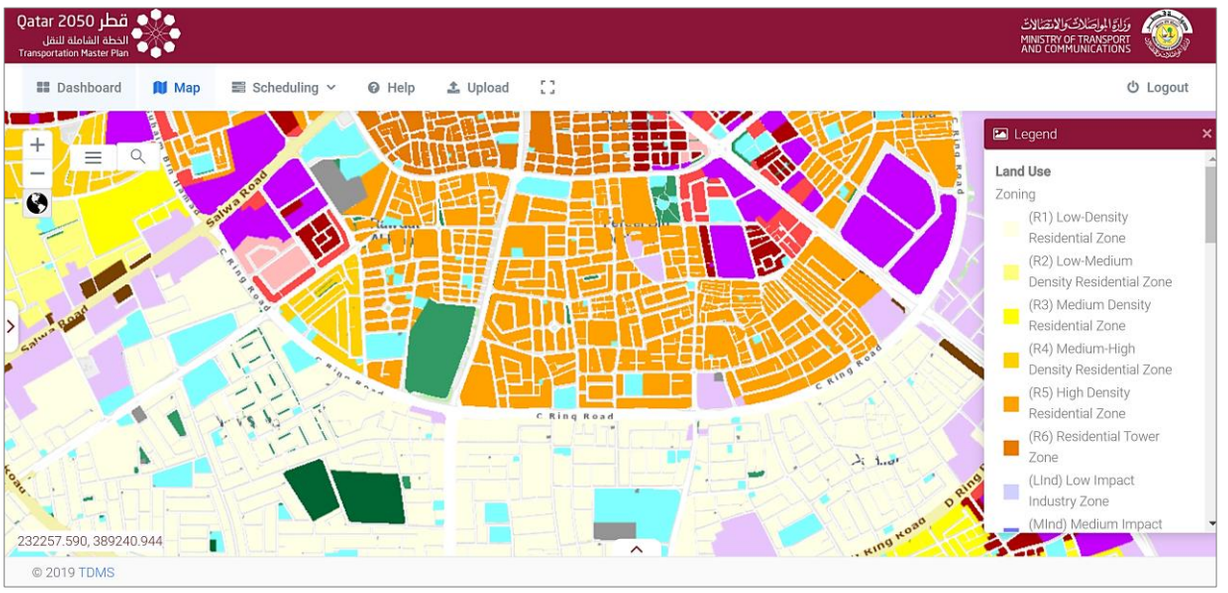



Figure 4-13: Legend Tool

> ***Note:*** *The legend cannot be expanded, the user has to scroll through the legend elements.*

**Example 6:** Layers tool

Please note that the Layers tool is discussed in more detail in **Section 4.3**.

**Example 7:** Identify tool

Please note that the user should be in "**Map View**" to use the Identify tool.

> ***Note:*** *Close the layer pop up box (if it was open) and access the identify toolbox from the menu.*

Mention the information boxes cannot be expanded - the user has scroll up/down and sideways

The Identify tool can be used to display the selected attribute information for the layers or objects selected (**Figure 4-15**).

**Step 1.** Select the layer of interest from the provided Layers 

dropdown.

**Step 2.** User can use point  to identify the characteristics of the selected layer at a specific location on the map, apart from the point, use could choose from a variety of shapes  to draw a region.

In both cases, a pop up is displayed with a list of characteristics of selection

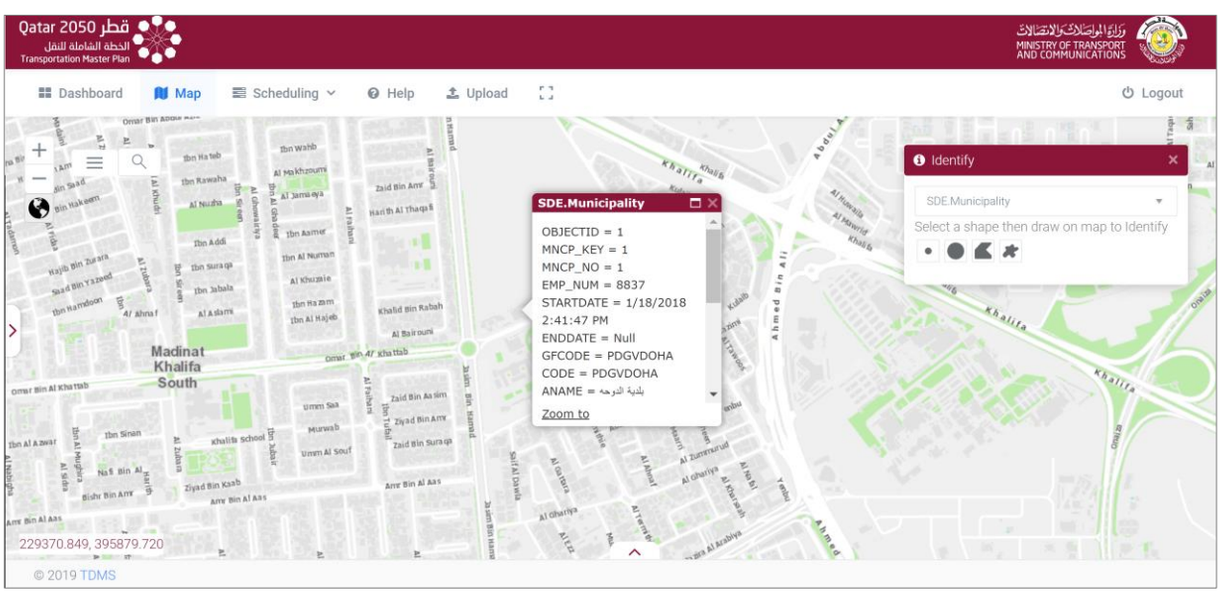



Figure 4-14: List of Characteristics of Selection

The layers included under the identifier tool are as follows:

- ATC Sites.
- MCC Sites.
- TMC Sites.
- SDE.Municipality.
- Zones.
- Landplan District Area.
- DE.BlockArea.
- Traffic Analysis Zone.
- Right of Way (حرم الطريق).
- Road Network.
- Doha Metro Stations.
- Doha Metro Network.
- Doha Bus Stops.
- Timing Points.
- Travel Time Routes.
- Footpath.
- Cycle Lane.
- DATA.POIs.
- Zoning.
- Khor_Wakra_Zoning.
- Centers_Zoning.
- Regions.
- TG Sites.

***Note:*** *The user has to click on an area of the map and once done, that an information box will appear with numerous identification fields.*

The Tabular Result tool is complimented by the Identify Tool 

and is only applicable if multiple features fall under the user selection.

After selection of the desired layer and shape, once the user completes drawing the area of interest on the map, the Tabular Results are displayed with all the features of the selected layer listed with their relevant details.

**Step 1.** choose the layer of interest (feature to identify) from the provided Layers 'identify' dropdown menu 

.

**Step 2.** User can use point  to identify the characteristics of the selected layer at a specific location on the map, apart from the point, use could choose from a variety of shapes  to draw a region.

> ***Note:*** *The table will automatically pop up and this option applies only when using a circle, polygon or freehand polygon search*

**Step 3.** Click to expand view if the table wasn't automatically pop up.

> ***Note:*** *The arrow icon, located at the foot of the screen can be clicked on to close the tabular results.*

**Step 4.** Slide bar/Scroll to browse through the attribute data.

**Step 5.** Click on the + icon to add/remove fields

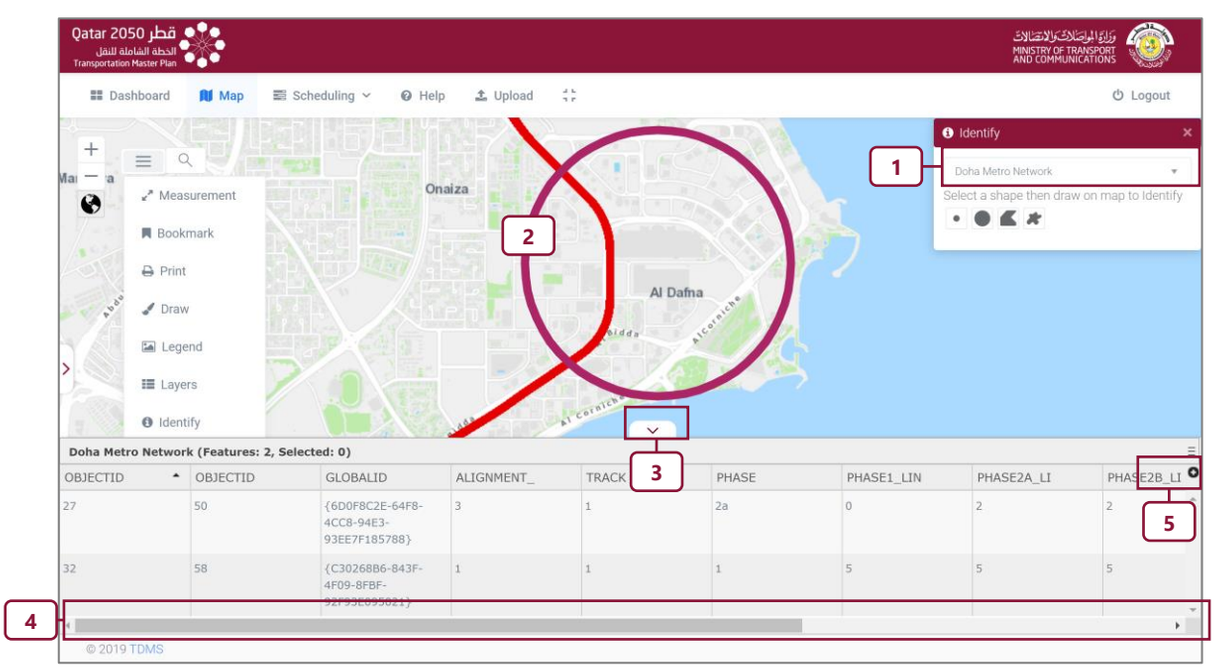



Figure 4-15: Tabular Result: Selection

> ***Note:*** *The arrow icon, located at the foot of the screen can be clicked on to close the tabular results.*
>
> ***Note:*** *By clicking on the 3 lines that user can 'default short order, clear selection etc.*

**Example 8:** HeatMap tool

Please note that the Heatmap tool will be discussed in more detail in **chapter 7**.

## 4.3 DISPLAYING LAYERS

The Transportation and Traffic data layers stored in TDMS are accessible via the Map Menu / Layers option. The system will display a list of Sublayers from which the user selects the layers to be displayed over the background map. Opacity controls are also added.

**Step 1.** In map view, click on the Map Menu then click on the Layers Tool.

**Step 2.** Tick box to add the layer then click on the arrow in front of it  to show the Opacity and the Sublayers.

**Step 3.** Click on "**Opacity**" to adjust the level of opacity of the added layers.

**Step 4.** Click on the Map Menu and choose the "Layers". The "**Sublayers**" tab will be selected by default.

> ***Note:*** *Sublayers are only available for traffic counts, public transport, travel time survey and point of interest.*

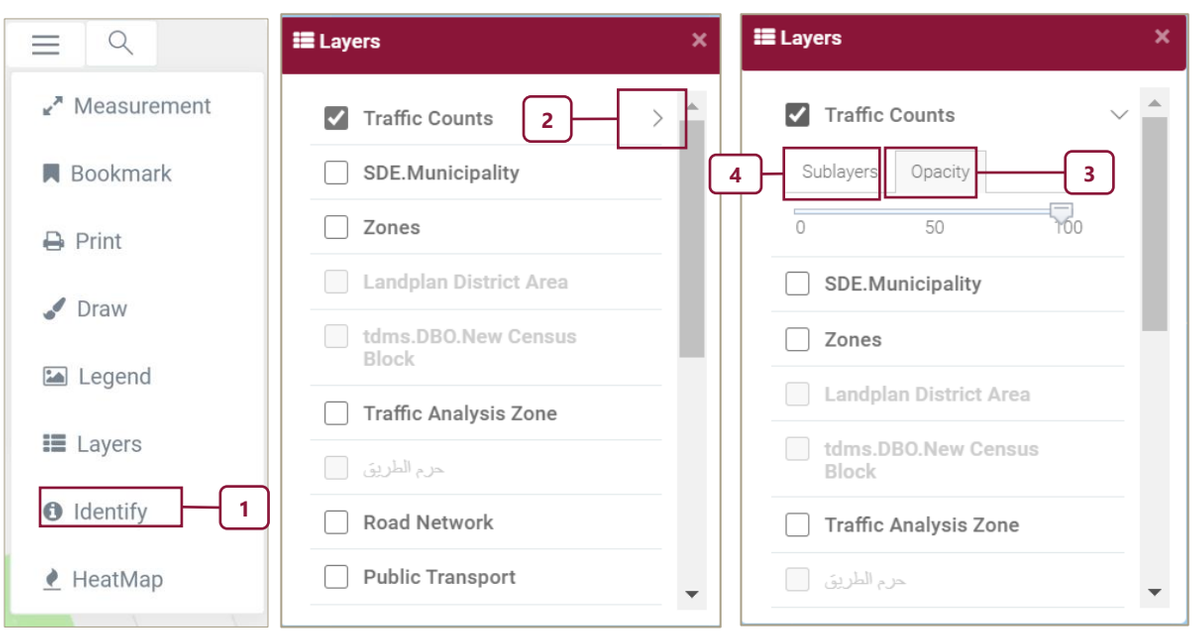



Figure 4-16: Layers of Available Information/Data

**Example 1.** Displaying the Qatar Metro (other layers follow a similar procedure).

Under the **Layers** menu. Click the **Sublayers** tab.

**Step 1.** In Map view, click on the Map Menu then click on the Layers Tool.

**Step 2.** Check the Box for Public Transportation Layer then click on the arrow in front of it to show the Opacity and the Sublayers.

**Step 3.** Under the Sublayers tab, check the Box for Public Transportation (2nd time) then check the boxes for:

**Doha Metro Network.**

**Doha Metro Stations.**

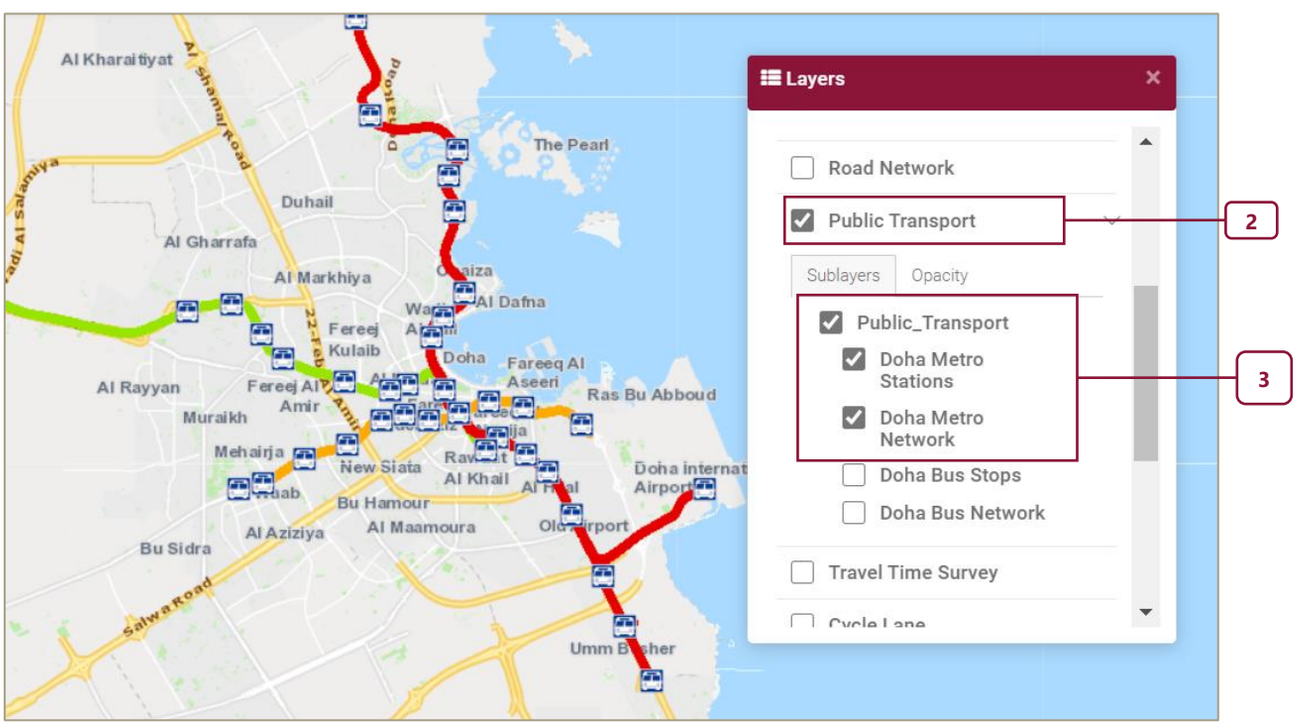



Figure 4-17: Map Menu: Displaying Layers

**Example 2**. Adjusting the opacity level.

On the **Layers** menu. Click the **Opacity** tab. Then Slide the bar to adjust the **Opacity which ranges from 0 to 100**.

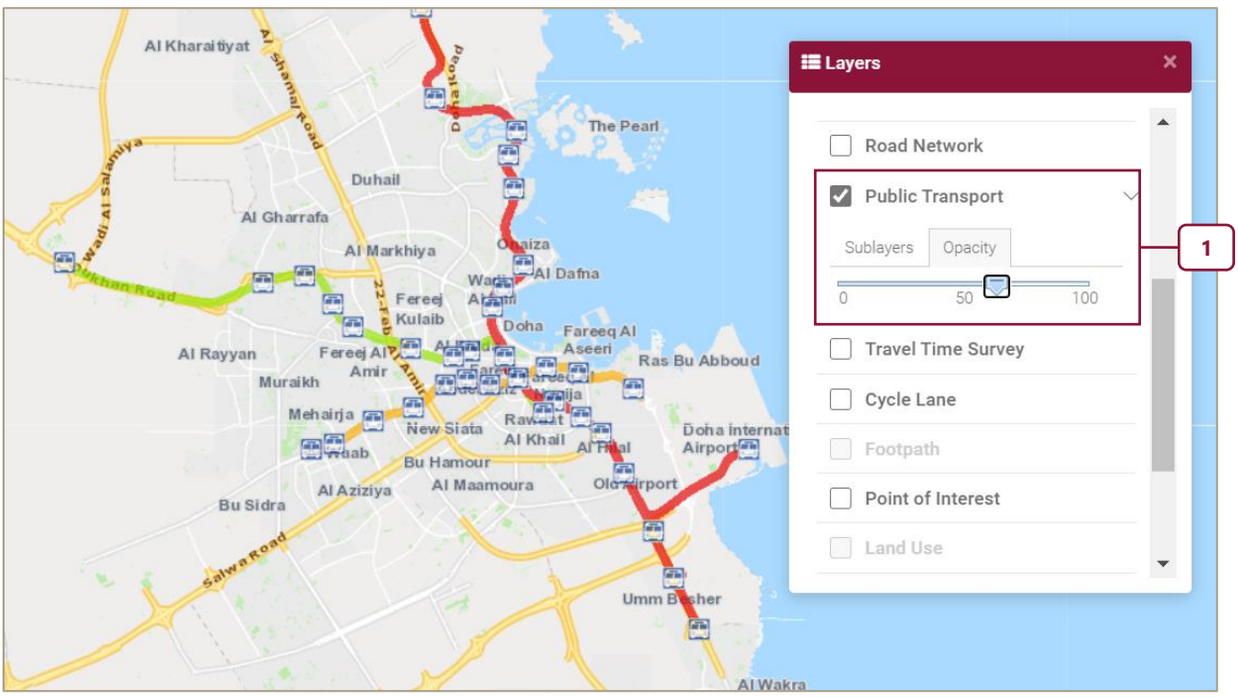
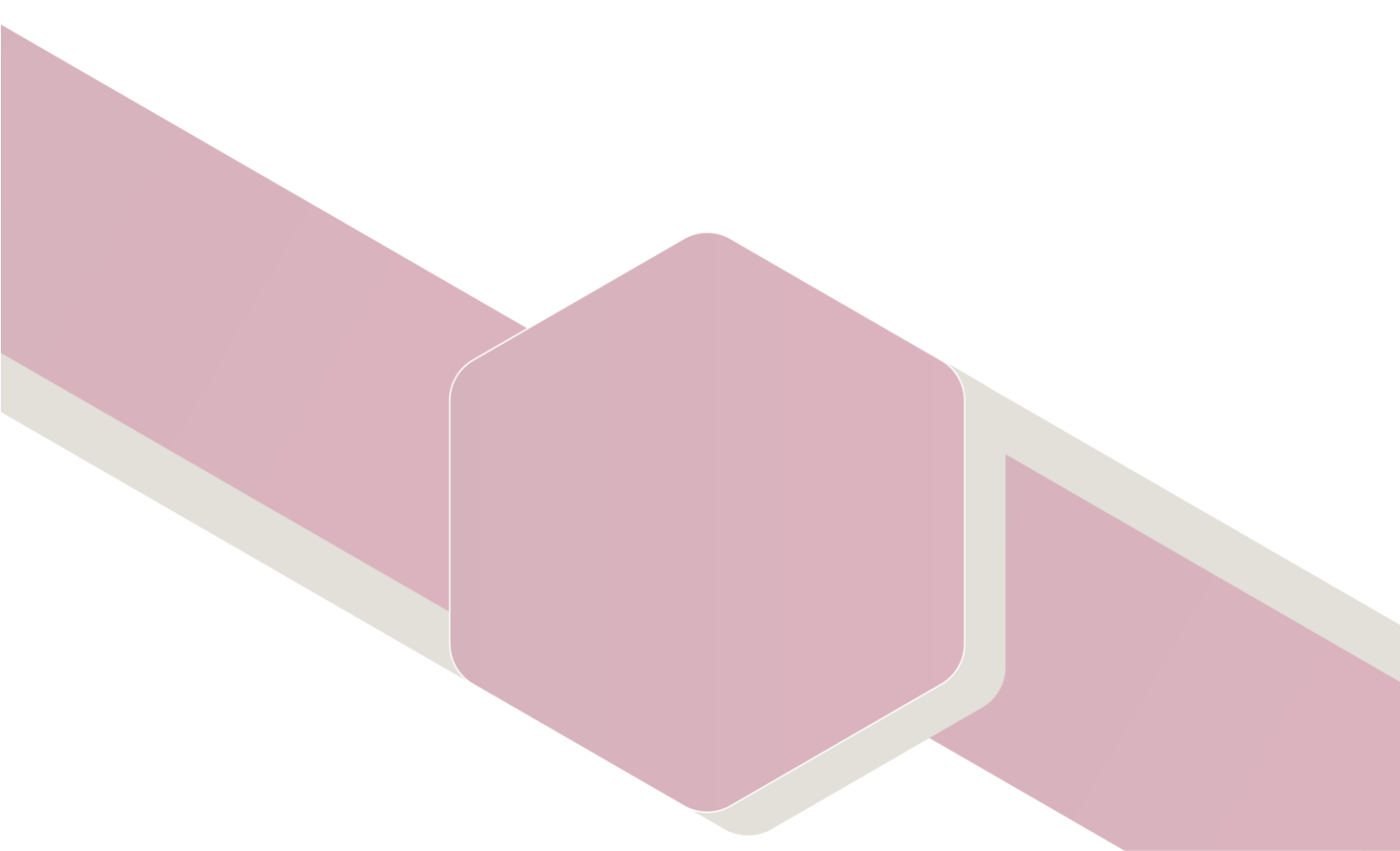



Figure 4-18: Map Menu: Adjusting Opacity Levels

# CHAPTER 5

## Interview-Based Tools



# CHAPTER 5 INTERVIEW-BASED TOOLS

## 5.1 OVERVIEW

This feature gives users the capability to query, view, and upload various interview-based survey data using common analytics tools available from the GIS interface. The data includes person and travel characteristics for households, hotel users, public transportation users, car park users, airport and port crossing passengers, as well as roadside interviews, attitudinal surveys (which included pedestrians and cyclists) and stated preference surveys conducted on a subset of the household interview sample. Please note that **the Search function (Chapter 3) must be enabled before the Interview-Based application can be accessed.** After clicking the search button, a new window will open offering the following search choices: **Pivot Table** which is a tool to produce tables, graphs or plots (**Figure 5-1**) and a **GIS Map** (**Figure 5-2**). The latter is a tool to produce origin-destination maps (default option).

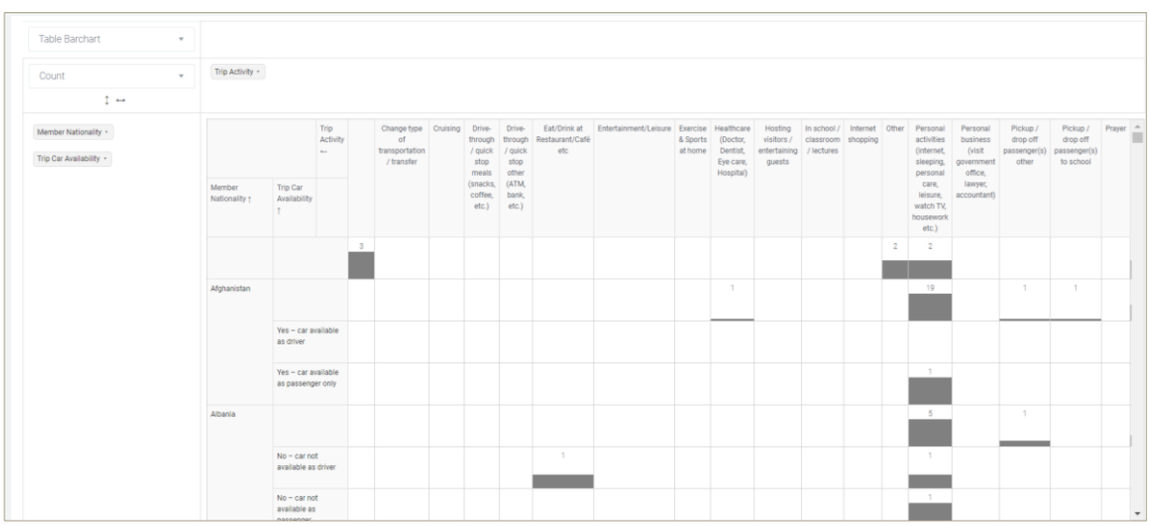



Figure 5-1: Interview-based: Pivot Table and Graph

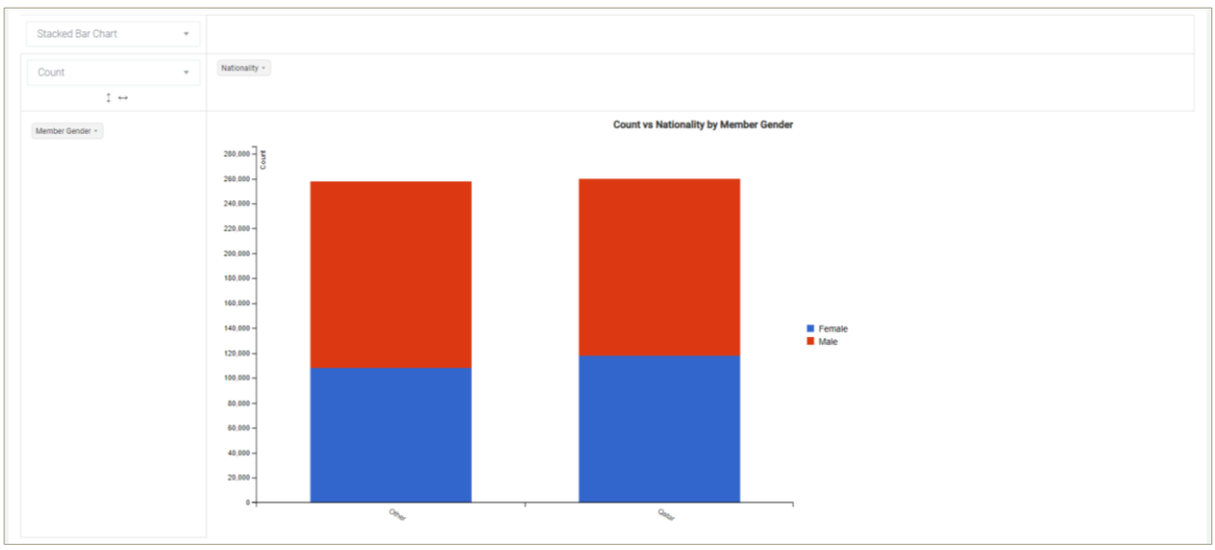



Figure 5-1: Interview-based: Pivot Table and Graph (Continuation)

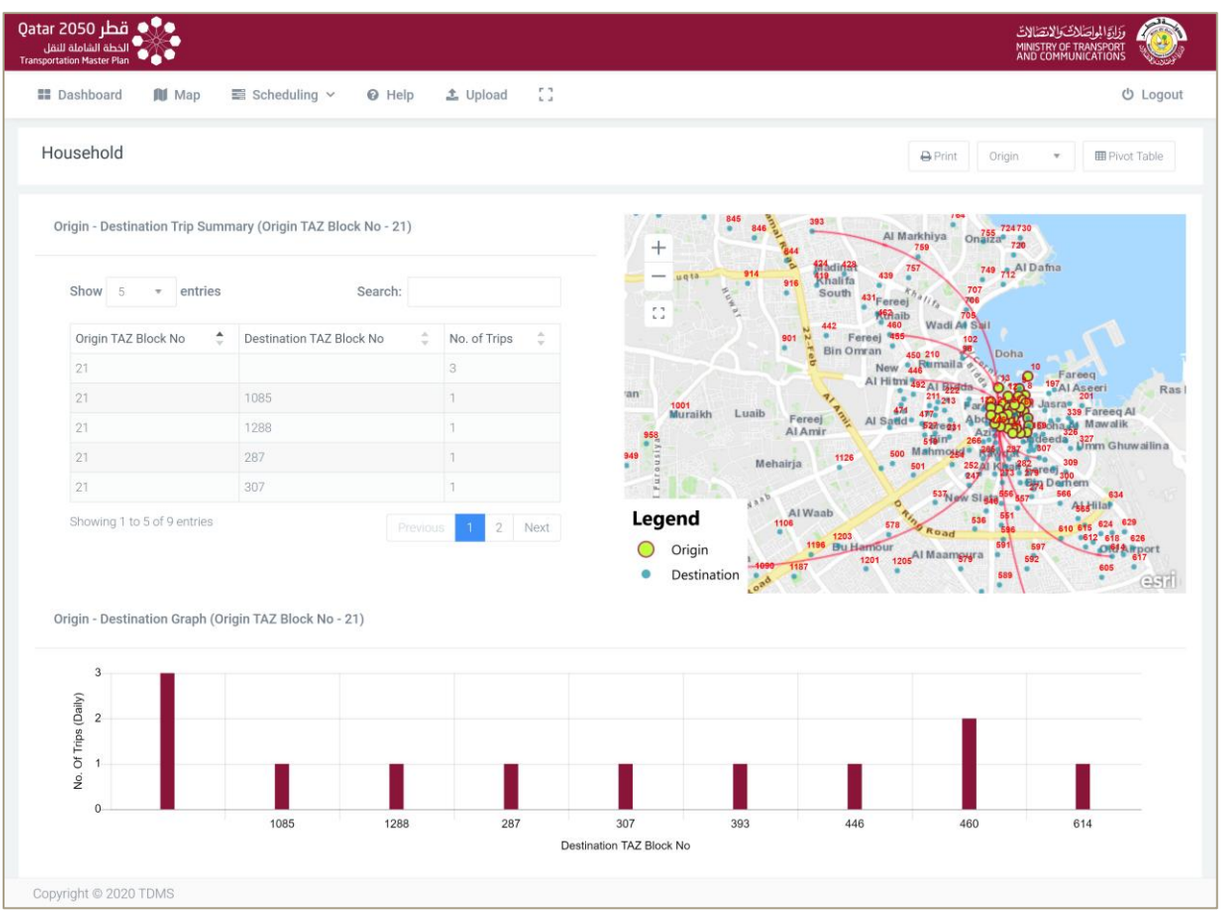



Figure 5-2: GIS Thematic Maps Feature

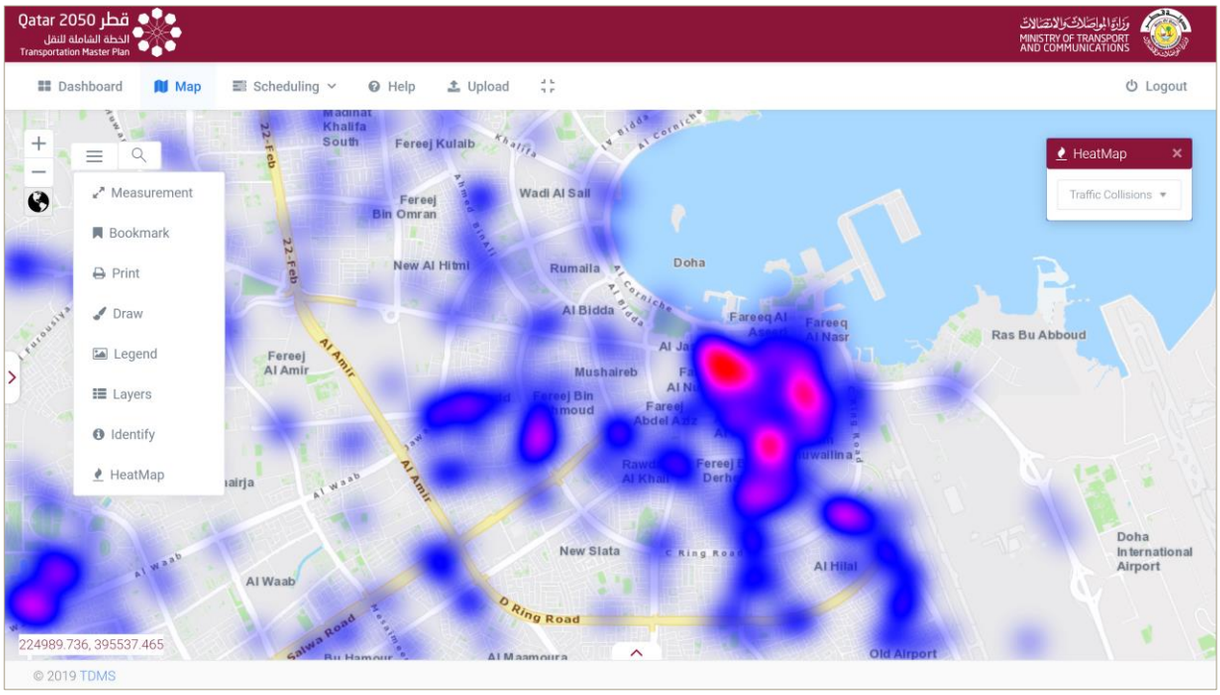



Figure 5-2: GIS Thematic Maps Feature (Continuation)

## 5.2 ORIGIN DESTINATION SUMMARY

The Origin Destination Trips summary is the default landing page after the user has selected the following:

1. Type of survey.
2. The municipality.
3. The TAZ zones of interest.

On the Menu Bar, click **Map** then click the "**Search By Attribute"** function.

**Step 1.** Select "**Household**".

**Step 2.** Select "**Doha**".

**Step 3.** Select **TAZ**.

**Step 4.** Select zones **1** and **2** then click on **Search.**

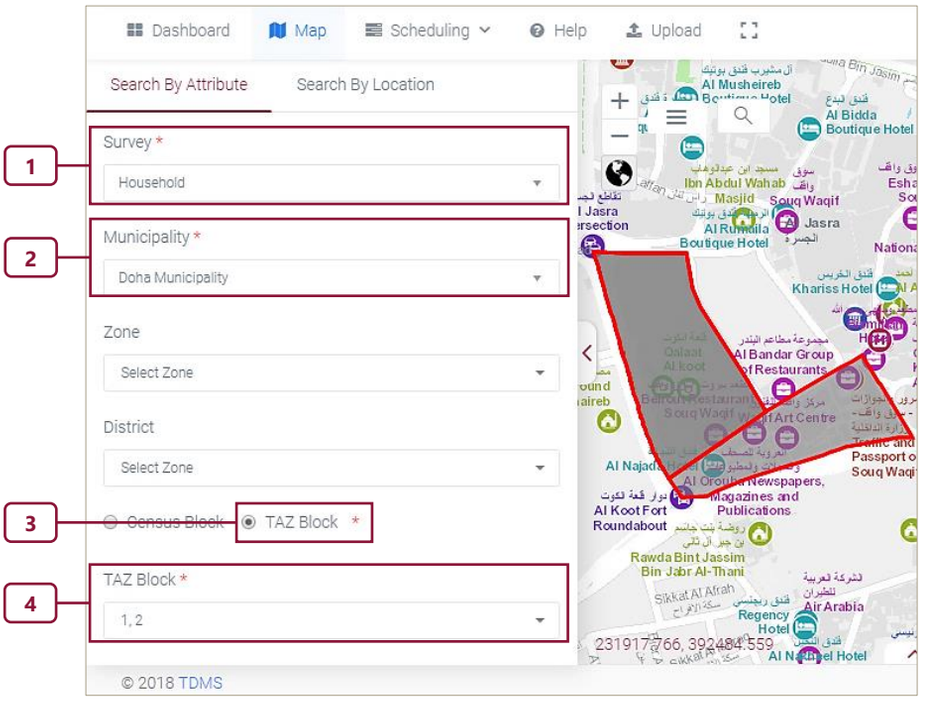



Figure 5-3: Steps Leading to the Origin Destination Summary page

**Step 5**. Click Pivot Table button.

**Step 6**. The software will take the user to the Origin Destination Trips Map.

**Step 7**. Zoom into the map and click on any zone to use as origin.

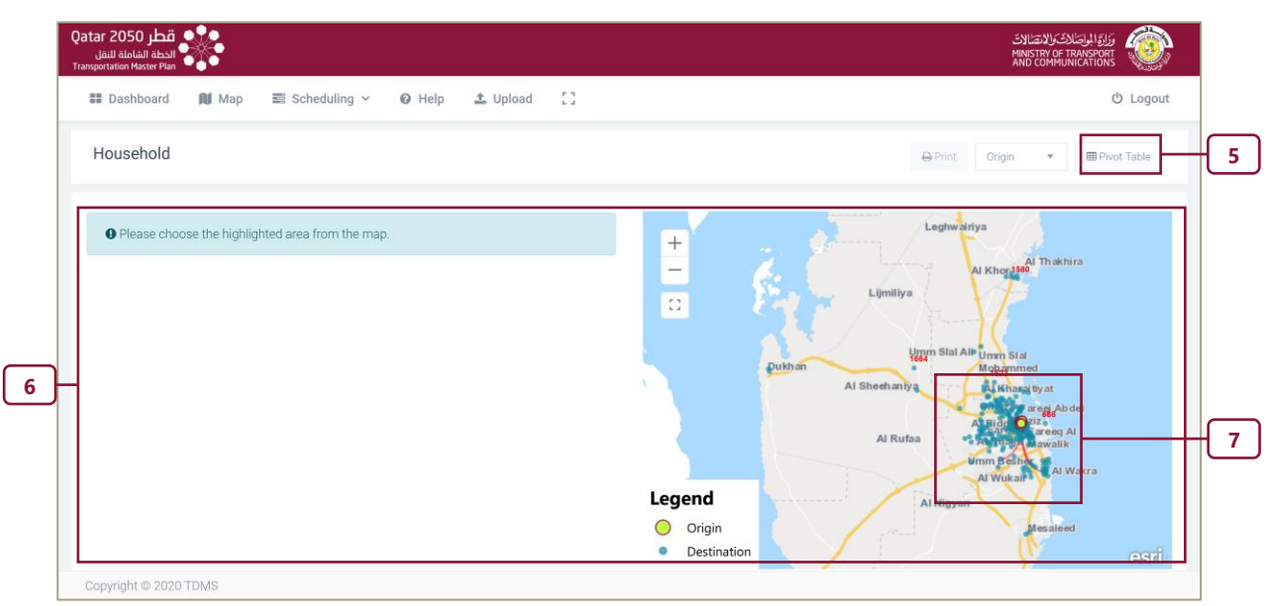



Figure 5-3: Steps Leading to the Origin Destination Summary page (Continuation)

The system will display the table of trips on the left and highlight with arrows the Origin Destination pairs for the fixed origin.

1. Display the Table with count of trips from Origin to Destinations.
2. Display Spatial visualization of pairs.
3. Display bar-diagrams.

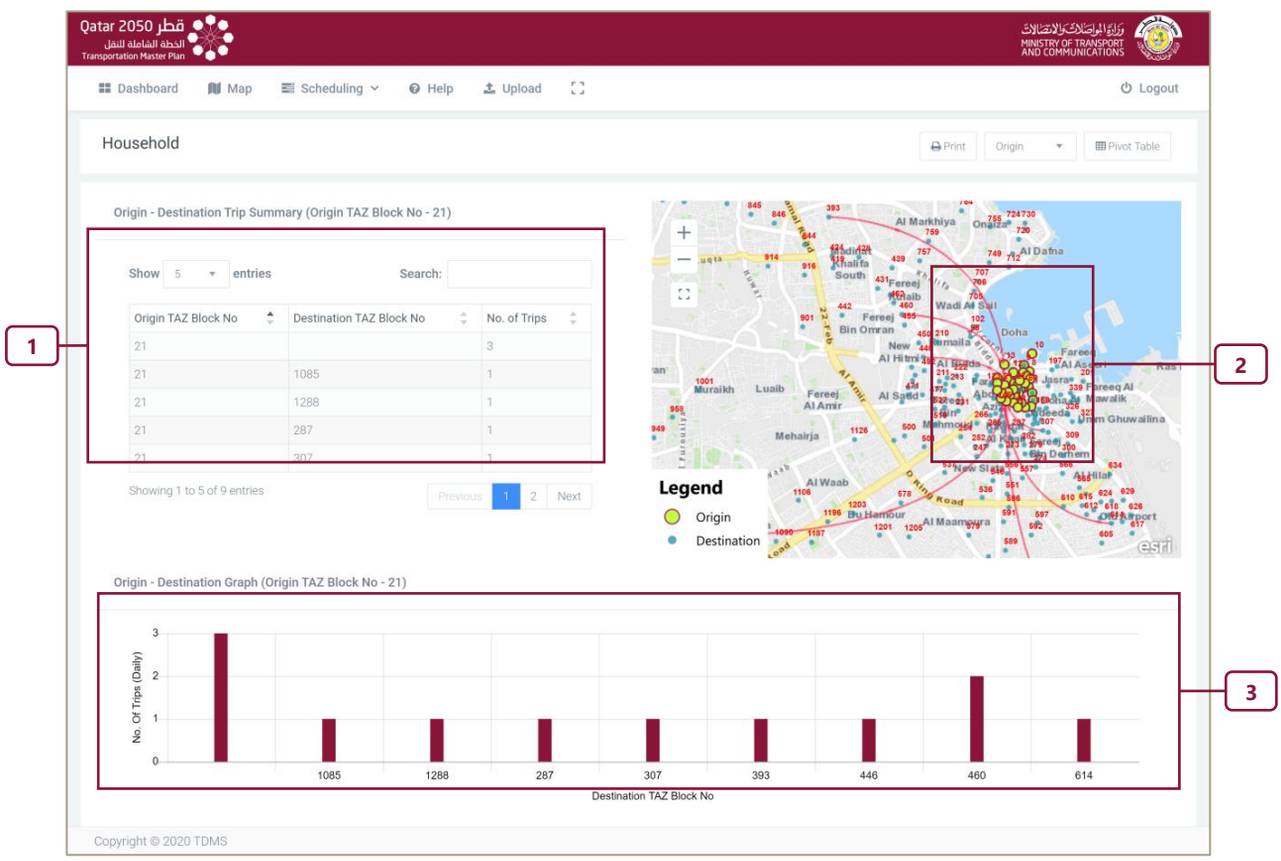



Figure 5-4: Origin Destination Trip Summary

## 5.3 PIVOT TABLE

The pivot table will display all attributes contained within the database for the corresponding survey type. It is advisable that the user filter the attributes of interest, this can be done by first browsing through the attributes and then selecting the attributes of interest in the "Configure" function.

**Example 1**. Filter the attributes for "Household Interviews" for TAZ zones 1 and 2 in Doha Municipality.

**Step 1**. Click on "**Pivot Table**".

**Step 2**. Click on Print to get a printout of the current screen.

**Step 3**. Browse through the complete list of attributes and select the ones of interest.

**Step 4**. Click on "**Configur**e" to filter the attributes of interest.

**Step 5**. Select the undesired attributes on the right pane, use **SHIFT/CTRL** for multiple selection.

**Step 6.** Click the "**<"** arrow to move them to the list of Unselected Columns.

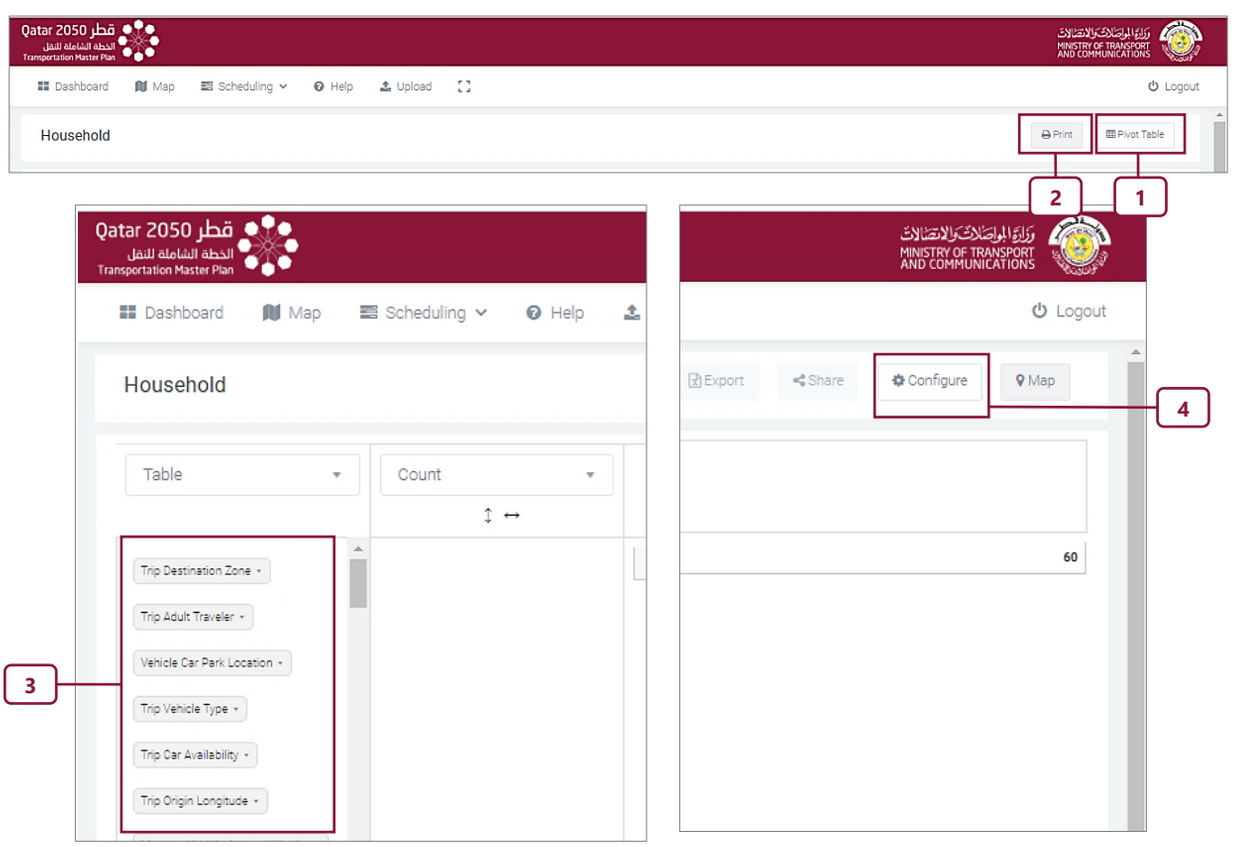



Figure 5-5: Pivot Table – Example 1

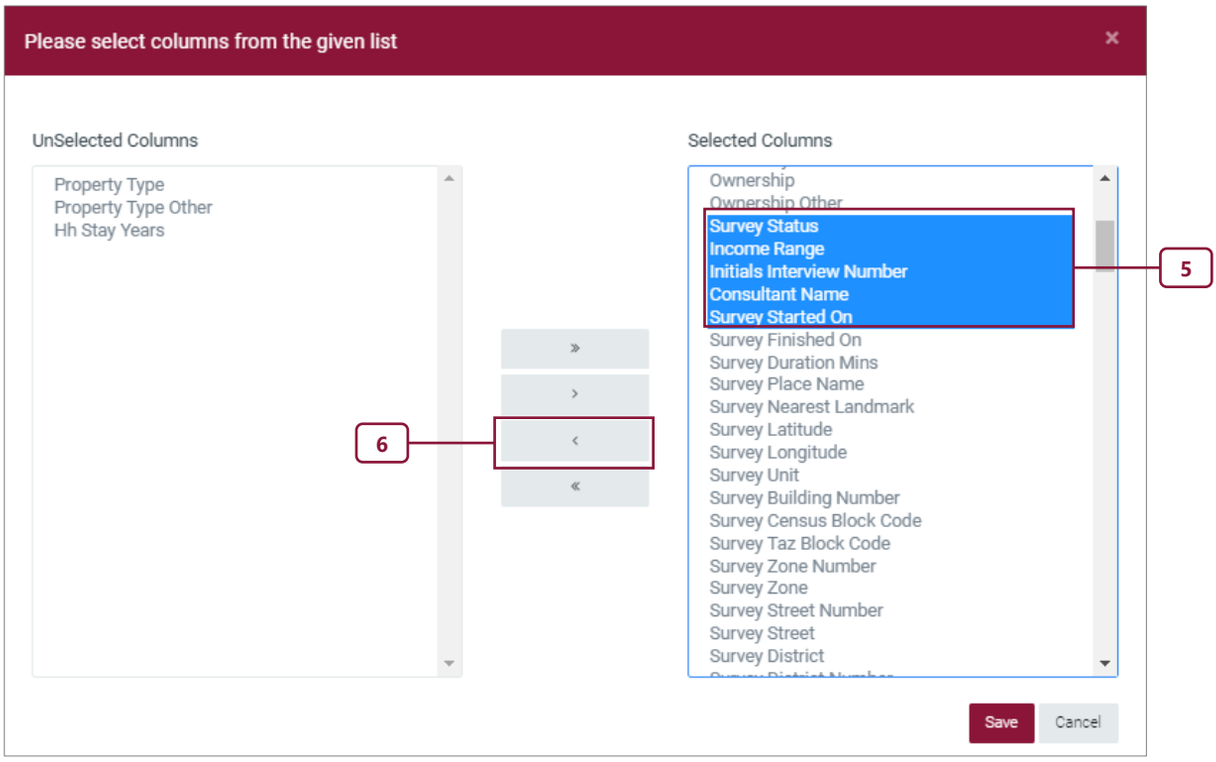



Figure 5-5: Pivot Table – Example 1 (Continuation)

**Example 2.** Produce different graphical representations for vehicle year and scatterplot for income from the previous selection.

**Step 1.** Select and Drag from the list and into the column list the label "**Vehicle Year**".

**Step 2.** Select from the **Table** the desired form.

**Step 3.** Select the **Count** Form.

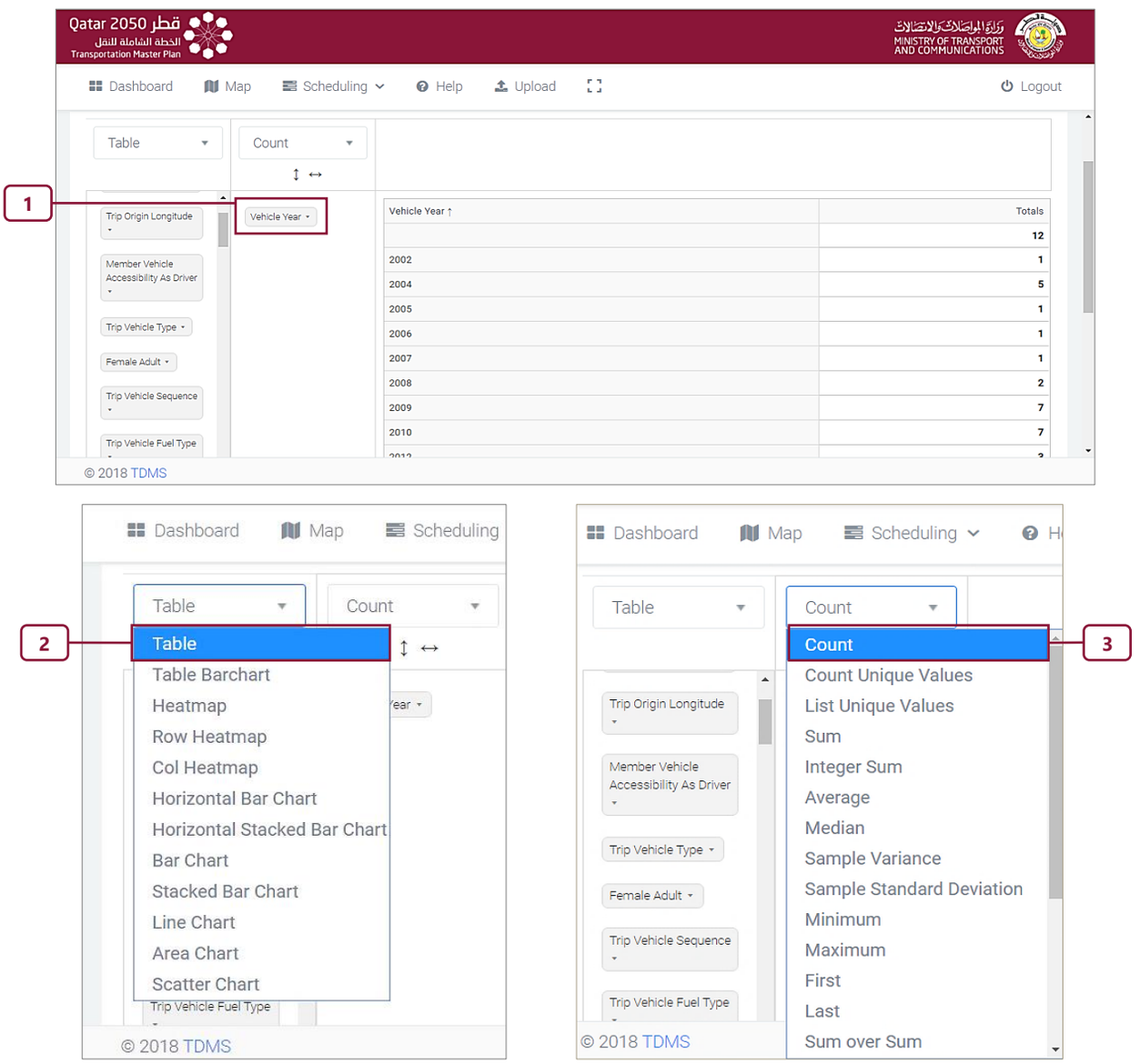
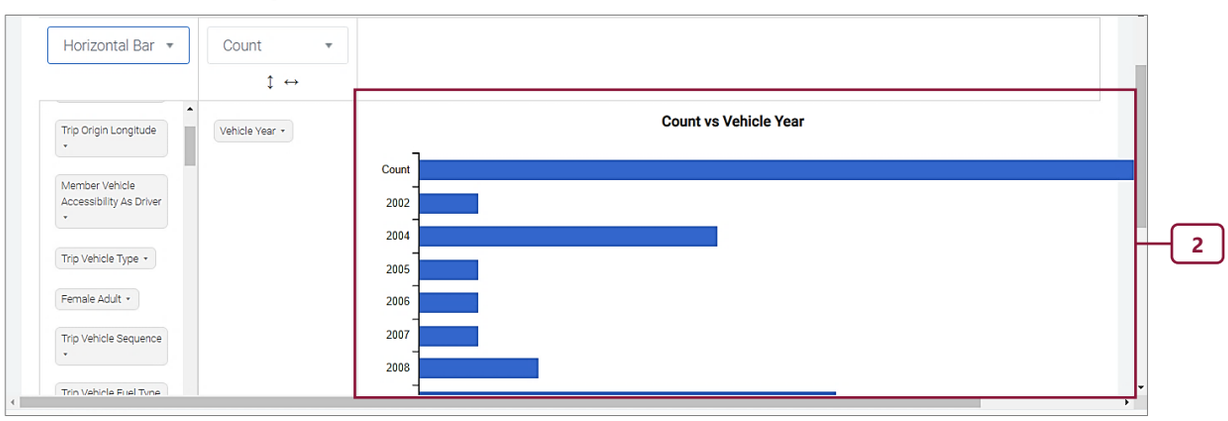



Figure 5-6: Pivot Table – Example 2

The system will return the corresponding types visualization including: heatmaps, bar diagrams, line charts scatterplots, etc.

**1.** Heatmap Visualization


**2.** Horizontal Bar Diagram




**3.** Line Chart


Figure 5-7: Pivot Table – Visualization

The top menu of the Pivot Table provides the following options: Save, Reset, Delete, Print, Export, and Share. The following example illustrates them.

**Example 3**. Save, Reset, Delete, Print, Export, Share.

**Step 1.** Click the **Export** button. This will export data to excel format.

**Step 2**. Downloaded Excel data.

**Step 3.** Excel file from exported data.

**Step 4.** (Pivot Table Functions) **Print Report** and **Save Report** window.

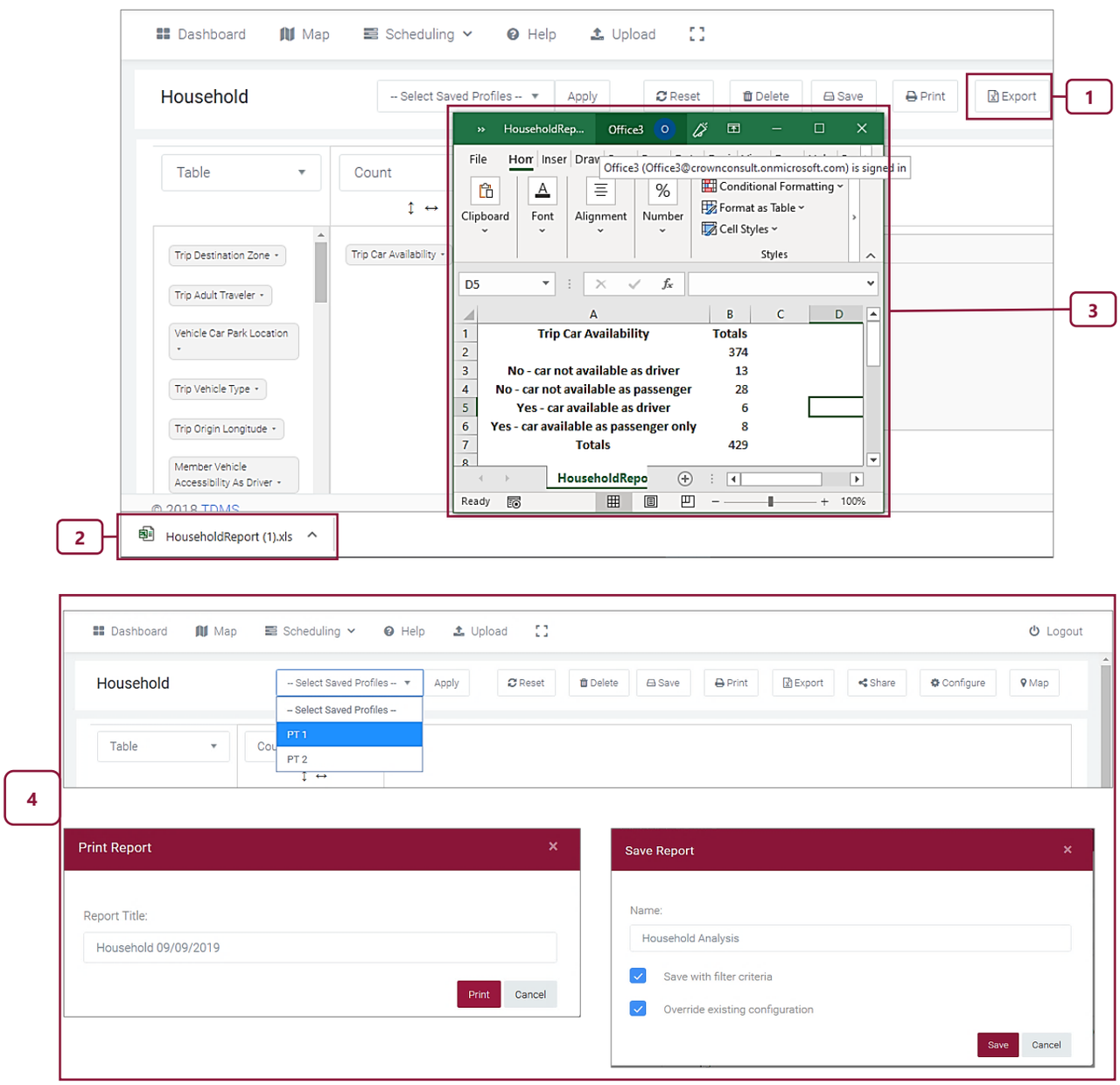



Figure 5-8: Pivot Table – Example 3

## 5.4 TRAVEL TIME SURVEYS

Travel time surveys have implemented a specific format where the user must select a street name to visualize travel time summary data. **Figure 5-9** shows the sequence of steps necessary to access a Travel Time Survey.

Select "**Travel Time**" from the drop-down list user then a street name from the drop-down list and hit "**Search**"

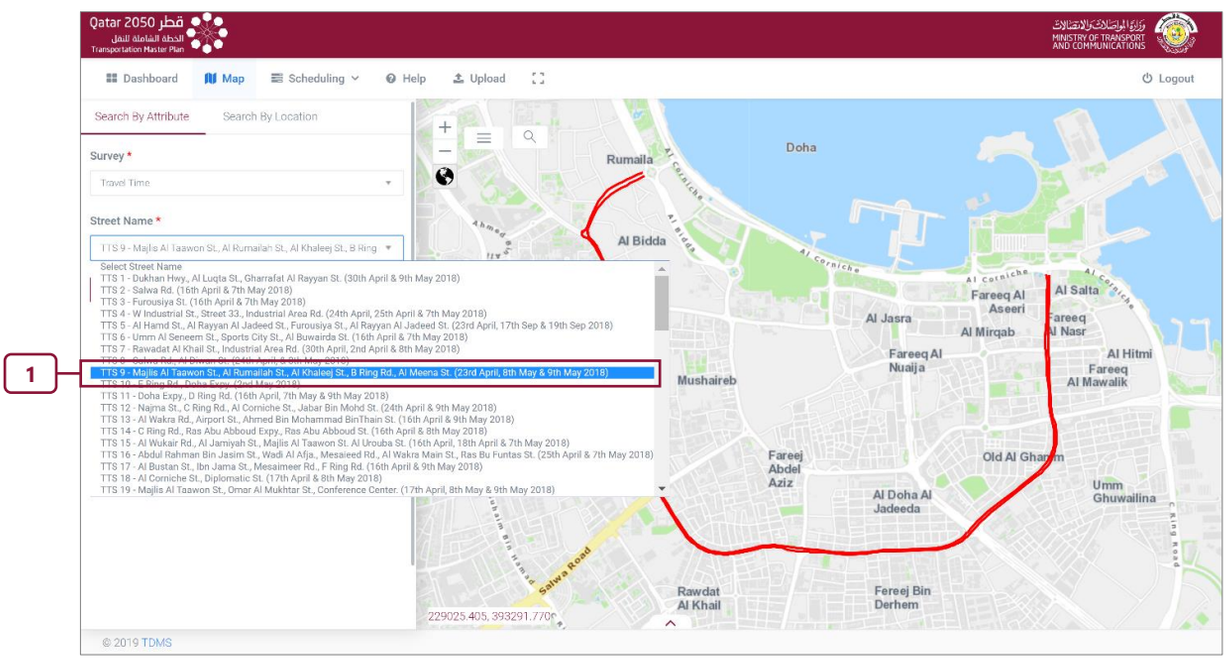
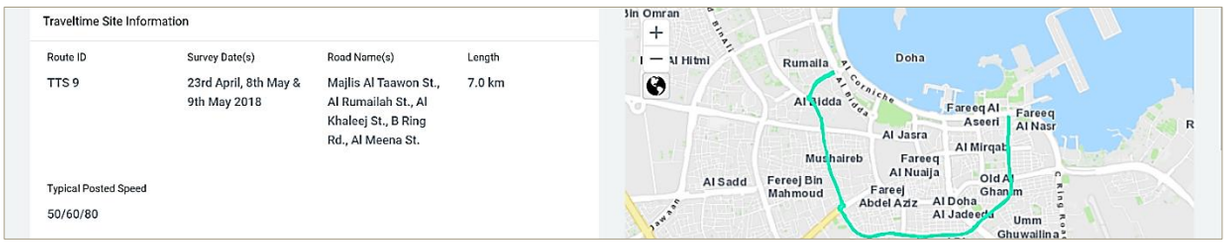


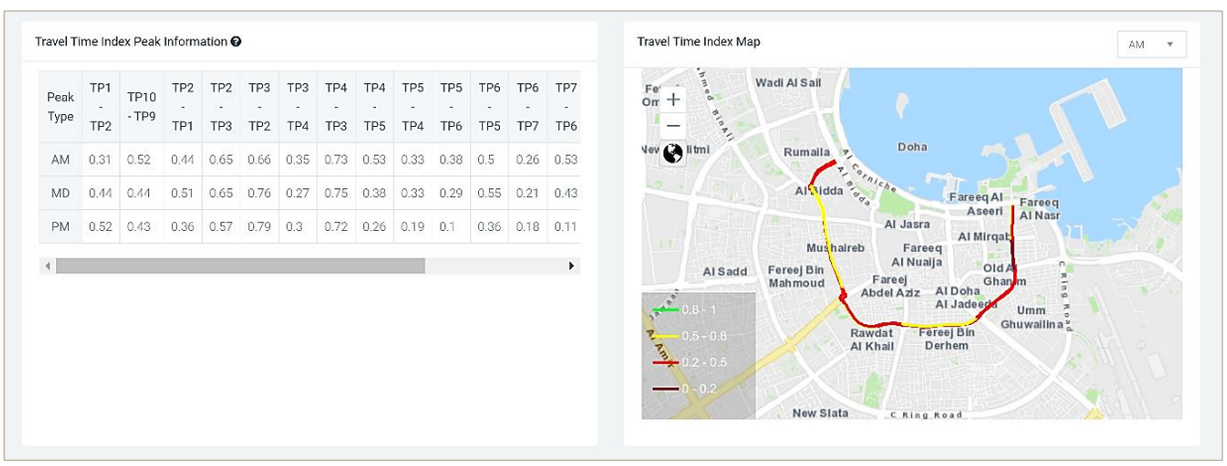

Figure 5-9: Travel Time Surveys

The following information will be shown:

**1.** Road Segment Information




**2.** Road Segment TTI Information




**3.** Road Segment PTI Information

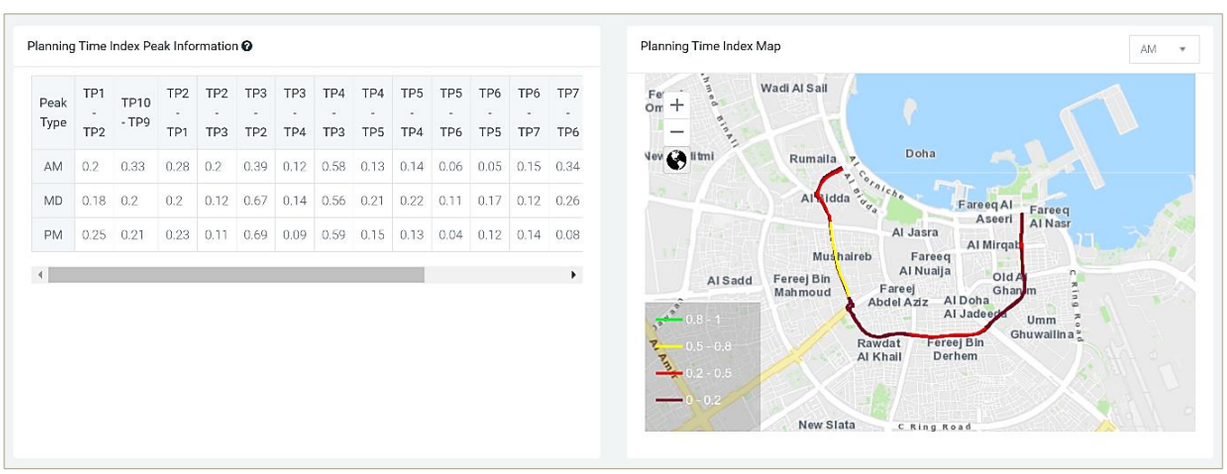



Figure 5-9: Travel Time Surveys (Continuation)

## 5.5 AIRPORT DEPARTURE/ARRIVAL

The user can search for arriving passengers considering their residency status (excluding business travelers and tourists) and their income level. To access the airport arrival data, follow the same approach presented in **Section 3.1** and **Section 5.3**, this is illustrated in **Figure 5-10**.

**Step 1.** Select **Airport Arrival** from the survey type.

**Step 2.** Select **Doha Municipality** from the municipality list.

**Step 3.** Hit **Search.**

**Step 4.** Select **Pivot Table** from the top right.

**Step 5.** Drag and drop "Income Range" to the columns list and **Residency Status**, "vehicle" available to the row list.

**Step 6.** Click on the "▼" of Residency Status and deselect **Business Travelers** and **Tourist**. Hit Apply.

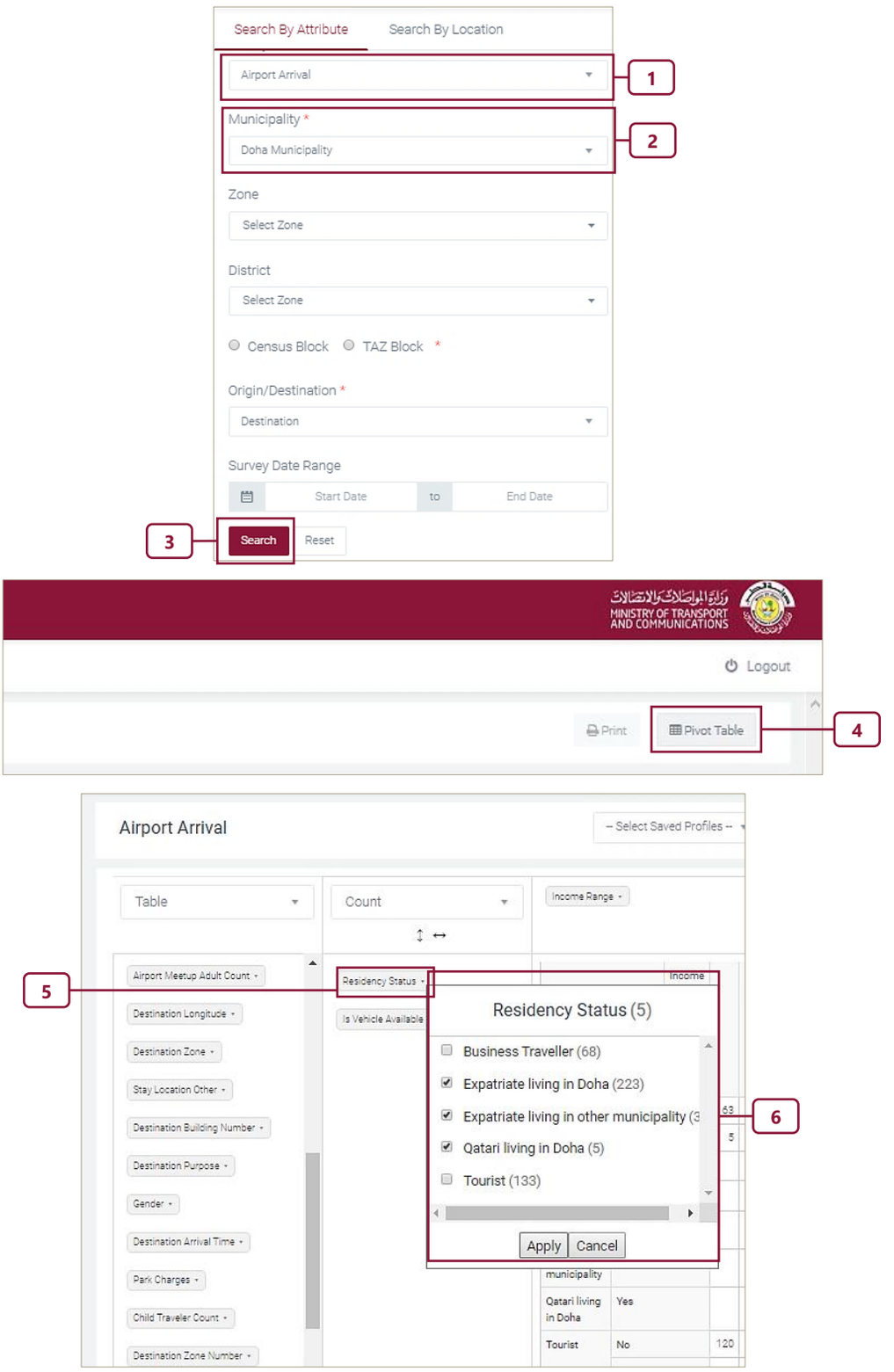



Figure 5-10: Airport Arrival or Departure

If the user wishes to present the results through a table with percentages for each column, or perhaps by sorting the totals from highest count to lowest count.

**Step 1.** Click on the "▼" and Select "**Count as Fraction of Columns**".

**Step 2.** Click on the "↑" button to sort based on the totals.

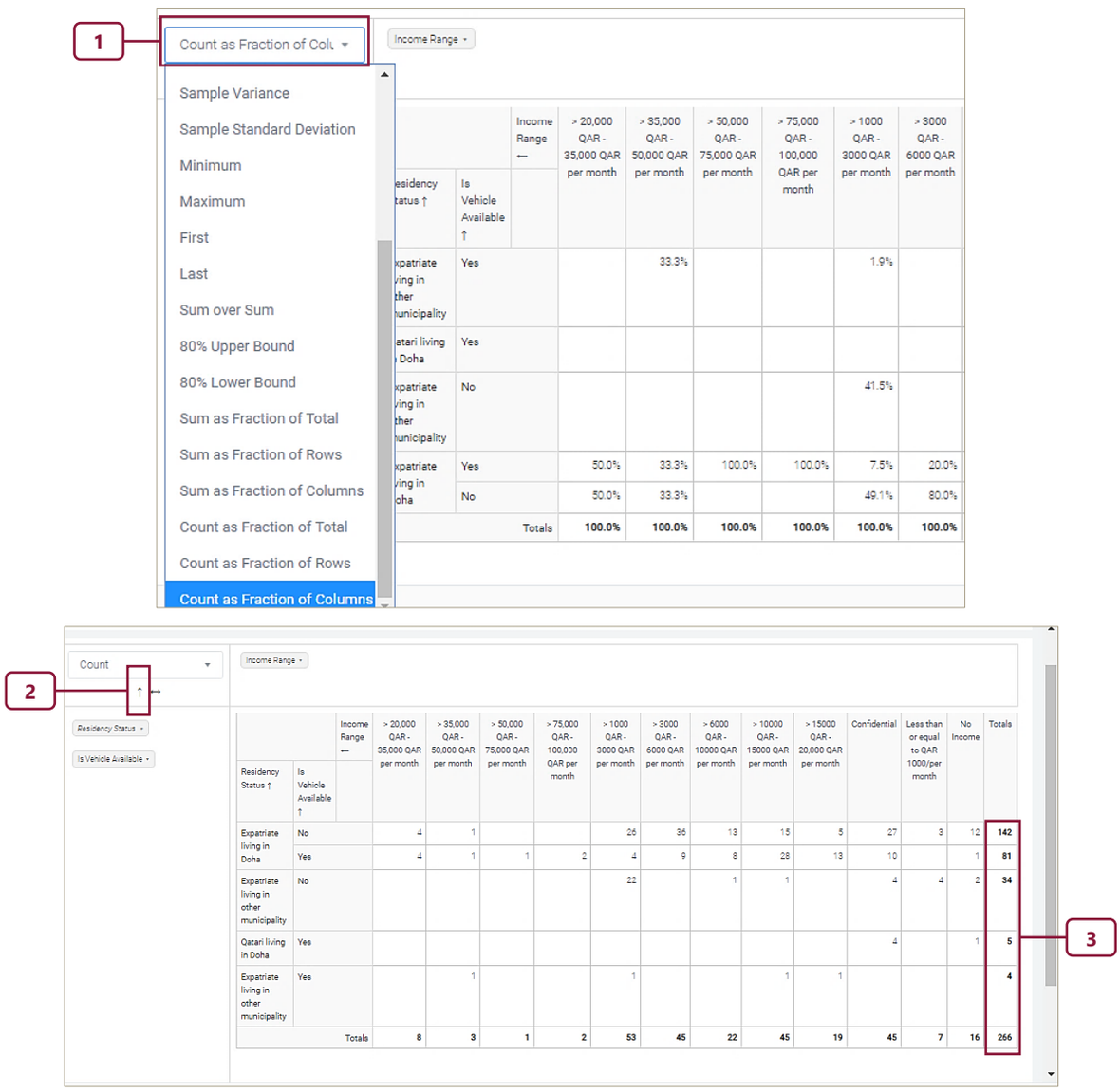
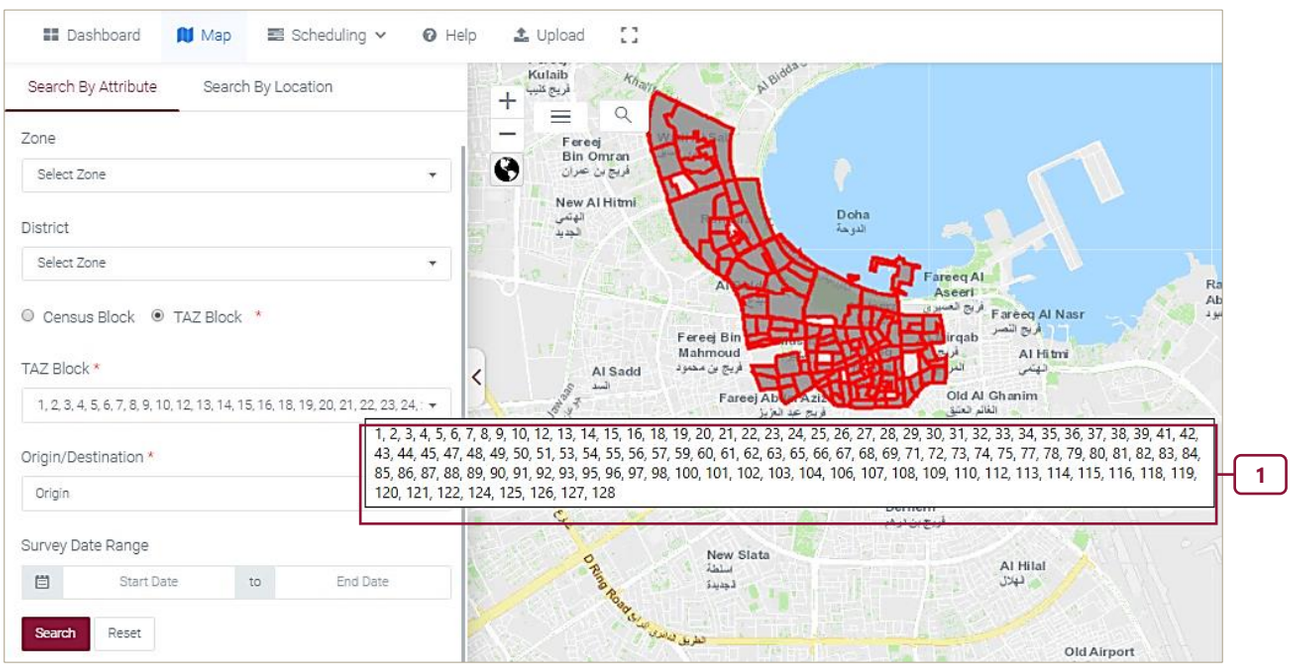



Figure 5-11: Results of Airport Arrival Example

## 5.6 CYCLIST INTERVIEW

Assume now the user wants to know where people walking on the Corniche in the proximity of the Museum of Islamic Art and the Al Bidda Park came from.

**Step 1.** Chose the **Cyclist Survey** and **TAZ Blocks** shown in the software.




**Step 2.** Zoom and Click on the **dots** near the area of interest, the lines indicate the area of origin.

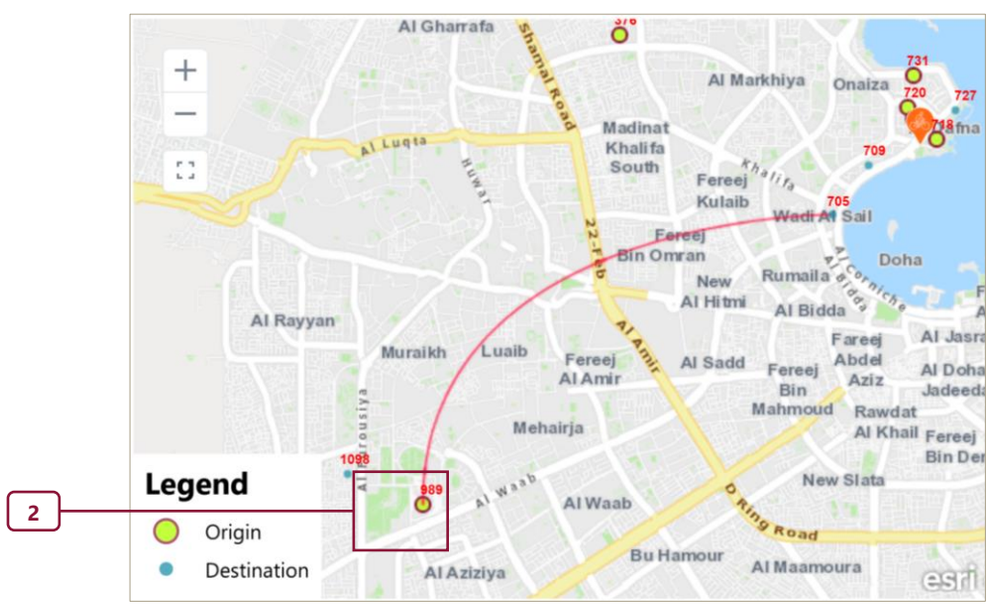



Figure 5-12: Results of Cyclist Interview Example

## 5.7 PEDESTRIAN SURVEY

Assume the user wants to repeat a similar exercise but for the Pedestrians. There is no need to retype the zones, simply changes the survey type and hit the Search button.

**Step 1.** Zoom and Click on the **Dots** on the area of interest, the lines indicate the origin.

**Step 2.** Drag the "**Pedestrian Winter Period for Occupation Duration**" to the provided Rows area and the Pedestrian Unwillingness Reason Driver Behavior to the provided Column area.

**Step 3.** Click on SAVE, enter a name, save the filter and click on Save

**Step 4.** Click on **RESET** if the user wishes to remove the filters and start again.

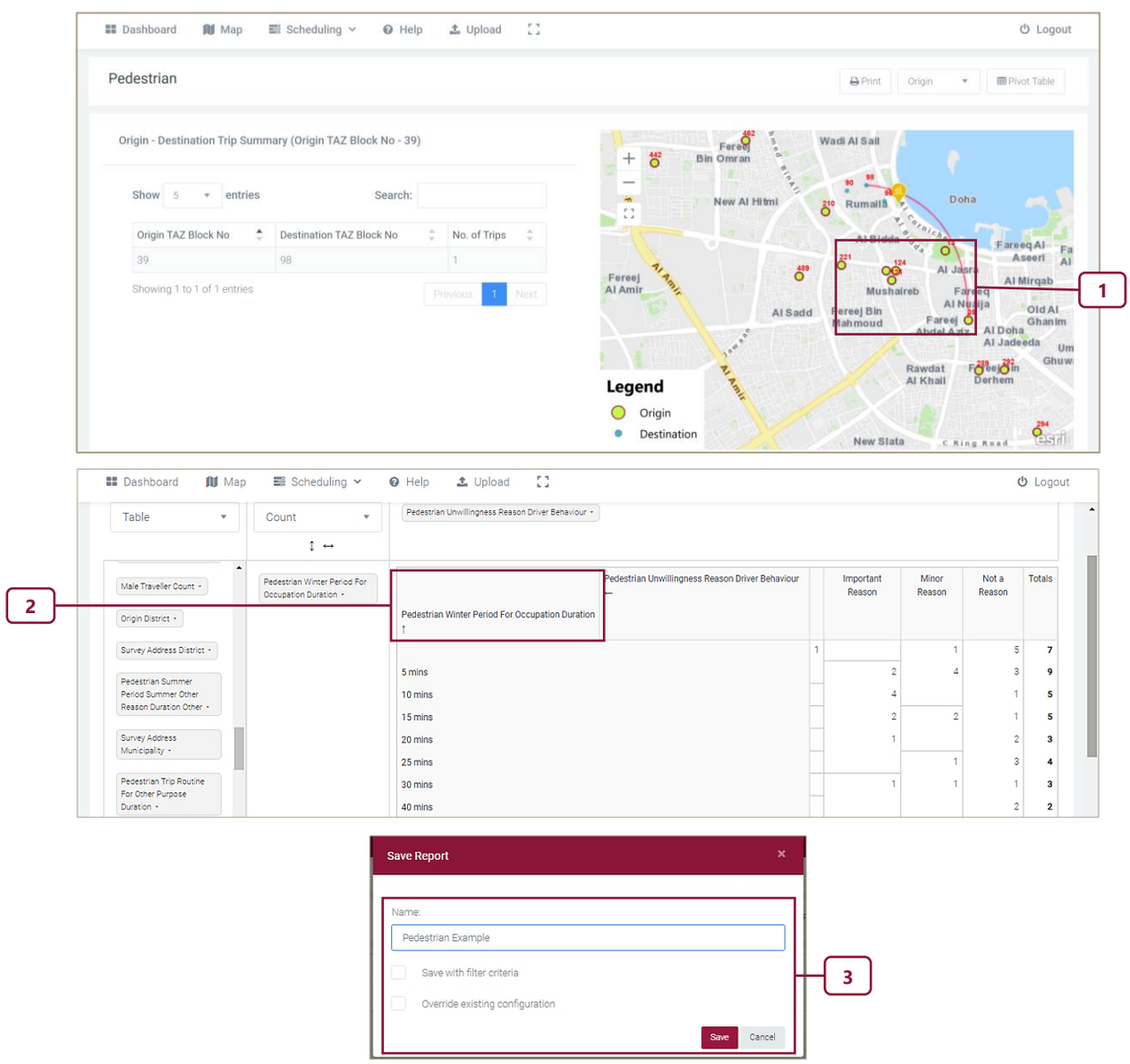



Figure 5-13: Results of Pedestrian Interview Example

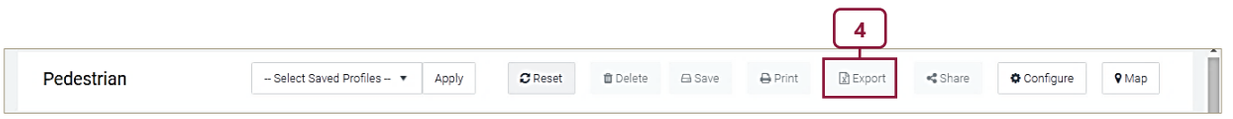



Figure 5-13: Results of Pedestrian Interview Example(Continuation)

## 5.8 HOTEL INTERVIEW

Now, assume the user is still interested in the same zones but wishes to check if there is a correlation between income levels and the number of visits to Qatar from the past year.

**Step 1.** Select **Hotel** from the list of surveys, select the zones of interest and hit **Search.**

**Step 2.** Drag and Drop the label "**Qatar Visit Frequency last year**".

**Step 3.** Select **Scatter Chart**.

**Step 4.** The user can visualize the scatterplot between the selected variables.

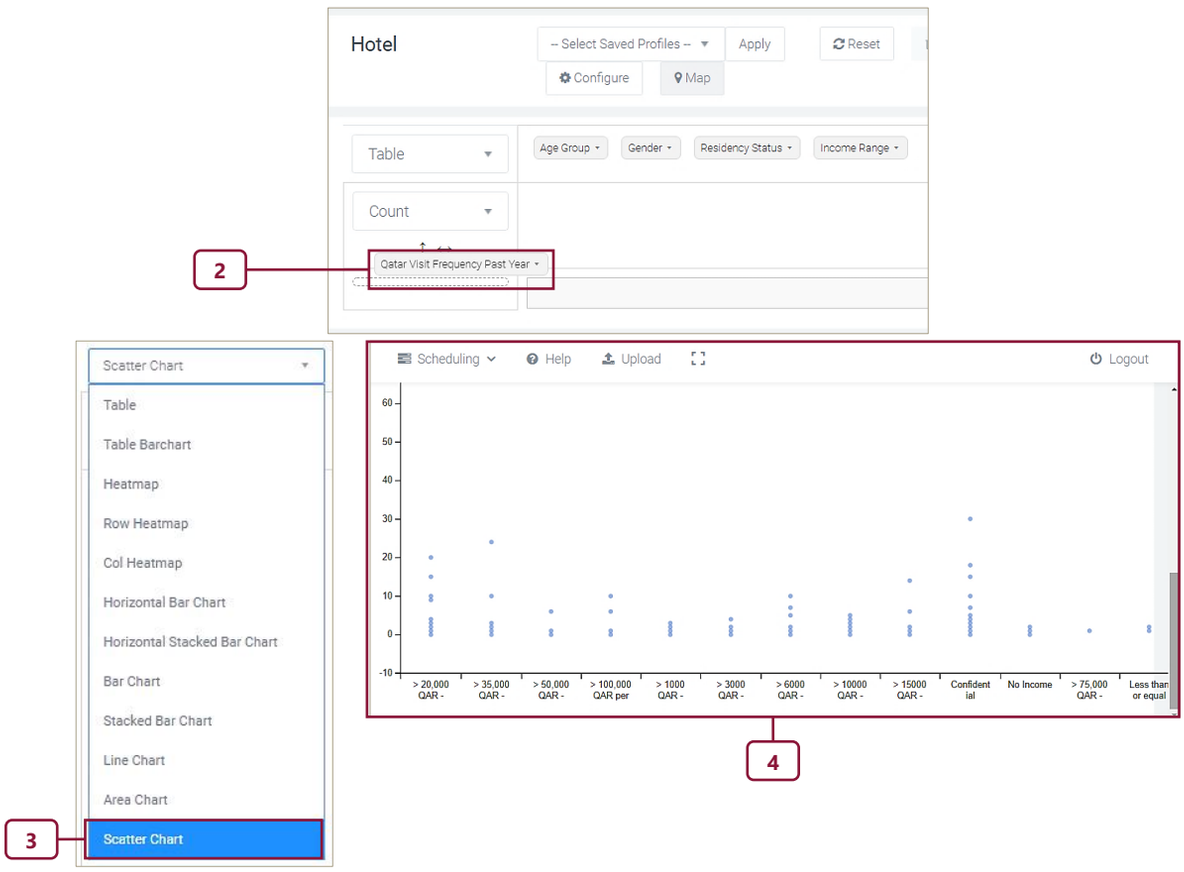



Figure 5-14: Results of Hotel Visitor Interview Example

## 5.9 PUBLIC TRANSPORTATION

Assume the user wishes to know where bus-users in zone 6 are coming from, and what is their gender and frequency of use of the bus service.

**Step 1.** Select "**Public Transportation**" from the list of surveys and click on **Search**.

**Step 2.** Click on **Zone 6** on the map, the lines will reveal the zones of origin and the bar diagram reveal the count for each.

**Step 3:** Drag and drop "**Gender**" and "**Trip Frequency**" to column and row fields and change the visualization to **Stacked Bar Chart.**

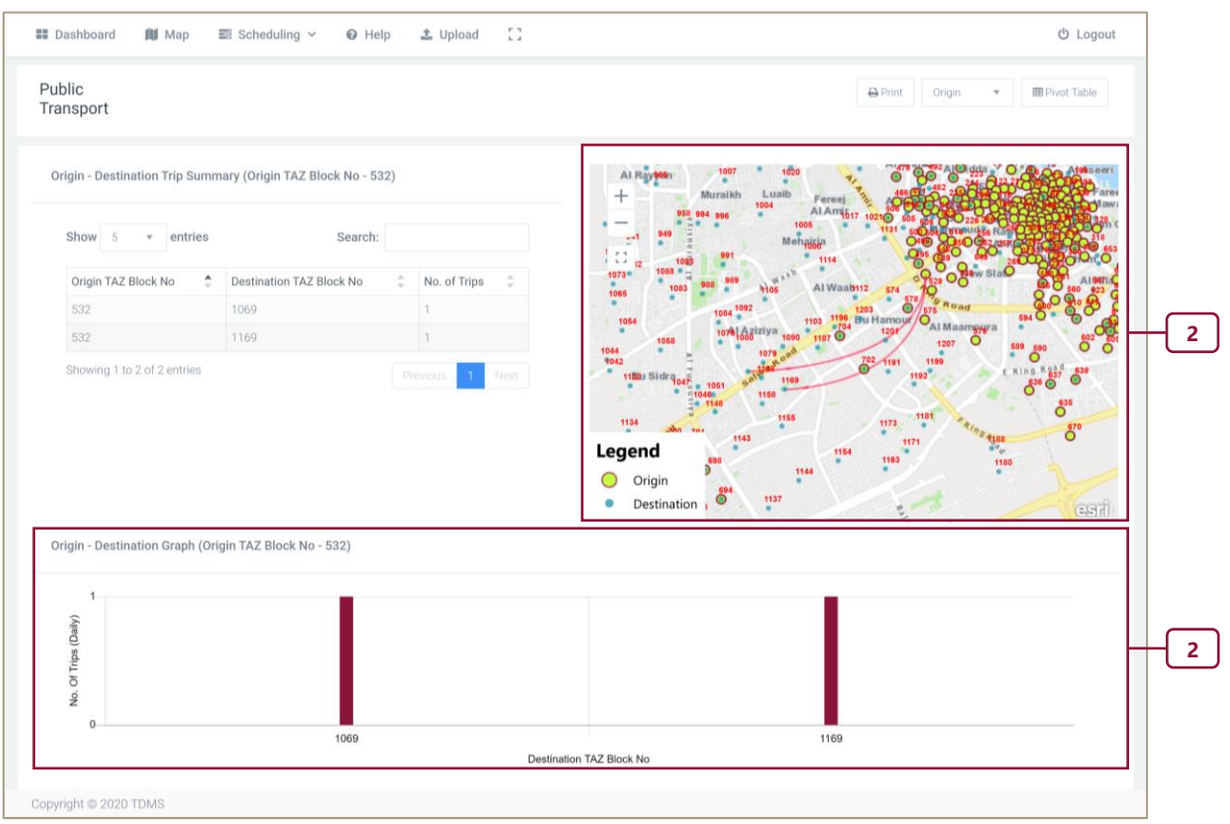



Figure 5-15: Results of Public Transport Interview Example

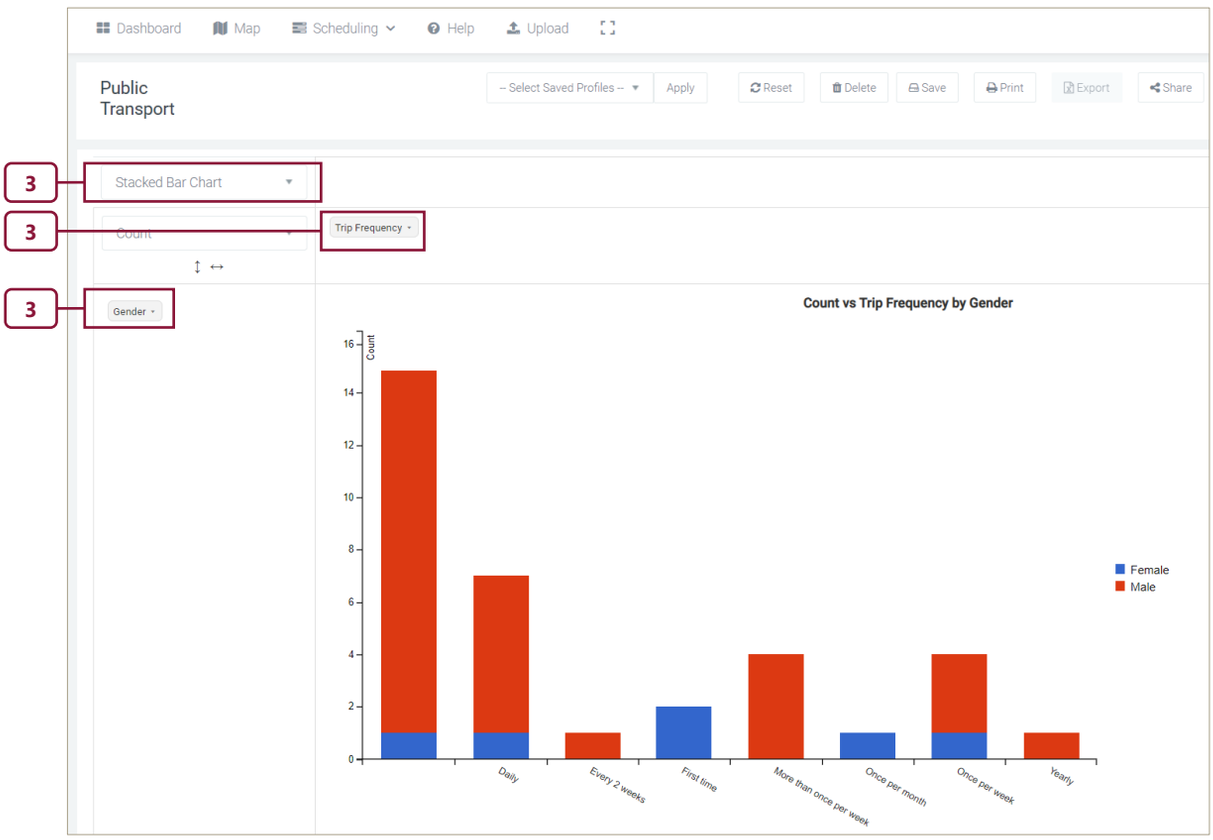



Figure 5-15: Results of Public Transport Interview Example(Continuation)

## 5.10 ROAD-SIDE INTERVIEWS (RSI) PRIVATE VEHICLES

Assume the user is still interested in Zone 6 but now the user wishes to know where drivers are heading to, and the age of drivers.

**Step 1.** Select "**RSI Private**" from the list of surveys and click on **Search.**

**Step 2.** Click on **Zone 6** on the map, the lines will reveal the zones of origin and the bar diagram reveal the count for each.

**Step 3.** Drag Drop the **Age Group** and the **Residency Status**. Change the type to **Horizontal Bar Chart.**

**Step 4.** Click on "**Export**" to save in Excel Format.

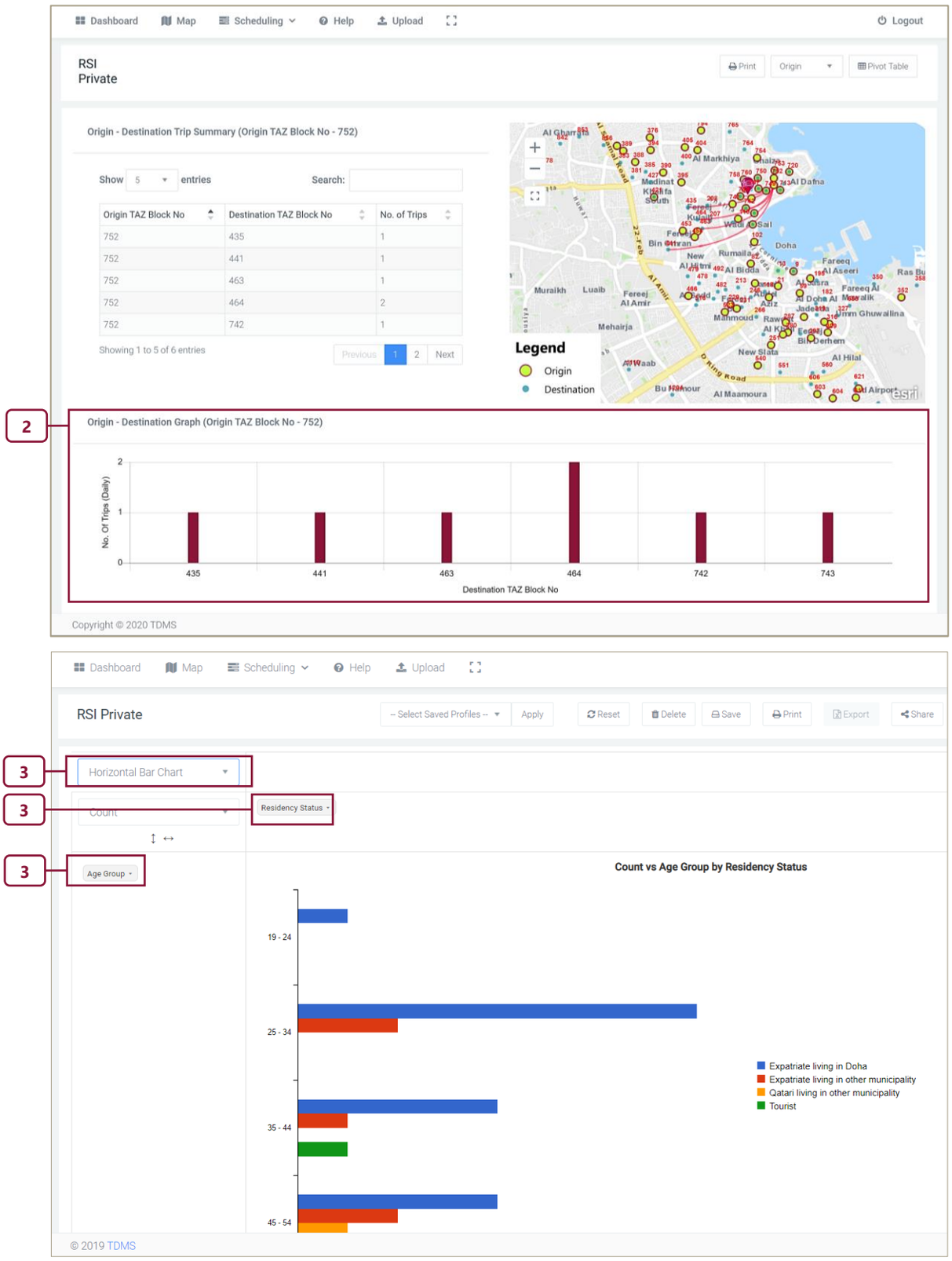



Figure 5-16: Results of RSI - Private Vehicles Interview Example

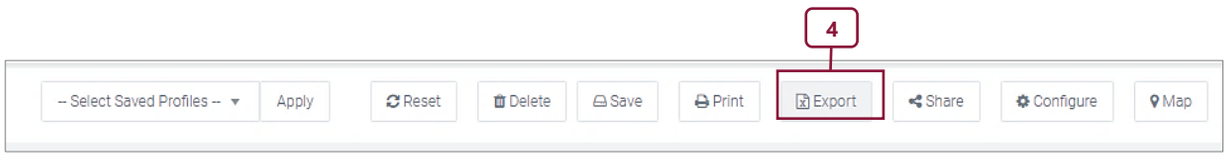



Figure 5-16: Results of RSI - Private Vehicles Interview Example (Continuation)

## 5.11 SEAPORT ARRIVAL

To look at the age profile of the passengers visiting Qatar and arriving at seaports the following is to be done

**Step 1.** Select "**Seaport Arrival**" from the list of surveys and click on **Search**.

**Step 2.** Select "**Area Chart**" from the drop-down list and drag the label for age group into the columns.

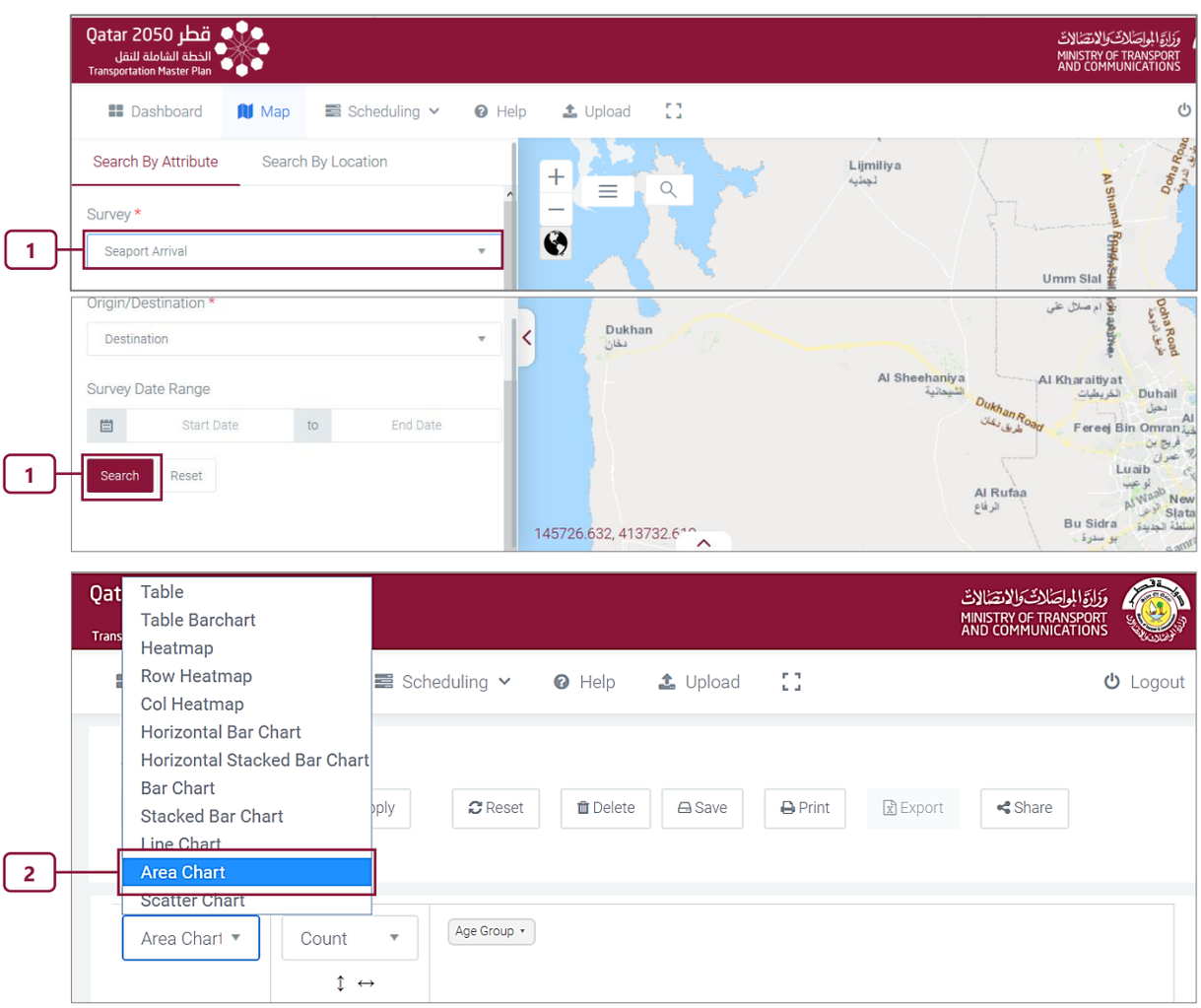



Figure 5-17: Results of Sea Port Arrival Interview Example

**Step 3.** The resulting area diagram will be displayed.


**Step 4.** The Line Chart will display a similar diagram without the shading.

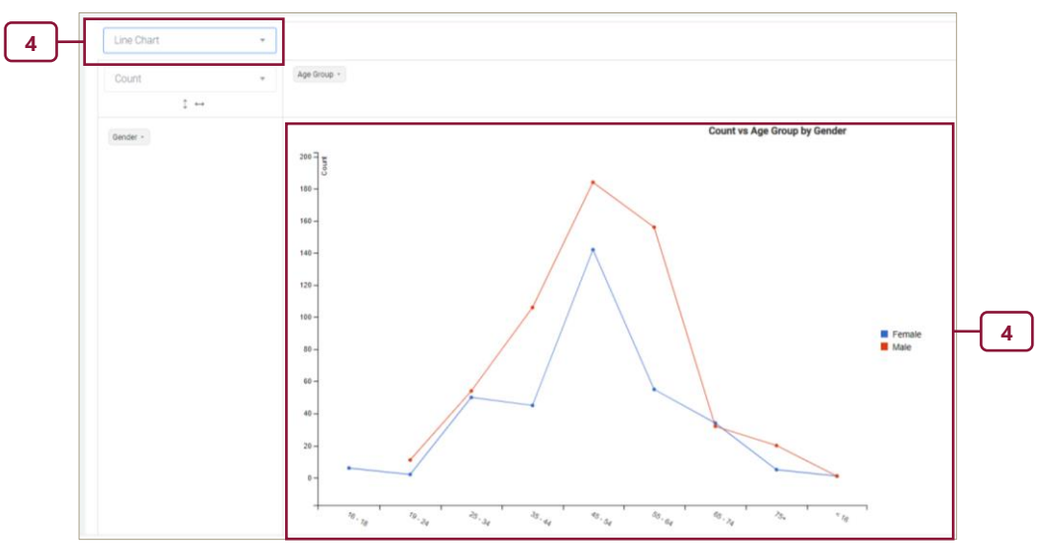



Figure 5-17: Results of Sea Port Arrival Interview Example (Continuation)

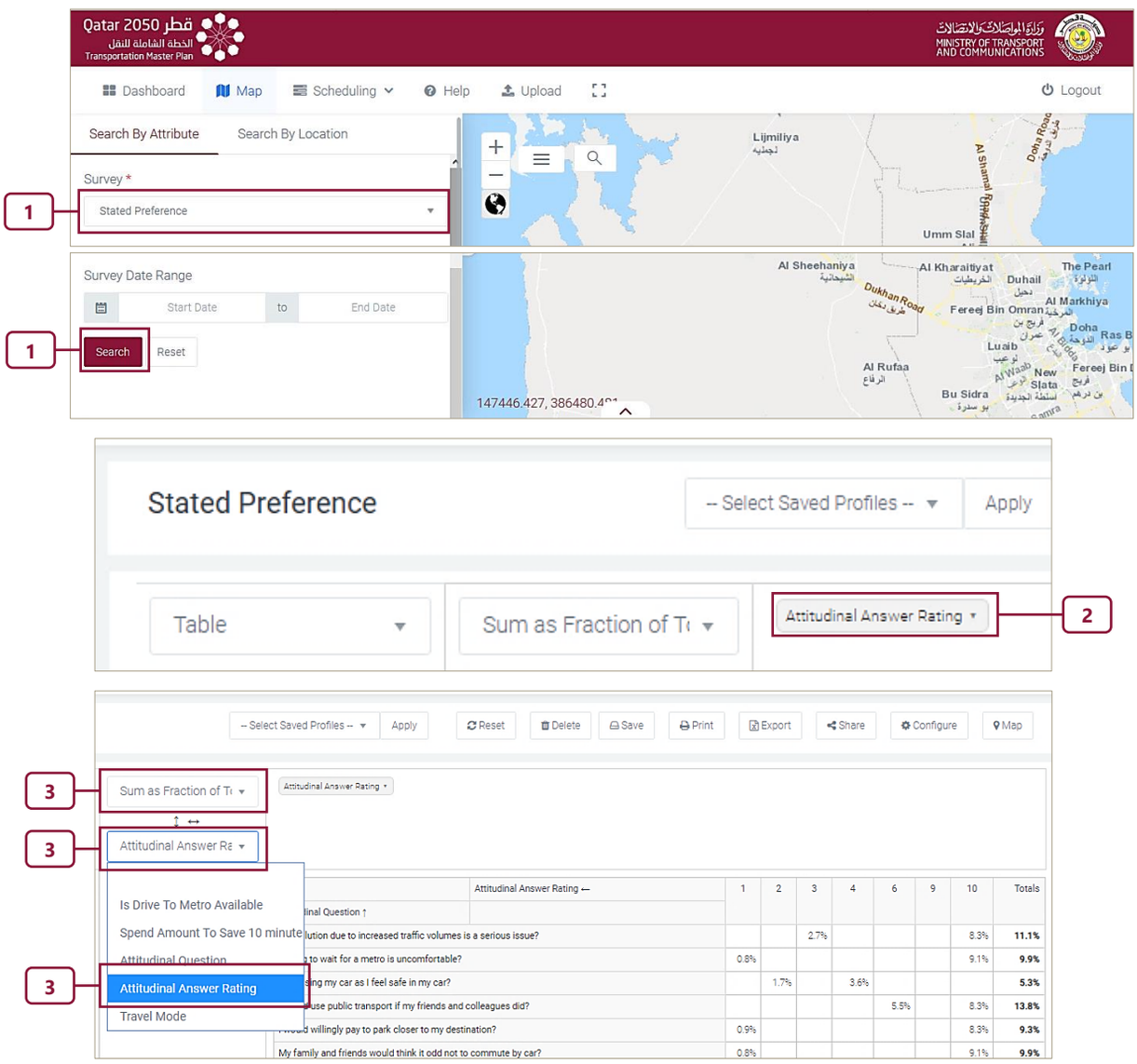
## 5.12 STATED PREFERENCE

Assuming now the user is now interested in the attitudes of people towards transportation in general and the user wants to sum as fraction of the total.

**Step 1.** Select "**Stated Preference**" from the list of surveys and click on **Search**.

**Step 2.** Drag and Drop the "**Attitudinal Question**" and "**Attitudinal Answer**".

**Step 3.** Select the **Sum as Fraction** of Total and Choose the "**Attitudinal Answer Rating"** as criteria for the summation.



**Step 4.** Use filters to remove undesired question. Click on the "▼" from the "**Attitudinal Question**".

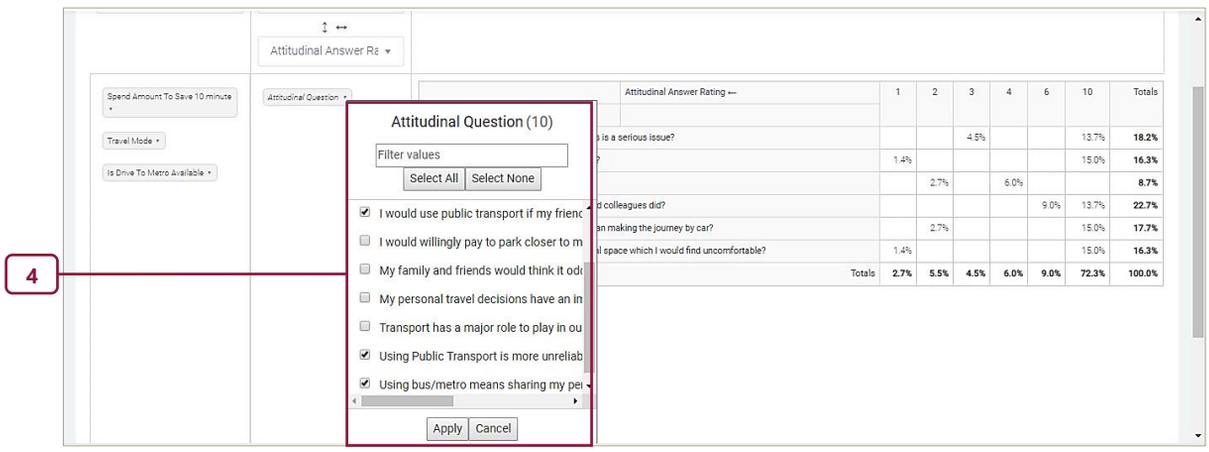



Figure 5-18: Results of SP Interview Example

Step 4 above only shows what the user is interested in the attitudinal questions related to usage of public transportation.

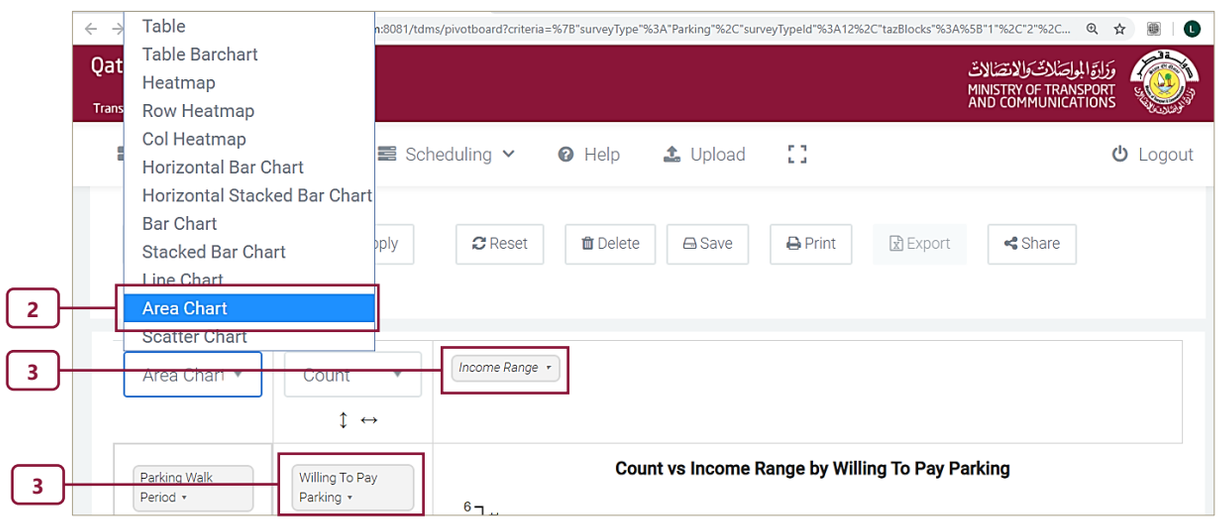
## 5.13 PARKING

Finally, assume the user is interested in knowing the willingness to pay for parking by residency status and income level.

**Step 1.** Select "**Parking**" from the list of surveys and click on **Search.**

**Step 2.** Select the "**Area Chart**".

**Step 3.** Drag and Drop the "**Income Range**" and the "**Willingness to Pay for Parking**".



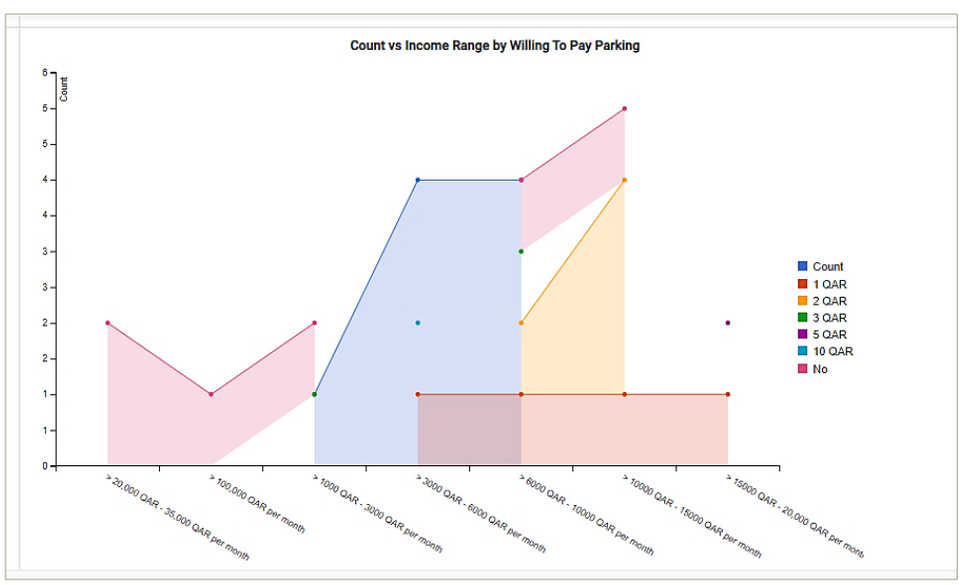




Figure 5-19: Results of Parking Interview Example

# CHAPTER 6

## Traffic Count Tools

# CHAPTER 6 TRAFFIC COUNT TOOLS

## 6.1 OVERVIEW

This feature enables users to query, view, and upload traffic count survey data via the GIS interface.

**The Search function (Chapter 3) must be used before the Interview-Based application can be accessed.** After clicking the search button, a new window will open displaying the following four components (see also **Figure 6-1**).

**Item 1.** Summary of the site Information.

**Item 2.** Small Map with location of site.

**Item 3.** Key Site Statistics.

**Item 4.** Drop-down menu for details.

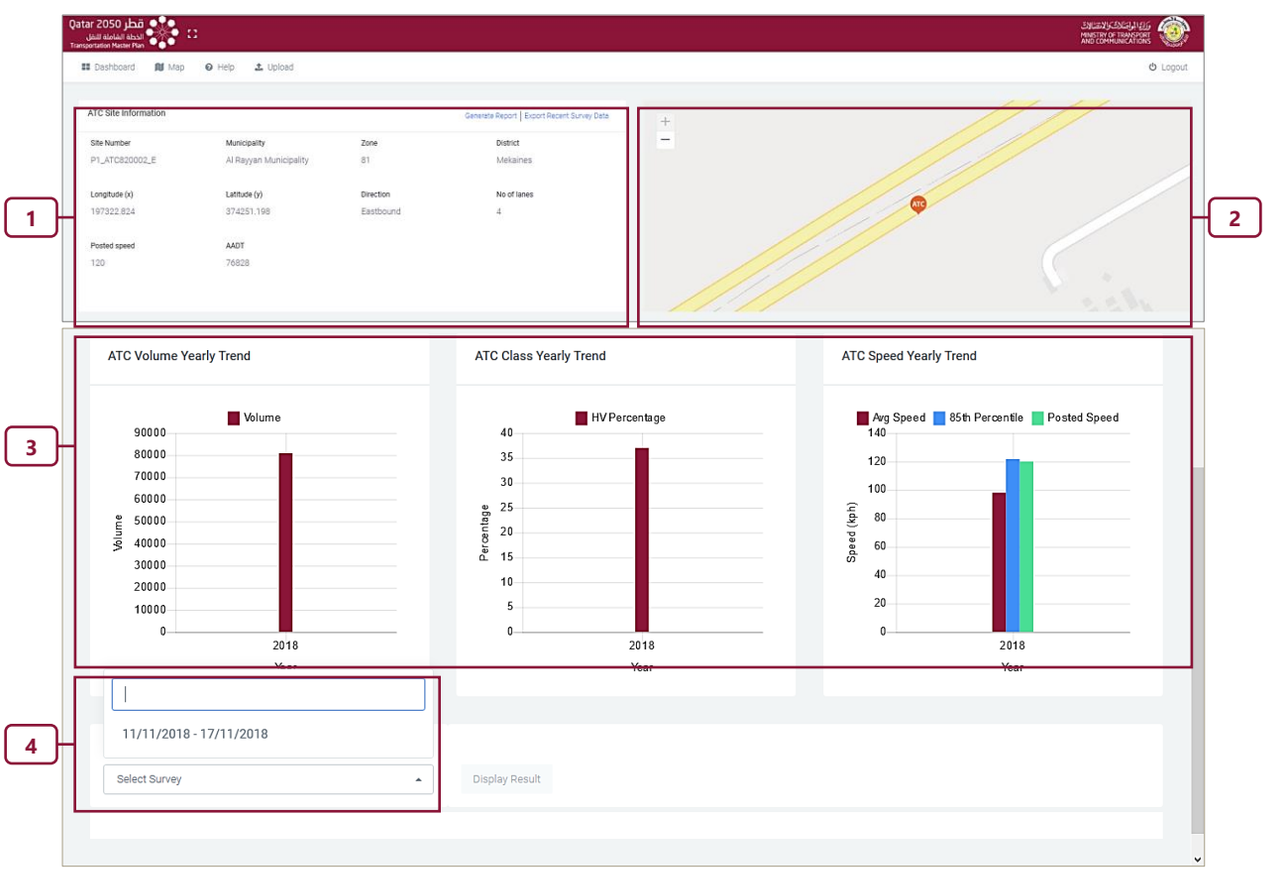



Figure 6-1: Traffic Count Survey: High Level Preview

## 6.2 AUTOMATED TRAFFIC COUNTS

Three templates are used to provide summary information for volume, vehicle classification and speed profiles for Automatic Traffic Counts (ATCs):

Traffic Volume summary (**Figure 6-2**).

Vehicle Classification summary (**Figure 6-3**).

Vehicle Speed Profile (**Figure 6-4**).

The summaries relate to a single count site. Where multiple observations are available at the same site, the summaries can be visualized on the same graph.

**Step 1.** Click on the **ATC Volume** tab to see volume information.

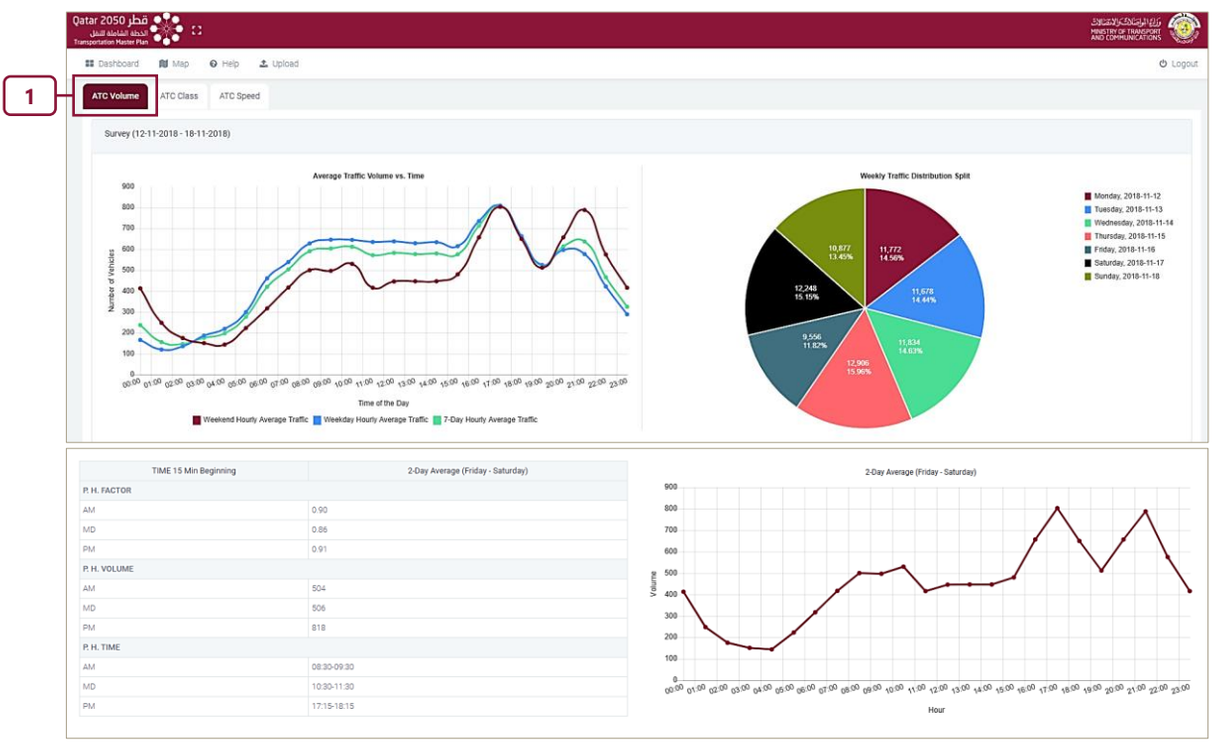



Figure 6-2: ATC - Traffic Volume Summary

**Step 2.** Click on the ATC Class button to see vehicle classification.

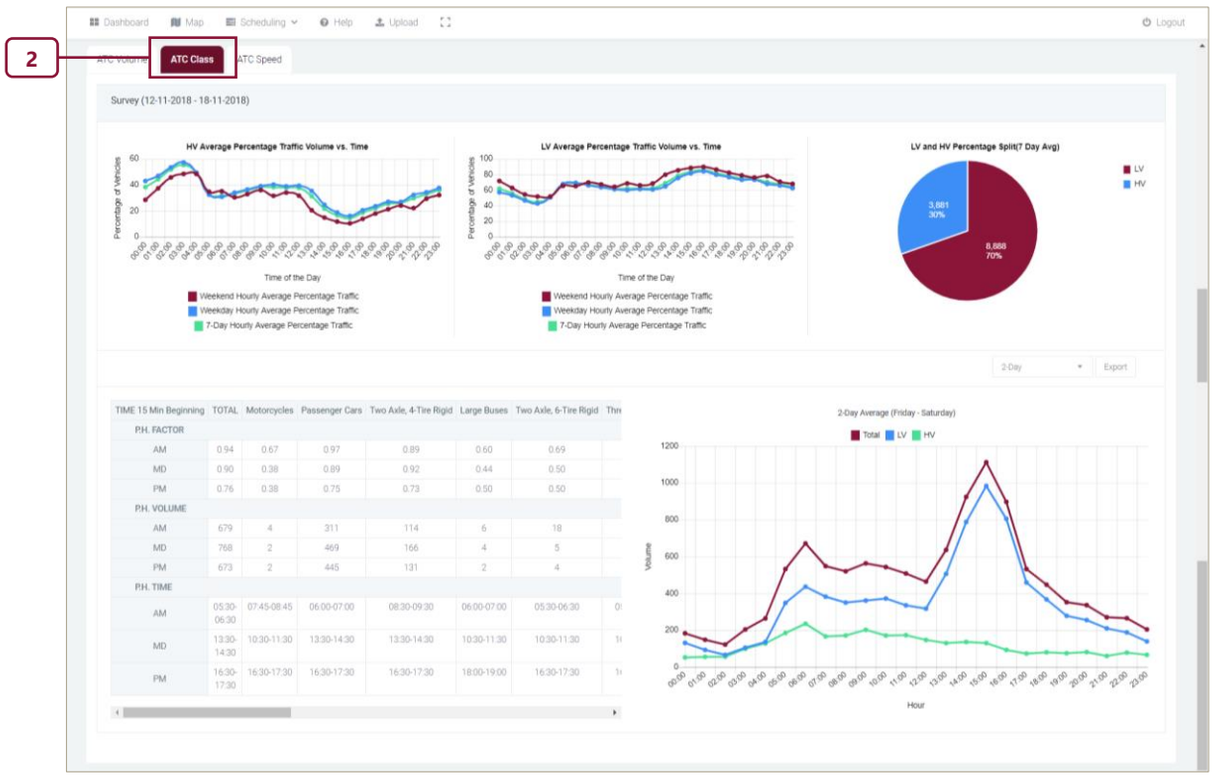



Figure 6-3: ATC - Vehicle Classification Summary

**Step 3.** Click on the ATC Speed to see speed information.

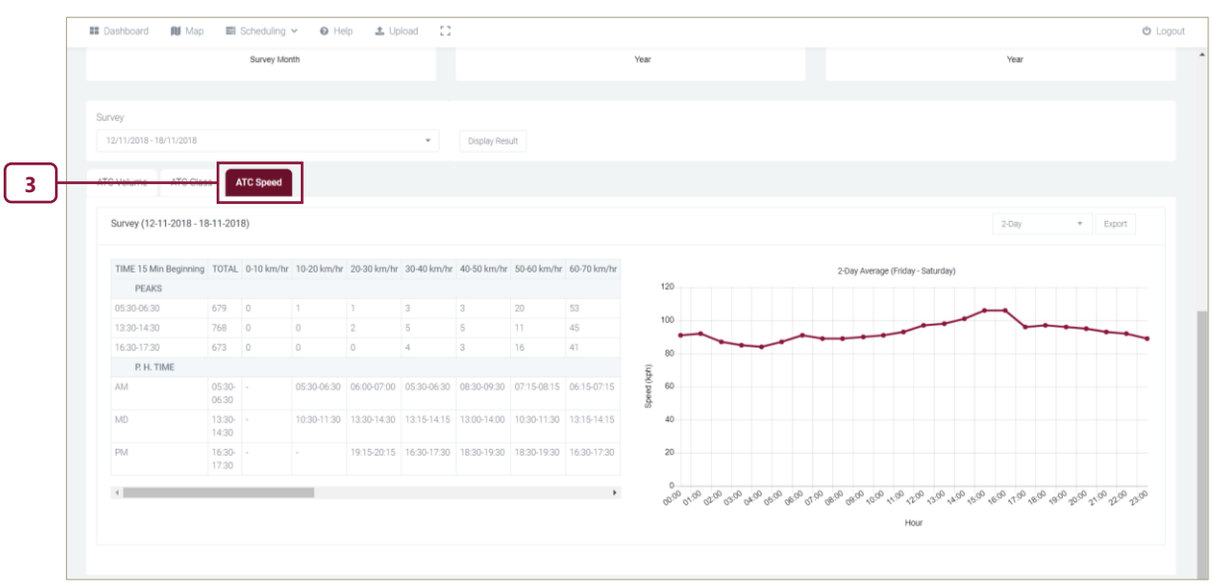


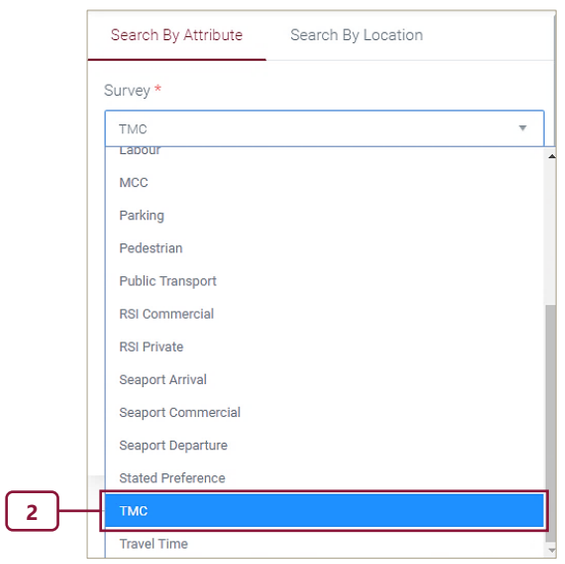

Figure 6-4: ATC - Traffic Speed Profile

## 6.3 TURNING MOVEMENT COUNTS

The Search by Location option also provides access to the Turning Movement Count data (TMC). A sample summary is shown in **Figure 6-5**.

**Step 1.** Select **TMC** from the drop-down list.

**Step 2.** Hit **Search.** (Not shown here)




**Step 3.** Select "**Show Details**" from the TMC site on the map, or

**Step 4.** Select "**Show Details**" from the table.

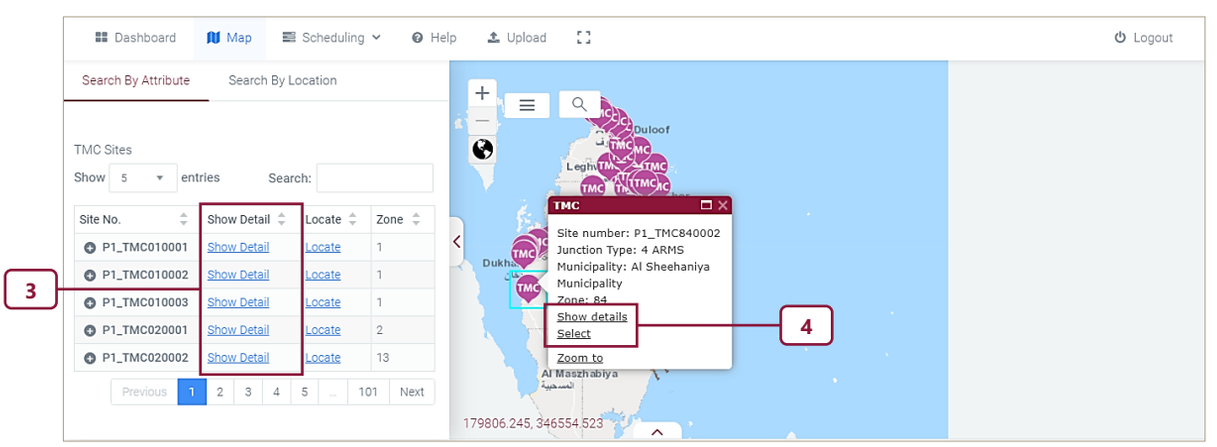
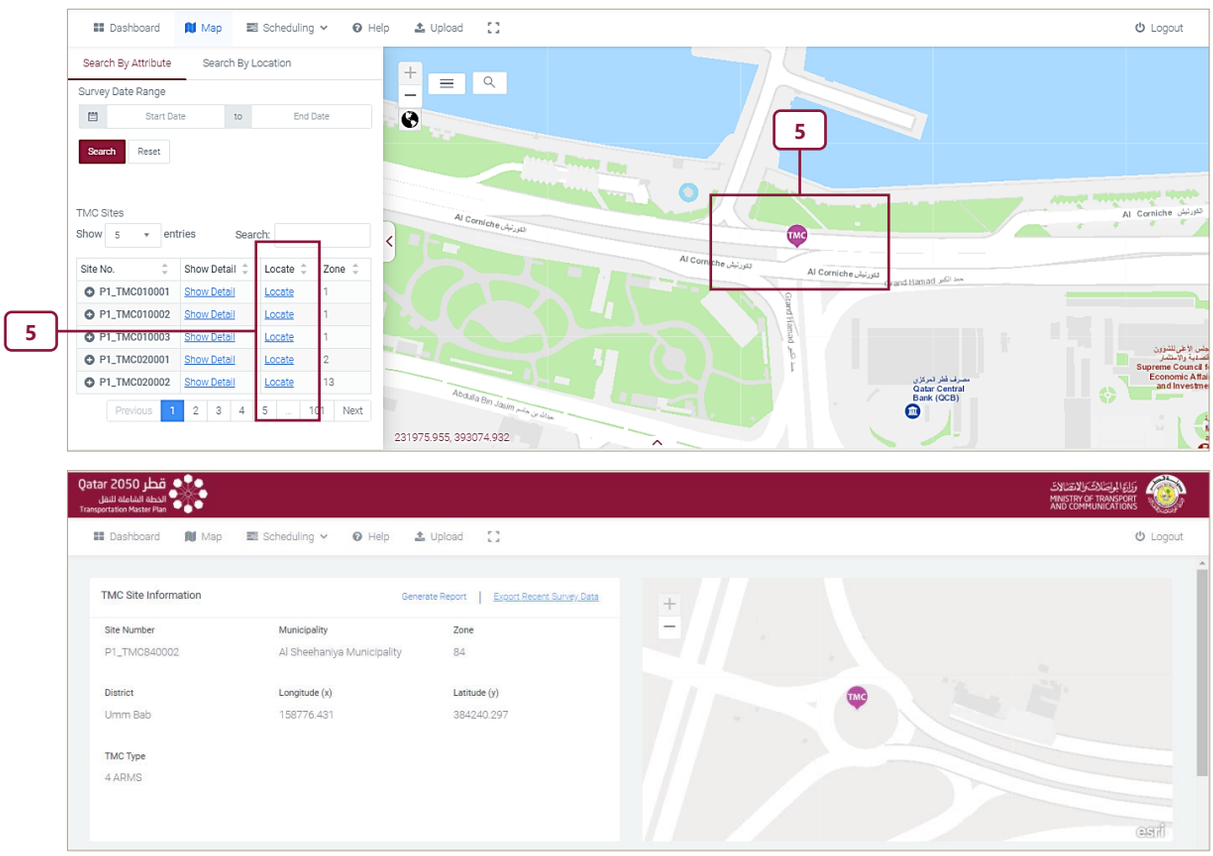



Figure 6-5: TMC - High Level Preview

**Step 5.** The "**Locate**" serve to zoom into a given site.




**Step 6.** Click on a survey date from the drop-down to view further details.

**Step 7.** Click "**Display Results**".

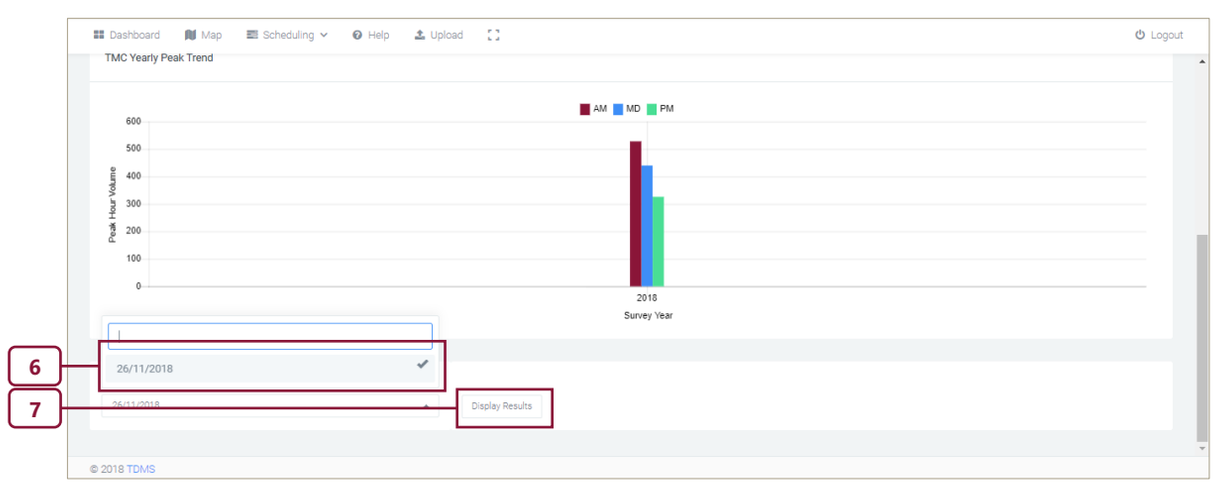



Figure 6-5: TMC - High Level Preview (Continuation)

Detailed view of turning volumes for each movement are seen after selecting a given date (**Figure 6-6**). The summary provides aggregated counts for each peak period time. Vehicle class summaries can be seen on the tabular form next to the TMC diagram.

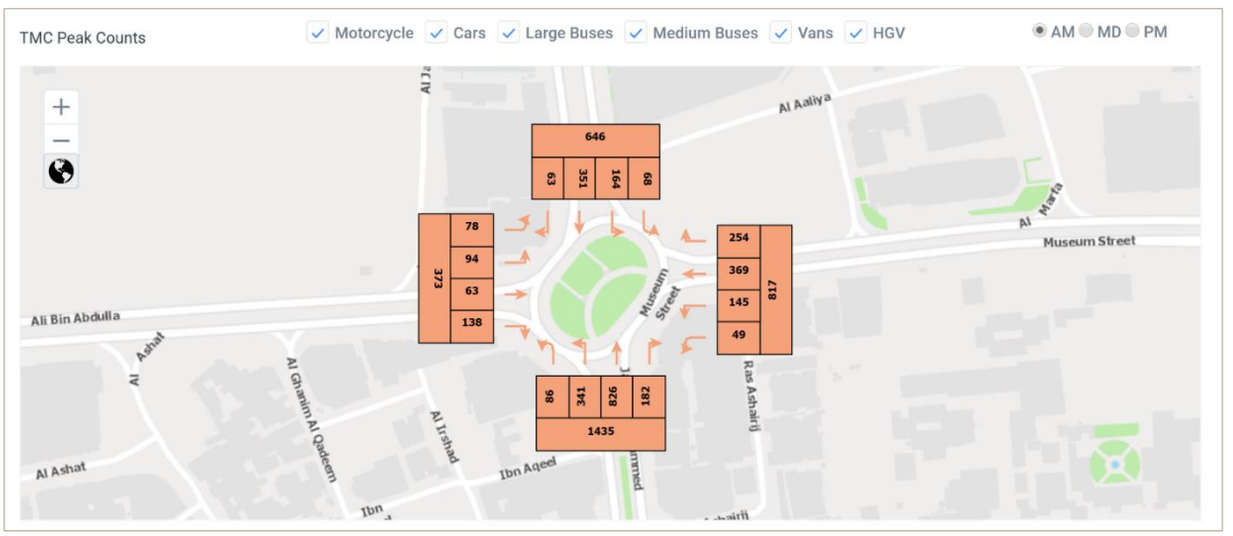



Figure 6-6: TMC - Graphical Summary

## 6.4 MANUAL CLASSIFIED COUNTS

Manual Classified Counts (MCC) area also accessed using the Search by Location function. A sample high-level preview is shown in **Figure 6-7**.

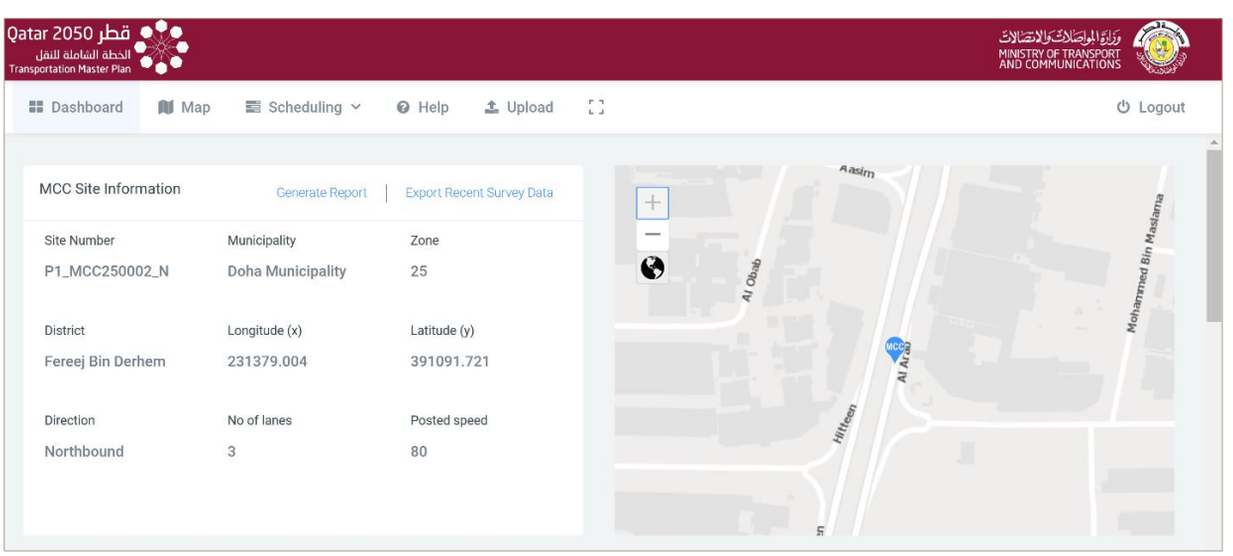



Figure 6-7: MCC - High Level Preview

A typical traffic volume and vehicle classification summary is shown in **Figure 6-8**.

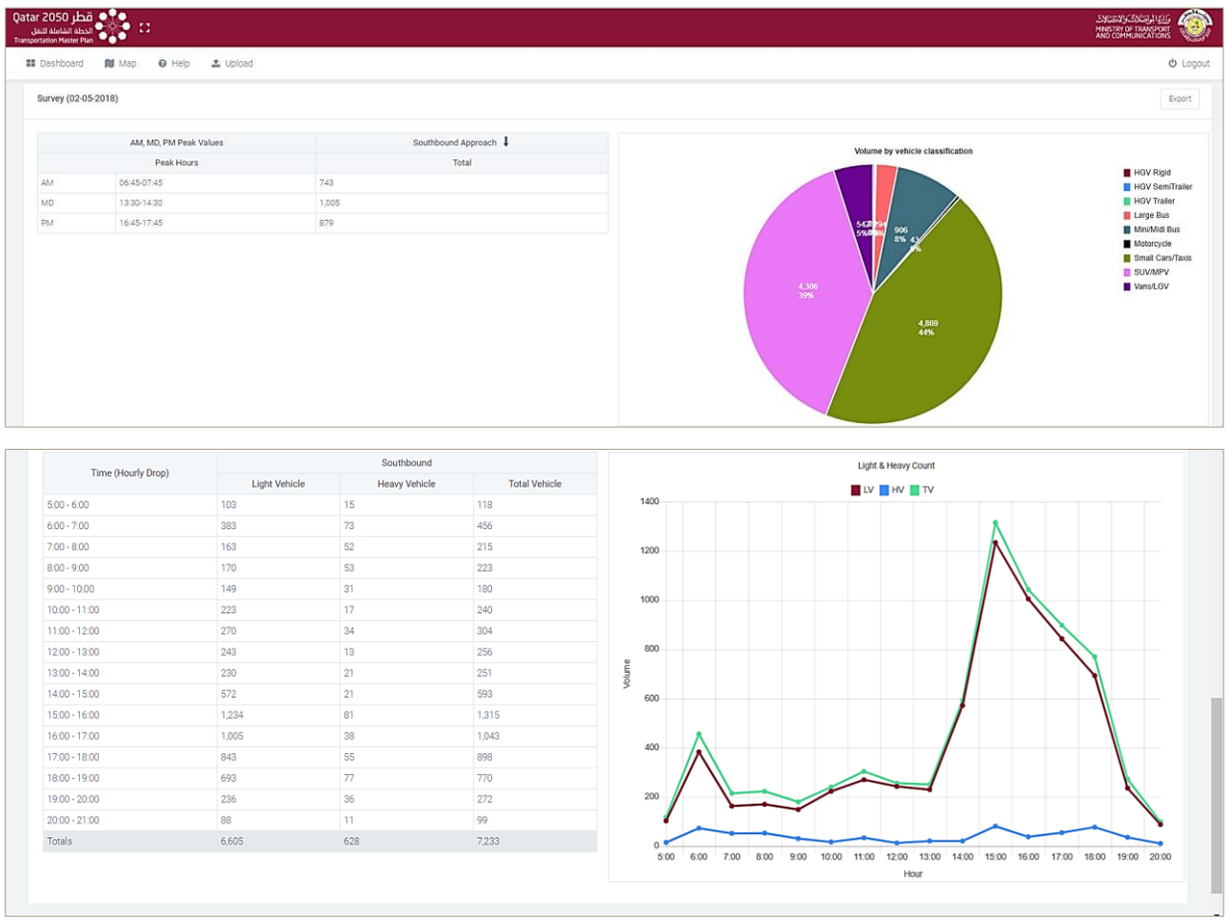



Figure 6-8: MCC - Volume and Vehicle Classification Summarized Information

For ATC, TMC and MCC data, the following functions are available:

1. **Export Traffic Count Survey data file:** The user is able to download a copy of the most recent traffic count survey data in Comma Separated Values (CSV) format.
2. **Export summary data to an Excel file:** The user can export summary data to MS Excel for a specific survey.
3. **View volume trend:** After selecting the Show Details option a bar chart is displayed showing traffic volumes for the selected site. Where multiple surveys have been conducted at the same location, they will be shown as separate bars allowing simple trend analysis.
4. **View Volume/Speed and Class count summary by day:** For ATC based survey, the user has the option of choosing to see the peak hour summary, all day summary, and 2-Day, 5-Day, 7-Day averages for traffic volume, traffic speed or vehicle class.

5. **Compare survey data of a site:** Available for ATC (Volume, Speed) and MCC (Volume regardless of class) based surveys at sites where multiple observations have been recorded. The comparison will be for two or more surveys conducted at the same site.
6. **TMC Survey data of a site:** Peak hour summaries and junction diagrams (by vehicle class and turning movement) can be displayed for a selected TMC site.
7. **Upload Traffic Count Survey data:** Authorized users will have the ability to upload new survey data.
8. **Export report:** The user can export a PDF report such as the example shown in **Figure 6-9.**


Figure 6-9: Sample PDF Report for Traffic Count Surveys

# CHAPTER 7

## Accident Data and Heatmap

# CHAPTER 7 ACCIDENTS' DATA AND HEATMAP

This feature permits users to query, view, and upload road collisions (crash) data. These are stored as GIS point data and contain information relating to road characteristics, weather and visibility at the time of the collision, causal factors, and severity of the accident.

The TDMS contains only non-confidential attributes of crash data. All personal information has been removed. Data can be viewed in tabular format (for selected attributes) and in thematic map format (heatmaps) as illustrated in steps below and shown in **Figure 7-1**

**Step 1.** From the **Map** menu, open Layers and Select **Traffic Collisions**.

**Step 2.** From the **Map** Menu, open Layers and Select **Heatmap**.

**Step 3.** On the Heatmap and Select **Traffic Collision**.

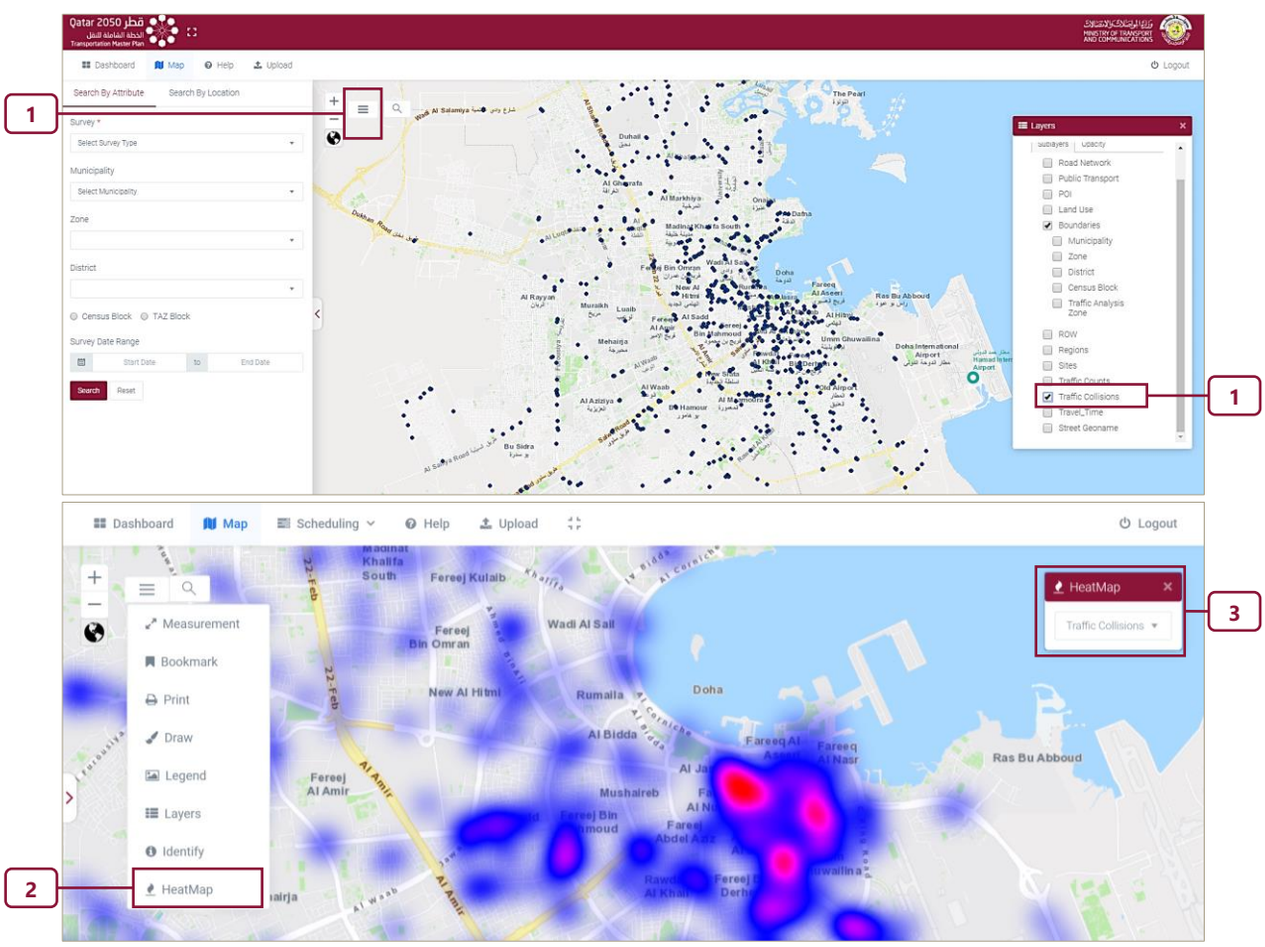



Figure 7-1: Accidents Data (Mock-up for Illustration only)

# CHAPTER 8

## Scheduling for Upcoming Surveys

# CHAPTER 8 SCHEDULING FOR UPCOMING SURVEYS

## 8.1 OVERVIEW

This feature enables users to schedule:

1. Traffic Count Surveys.
2. Interview-Based Surveys.

**Traffic Count Survey** The user will first choose the type of survey to be conducted (ATC, MCC or TMC) and then either select an existing survey site from the map or add a new one. After identifying the site location, the user enters the required information as prompted.

**Interview-based Survey** The user first chooses the required survey type (Household, Parking etc.) and then selects the relevant TAZ(s) or zones(s) from the map and completes the required information to schedule a new survey.

The minimum information required for scheduling a survey is as follows:

1. Data Collection Purpose.
2. Data Collection Type (ATC, TMC, MCC, HHI, etc.).
3. Supervisor (MOTC staff).
4. Assigned Consultant.
5. Project Name.
6. Planned Start Date.
7. Planned End Date.
8. Actual Start Date.
9. Actual End date.

For each scheduled task, the current status will be monitored and updated by the Ministry of Transport and Communications (Qatar) - Land Transport Planning Department (MOTC-LTPD), using the following designations.

1. Planned.
2. In Progress.
3. Cancelled.
4. Overdue.
5. Completed.

Users can search for scheduled surveys based on the survey type, the date and the status then display them via the GIS portal showing their current reported status. As most of the data objects

are accessible via the portal, right-clicking on an object of interest (e.g. a site location pin or TAZ) will display a pop-up window with all recorded attribute values for that object.

## 8.2 APPROACH TO SCHEDULE A NEW SURVEY

### 8.2.1 SCHEDULE TRAFFIC COUNT SURVEY ON EXISTING SITE

Follow these steps to schedule a new traffic survey:

**Step 1.** From the Main Menu, select "**Scheduling**" then click on "**New Survey**".

**Step 2.** Select the type of survey (i.e., ATC, TMC, or MCC)

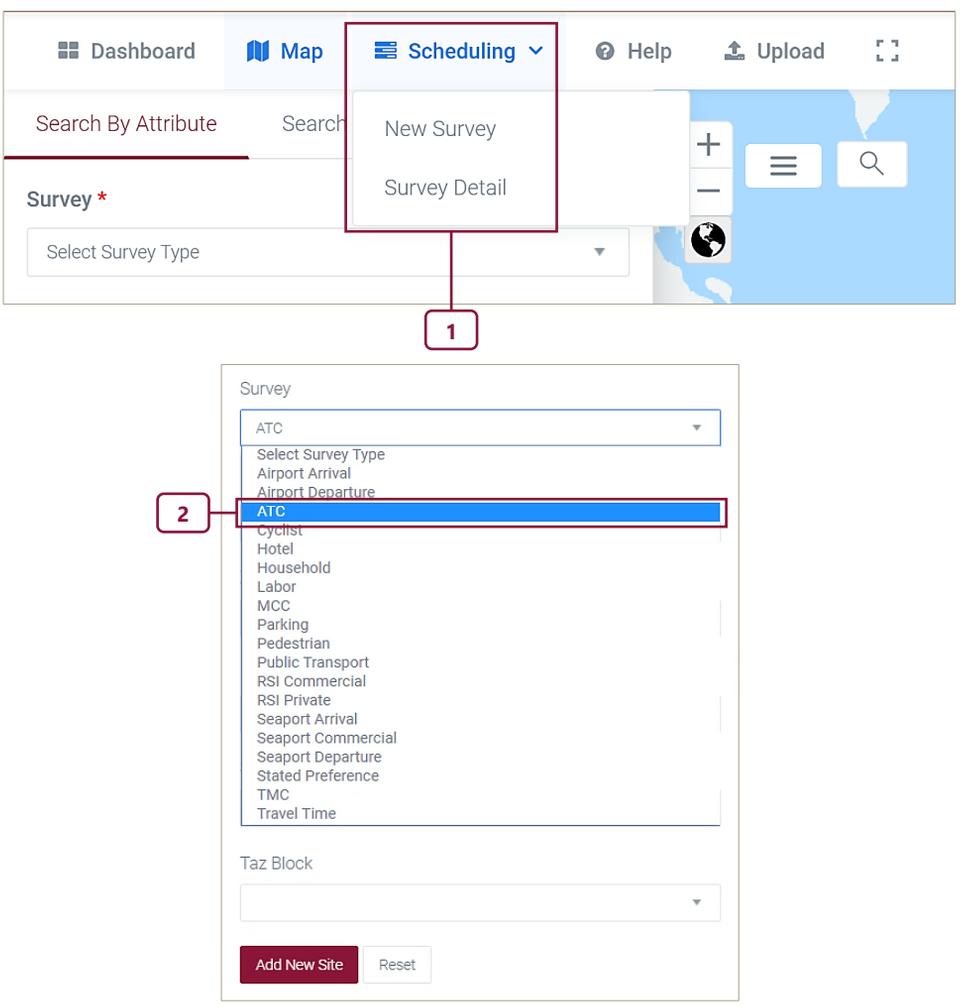



Figure 8-1: Schedule Traffic Count Survey on an Existing Site

**Step 3**. From the Drop-down select "Municipality".

***Note:*** *Notice* ***the existing sites*** *are now shown on the map interface*

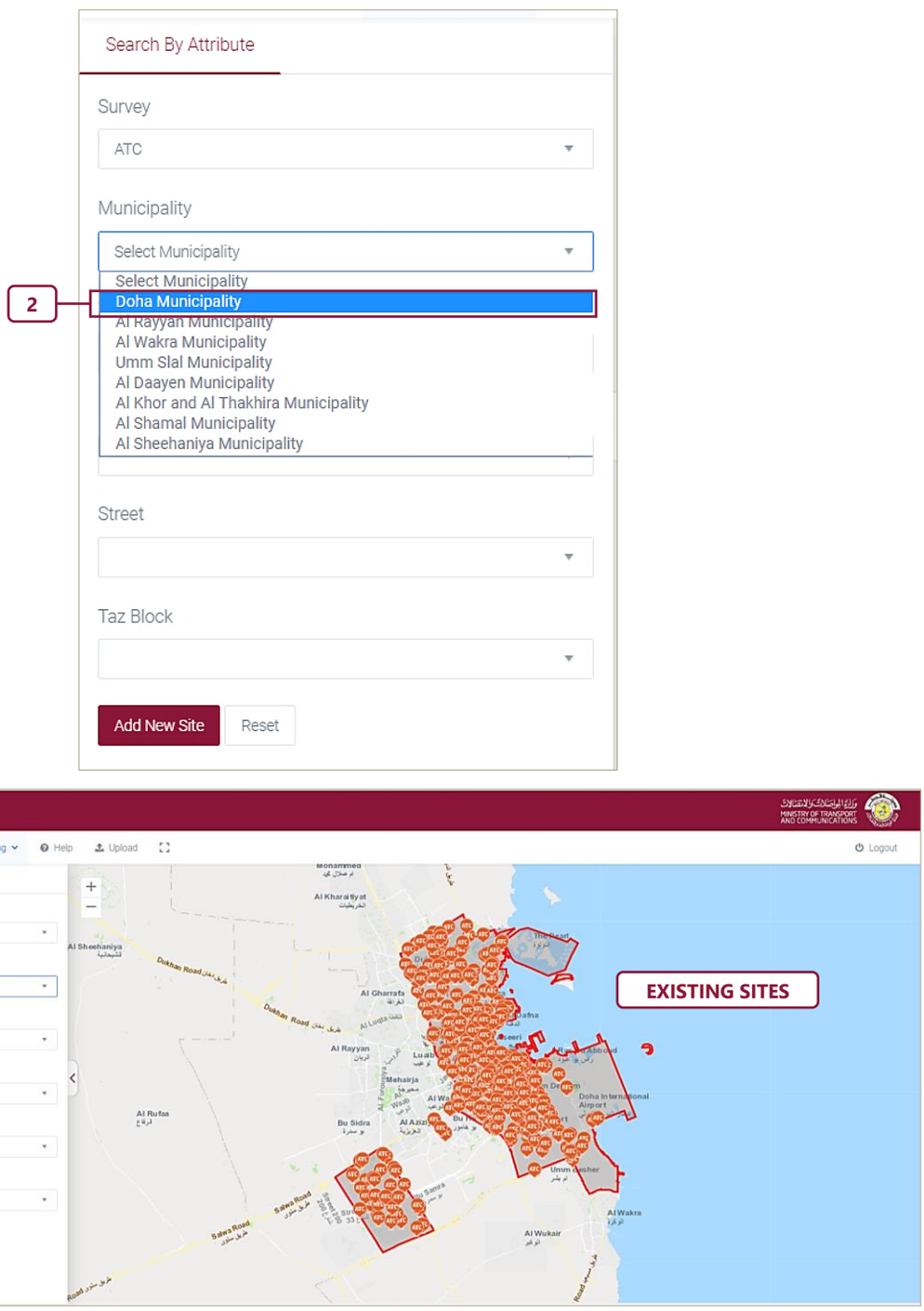



Figure 8-1: Schedule Traffic Count Survey on an Existing Site (Continuation)

**Step 4**. Zoom into the desired area, and click on the desired site

**Step 5.** Click on "**Schedule Survey**".

**Note:** a pop-up window appears

**Step 6**. Fill out the details on the "**Schedule New Survey**" window

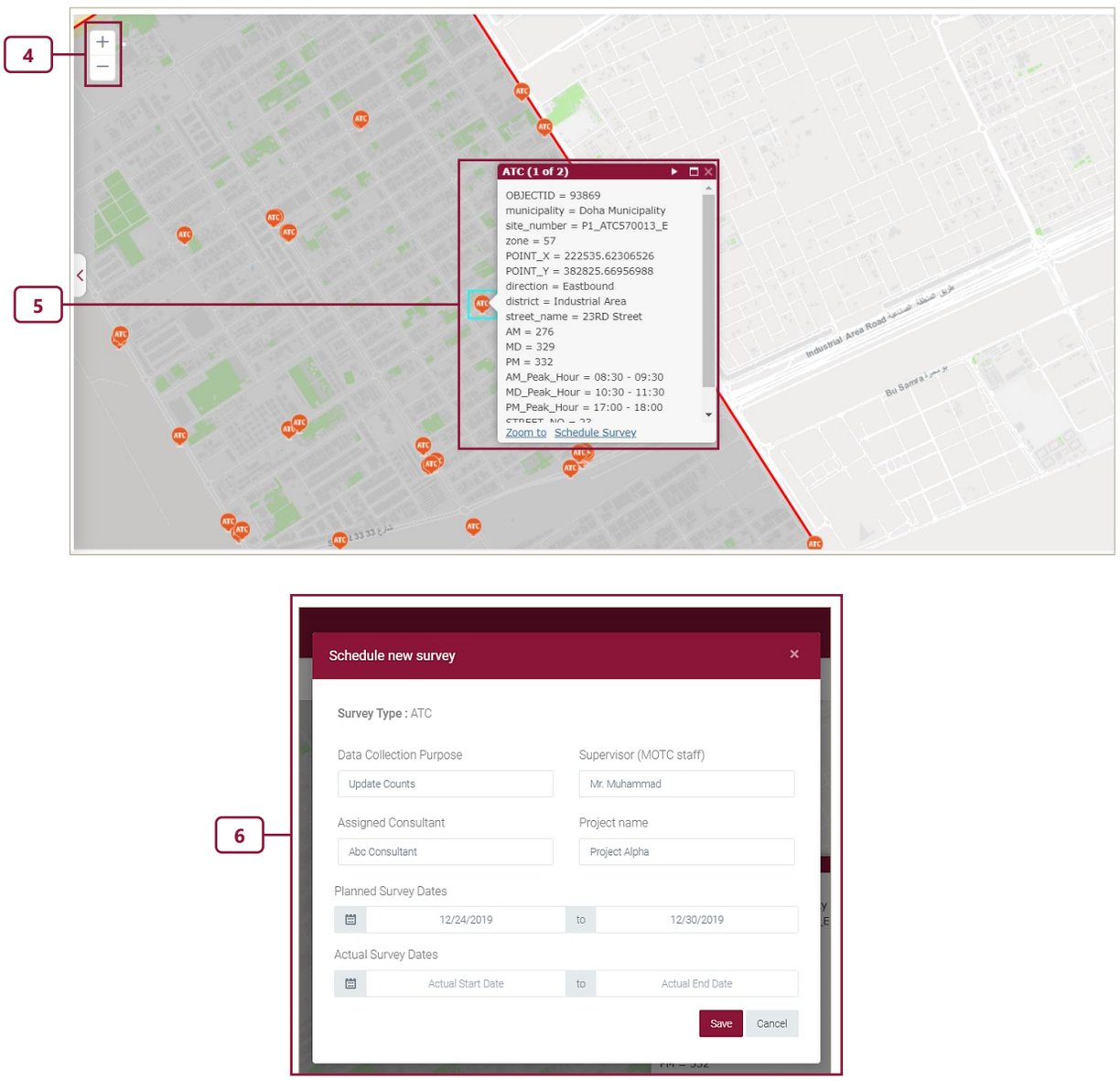



Figure 8-1: Schedule Traffic Count Survey on an Existing Site (Continuation)

## 8.2.2 SCHEDULE TRAFFIC COUNT SURVEY ON A NEW SITE

To schedule a Traffic Count Survey on a new site, follow steps 1 to 7 below, notice that steps 1 to 3 are the same as the ones in the previous section:

**Step 1.** From the Main Menu, select "**Scheduling**" then click on "**New Survey**".

**Step 2**. Select the type of survey (i.e., ATC, TMC, or MCC)

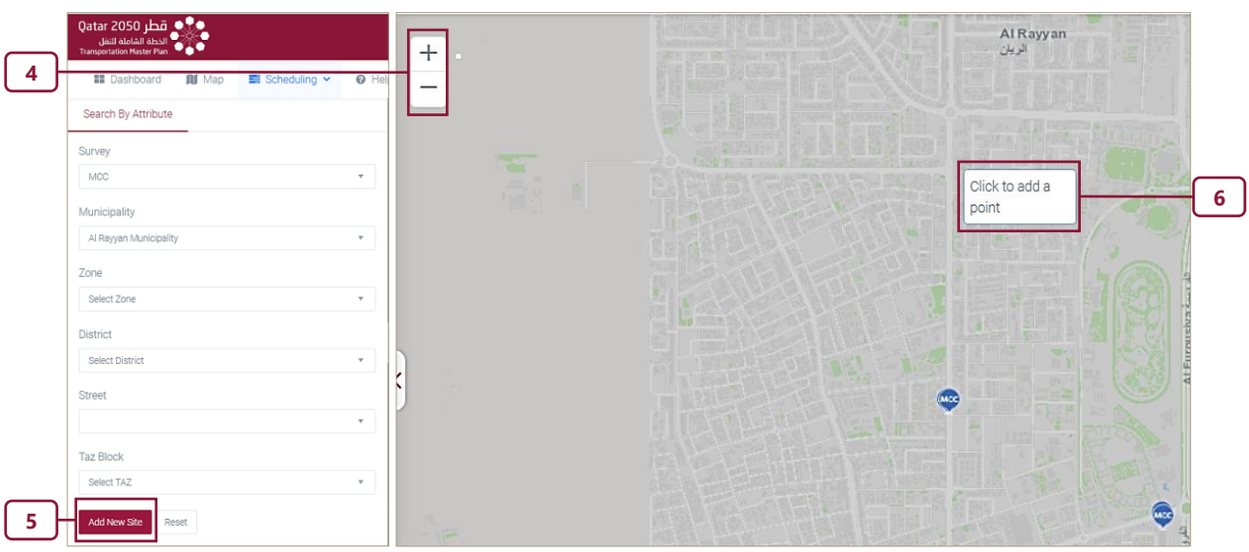
**Step 3**. From the Drop-down select "**Municipality**".

**Step 4.** Zoom into the desired area where the new site will be located

**Step 5**. Click on "**Add New Site**".

**Step 6**. Click on the desired location

> ***Note:*** *the pointer will now include a message* ***"Click to add a point"***




**Step 7.** Fill out the details on the "**Schedule New Survey**" window.

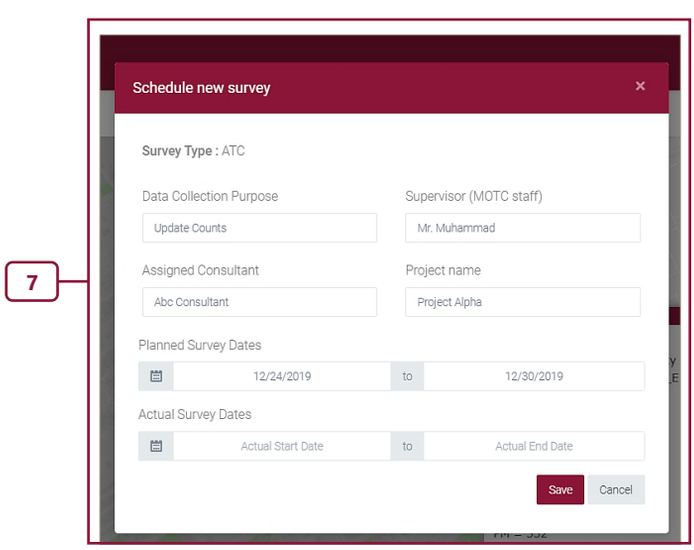



Figure 8-2: Schedule Traffic Count Survey on a New Site

### 8.2.3 SCHEDULE INTERVIEW BASED SURVEY

To schedule a new interview-based survey follow steps 1 through 6 below. The list of Interview-based surveys can be seen on **Section 1.3.**

**Step 1.** From the Main Menu, select "**Scheduling**" then click on "**New Survey**".

**Step 2A.** Select the type of Interview Survey to be scheduled (i.e., **Household**.)

**Step 2B** (optional). From the Drop-down select "**Municipality**", "**Zone**", "**District"**, "**Street"** or "**TAZ Block"**.

> ***Note:*** *this step is optional and serves to pinpoint the spatial location of the new survey.*

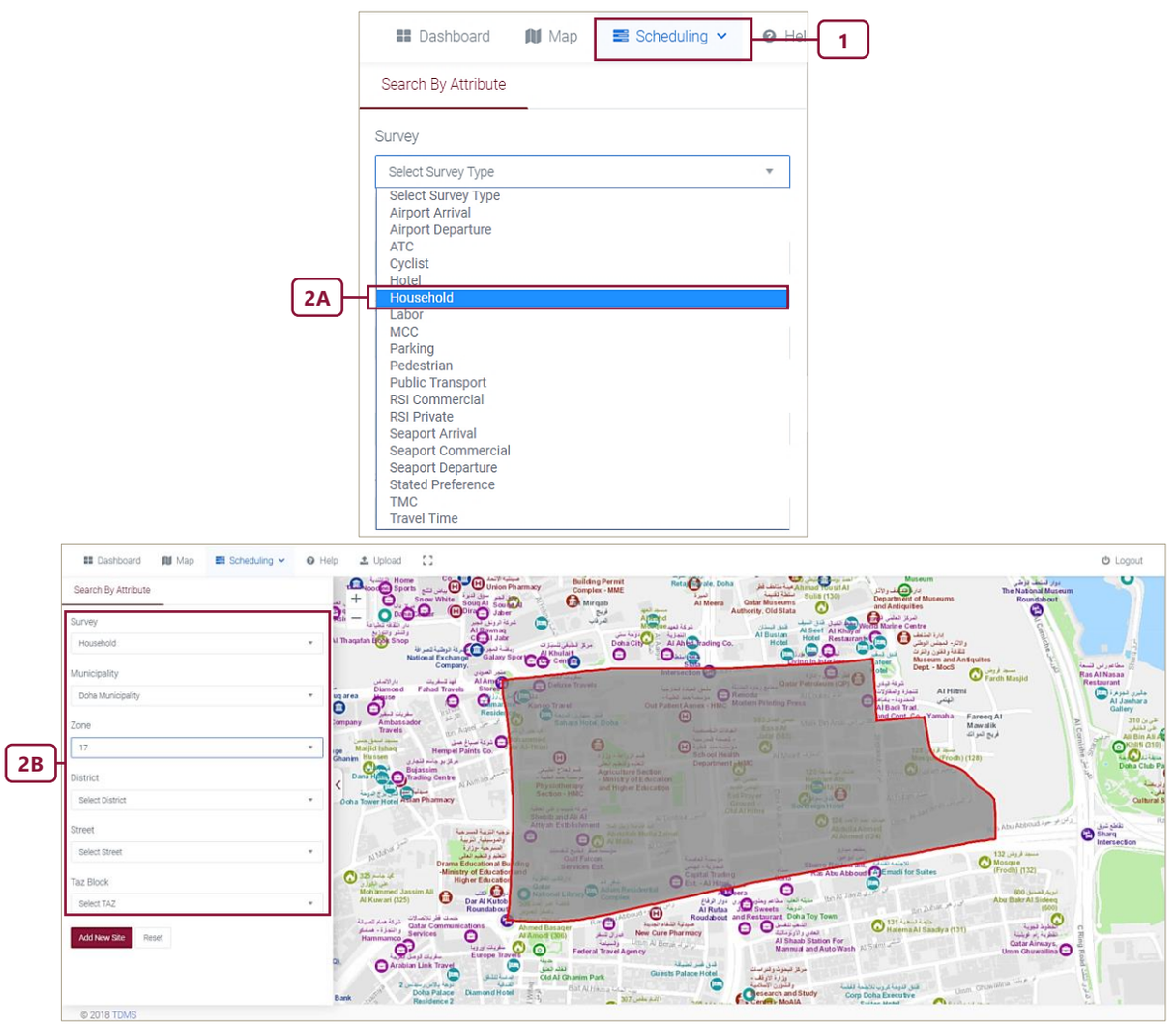



Figure 8-3: Schedule Interview Based Survey

**Step 3.** Hit "**Add new site**".

**Step 4.** Click on the map to confirm the location.

> ***Note:*** *the system will gather the zone or TAZ information automatically. Also notice you can click on a different zone than the one selected on step 2.*

**Step 5.** Fill out the Scheduling Menu fields (status, data collection purpose, supervisor from MOTC, assigned consultant, project name and dates.

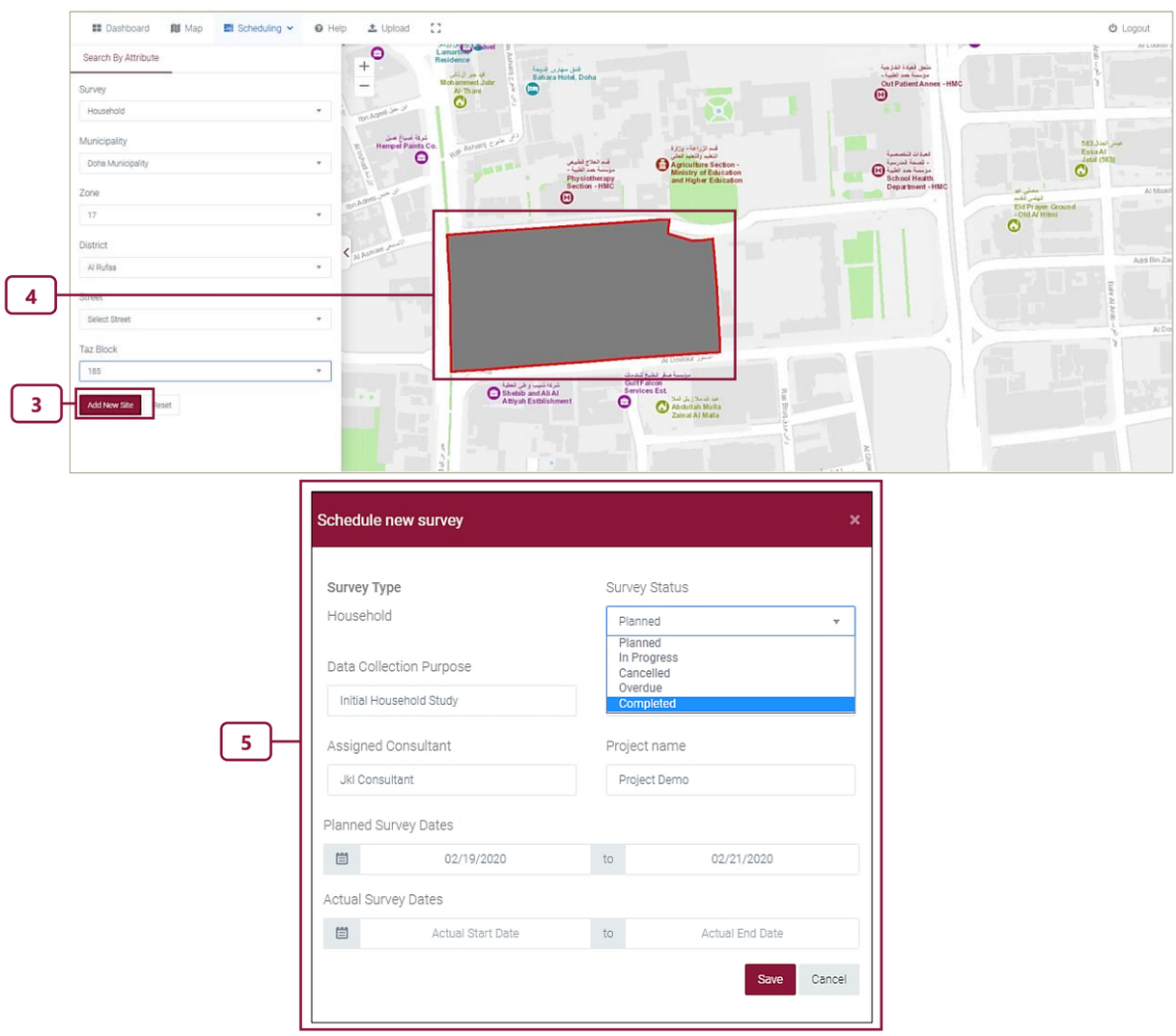



Figure 8-3: Schedule Interview Based Survey (Continuation)

## 8.3 APPROACH TO SEE DETAILS OF SURVEY WORKS

To see the details of the survey works follow these steps:

**Step 1**. From the Main Menu, select "**Scheduling**" and "**Survey Detail**"

**Step 2**. Select the "**Status**" of surveys to be visualized. The available options include planned, in progress, overdue, completed and cancelled.

> ***Note:*** *you can also filter by data collection purpose, supervisor (MOTC staff), assigned consultant, and project name.*

**Step 3.** Click on Search.

Notice the system will display **pointers** on the map with the **details of each survey and a legend** with the survey status.

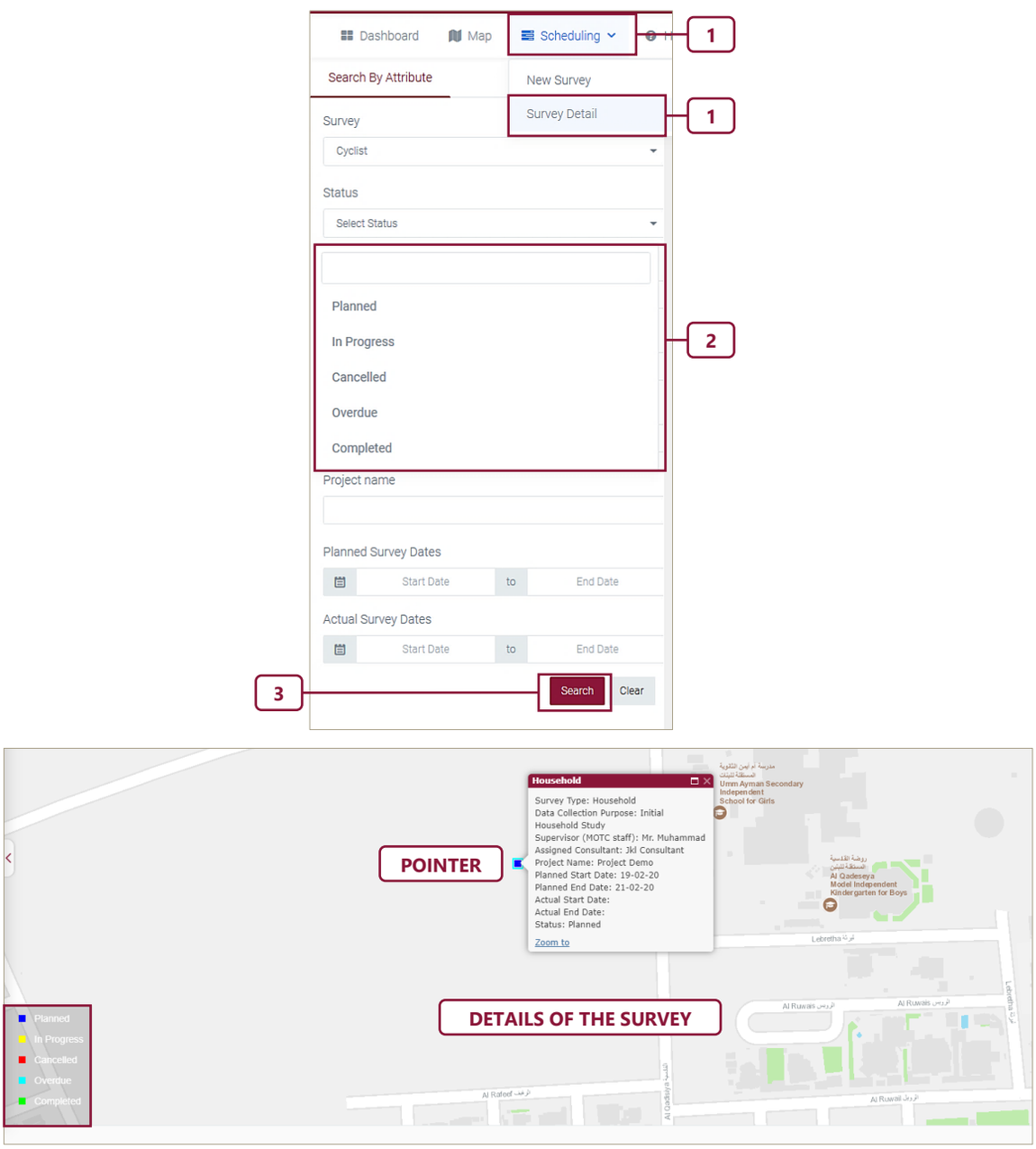



Figure 8-4: Approach to see the Details of the Survey Work

### 8.3.1 EDITING THE DETAILS OF A SURVEY

To edit the details of a new survey, follow the steps presented before to "See details of survey works at the beginning of **Section 8.3**", then do the following:

**Step 1.** Click on **Edit** next to the scheduled Survey.

**Step 2.** Change the details of "**Survey Status**", "**Actual Survey Dates**" or any other information directly in the "Schedule New Survey" box.

**Step 3.** Click on "**Save**" when the editing is finished.

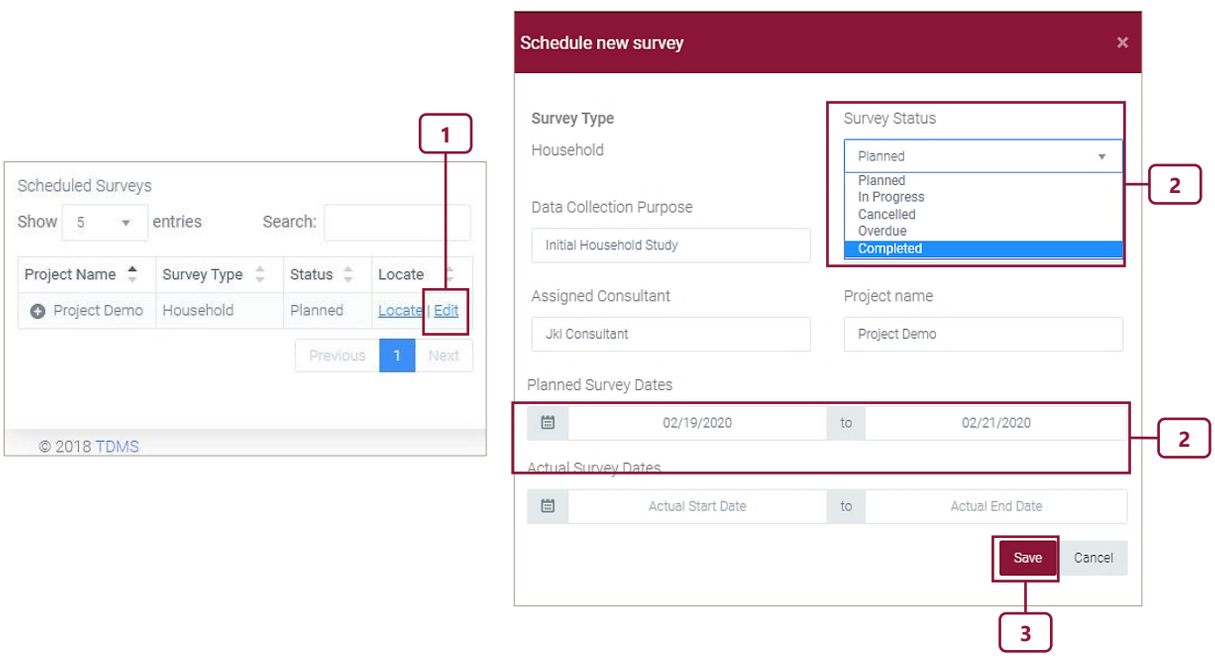



Figure 8-5: Editing the Details of a Survey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