Traction

HELP AND USER MANUAL
SEPTEMBER 2019

INTRODUCTION

WHAT IS TRACTION?

Traction is a browser/mobile-based, cloud-hosted solution featuring comprehensive transportation performance analytics, on-line reporting, and powerful data visualizations, accessible from your workstation, smartphone, or tablet.

HOW DOES IT WORK?

No costly infrastructure or time-consuming deployments are required. Traction immediately unlocks the ability to gather single vehicle and crowd-sourced travel times, along with other key health indicators for your freeways and arterials.

KEY FEATURES

Traction is a powerful transportation analytical tool, designed to provide data and analytics to drive congestion improvements for municipalities and other government agencies. Leverage the mobile app to collect travel times for user-defined trips. Access this data along with crowd-sourced travel times and high-level performance measure indicators through your browser on the Traction website.

Traction allows users to:

- Collect real-time travel time, speed, and heading information for a user trips through use of the mobile application.
- Collect crowd travel time data for any corridor of interest, up to once per minute.
- View analytical reports including travel time versus time of day and speed versus distance graphics.
- Use data for calibration of other probe sources.

GETTING STARTED

To establish an account, please email traction@kimley-horn.com.

For more information, visit www.kimley-horn.com/traction.

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HOW TO GUIDE

1 ACCESS THE APP AND WEBSITE

1.1 Open the App

- Download the *Traction by Kimley-Horn* app from the Google Play or Apple App Store.
- Launch the Traction application by selecting the icon from your mobile device.
- The application includes a location-based map. A window may appear requesting permission for the application to access the user's location; if this occurs, select the "Always Allow" option.
- Enter your Microsoft credentials when prompted.

1.2 Open the Website

- Using Chrome, browse to the Traction website at https://traction.kimley-horn.com/ and enter your Microsoft credentials.

2 USER TRIPS

Use the Traction mobile app to record user trips and view key trip information. Additional viewing is available through the website

Warning: *Do not use the app in any way that distracts you or prevents you from obeying traffic or safety laws. Additional data points captured getting to and from your parking locations can easily be trimmed from the desired route through our online tools.*

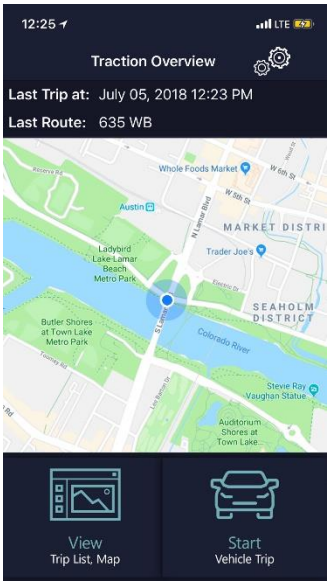
2.1 Record a User Trip

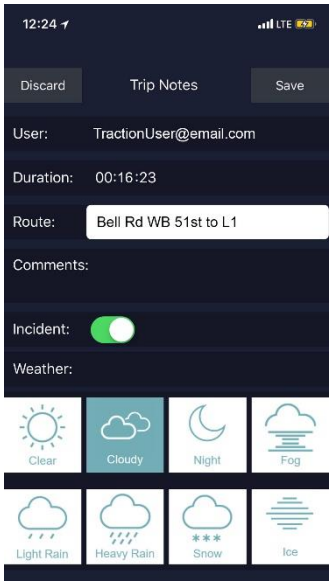
- While the vehicle is in park, select "Start". The application will immediately begin collecting trip data. No further interaction with the app is needed for the duration of the route.
- Drive the desired travel time route, travel through the last desired location, and safely navigate to a parking location.
- Once parked, select "Stop". Add any relevant trip details and select "Save" to commit the data. To cancel the trip, select "Discard".

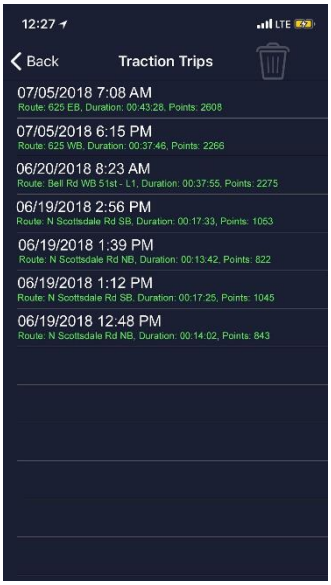
2.2 View a User Trip (App)

- Select "View", then "Trip List". A list of your user trips will be displayed with the date, time, route, duration, and points.
- Tap any trip to view further details. The following page presents summary statistics. The page also has options to view the trip in a Speed vs Time graph or view a color-coded Map view of the trip, as well as an option to delete the trip.

- Use the back arrow in the top left to navigate to the previous page.
- Deleting a previous trip can also be done directly from the Trip List, by swiping left on the specific trip and tapping the resulting Delete button.



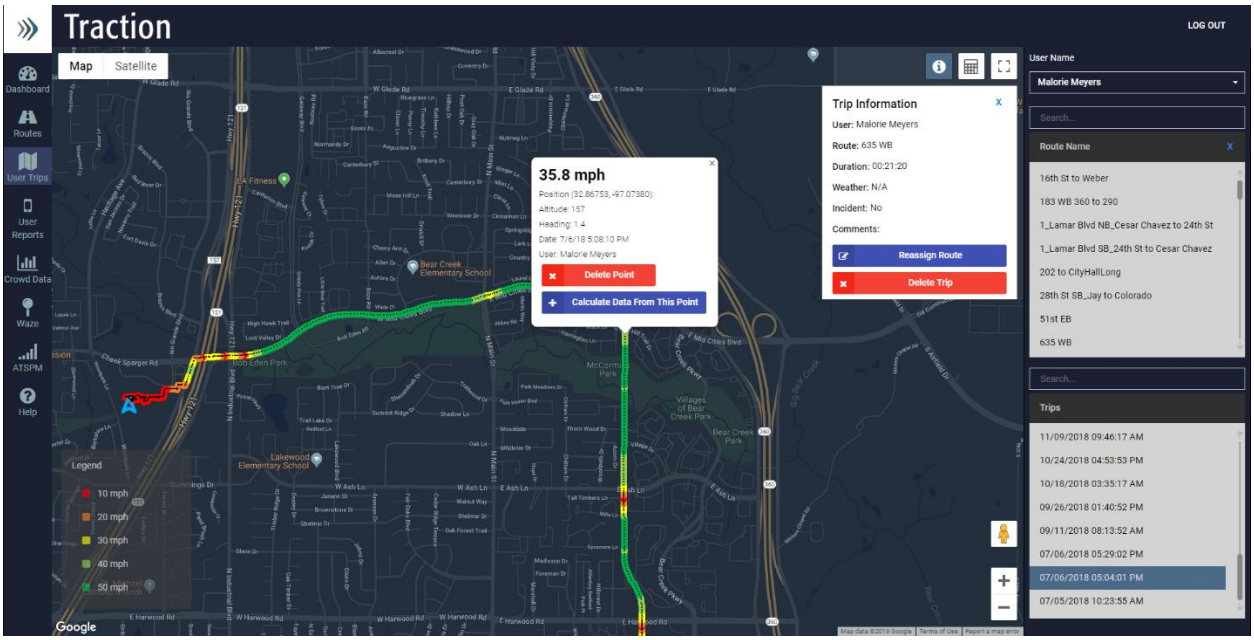




2.3 View a User Trip (Website)

2.3.1 Map View

- Navigate to the **User Trips** tab.
- If desired, use the User Name dropdown and Route Name list to filter the list of Trips shown. To remove the User Name filter, select the None option at the top of the list. To remove the Route Name filter, click the X in the top right of the list box.
- Select a trip from the Trip list. The user trip is displayed on the map, color-coded by speed based on the legend shown in the lower left.
- A label with exact speed, position and other detailed information can be displayed by clicking on any point along the route.
- Trip information such as total duration, weather, and comments can be viewed by clicking on the information button in the top right of the map view. Since filtering on user and route is optional, this popup also displays the user and route names.



2.3.2 Point to Point Travel Times

Travel times between user-selected points can be dynamically calculated while viewing the map view. While a trip is selected in the website User Trips tab, use the following steps to do so.

- Click on a point along the route, and then select “Calculate Data From This Point” on the popup.
- Click on a second point and select “Calculate Data To This Point” on the popup.
- A window in the upper right will display the selected coordinates along with the distance, time elapsed, and average speed.
- To calculate travel times with entirely different points, click the “Clear” button, then select new points on the map. To repeat the calculations with one different origin or destination, use the red circle with a minus sign to remove the origin or destination, then click on the new point on the map.
- To hide the results, click on the calculator button above the results.

3 USER REPORTS

Use the Traction website to generate reports with User Trip data.

3.1 View User Trip Reports

- Navigate to the **User Reports** tab.
- Select the desired trip from the table and select “View”. The Speed vs Distance graph is generated.

- Select multiple trips of the same route and select “View Multiple” to see multiple trips in the report, along with travel time average, standard deviation, buffer index, and planning index.

4 ROUTES

Use the Traction website to create routes for User Trip and Crowd Data collection.

Warning: *Creating a route does not initiate travel time data collection. Data collection settings and route activation are also required. Please see the Crowd Data section, below.*

4.1 View Current Routes

- Navigate to the **Routes** tab. Existing routes are displayed on a map and listed at the right. Route start points are indicated by a circle while route ends are marked by an arrowhead.
- Select any route from the list at the right to show only that route on the map.

4.2 Considerations for Route Creation

Routes are used in nearly all aspects of Traction. The following are some points to keep in mind for overall organization, user reports, and crowd data reports.

Organization

Having a clear and consistent pattern for naming routes can be helpful when viewing a long list of routes. Consider identifying the major road, direction of travel, and the start and end boundaries.

Tags can be assigned to routes, and then used for filtering lists of routes such as on the Crowd Data page. Tags for each agency user are provided by default, and custom tags can be created and organized in a folder-like structure.

Reports from User Trips (Mobile App Data)

The **route waypoints** (any pins between the origin and destination) are used to break the trip up for node-by-node analysis reporting.

The **street names** of route waypoints can be displayed on the user trip report graph and are used in node-by-node analysis reporting. Consider revising the default names when creating a route – for example, a numeric street address may not be as helpful as the cross streets of an intersection.

The **speed limit** along route segments are used to calculate node-by-node delay. Speed limits default to 35 mph unless the user modifies them.

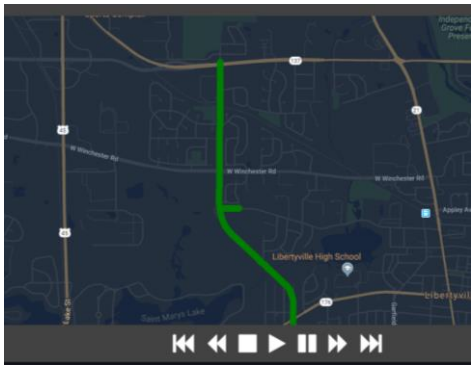
Crowd Data

The **route waypoints** are used in multiple ways in the Crowd Data module.

- **Fastest Route or Fixed Route** Some data sources may provide the travel time for the fastest path between the specified points. Defining just an origin and destination may collect data from a route other than the one shown when creating the route, if an alternative is the fastest option. Adding waypoints helps ensure the travel time is for a specific path.
- **Segments on View Playback** The Crowd Data reports include images of Azure data as a color-coded route, reflecting the level of delay along each segment. The granularity is determined by the waypoints: a route with just an origin and destination is a single segment and would be displayed as a single color. Adding waypoints can help examine subsections of a corridor.

Data Sources and Location Positioning

Crowd data sources can be sensitive to location positioning. Different data sources may interpret the same GPS coordinates as being in different locations, especially on divided roadways, near frontage roads, or near intersecting streets. This can lead to driving directions involving unintended paths, such as U-turns to access the other side of a divided roadway or jogging briefly onto a side street before returning to the main road. Viewing an image of the route is an effective way to identify and resolve these issues.



The website uses a Google Maps visualization when creating a route, providing immediate feedback on Google's interpretation of the selected GPS coordinates. If a route will collect Azure data, it's advisable to use the View Congestion Map Playback feature to view the path after initiating data collection. See section 5.3 for more details on this feature.

4.3 Create a New Route

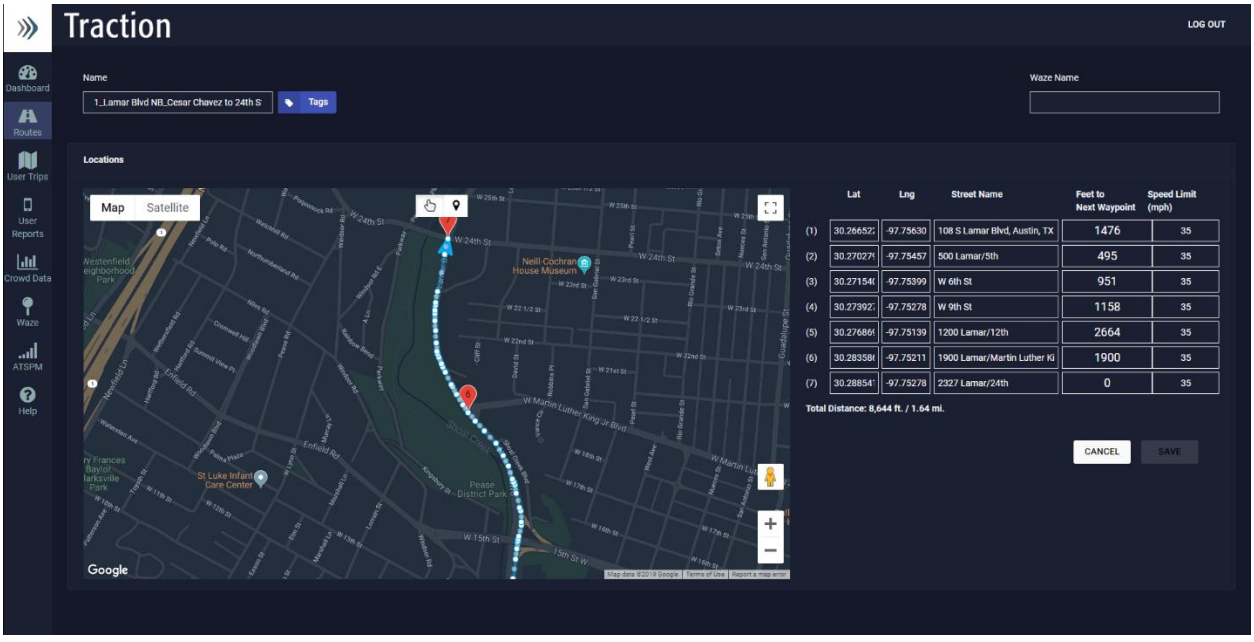
- Navigate to the **Routes** tab.
- Select "New" to create a new route.
- Enter a route name. You may want to include the direction and route boundaries in the route name (e.g. NB Central Ave from Jefferson to Roosevelt).
- Zoom and pan to the desired area.

- Select the pin icon and click the start point of the route. (Alternatively, add points with a right-click on the desired location)
- Reselect the pin icon and click additional waypoints along the route. The last selected point will become the end point of the route.
- Waypoints can also be inserted along the existing route: using the pin icon or a right-click, select one of the white circles between existing route pins. A new pin will be created and the pins numbering will update accordingly.
- Once finished with the route, select “Save”. If a route in the opposing direction is desired, repeat the process to create a new route.

Note: *Careful use of waypoints ensures the travel time data is collected for the specified path. The recommended number of waypoints generally increases with route length, but also relates to the type of road and environment. For example, a 5 mile stretch of interstate without any exit ramps does not need multiple waypoints, because there is no opportunity to deviate from that route. A single mile in an urban area has more potential routes, so additional waypoints should be used if a specific route is desired.*

4.3.1 Waze Routes

Agencies who participate in the Waze Connected Citizens Program (CCP) may be able to integrate their Waze data to collect route-based travel time information. After configuring a route in the Waze website, it may be linked to Traction by typing the exact route name in the Waze Name field when creating or editing a route.



Please contact us for more information on setting up Waze CCP integration.

4.4 Edit a Route

- Navigate to the **Routes** tab.
- Select a route from the list and select “Edit”.

4.4.1 Edit a point location

- Once two points have been defined, dots will connect the pins in the map. Clicking on one of these dots and dragging it to a desired path will create a waypoint, inserted between the previously created points.
- Click and drag any existing pin to move the waypoint location, or use the table on the right to enter the desired latitude and longitude coordinates.
- Save the route.

4.4.2 Delete a point

- Right click any point and select “Delete” to remove that point.
- Save the route.

4.4.3 Edit the street name

- Street names will automatically be suggested for each point. Street names are used in some of the User Trip reports. Enter the desired description.
- Save the route.

4.4.4 Edit the route name

- Enter a route name.
- Save the route.
- If a name is not initially entered, it will be automatically suggested based on the first selected points.

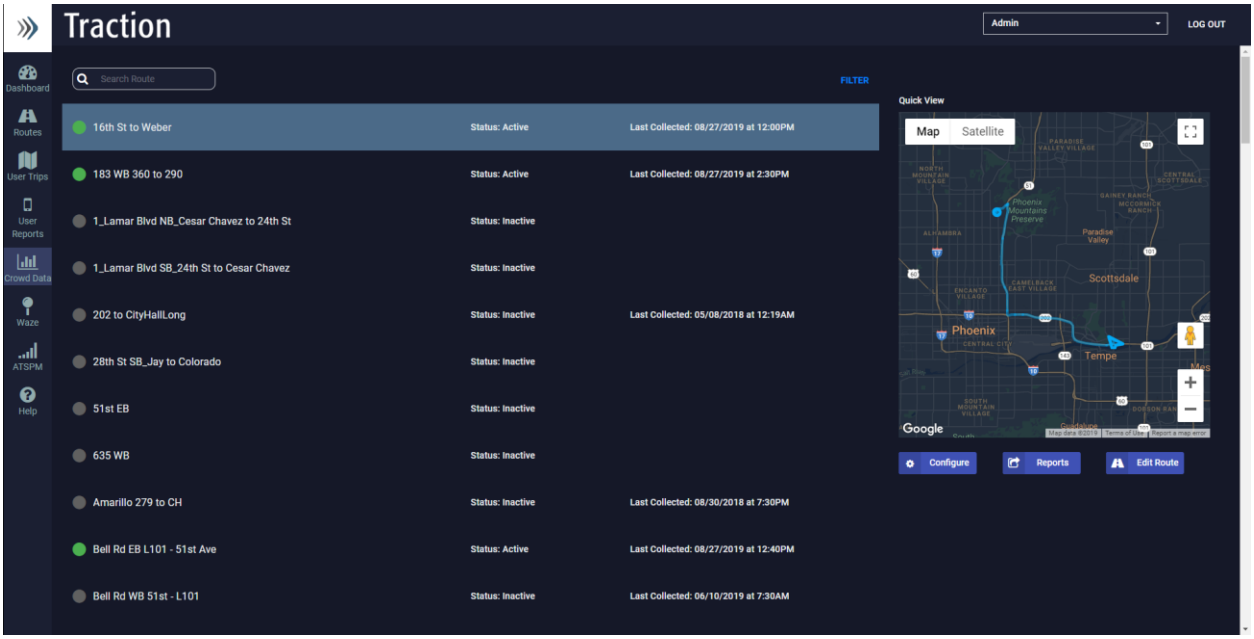
5 CROWD DATA

Use the Traction website to configure automated collection of end-to-end travel times for a given route.

5.1 Edit Crowd Data Collection Settings

- Navigate to the **Crowd Data** tab.

- Select the desired route. The map will update to show the selected route. Click the "Configure" button below the map.



5.1.1 Capture Information

Traction allows detailed customization of data collection. For example, data could be collected every 10 minutes during peak weekday periods, every 30 minutes during off-peak weekday periods, and not at all on weekends. The data source(s) can be selected, and each data source could have the same or distinct collection schedules.

Data collection can also be scheduled to start and end on certain dates, or to continue indefinitely.

To set up data collection for a new route:

- Select each day of the week you would like to collect data.
- Select the start and end times for data collection.

  Note: Start and end times spanning midnight will wrap to the following weekday. For example, a schedule from 9 pm to 5 am on Friday will collect late night data on Friday and early morning data on Saturday.

- Select the frequency of data collection (e.g. every 15 minutes).
- Click on the desired data source(s).

  Note: agencies participating in the Waze Connected Citizens Program (CCP) may see an option for Waze data source. Please be aware that the Traction route must be linked to a Waze route in order to actually collect Waze data. See section 4.3.1 for more information on linking Traction and Waze routes.
  Contact us for more information on integrating Waze with Traction.

- If desired, use the Start Date field to delay data collection until the specified date.

  Note: whether or not a Start Date is set, each schedule must be **activated** in order to collect crowd data.

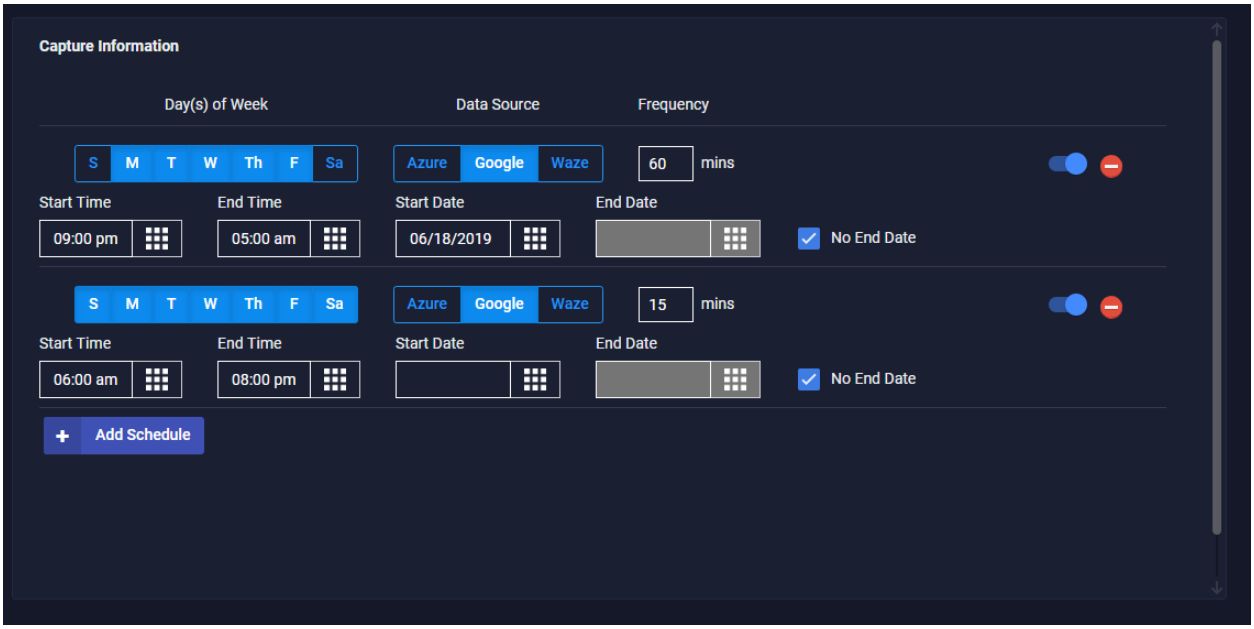
- If desired, uncheck the "No End Date" box and set a date for data collection to end.

- To activate this schedule, click the white slider icon next to these settings so that it turns blue and moves to the right. Click the “Save” button in the lower right.

 Inactive schedule  Active Schedule

- For different collection frequencies, times of day, or days of week, add additional schedules as desired. Continue activating each new schedule and saving the changes.

Reading existing data collection schedules:



In the example graphic above, the route has 2 crowd data collection schedules defined.

Schedule 1 could be characterized as ongoing infrequent data collection during weekday nights:

- The schedule is active: the slider is to the right, the Start Date is in the past, and there is no end date.
- Data collection runs overnight, from 9 pm to 5 am.
- Data collection will begin on weekdays, Monday through Friday. Because data collection runs overnight, this will result in data on Saturday mornings, and there will not be data from Monday midnight to 5 am.
- Data is being collected from a single source, Google, every 60 minutes.

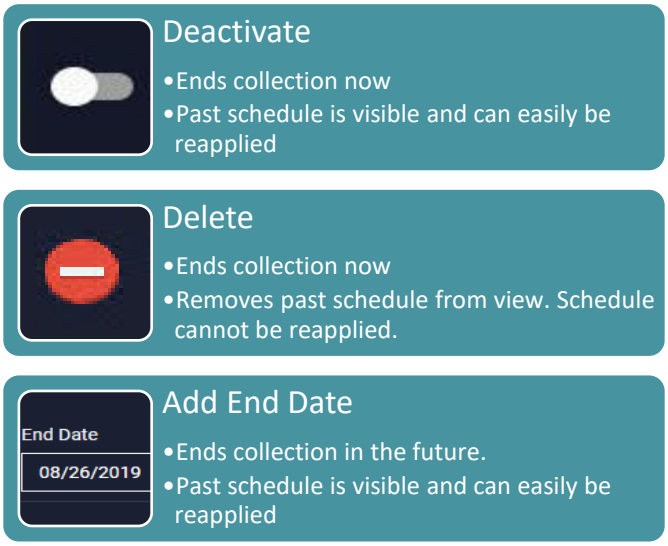
Schedule 2 could be characterized as ongoing daytime data collection during the full week:

- The schedule is active: the slider is to the right and there is no start or end date.
- Data collection runs during the day, from 6 am to 8 pm.
- Data collection runs every day of the week.

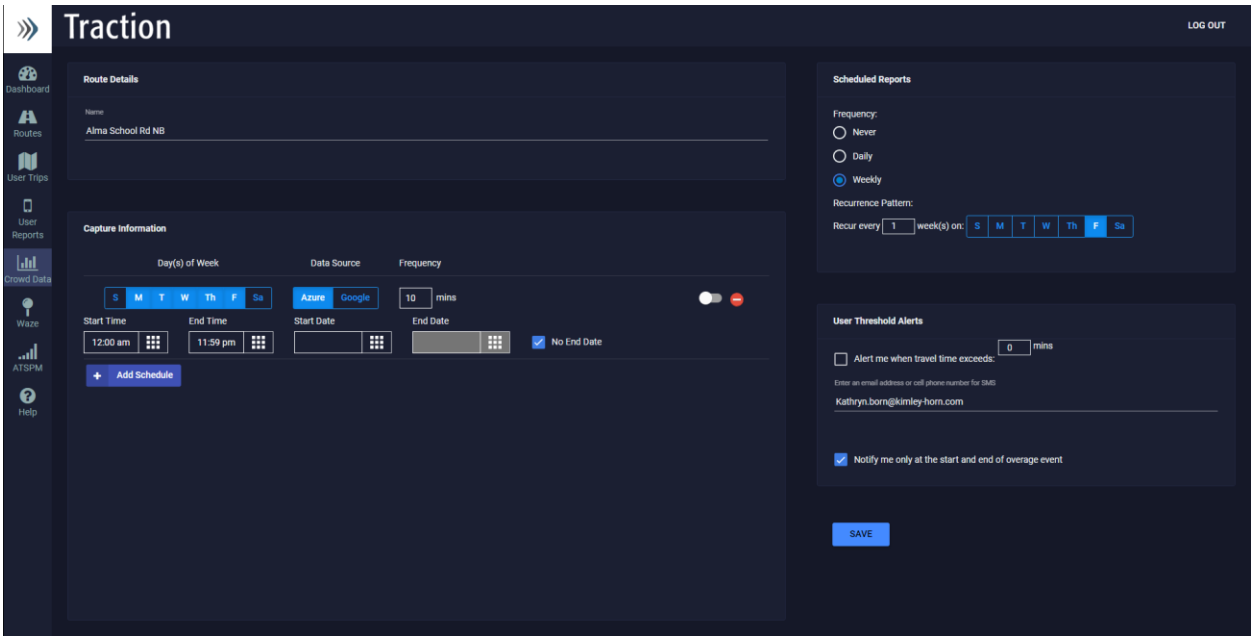
- Data is being collected from a single source, Google, every 15 minutes.

To end existing data collection:

- From the Configuration page for the desired route, review the existing data collection schedule(s). Decide whether you want to deactivate, delete, or add an end date to an individual schedule – see graphic below.



- **To immediately suspend data collection**: click the slider next to the desired schedule, so that it turns white and the circle moves to the left. Click the "Save" button so the change will take effect.
  The schedule remains in the list and can easily be reapplied.
- **To immediately stop data collection and reduce the list of schedules**: click the red circle with a white subtraction sign, next to the slider. In the popup, confirm that you want to delete this schedule, then save the page so the change will take effect.
  The schedule is removed from the list. It cannot be viewed or reapplied. *Existing crowd data is not deleted.*
- **To schedule an end in the future**: Uncheck the "No End Date" box and specify the last day of data you want to collect. Data collection will include that calendar date. Any overnight data collection will terminate at midnight. Click the "Save" button so the change will take effect.
  The schedule will continue collecting data until the end of the End Date, will remain in the list, and can easily be reapplied.
- Each route may list multiple schedules, so repeat as needed for all relevant schedules.



5.1.2 *Scheduled Reports (Optional)*

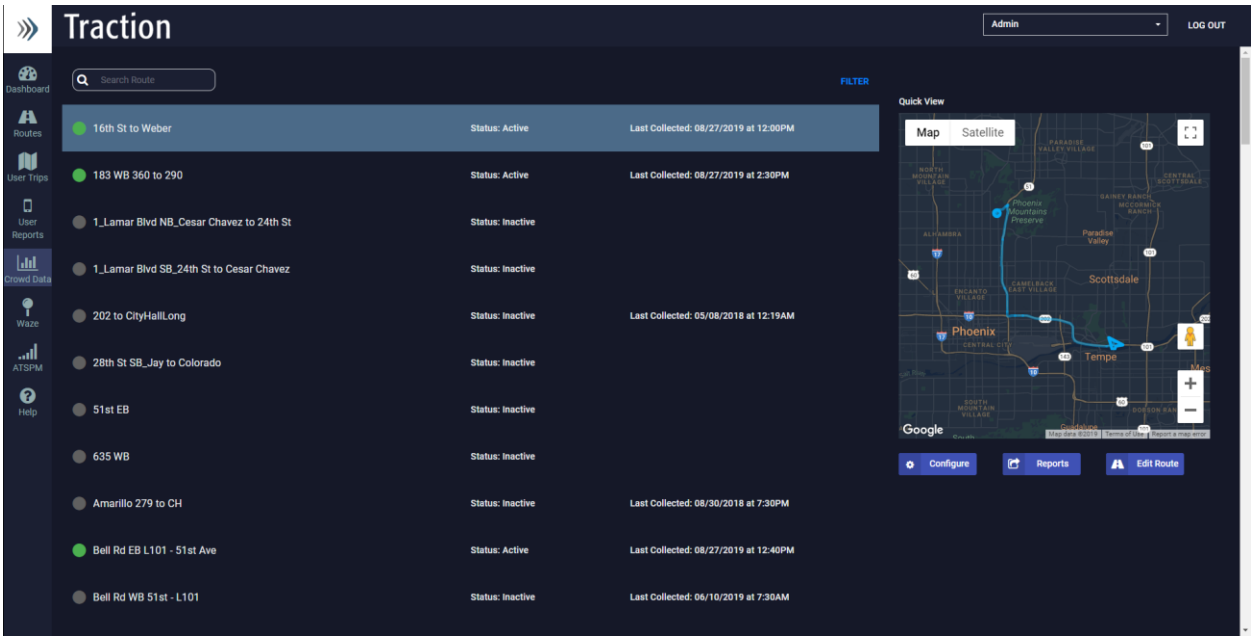
- Select the frequency and day(s) you would like to receive Crowd Data reports via email.
- Once finished with the Scheduled Reports, select “Save”.

5.1.3 *User Threshold Alerts (Optional)*

- Select if you would like to receive threshold alerts.
- Specify the travel time you would like to use as the threshold.
- Input the email address or phone number for the alerts to be sent to.
- Select if you would only like to only be alerted at the start and end of the overage.

5.2 View Travel Time History Reports

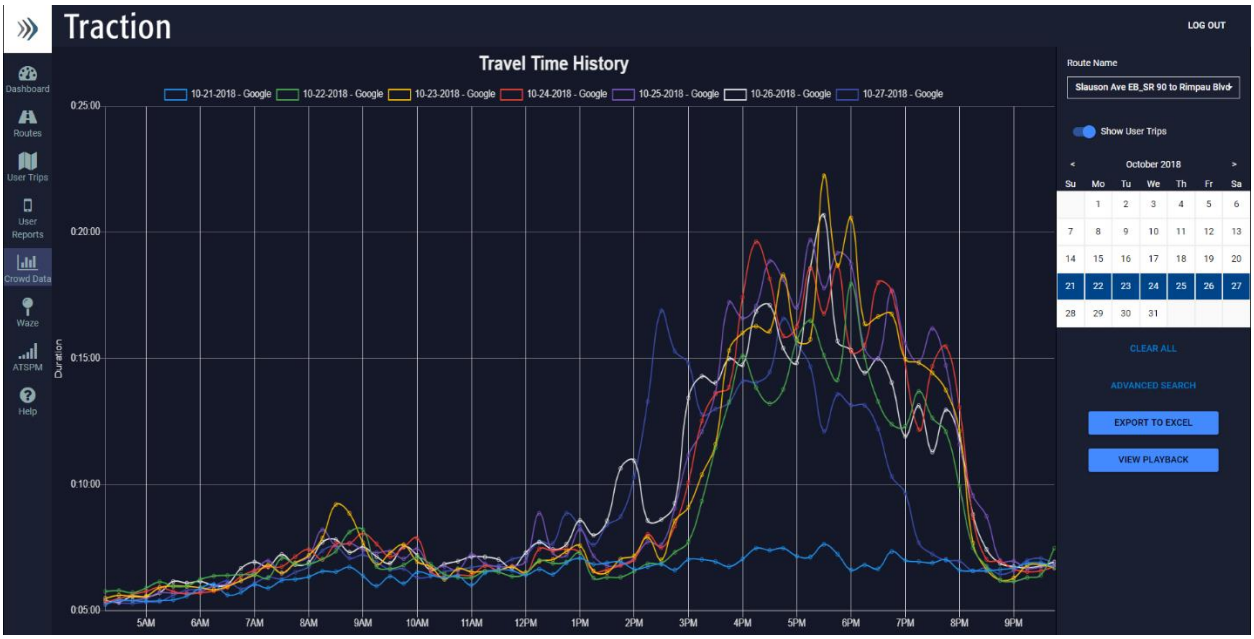
- Navigate to the **Crowd Data** tab.
- Select the desired route, then click the “Reports” button below the map.



- Select dates to be displayed on the graph. Use the arrows to toggle between months. Alternatively, use the Advanced Search feature, described in the next section.

  Note: Dates grayed out have no data available, either because the collection was not set-up for these days or that the date is in the future.

- To remote a date, click it again. Clear all the dates by selecting “Clear All”.



Note: *The graph centers itself on the selected days of data, so the travel time axis may not begin at zero and the time of day axis may not show 24 hours.*

5.2.1 Advanced Search

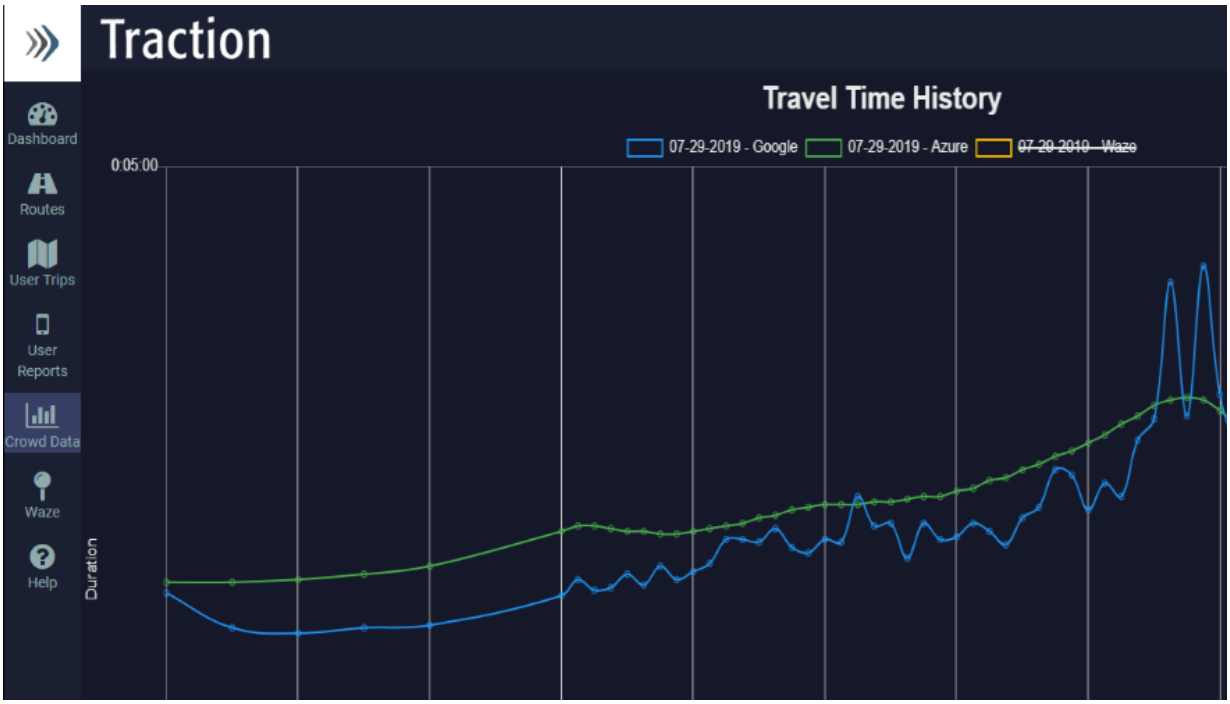
This feature helps to quickly identify days with high travel times, view data over large time periods, or select dates on a specific day of week.

- Within the **Crowd Data** – **Reports** page, click on “Advanced Search”, below the calendar.
- Select a Start Date and an End Date.
- If desired, limit the times of day which will be shown on the graph using the Start Time and End Time.
- Look at the Days of Week boxes and click the boxes to enable or disable days as desired.
- To identify a specific number of days with high travel times, check the box by “[10] days with highest average travel time”, and type in the desired number of days.
  The Start Date, End Date, and Days of Week filters apply to this search.
- To select all dates within the range which go above the user-defined Threshold for the route, check the box for “Only days exceeding travel time Threshold”
  Thresholds are set by each user for each route in the Crowd Data – Configuration page. This search feature is not available if the user does not have a threshold for the current route.
- Click Apply

5.2.2 Toggle Data Sources

The Calendar date picker will select all available data for the dates. For routes which use multiple data sources, this results in multiple graph lines per day. A user can hide specific days and sources

of data by clicking on the label in the legend. The line will disappear from view, and there will be strikethrough in the legend entry.



The legend entry for 7-29-2019 - Waze has strikethrough, meaning that data is available for this route but is hidden from the current view.

5.2.3 Export Data to Excel

After selecting the desired days in the calendar, the data can be exported to excel by clicking the button below the calendar. The resulting file will have the route name and date of export in the file name.

5.3 View Congestion Map Playback

Routes collecting Azure data can indicate where, relative to the user defined route waypoints, delays occur along the route.

- Navigate to the **Crowd Data** tab.
- Select “Reports” for the desired route.
- Click the “View Playback” button
- Select a Start Date and click the triangular Play button below the map.

5.3.1 Interpreting the graphic

Colors A green-yellow-red color coding is used, where green reflects little to no delay, red indicates significantly slower than usual traffic, and yellow is in the middle. Delay is based on the relative increase in travel time, or percent of free flow travel time.

Subsections Delay is evaluated and shown between the user-defined route waypoints. If the route was created with just an origin and a destination, the entire path would always be a single color,

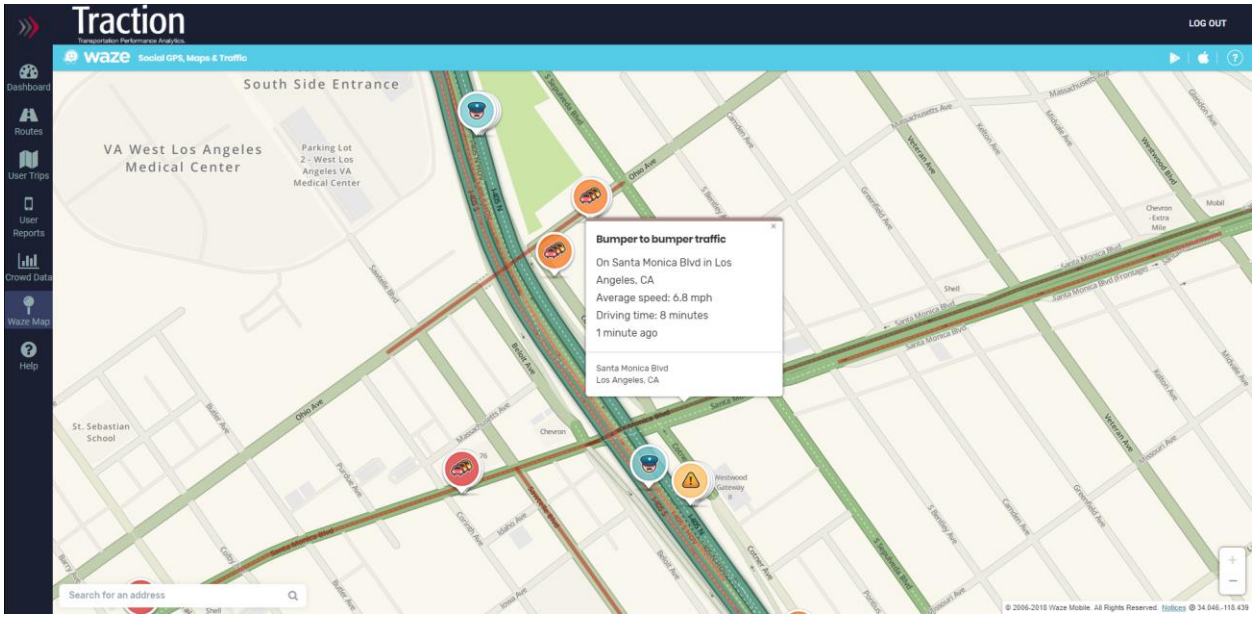
regardless of the length of the route.
The data is saved using then-current waypoints. Changing the route waypoints now will affect future data collection, but it does not impact how historic data is analyzed and displayed.

6 WAZE MAP

Use the Traction website to view an integrated Waze map including details on traffic conditions and incidents. Additional features are available for agencies that are part of the Waze Connected Citizens

6.1 View Traffic Congestion Information

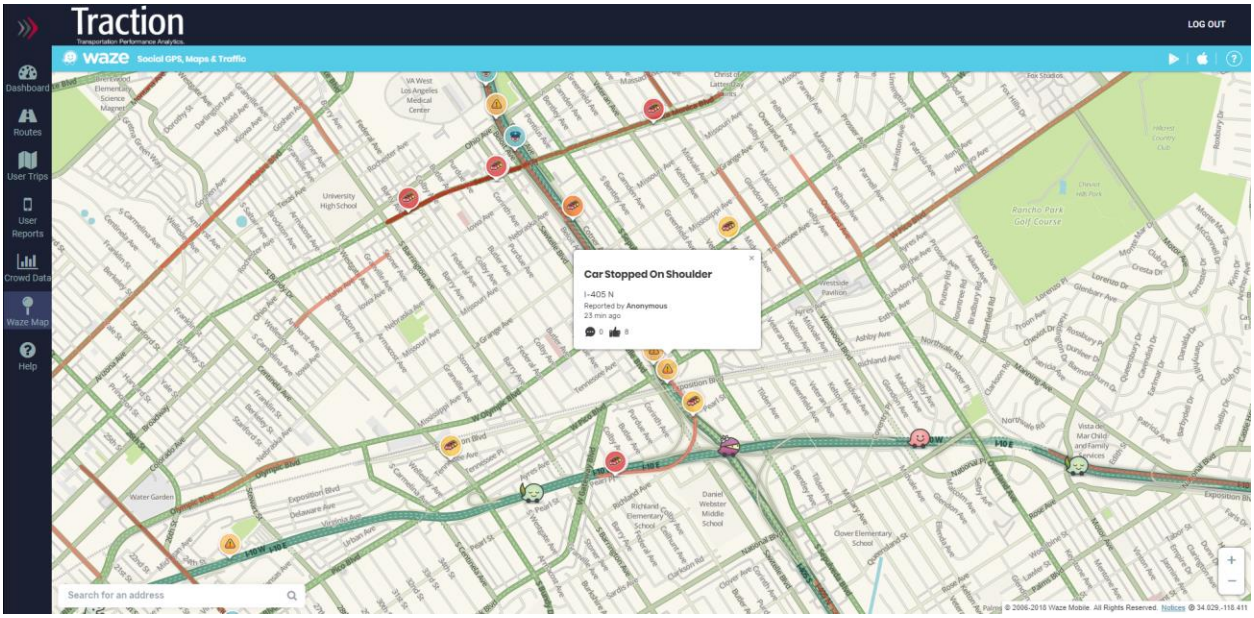
- Navigate to the **Waze Map** tab.
- Zoom and pan to locate colored lines along a roadway.
- Click the line to see additional details including:
    a. Traffic level (light, moderate, heavy, bumper to bumper),
    b. Average speed, and
    c. Driving time.



6.2 View Event Information

- Navigate to the **Waze Map** tab.
- Zoom and pan to locate event icons, such as hazards, accidents, construction, and traffic jams.

- Click the icon to see additional details.

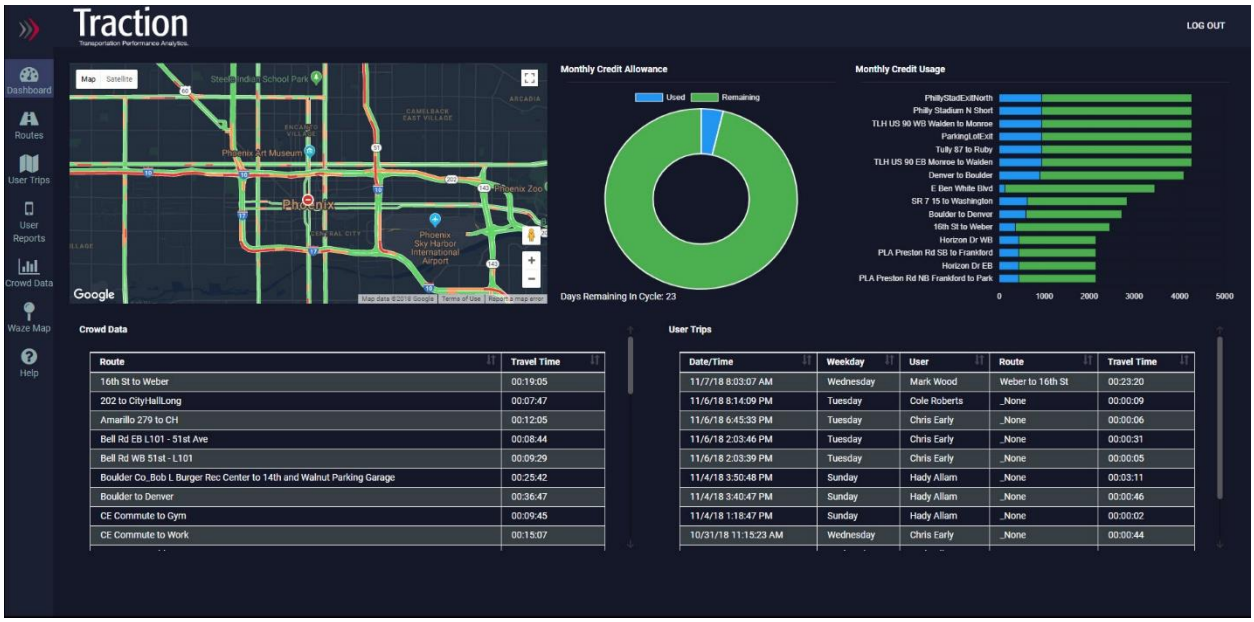


7 DASHBOARD

Use the Traction website dashboard to view overall traffic conditions, travel times, and credit usage metrics. Data on the dashboard is an aggregate of all users within the agency group.

7.1 View Traffic Conditions Map

- Navigate to the **Dashboard** tab.
- View the map at the top left with current traffic conditions. Zoom and pan to locate areas of interest.



7.2 View Monthly Credit Allowance

- Navigate to the **Dashboard** tab.
- Locate the Monthly Credit Allowance donut chart.
- The used and remaining crowd data credits are shown for the current billing cycle.
- Days remaining in the current cycle is shown at the bottom.

7.3 View Monthly Credit Usage

- Navigate to the **Dashboard** tab.
- Locate the Monthly Credit Usage chart.
- Used and remaining crowd data credits are shown by route for the current billing cycle.

7.4 View Crowd Data Information

- Navigate to the **Dashboard** tab.
- Locate the Crowd Data table.
- View recent Crowd Data collected, including the route name and travel time.

7.5 View User Trips Information

- Navigate to the **Dashboard** tab.
- Locate the User Trips table.
- View recent User Trips collected, including the trip date/time, user, route, and travel time.