CodeGREEN

Data Module

User Guide

UF | Transportation Institute | UNIVERSITY of FLORIDA | McTrans

Introduction

This user guide describes both the common and the specific features of the data visualizations so that the traffic engineer can use and manipulate them to achieve the best data representation. The charts provide insights into different aspects of traffic conditions - at the intersection, approach, or phase level. The traffic engineer has the flexibility to review a single metric or a combined dashboard of charts to confirm risks of bottlenecks, patterns, and delays that might call for immediate action. The McTrans CodeGREEN data module enables informed decisions toward improving the safety and the satisfaction of the motorists and pedestrians with their on-the-road experience. Agencies may also use the reports to understand capacity usage and to plan for infrastructure upgrades.

Version 3.2 / March 2025

McTrans Center

University of Florida
PO Box 116585
Gainesville, FL 32611-6585

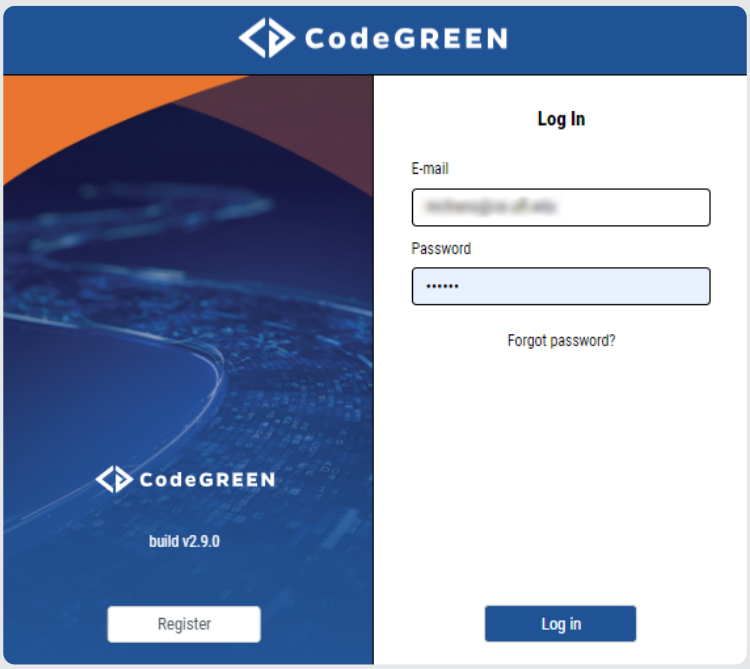
mctrans@ce.ufl.edu
1-800-226-1013
Fax: 352-392-6629

Contents

Chapter 1. Data Module

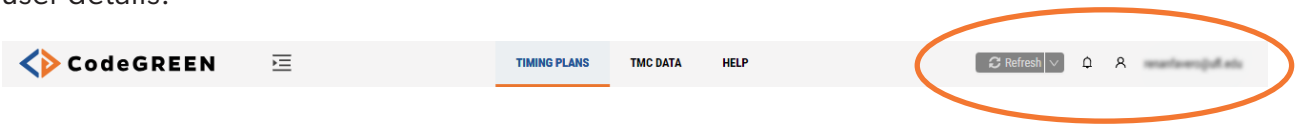
1.1. Logging in

The data module is part of a web-based user interface. Register a new account on the left-hand pane of the home screen. Then, log into the user interface with your email address and password from the right-hand pane of the home screen.



1.2. System Controls

The control panel consists of the the Refresh button, the Notification icon and the user details.



- Clicking the Refresh button will reload the current configuration and settings.
- The Notification list displays alerts, for instances when data is not available or there is an issue with incorrect arterial or intersection setup.
- The user icon shows the identity of the current user and allows them to log out of the system.

1.3. Reporting Chart Basics

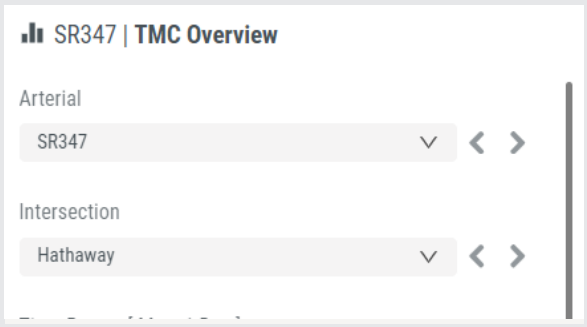
The following parameters are common across all reports:

Time Stamp

The time stamp shows the period under reporting, the resolution – the time periods per which data will be binned and presented e.g., 15 minutes, one hour etc. and level of granularity – phase, approach, direction, intersection.

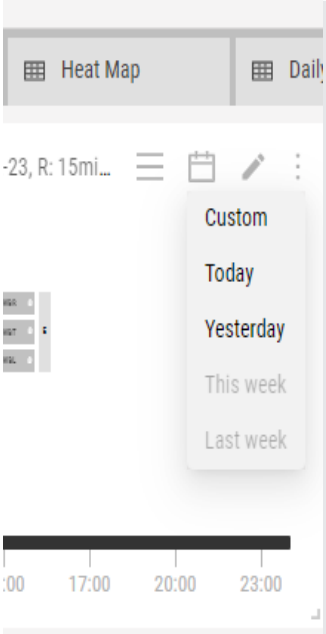
Quick Location Change

You can quickly change the intersection through the menu icon (three horizontal lines) on the control bar in each chart, available in the upper right corner. This will immediately generate an updated chart for the new location.



Predefined Time Ranges

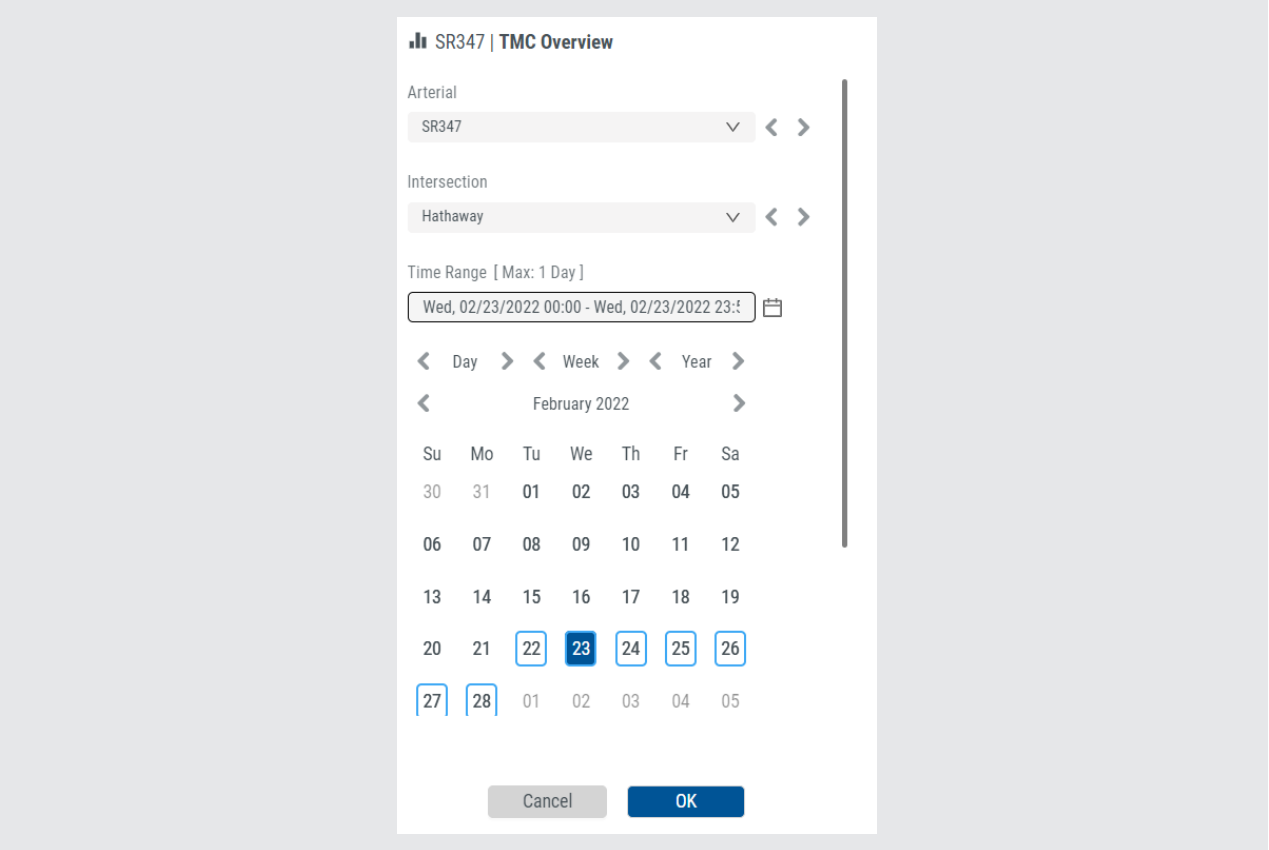
The stats are grouped into different time ranges for flexibility of the analysis. Select from the available options through the calendar (second) icon on the control bar.



- Last Hour – 60 min counted backwards from the current time
- Today – 24-hour period from midnight of the past date through 23:59 of the current day
- Yesterday – self-explanatory
- This Week – Monday – to date
- Last 7 days – counted backwards from today's date
- Last Week – Monday through Sunday of the previous week
- This Month – as of the 1st of the current month to date
- Last Month – the month preceding the current month
- Custom Range – free selection of period e.g., weekend days only

Custom Chart Properties

You can select or modify the time range as well as many other properties of the given chart from the Edit (Pen) icon



.

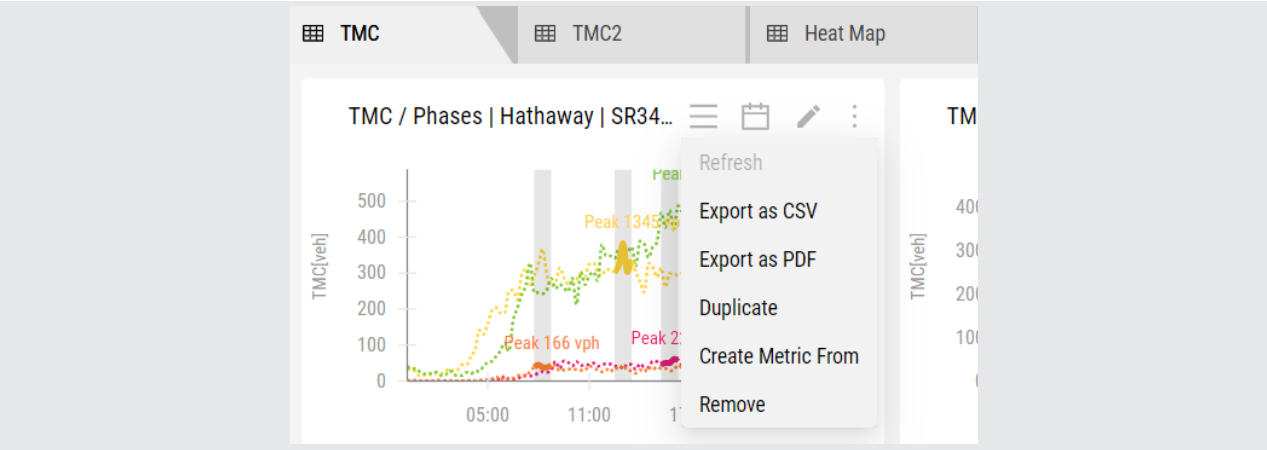
The pane that opens allows the user to change:

- Arterial and Intersection
- Time Range
- Chart data for different approaches or directions (if available for that chart)
- Data Resolution

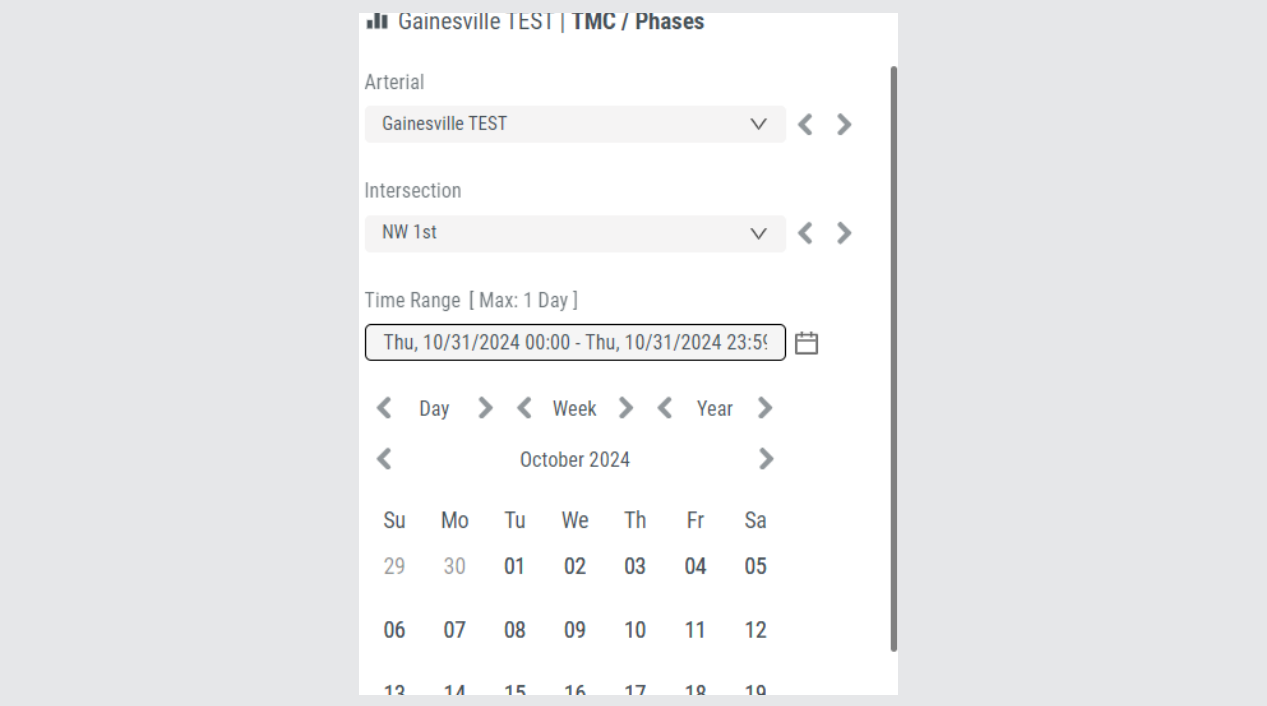
Example: On the previous screenshot, we would like to generate an Average Delay report for the period of February 22th through 28th, 2022 for the Eastbound approach of the intersection at Arterial SR 347.

Additional Viewing Features

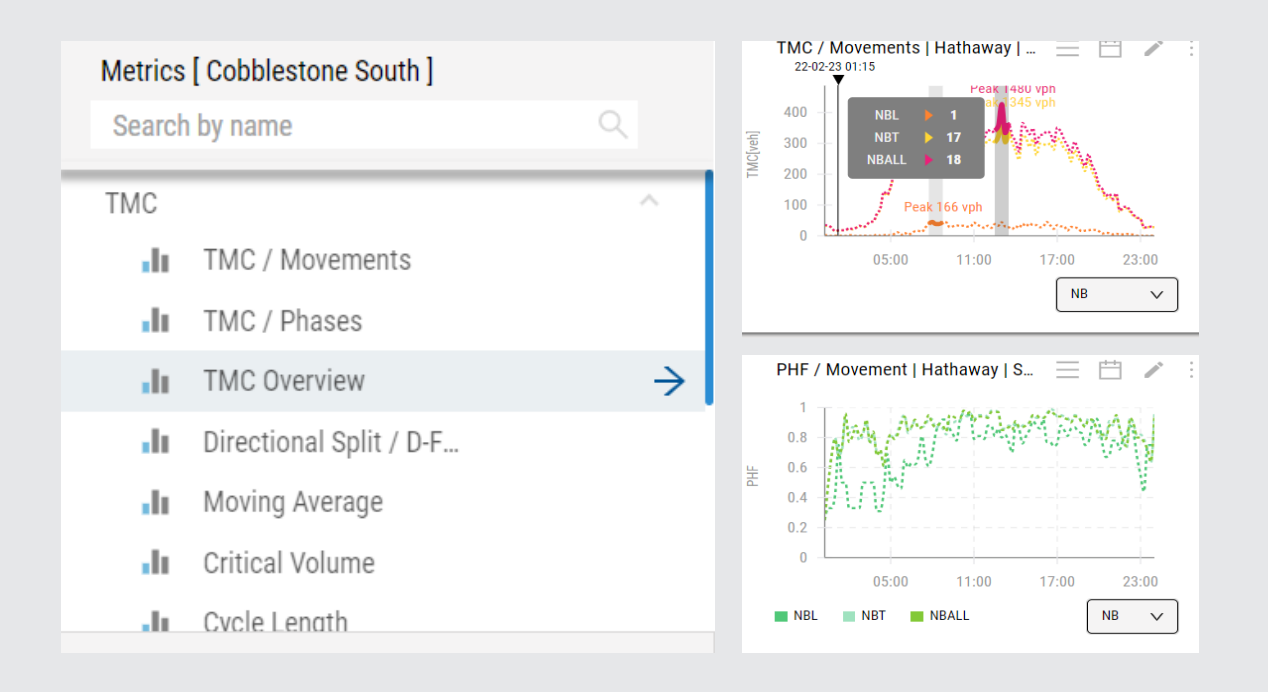
The additional features menu (three vertical dots) allows the following additional actions:



- Export as PDF – exports the respective chart into a PDF file
- Export as CSV - exports the current chart data as a .csv file.
- Duplicate – creates a copy of the chart to quickly change the intersection and timing details. This way you can observe the same metric across multiple intersections.



- Create Metric From – creates a chart, based on a selected metric. For instance, it is possible to create a Volume per Approach chart which will inherit all of the settings of the PHF per Phase chart, including location, time range, resolution etc. It is possible to create multiple charts without the needs to configure their individual settings.



- Remove – removes the chart from the dashboard.

Comprehensive Dashboard

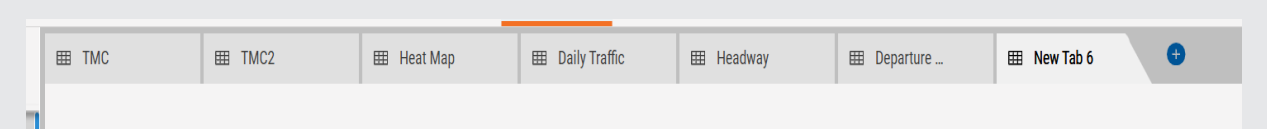
The interface allows arranging of multiple reports or different chart types on the screen for simultaneous viewing and comparing data, trends, patterns, etc.

TIP: *You can duplicate a chart and quickly change the intersection details, as explained earlier, in order to view and keep track of all intersections on the same dashboard. This way you can monitor the progression through the entire arterial.*

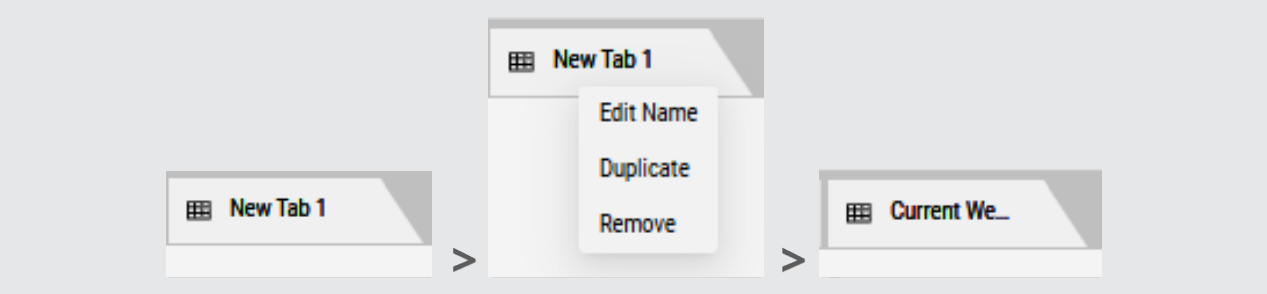
Chapter 2. TMC Data Tab

2.1. Accessing TMC and Derivative Metrics

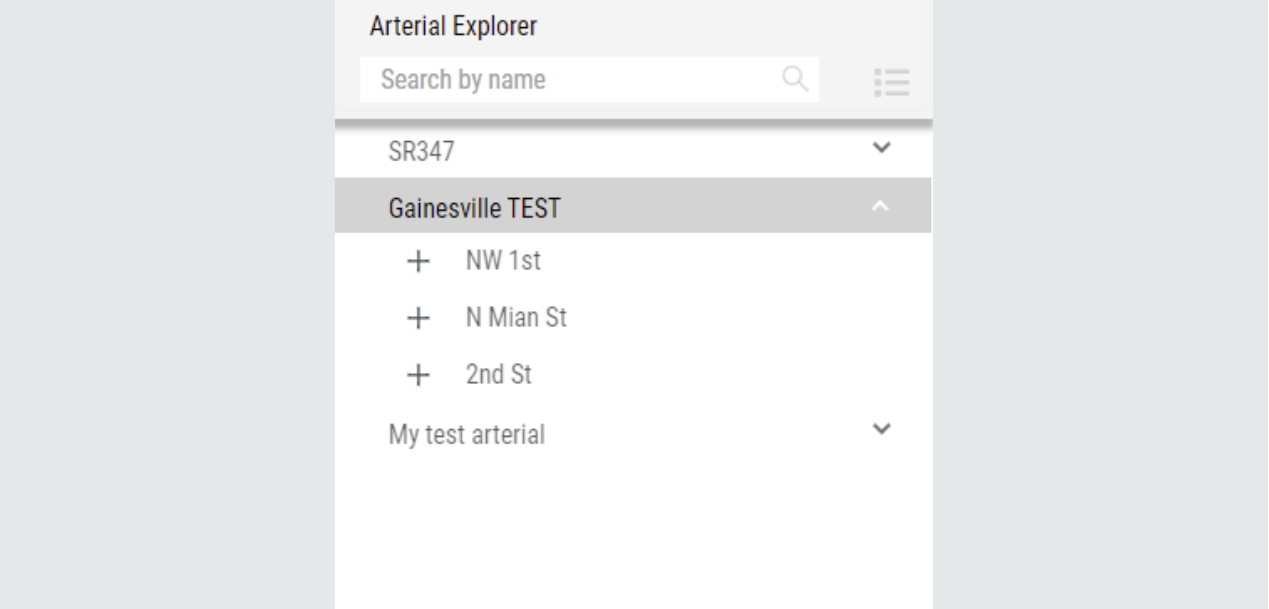
The TMC Data tab can be found on the top menu bar of the Home screen on the right of the ATSPM Data tab.



1. Click on the **"+"** button to open a new tab, and then click on Edit from the context menu (vertical dots) and give it a name e.g., Current Week.

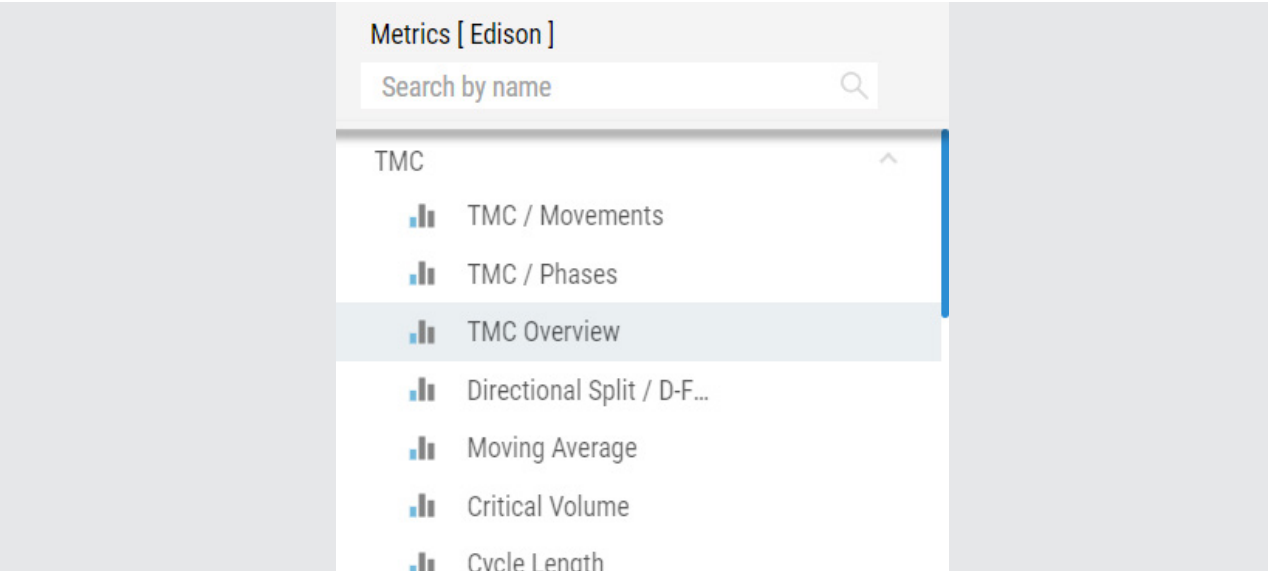


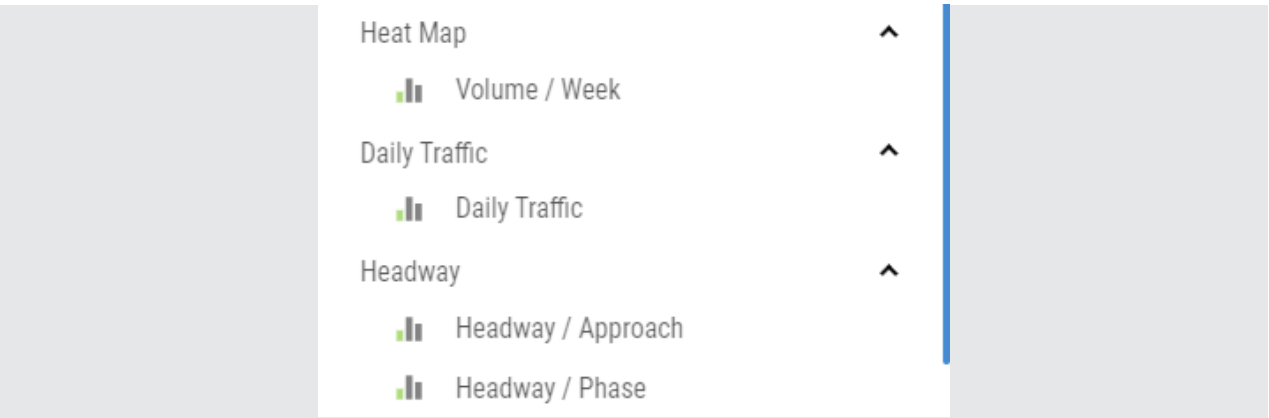
2. Select the intersection for which you would like to get statistics under Arterial Explorer e.g., Arterial Name: **SR347** and Intersection Name: NW 1 st. Expand first the Arterial to see the list of its intersections.



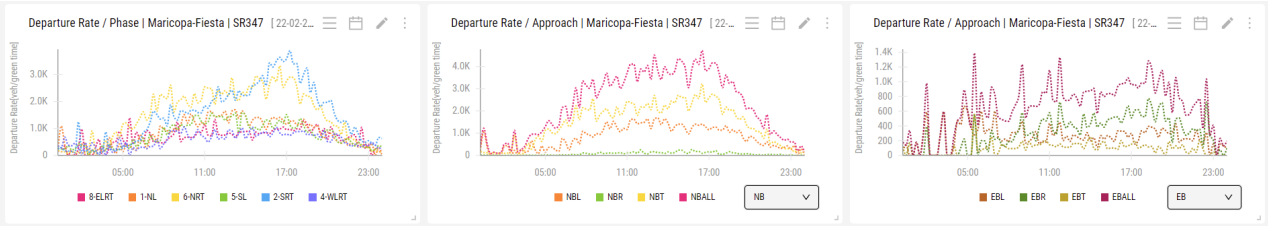
3. Click on the intersection name of your choice for bespoke calculation of statistics. This will open the list of available reports. Expand each section to see the charts pertinent to that line of analysis.

4. Clicking on the name of a report will visualize it on the screen.





5. Arrange the charts per your preference – side by side, one above the other, or in different viewing patterns. You can resize them by dragging the corners in or out of a chart.



2.2. Turning Movement Count Reports

Turning Movement Counts (TMC) is a count of the vehicles registered on a particular approach of the intersection. Each approach at the intersection will get its own calculation.

2.2.1. TMC / Movements

This chart presents a time series of vehicular TMC by movement (left, through and right).

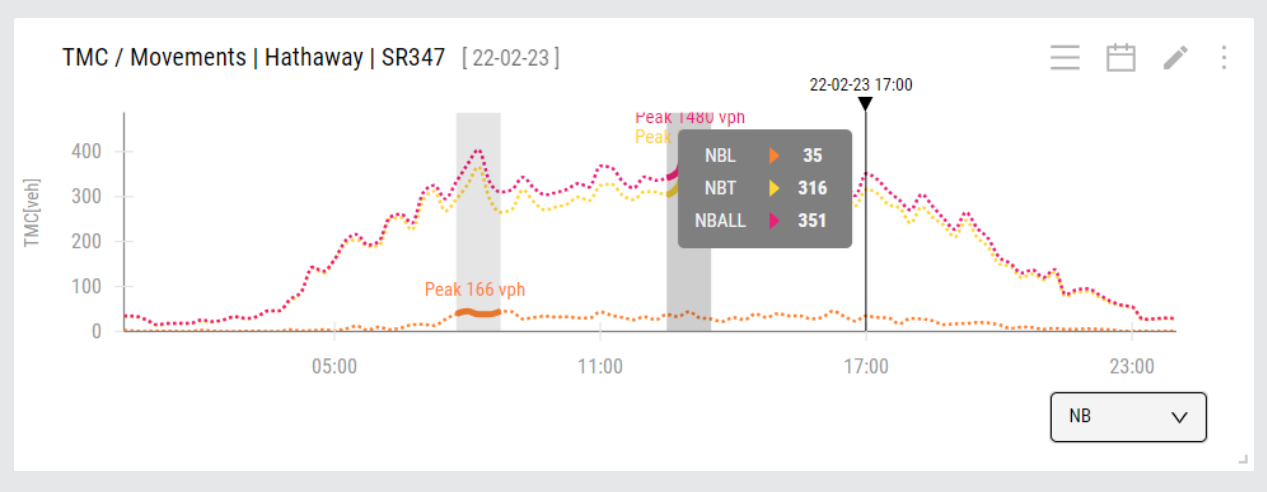
- X-axis – Time period
- Y-axis – Turning movement counts total
- Settings:

» Single movement: L, T, or R can be observed for the selected approach.

» ALL: Total for the intersection - L, T, and R summed together for all approaches.

» The peak volume for the selected period is highlighted with an explicit value (the largest 1-hour sum of counts in the dataset).

» Max range: 1 day.



2.2.2. TMC / Phase

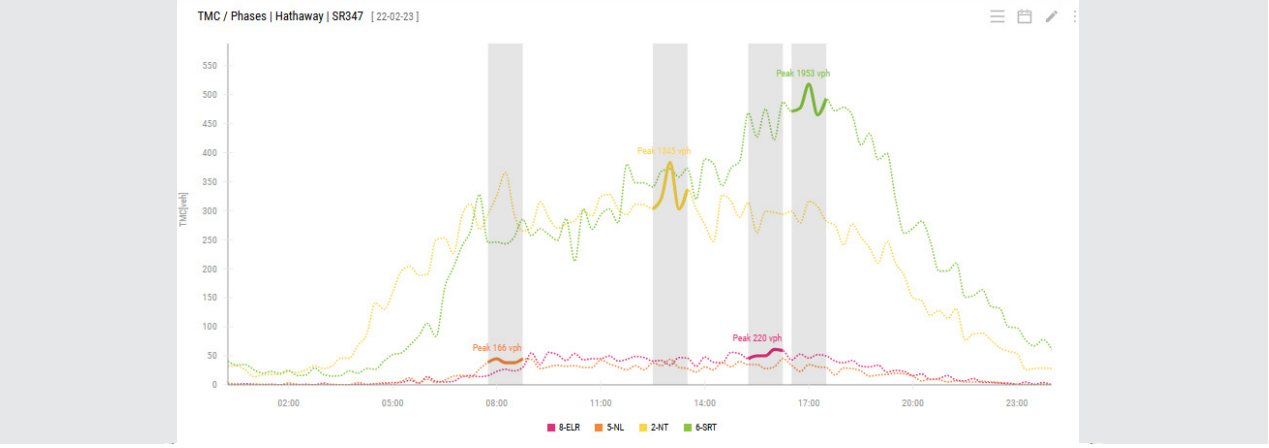
This chart depicts TMC total by phase.

- X-axis – Time period
- Y-axis – Turning movement counts summed up for the phase
- Settings:

» Single phase for the selected direction can be observed.

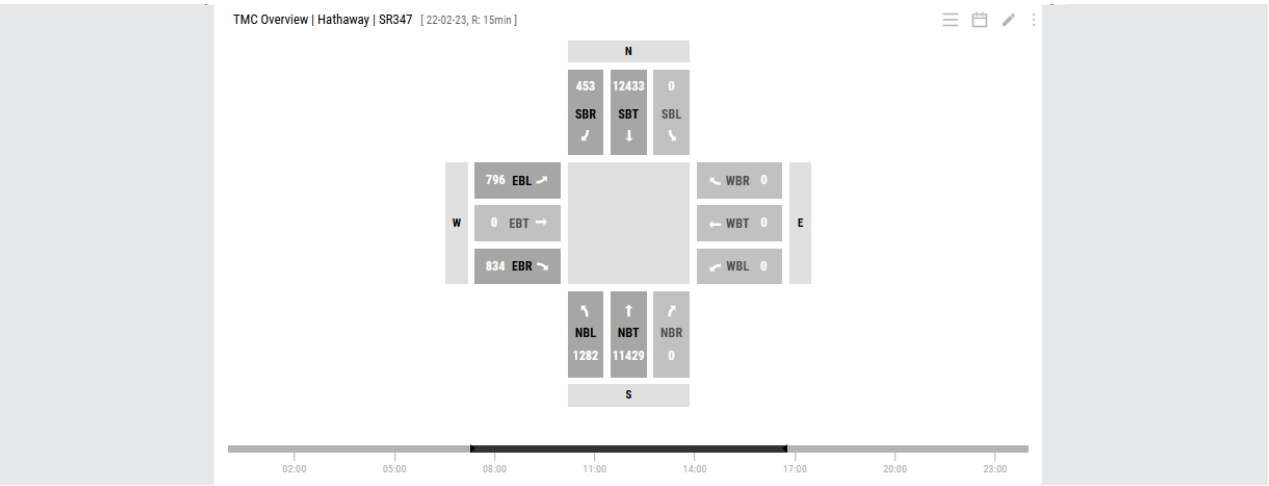
» The peak volume for the selected period is highlighted with an explicit value (the largest 1-hour sum of counts in the dataset).

» Max range: 1 day.



2.2.3. TMC Overview

This is an overhead four-approach view of vehicle TMC data counts. Data is collected from each movement on a specific approach. One movement may comprise more than one lane.



- Lanes are represented by structural blocks within the approach.
- The time bar at the bottom indicates the reporting period.
- The time bar allows manual sliding through the time axis to review different segments of the reporting period.

- The default resolution can be adjusted by dragging the points of the slider in or out.

2.2.4. TMC Moving Average

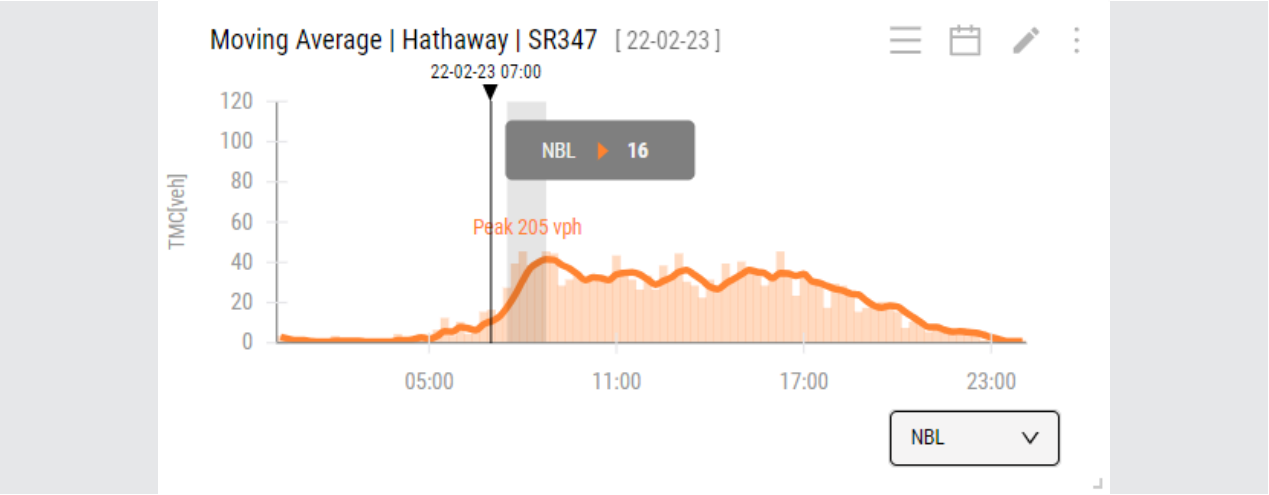
The chart shows a graph of moving averages for the selected time window plotted as a line. It is calculated in vehicles per hour. We use a simple moving average calculation which is the unweighted mean of the previous date points. The user can select the data resolution (15 min., 30 min., 1 hour) and the moving average Window in Hours (1-24).

- X-axis – Time period
- Y-axis – Vehicle count averaged for the time window
- Settings:

» The approach can be selected from the drop-down list in the lower right corner.

» The peak volume is highlighted with a numeric value tag.

» Max range: 10 years.



2.2.5. Directional Split

Directional Split is a factor used to analyze roadway capacity*. It is the ratio of one-directional volume to the sum of all directions, expressed as a percentage. Two key

parameters are plotted over the main graph with explicit visualization of the peak hourly values:

D-factor

D-factor is the ratio between the peak hour traffic volume for the direction (North or South) and the total traffic volume for both directions in that peak hour. The peak hour D factor is calculated for each direction for the peak hour by dividing the peak hour directional volume by the total bi-direction peak hour volume.

K-factor

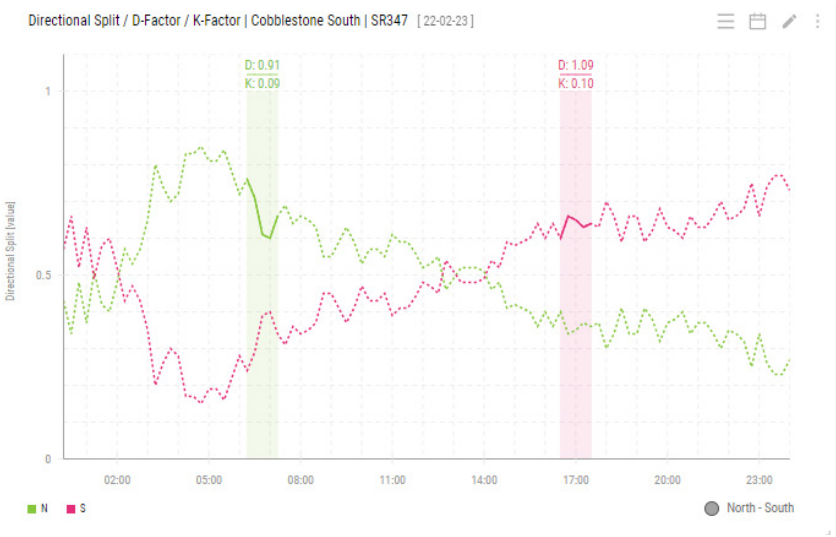
It is a daily measurement, denoting the ratio of the peak hour volume to the total traffic for the day. It is non-applicable if the analysis period is shorter or longer than 24 hours**.

The K-factor is calculated for each direction as the ratio of the Peak Hour Volume for the direction (South or North) plus the Hourly Volume for the other direction, to the total 24-hour sum volume for both directions.

*FHWA pocket guide, p. 37:

fhwa.dot.gov/policyinformation/pubs/pl18027_traffic_data_pocket_guide.pdf

**ATSPM Component Details, Atkins for GDOT, A.11., p.54:
https://udottraffic.utah.gov/ATSPM/Images/ATSPM_Component_Details_20200120.pdf

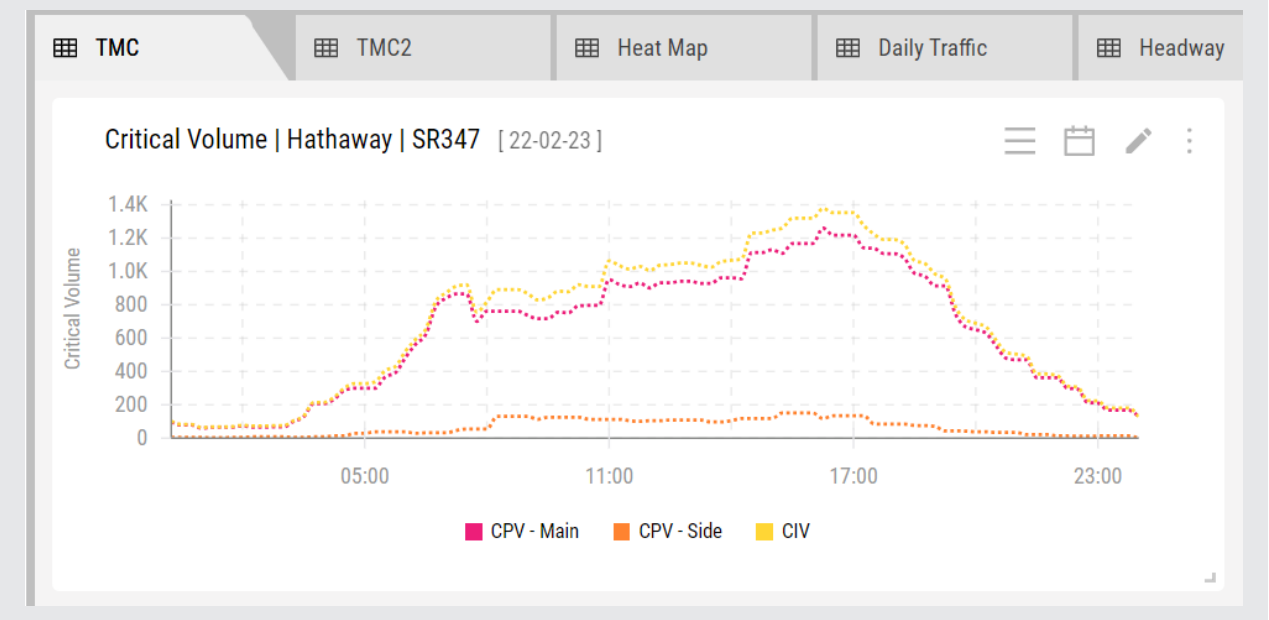


2.2.6. Critical Volume

This chart provides data statistics per phase. It depicts three graphs: the Critical Volume for the Mainline phases, the Side-street Phases and the total/sum CIV (Critical Intersection Volume). The Critical Lane Volume is first computed, and then the Critical Phase Volume for the Main and Side streets is computed.

» **Critical Volume** - A volume which produces the greatest utilization of capacity for the street or lane in question, given either in passenger cars or mixed vehicles, per hour per lane.

» **Critical Movement or Lane** - The lane or movement for each phase, depending on how you choose to subdivide you intersection that requires the biggest amount of green time.



- X-axis – Time period
- Y-axis – Critical Volume
- Settings: The default resolution is 15-minute data bins but can be changed to show data in 1-hour segments.

The data comprises mixed vehicle classes, except for bicycles. You can view any graph separately by disabling the others from the checkboxes at the bottom.

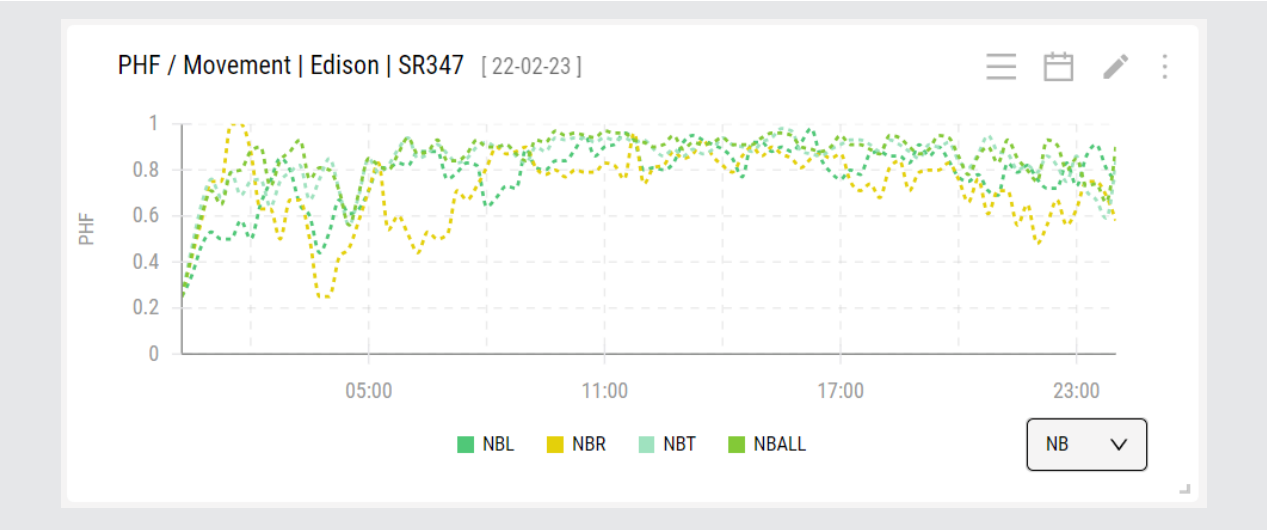
2.3. PHF

The Peak Hour Factor describes the relationship between full hourly volume and the peak 15-min flow rate within the same hour. Computations are distributed in 15-minute bins because that is considered the minimum time over which traffic flow is statistically stable.

2.3.1. PHF / Movement

This chart is based on the peak hour volume (largest 1-hour sum of vehicles in the dataset) per movement. When sliding your mouse through the graph, it pinpoints data in

15-minute intervals.



- X-axis – Time period
- Y-axis – PHF values for each movement
- Settings: Direction can be selected from the drop-down list in the lower right corner.

» Movements can be selected/deselected.

» ALL is the PHF for the sum of all movements.

» Max range: 20 days.

2.3.2. PHF / Phase

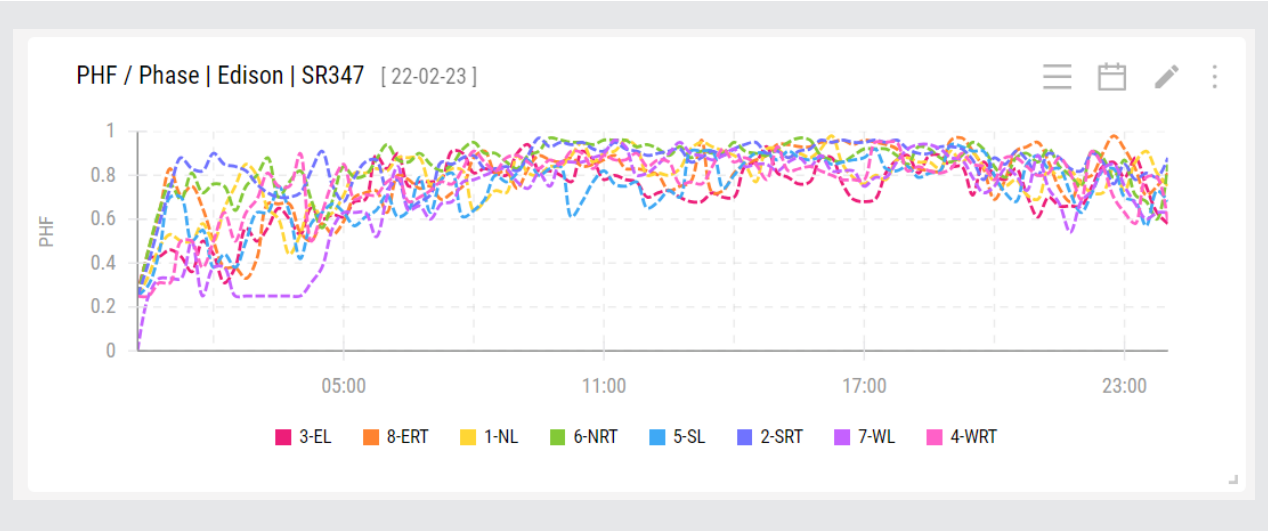
This chart is based on the peak hour volume (largest 1-hour sum of vehicles in the dataset) per phase.

- X-axis – Time period
- Y-axis – PHF values for each phase
- Settings:

» Phases can be selected/deselected.

» The phase naming follows this convention: Phase Name-ApproachMovements. For instance: 2-NBLTR, 4-EBTR etc.

» Max range: 20 days.



2.4. Heat Map

2.4.1. Heat Map of Volume / Week

This report is a table where lower and higher values have their cells colored according to which end of the spectrum they are on. In this case, lower values are green and higher values are red. If your value is close to the middle, then it will be visualized in a gradient of red and green, where each cell is colored according to the computed total volume per week. You can set the lower and upper thresholds.

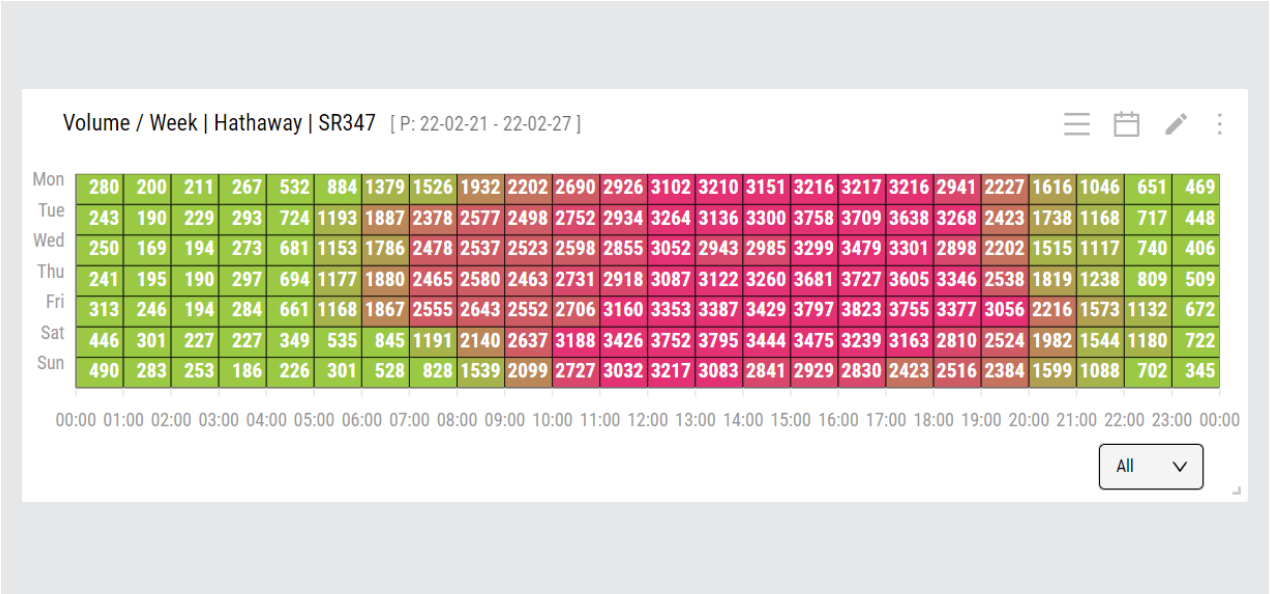
- X-axis is the hour in the day
- Y-Axis is the day of the week.
- Settings:

» Data is computed and displayed for each day of the week.

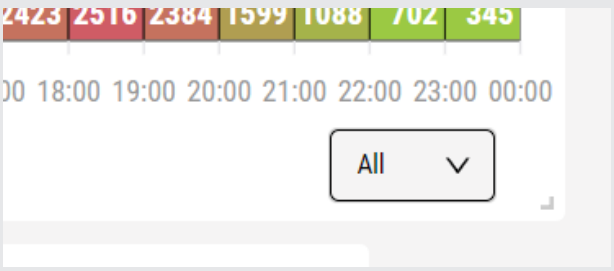
» You can assign thresholds and colors in the Threshold pane.

» The gradient produced in each cell is assigned from a range between the minimum and the maximum value.

» Min range: 7 days; Max range: 20 days.

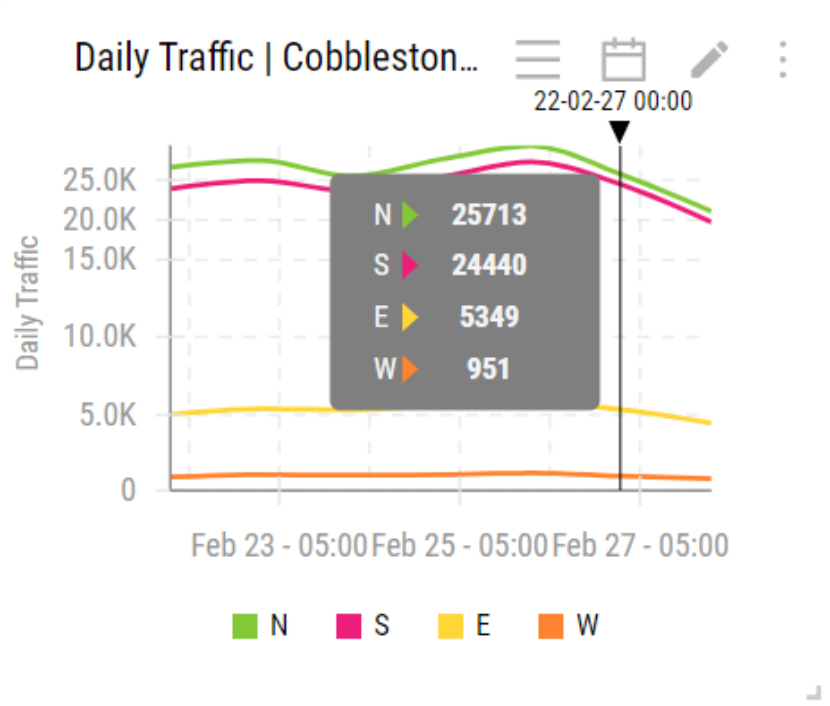


You can switch between data per approach and per phase from the pop-up menu in the lower right corner.



2.5. Daily Traffic

This chart depicts the daily sum of vehicles on the movements that feed the directions e.g., North is the sum of NL, EL, WR and SU; East = ET, SL, NR, WU; South = ST, WL, ER, NU; West = WT, NL, SR, EU.



- X-axis – Time period
- Y-axis – Daily traffic volume
- Settings:
  - » The default resolution is one day, and the stats are binned into 12-hour intervals.
  - » Directions can be selected and deselected.
  - » Max range: 20 days.

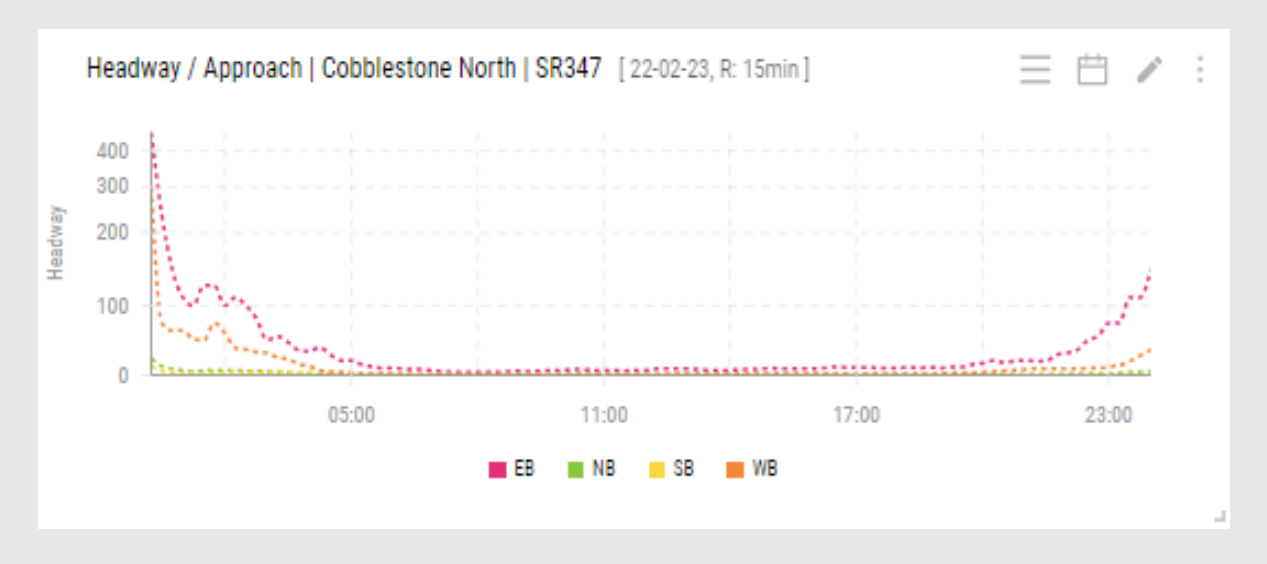
2.6. Headway

Headway is the time difference between successive vehicles as they pass a point on a roadway, measured from the same point on each vehicle e.g., bumper to bumper. It is a key parameter in determining macroscopic traffic parameters like flow rate and average speed of the traffic stream.

2.6.1. Headway/Approach

The report presents the headway per approach, calculated as an aggregate sum of all time differences on an approach. When hovering over the graph, the values are changing at 15-min intervals.

- X-axis – Time period
- Y-axis – Headway in seconds
- Settings:
  - » Approaches can be selected and deselected.
  - » Max range: 1 day.



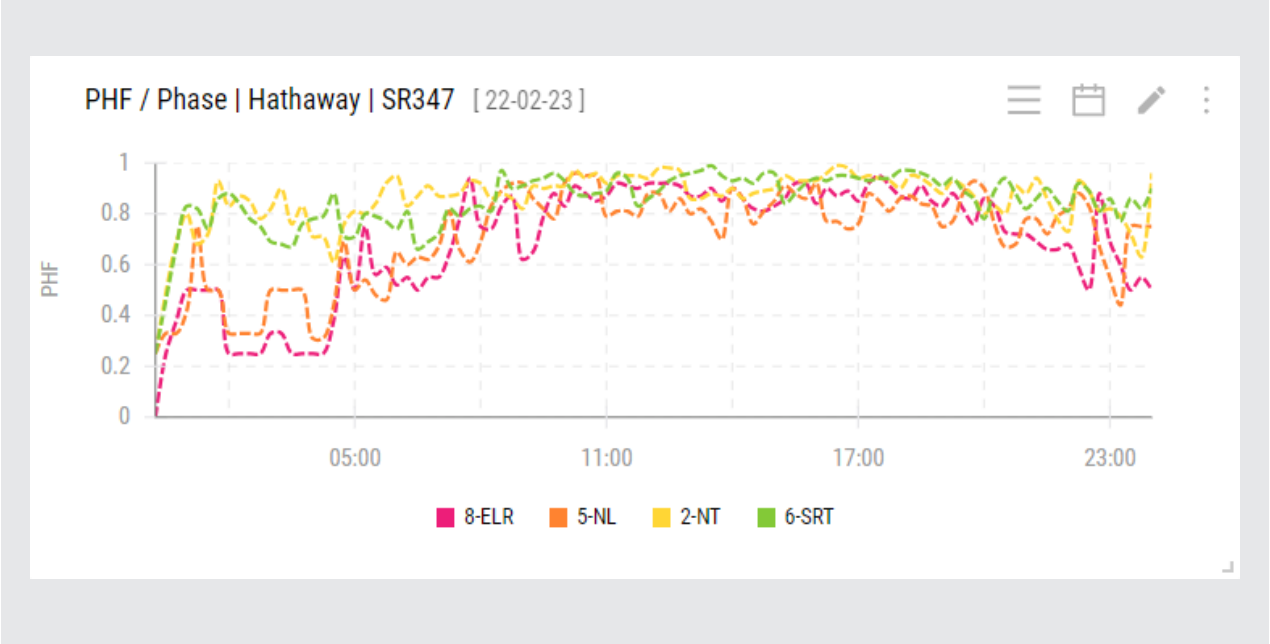
2.6.2. Headway/Phase

This report presents the headway per phase, calculated as an aggregate sum of all time differences on a single phase. When hovering over the graph, the values are changing at 15-min intervals.

- X-axis – Time period
- Y-axis – Headway in seconds
- Settings:

» Phases can be selected and deselected.

» Max range: 1 day.



We trust that the information here is helpful. If you have any further questions or require further support please don't hesitate to reach out to us at:

mctrans@ce.ufl.edu

1.800.226.1013

mctrans.ce.ufl.edu/contact