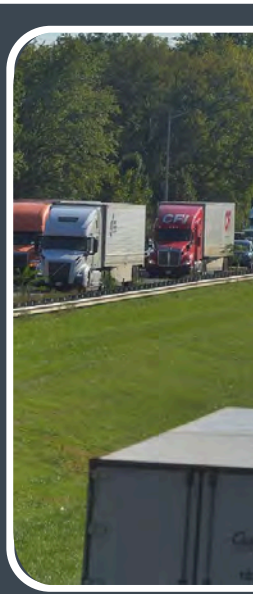
HEPMPO CONGESTION MANAGEMENT PROCESS



May 2024
Draft for Public Review

Hagerstown Eastern Panhandle MPO

Michael Baker INTERNATIONAL

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Acknowledgements

The Hagerstown/Eastern Panhandle Metropolitan Planning Organization (HEPMPO) would like to thank the Stakeholder Advisory Committee (SAC) for its valuable contributions throughout the planning process.

- City of Charles Town
- City of Hagerstown
- City of Martinsburg
- Berkeley County Development Authority
- Eastern Panhandle Transit Authority
- Federal Highway Administration (FHWA)
- Greater Hagerstown Committee
- Maryland Department of Transportation State Highway Administration (MDOT SHA)
- River Riders
- Washington County Division of Engineering
- Washington County Transit
- West Virginia Division of Highways (WVDOH)

PURPOSE AND ROLE OF THE CMP

A Congestion Management Process (CMP) provides the Hagerstown / Eastern Panhandle Metropolitan Planning Organization (HEPMPO) with a framework to evaluate and monitor traffic congestion within the region. It also assists HEPMPO in the identification and prioritization of transportation strategies that focus on congestion and travel reliability.

While CMPs are mandatory in metropolitan areas with populations exceeding 200,000 (known as Transportation Management Areas or TMAs), the region's largest metropolitan area encompassing the cities of Hagerstown, MD, and Martinsburg, WV, falls just below this threshold. Consequently, the area is not designated as a TMA and thus does not necessitate a CMP. However, it does provide reliable information on the transportation system's performance and evaluates alternative approaches for congestion management.

The HEPMPO has developed this CMP to enhance the planning process and provide essential insights for the Long-Range Transportation Plan (LRTP), Transportation Improvement Program (TIP), and other regional operational studies. HEPMPO aims to update the CMP on a regular basis in coordination with the LRTP, drawing from the Federal Highway Administration (FHWA) CMP Guidebook, national best practices, and emerging data sources.

This document offers a technical summary of developing the 2024 CMP, supported by a public survey, GIS mapping files, electronic databases, and collaborative efforts with key partners and stakeholders in the region.

PROCESS STEPS

The CMP has been developed through a series of steps that include stakeholder coordination, public outreach, data analysis, and location prioritization. The CMP sets the stage for future activities to further evaluate priority corridors, the identification and programming of congestion reduction projects, and the evaluation of completed congestion-focused projects.

STAKEHOLDER COMMITTEE

The Stakeholder Advisory Committee has supported the HEPMPO in defining key objectives of the CMP, informing the identification of congestion locations and issues, and reviewing key materials and deliverables including the public survey and priority location mapping. The committee included local, regional and state representatives from the agencies shown in Figure 1.

Figure 1: Stakeholder Advisory Committee Members

KEY COMPONENTS OF CMP ANALYSIS PROCESS

A CMP typically aims to address the key components provided in Figure 2. This 2024 CMP focused on several of these components to set the stage for future corridor evaluations and studies.

Figure 2: Key Components of a CMP

The key focus areas included:

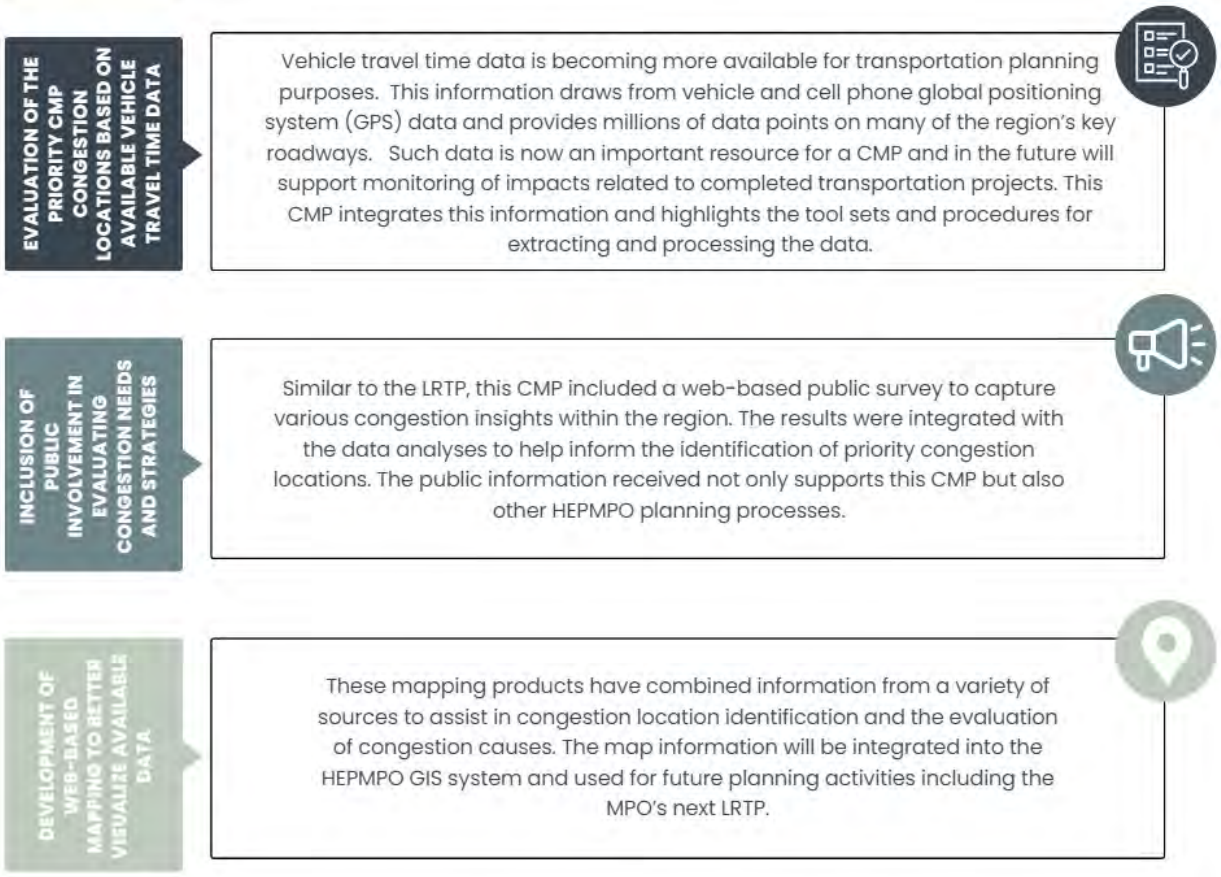


Figure 3: CMP Key Focus Areas

The CMP is an evolving process and future updates will continue to focus on the above items as well as methods and procedures to better assess potential strategies. Strategy assessments will require continued coordination with local and state partners including DOT's District offices.

PUBLIC CONGESTION SURVEY

This CMP has included public outreach to capture insights on regional congestion needs and priority locations. The public outreach utilized a web-based survey using the MetroQuest software platform. The survey aimed to gather information from the public about what they believe are the causes of congestion, strategies to mitigate it, and locations in need of improvement. The survey included an interactive map that allowed participants to provide

comments at any location within the region. This map information played an important role in defining the CMP priority congestion locations.

The survey was conducted in coordination with a regional roadway safety survey. The survey, open from November 15, 2023, to December 15, 2023, garnered insights from 574 participants (Figure 4). Key survey topic areas related to the CMP included the following question topic areas.

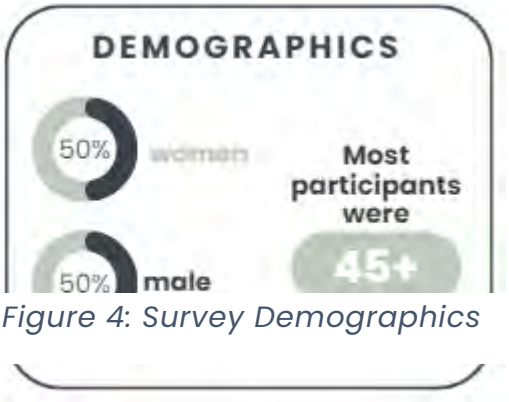


Figure 4: Survey Demographics

COMMUTE / TRAFFIC

Participants were asked questions regarding travel and commuting. 66% of participants said they experience significant delays at least once a week, and nearly 40% of participants almost always check traffic before leaving. Figure 5 represents ways participants have changed their plans due to congestion in the area.

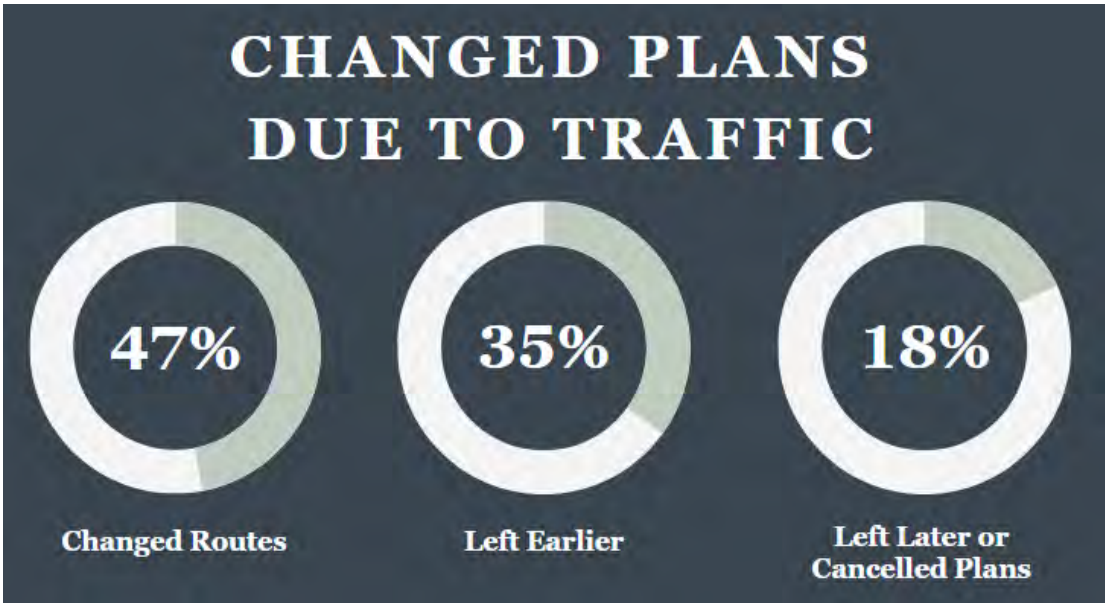


Figure 5: How traffic impacts plans

CONGESTION LOCATION MAPPING AND COMMENTS

The survey allowed participants to drop pins on a map to locate high congestion areas. There were 696 pins and 299 congestion related comments provided in the survey. The congestion pin also asked the participant about the time of day that congestion was experienced (Figure 6). Figure 7 provides a map highlighting the location of congestion comments within the region. In addition to the congestion locations, participants highlighted items related to congestion causes and potential strategies. Some of the most comment responses are summarized in Figure 8.

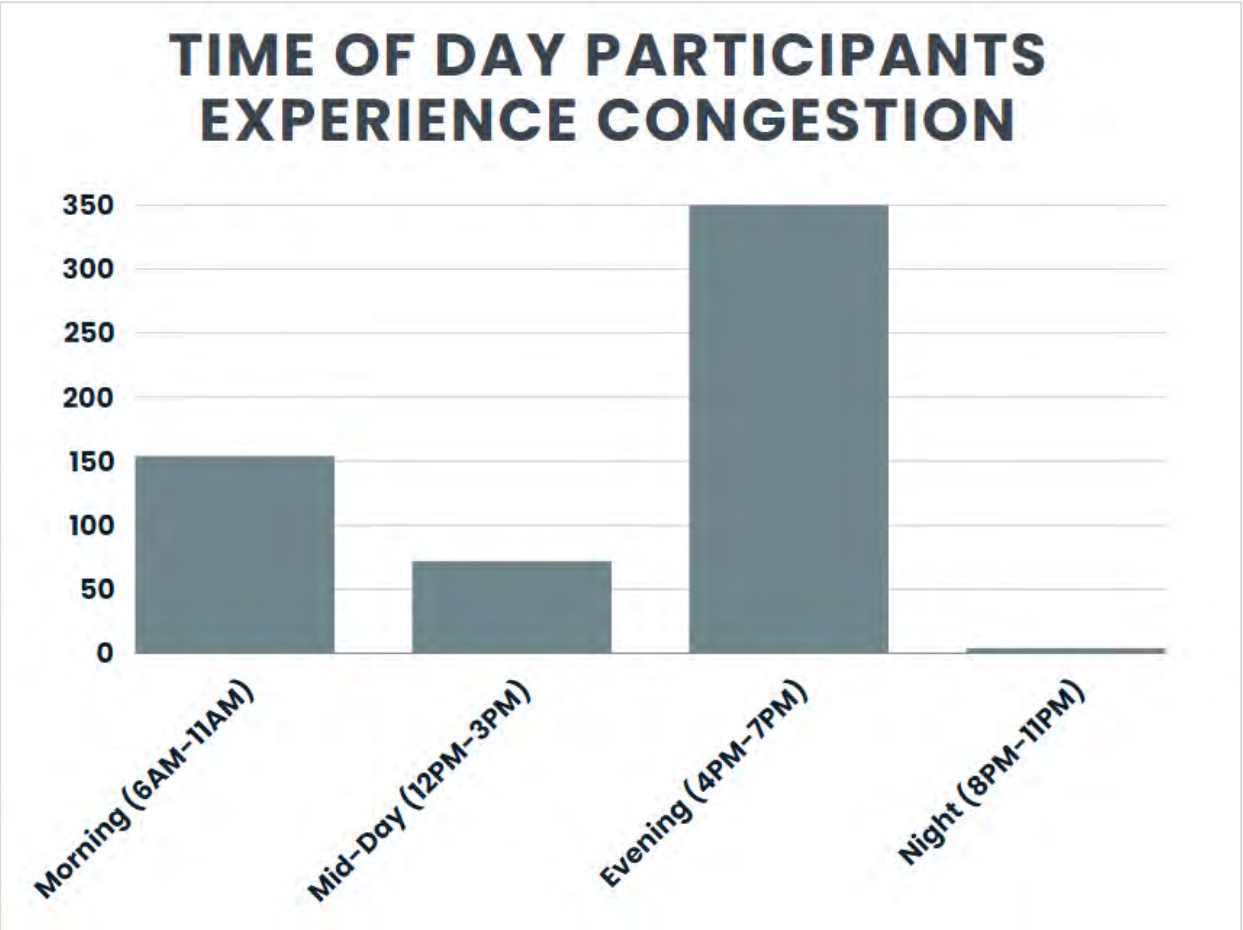


Figure 6: Congested times related to map markers

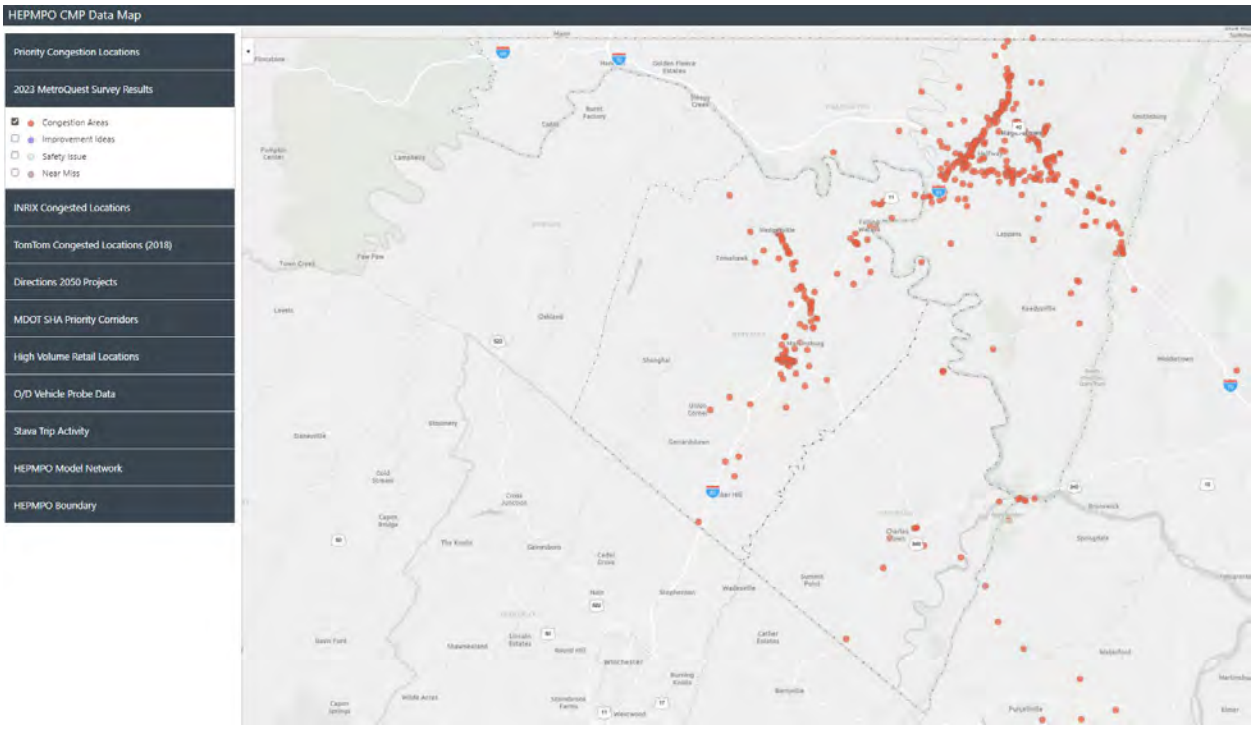


Figure 7: Congestion Pins

Figure 8: Congestion-related comments

DATA AND TOOLS FOR CONGESTION ASSESSMENT

Developing performance measures is a critical element of the CMP. Performance measures assist in identifying problem areas and communicating this information to the public and decision-makers. At the regional level, performance measures can be used to monitor congestion trends and track progress toward the achievement of objectives. At the roadway level, performance measures are used to identify locations experiencing congestion problems. They also are used to support the assessment and selection of congestion mitigation strategies and evaluation of completed projects.

SOURCES OF TRAVEL TIME DATA

This CMP integrates travel time data from cellular and vehicle GPS devices through several available web-based software platforms. The data for Washington County, Maryland was obtained using the Regional Integrated Transportation Information System (RITIS) available through the Maryland Department of Transportation (MDOT). Data for both Berkeley and Jefferson counties in West Virginia was obtained separately by HEPMPO through the purchase of a subscription to the INRIX IQ platform. In addition, a separate data system called Replica HQ was used to supplement those listed above. Each of these platforms is discussed in more detail below.

REGIONAL INTEGRATED TRANSPORTATION INFORMATION SYSTEM (RITIS)

RITIS is a platform developed and maintained by the University of Maryland CATT Lab and is used by transportation agencies across the country (Figure 9). RITIS provides access to the travel times for every hour and day on many of the primary roads in Washington County. In RITIS, travel time data is available from the INRIX provider at several different roadway segment aggregations (referred to as the "TMC" and "XD" segment levels). RITIS also provides access to the National Performance Management Research Data Set (NPMRDS) that is

maintained by the Federal Highway Administration (FHWA). This is a free-access national database of travel time data that is used to calculate the national travel time reliability metrics. The NPMRDS data is only available for the National Highway System (NHS) and has much less roadway coverage than the INRIX XD and TMC data. Access accounts to RITIS were obtained through existing contracts with MDOT and coordinated with the University of Maryland CATT Lab team.

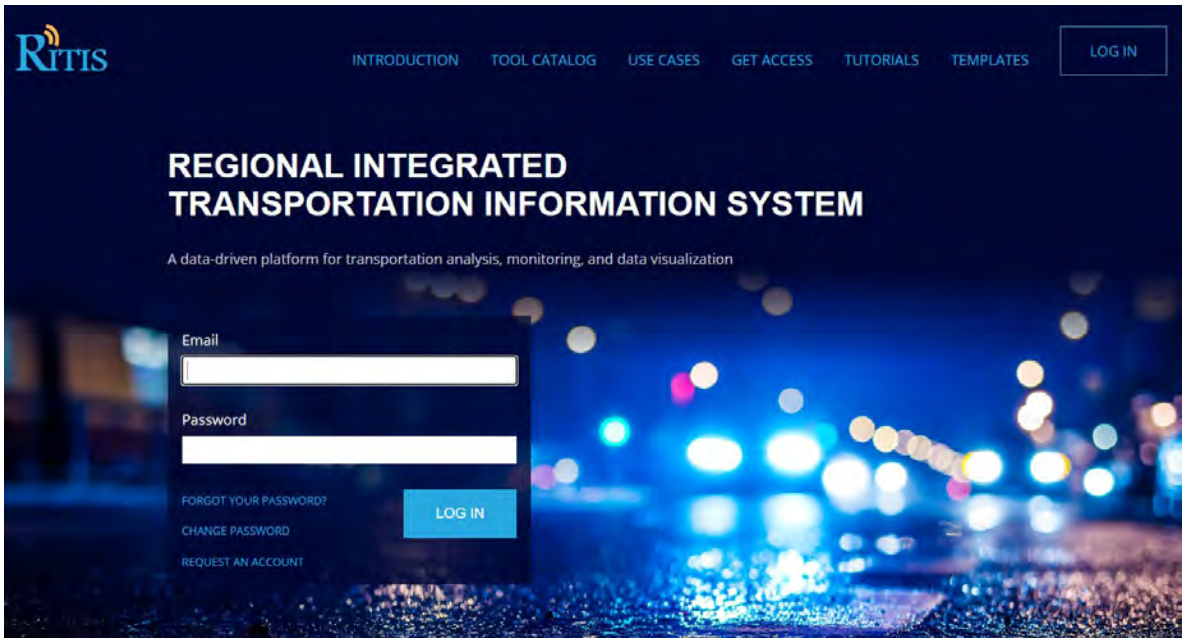


Figure 9: RITIS platform login screen

The platform provides a diverse set of analytical tools including the Probe Data Analytics (PDA Suite), which provides congestion and performance reports using common travel time metrics like Travel Time Index (TTI), Planning Time Index (PTI), travel delay. The reports also provide insights on the causes of congestion, based on innovative new data integration methods that bring together crash, signal, and other incident information. The array of PDA tools is highlighted in Figure 10. Those tools outlined in red are ones that played an integral role in developing the HEPMPO CMP.

RITIS also provides access to a Signal Analytics tool that provides signal timing data for intersections as well as vehicle counts along each movement for every intersection (Figure 11). It is a relatively new feature within the RITIS platform, and signal timing data have been aggregated based on availability for this CMP. However, future CMP enhancements may make use of other available tools.

Figure 10: PDA Suite Tools

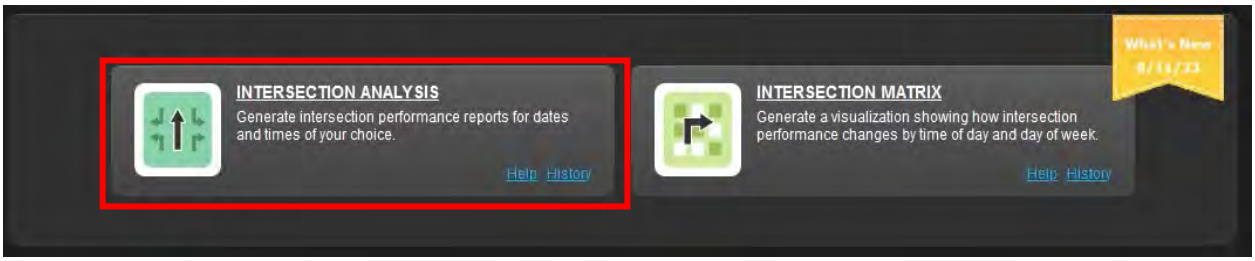


Figure 11: Signal Analytics Tools

The key tools used for this CMP for Washington County include:

- Trend Map: To calculate and extract segment hourly travel time data in the form of a travel time index (TTI). This measure was used to help identify congestion locations throughout the region.
- Congestion Scan: To generate a visual of congestion for every priority congestion location by direction of travel and hour of day. This measure was used as a secondary source to identify specific bottlenecks along a corridor and the intensity of congestion throughout the day.
- User Delay Cost Analysis: To assess overall county travel delay trends by year.
- Bottleneck Ranking: Used as a secondary data source to identify and prioritize congestion locations within the region.
- Causes of Congestion Graph: To assess overall congestion causes for Washington County.
- Intersection Analysis: To extract and assess signal timings for priority intersections depending on data availability. This measure was used to further pinpoint the cause of congestion for each corridor. Note the locations of signal data were dependent on locations previously specified by MDOT.

INRIX IQ

Similar to RITIS, INRIX IQ is a cloud-based platform that provides access to historic travel time data. Through a data user's agreement, the HEPMPO acquired

access to Berkeley and Jefferson County travel time data for 2022 and 2023 through the INRIX IQ platform. INRIX IQ provides a suite of applications specifically designed to extract actionable insights from location-based data (Figure 12).

Among the notable applications within INRIX IQ is Roadway Analytics, which provides performance measures such as TTI, PTI, and performs congestion scans and bottleneck analysis similar to RITIS. Notably for the CMP, all traffic performance data for the HEPMPO West Virginia counties were sourced from INRIX IQ, as RITIS lacked access to that data.

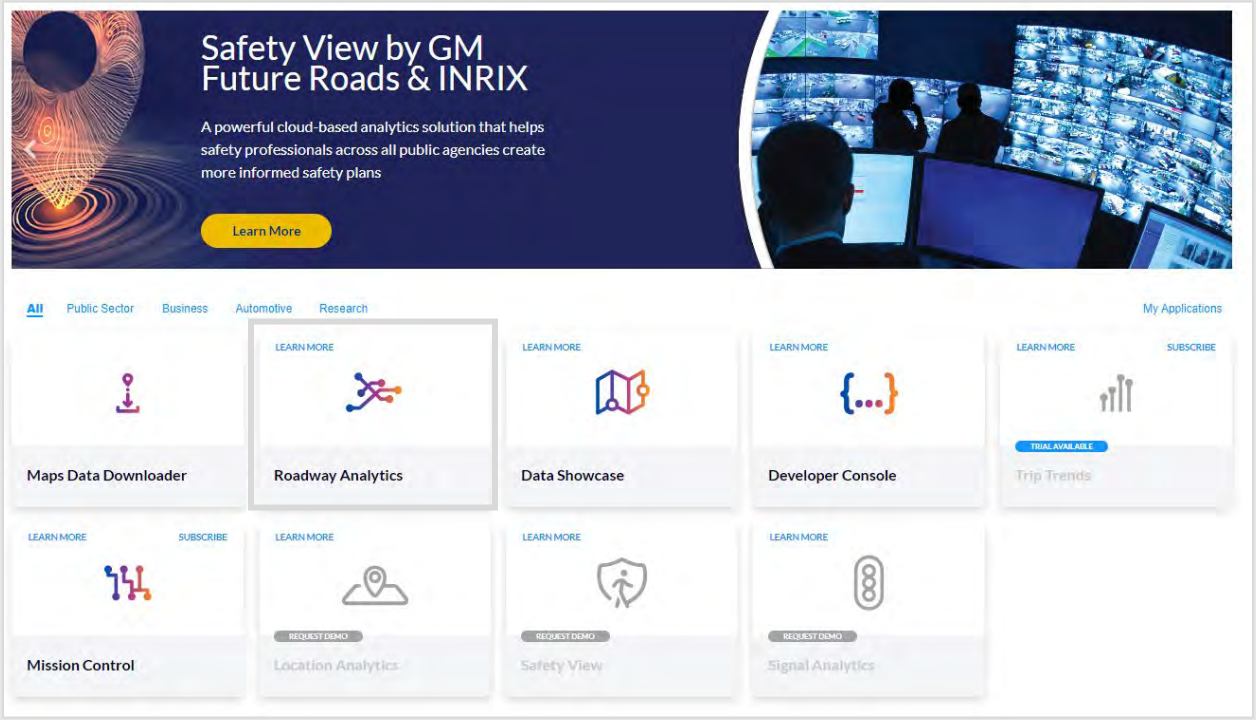


Figure 12: INRIX IQ Tools

REPLICA HQ

To supplement the above tools, the CMP consultant team leverage their corporate license to Replica HQ, which is an urban planning tool that provides comprehensive data to drive decisions about the built environment. It addresses the challenge of finding high-quality, recent data and insights related to how people move, where they move, and why (Figure 13).

Replica's platform offers more than a dozen datasets, over 50 metrics, and a suite of tools and applications spanning multi-modal transportation, demographics, economic activity, land use, and infrastructure. Key features used for this CMP include the traffic movement counts for intersections (depending on availability), trip activity summaries, land use information, and transit usage data.

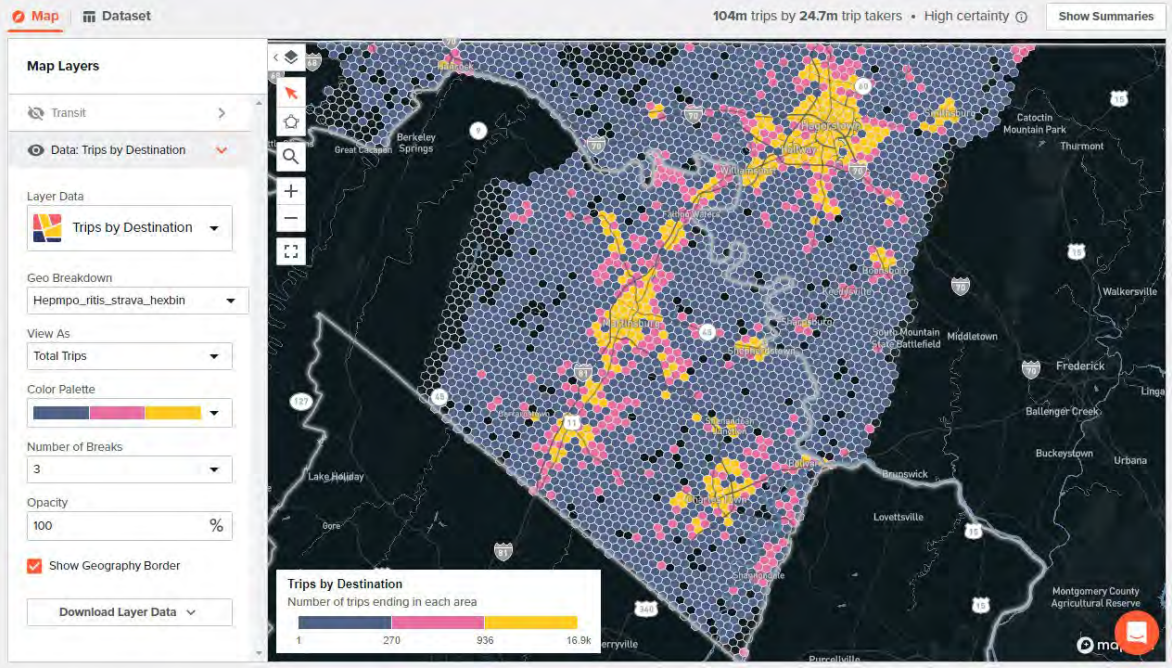


Figure 13: Replica Trip Activity Map

In addition to the information extracted from the above tools, a variety of other information was extracted from multiple data sources and used to evaluate congestion causes and to support future strategy evaluations. Table 1 provides a summary of these data measures and sources.

Table 1: CMP Performance Measures and Data Sources

Measure	Description	Data Source	Role in CMP
Travel Time Index (TTI)	The ratio of average travel time in the peak period to the travel time at free-flow conditions. Analyses are conducted on average weekdays.	2022 INRIX "XD"	Identify locations of recurring congestion. Primary data is used to assess congested locations in the region.
Travel Delay (Hours)	Vehicle hours of travel above free-flow conditions	2018-2023 INRIX NPMRDS "TMC"	Assess regional congestion trends within the region
Regional Bottlenecks	RITIS methodology to assess sources of congestion based on multiple factors including duration and extent	2022 INRIX "XD"	Assess priority locations where congestion originates
Federal Reliability Measures	The ratio of peak period to free-flow travel times (calculated differently than TTI)	2023 NPMRDS[1]	Assess regional trends on the National Highway System
Crashes	Numbers of Crashes and Fatalities	MDOT & WVDOT 2018-2022	Used to evaluate the source of non-recurring delay on segments
Traffic Volume	Total daily traffic volume on roadway	MDOT & WVDOT RMS[2] WV(2023) & MD(2022)	Measure of demand – utilized in delay calculations
Truck Volume	Total daily truck volume on a roadway	MDOT & WVDOT 2018 HPMS	Can be used to help assess potential strategies
Signal Timings	Signal Timings along each movement for intersections	RITIS Signal Analytics (MD Only)	Evaluate potential causes of congestion and strategies for intersections
Signal Characteristics	Evaluated signal systems for each priority corridor	HEPMPO LRTP Data Repository	Evaluate the potential for signal technology strategies

Measure	Description	Data Source	Role in CMP
Public Comments	2024 HEPMPO survey results with responses grouped by congestion, safety, and improvement locations	2023 online MetroQuest Survey	Assist in identifying and prioritizing congestion locations in the region
High-Volume Retail Locations	Point locations of high-volume retail locations (Walmart, Sheetz, Home Depot, CVS, etc.)	Open Street Map	Evaluation of congestion causes
MPMS Future TIP Projects	Existing congestion & safety related projects on HEPMPO's existing TIP	LRTP Direction 2050	Assess other programmed projects that may provide benefits or support additional operation improvement enhancements
Replica O/D Trip Activity	Aggregated commercial vehicle probe data of trip origin & destination hot-spot locations	Michael Baker Intl. license for Replica-HQ	Assist in evaluating potential congestion causes or potential strategies
Replica Turn Movement	Aggregated turn movement data of intersection locations	Michael Baker Intl. license for Replica-HQ	Assist in evaluating potential congestion causes or potential strategies

[1]NPMRDS = National Performance Management Research Data Set

[2]RMS = Roadway Management System

REGIONAL CONGESTION TRENDS AND NATIONAL PERFORMANCE MEASURES

This section provides an overview of congestion trends in the region based on vehicle travel time data available through INRIX and NPMRDS. The information serves as a benchmark for evaluating and monitoring regional levels of congestion and provides context to the national performance measures related to travel time reliability.

NATIONAL RELIABILITY PERFORMANCE MEASURES

FHWA has established a set of performance measures for State Departments of Transportation (State DOTs) and MPOs to use as required by the Infrastructure Investment and Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law (BIL). More information on the federal performance measures can be obtained at: https://www.fhwa.dot.gov/tpm/rule.cfm

The national performance measures focus on travel time reliability on the interstate and non-interstate National Highway System (NHS). The NHS includes the following interstates in the region: I-81, I-70, and I-68. Non-interstates covered by the NHS includes portions of the key primary arterials that traverse the region including US 11 (only in MD), US 40, US 340, US 522 (small portion at I-70 interchange in MD), WV 9, and WV 45 (just Apple Harvest Drive section).

Reliability measures the consistency or dependability in travel times, as measured from day to day or across different times of day. For more information on traffic reliability measures, see FHWA's Travel Time Reliability brochure (Figure 14).

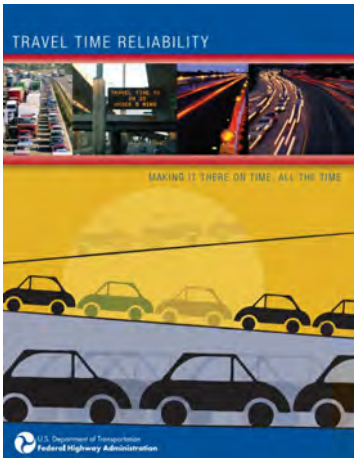


Figure 14: FHWA Travel Time Reliability Brochure

The national reliability measures include:

RELIABILITY PERCENTAGE (FOR INTERSTATES AND NON-INTERSTATES)	TRUCK TRAVEL TIME RELIABILITY (TTTR) INDEX
Based on the percentage of person-miles traveled on the interstate or non-interstate system that are reliable (using a measure referred to as the Level of Travel Time Reliability or LOTTR). The higher the percentage, the better the reliability.	**The TTTR Index specifically measures the reliability of travel times for trucks on the Interstate System. It is defined as the ratio of longer truck travel times (95th percentile) to a normal truck travel time (50th percentile). The higher the index, the worse the reliability.**
For example, 100% means that travel times are very reliable for nearly all times of the year. The LOTTR measure is only used to track reliability on primary roads part of the NHS. It is calculated as the ratio of the longer travel times (80th percentile) to a "normal" travel time (50th percentile), using data from the NPMRDS.	For example, a value of 1.30 means truck travel times can be 30% higher than average times.

Figure 15: National reliability measures

The key difference between these two metrics is the percentile used to represent longer travel times—80th for LOTTR and 95th for the TTTR Index—and the specific focus on trucks for the TTTR Index. While LOTTR provides a measure of reliability for all vehicles, the TTTR Index focuses on the higher impacts of delays on freight movement. Both are important for understanding and improving the performance of the transportation system (Figure 15).

Both WVDOT and MDOT have established 2025 statewide targets for the travel time reliability measures for the West Virginia and Maryland NHS respectively. The national measures can also be used to track progress in reducing or maintaining traffic congestion on NHS roads in the HEPMPO region. The national

measures and associated statewide targets are incorporated into the HEPMPO's TIP and LRTP.

Table 2 summarizes the regional HEPMPO metrics compared to the current statewide targets. Note the interstate reliability metrics of 100%. This performance is counterintuitive to many travelers in the region who rank the I-81 delays in Washington County as a primary concern related to traffic congestion. The methodology for calculating the measure is based on the 80th percentile speeds in each time period. The current issues on I-81 most likely relate to less frequent events that do not get reflected in the averaging of travel times.

Table 2: Federal Reliability and Truck Travel Index Values for HEPMPO

Interstate Reliability (MD State Target 76.4%) (WV State Target 96.0%)	Non-Interstate Reliability (MD State Target 87.2%) (WV State Target 92.0%)	Truck Reliability (MD State Target 1.81) (WV State Target 1.40)
Year's Performance	Year's Performance	Year's Performance
2020 100.0%	2020 97.6%	2020 1.12
2021 100.0%	2021 98.6%	2021 1.18
2022 100.0%	2022 98.8%	2022 1.19
2023 100.0%	2023 97.0%	2023 1.24
2024 100.0%	2024 96.6%	2024 1.17

The RITIS website platform provides access to the data needed to assess regional values for national reliability measures. The federal NPMRDS data is a subset of the travel times provided by the INRIX provider. The data can be accessed using tools available at the following web location: https://npmrds.ritis.org/analytics/. Similar to RITIS, access to this platform requires a user agreement to be signed. The system provides access to a series of MAP-21 summary tools and dashboards. Figure 16 provides the input data within the NPMRDS tool set to generate the reliability measures for the HEPMPO region.

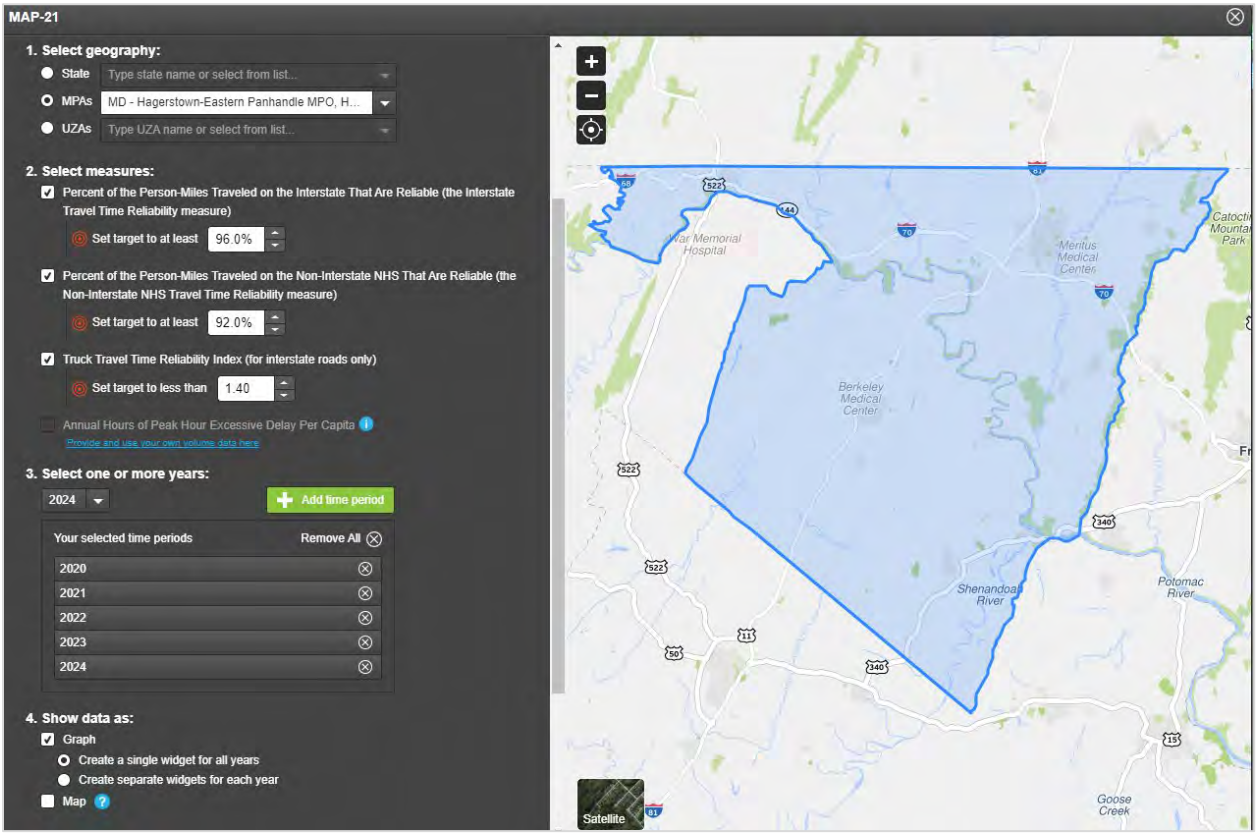


Figure 16: NPMRDS Tool Inputs to Generate HEPMPO Reliability Measures

Traffic congestion occurs on many roads outside of the NHS system. The federal performance measures, alone, do not provide sufficient information to identify all regional issues and needs related to traffic congestion. To supplement the national measure trends and to provide context to a broader range of roadways including those outside of the NHS, an additional assessment of historic regional traffic delay (in hours) has been conducted using available INRIX travel time data for Washington County. At this time, the data available for West Virginia does not provide historical information before 2022.

Delay measures the time difference between actual travel time and free-flow time (e.g., the travel time typically encountered during the night hours). Total delay integrates the number of vehicles experiencing these travel time values through the application of traffic volume data available from counts.

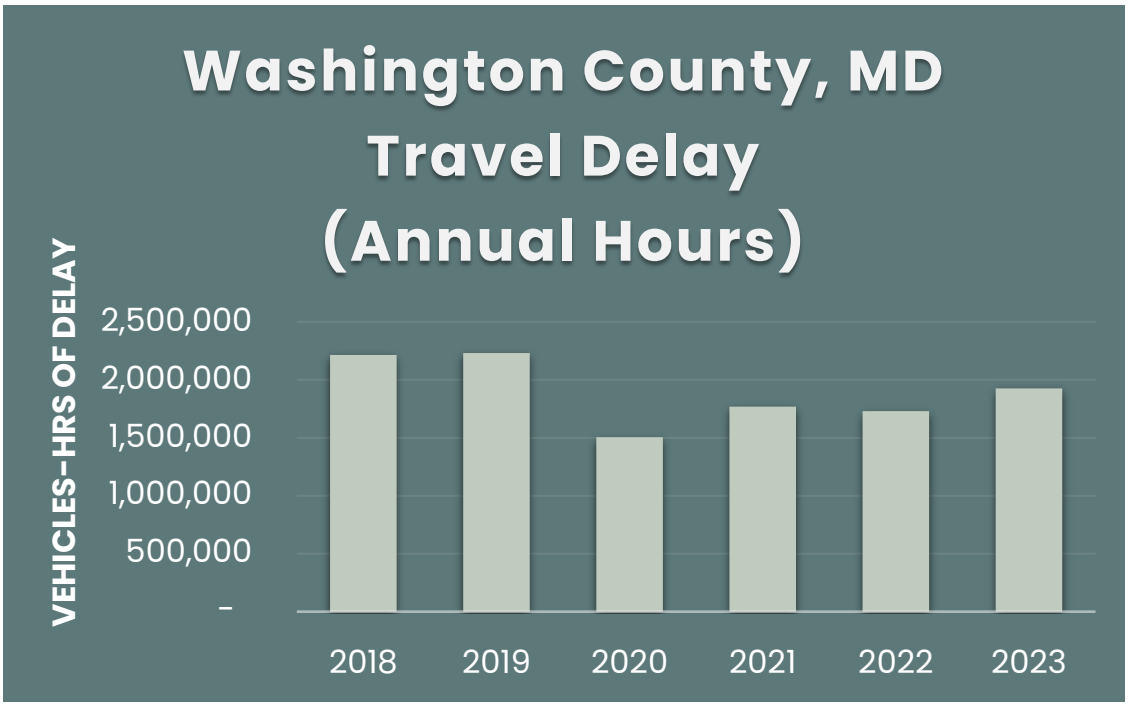


Figure 17: Washington County Annual Delay Trends (2018 – 2023)

The delay trend shown in Figure 17 highlights the impacts of the COVID-19 epidemic on regional travel in 2020, as delays were the lowest in the last decade. A rebound in delay has occurred in 2021-2023 but has not reached pre-pandemic levels.

Future updates to the CMP can track regional delays using the reports from the RITIS platform for Washington County. The User Delay Cost Analysis tool provides hourly delay totals based on travel time data and available traffic count volumes extracted from the Highway Performance Monitoring System (HPMS). Figure 18 provides a sample of the input parameters that are supplied to that tool to produce a delay summary table.

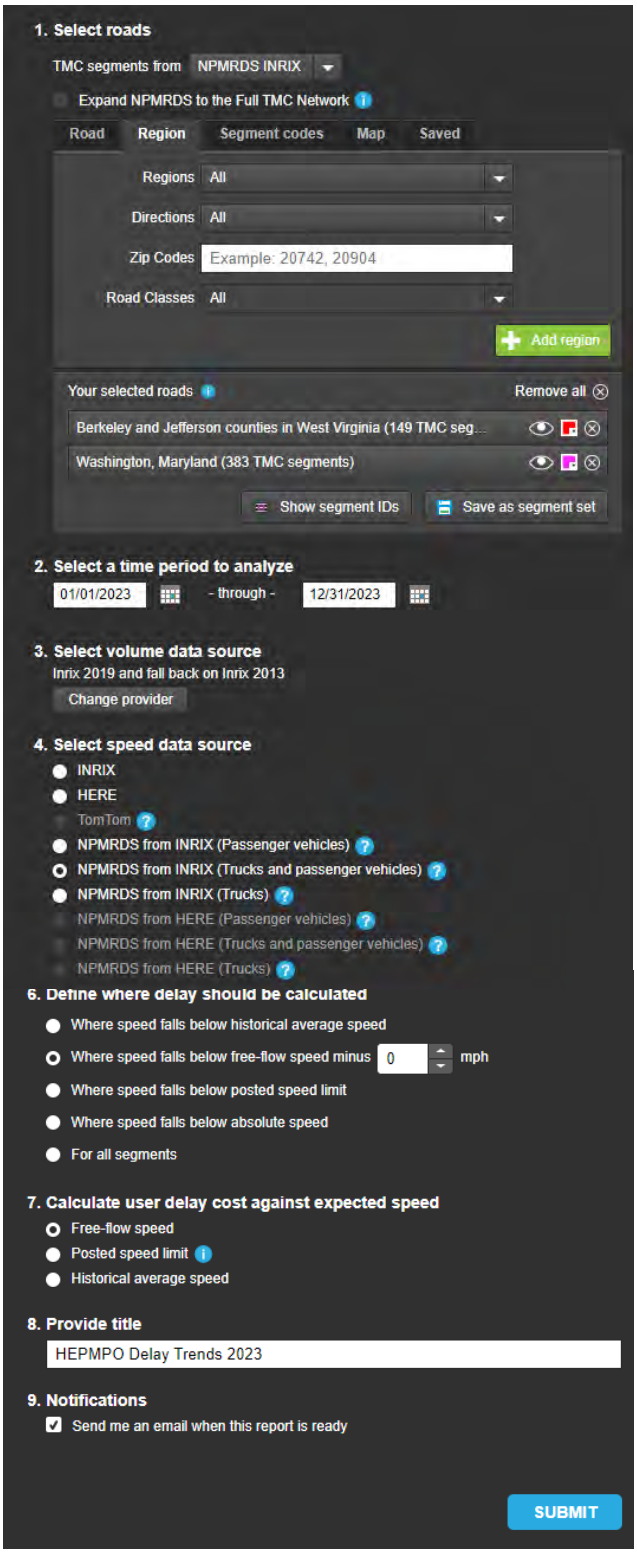


Figure 18: Sample Inputs to the User Delay Cost Analysis Tool for Reporting Regional Delay

DEFINING AND PRIORITIZING CMP LOCATIONS

Building off regional monitoring of traffic congestion, a key objective of the HEPMPO CMP is to identify priority congestion locations within the region using the most up-to-date data available. CMP locations encompass key roadway corridors and spot intersections that hold the highest priority for further assessment. These corridors are also the ones the HEPMPO closely monitors for detailed traffic congestion measures. Additional data is collected for these corridors, including traffic volumes, delays, travel times, crash statistics, signal characteristics, and other relevant data. This comprehensive information helps HEPMPO to understand the underlying causes of congestion and assists in prioritizing potential strategy categories.

Figure 19: Process for Determining CMP Priority Congestion Locations

Figure 19 provides the process used to identify the priority congestion locations for this CMP update. The process included integrating past information from the 2022 LRTP, analyses using GPS travel time data, over nine hundred public map comments, visual observations of the corridor, and other insights and comments from the CMP stakeholder committee.

PRIORITY CONGESTION LOCATIONS

Based on the process outlined above, Figure 20 and Figure 21 highlight the 24 CMP locations that were identified in Washington, Berkeley, and Jefferson Counties, comprising either sections of roadway or spot intersections. Note the locations are not prioritized within the listing. The reference number is an identification number that links to subsequent maps.

METHODS FOR DATA EVALUATION

The RITIS and INRIX IQ performance tools played an integral role in identifying priority locations within the region. Roadway segment Information from each of these tools was extracted including the travel time index (TTI) values. Data was compiled for peak periods during the 2022 year. 2023 and 2024 data was used to evaluate select corridors with recently completed transportation projects.

The RITIS **Trend Map** tool provides hourly TTI values for each available roadway segment in Washington County. The report utilized the INRIX XD layer, which is the finest detail available. Figure 22 provides a sample of the input parameters that are supplied to that tool to produce the trend map. The data was saved as a CSV (Excel) table and integrated into a GIS shapefile for visualization and overlay with other data layers. Key information summarized for each segment includes the maximum TTI and the number of hours above a 1.50 TTI ratio.

For the West Virginia counties, data extraction required more steps using the INRIX IQ **Performance Charts** feature. Individual roadway segments are selected, and data is summarized and exported for the 2022 year. Figure 23 highlights the application of a performance chart for a sample corridor in Berkeley County.

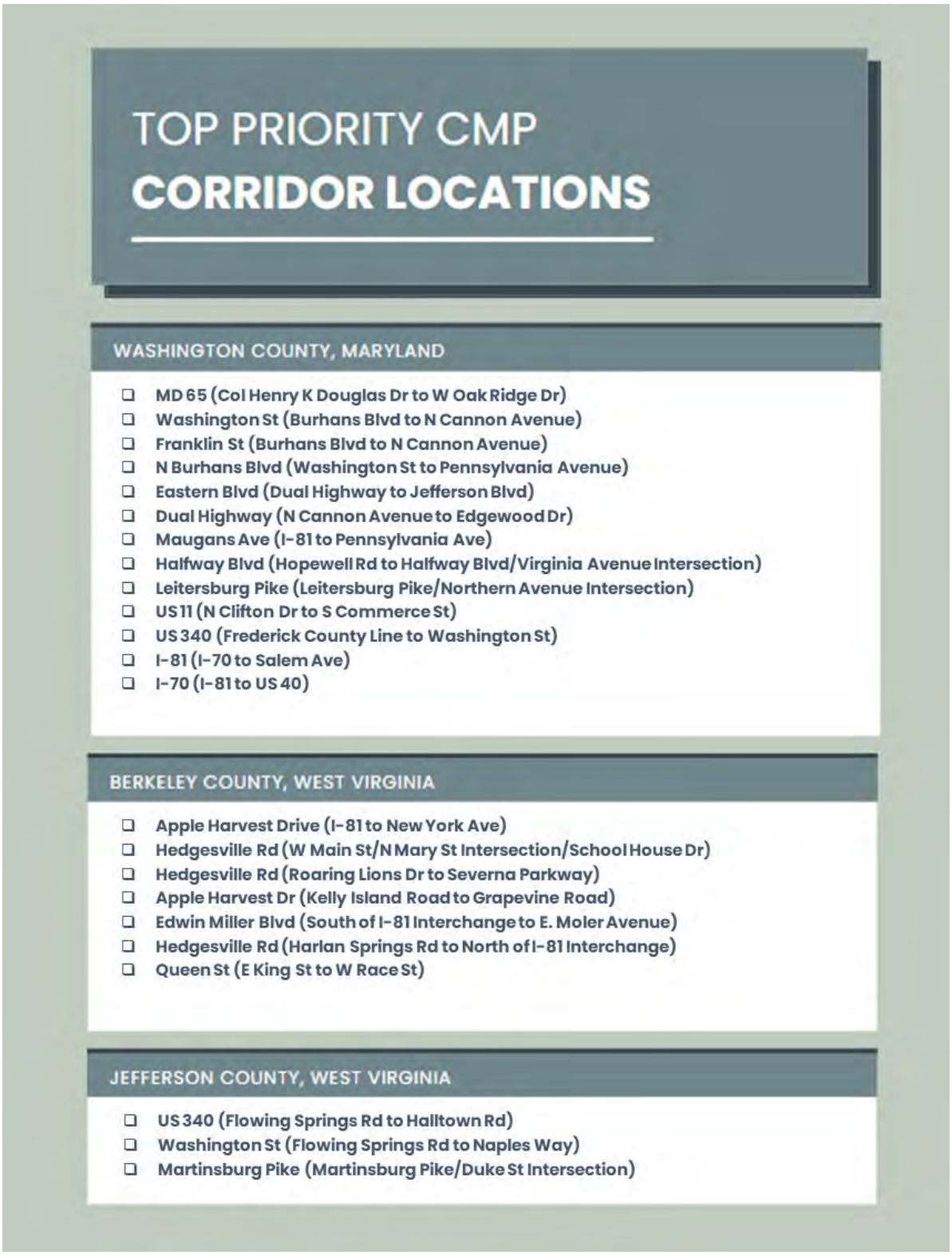


Figure 20: HEPMPO Top CMP Corridor Locations

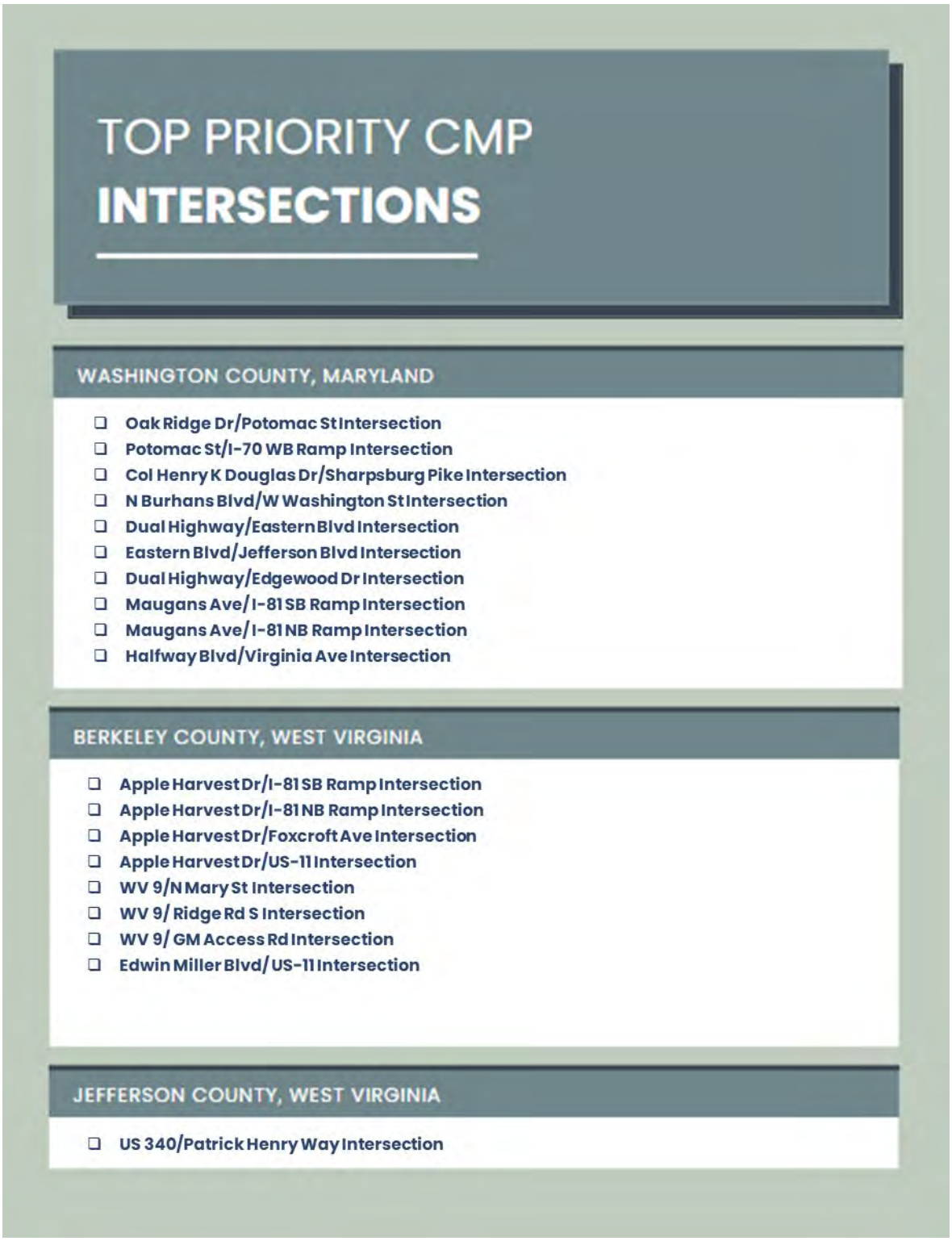


Figure 21: HEPMPO Top CMP Intersections

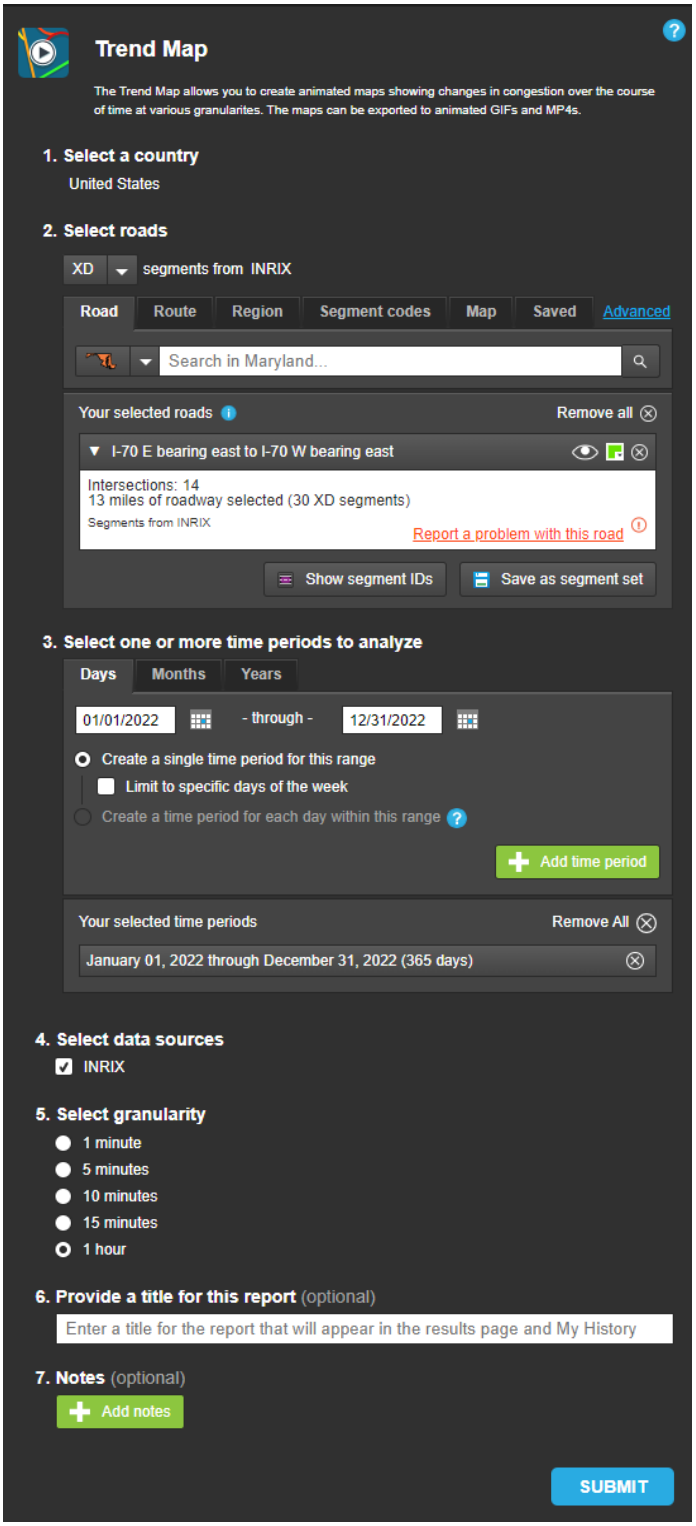


Figure 22: Sample Inputs to the Trend Map Tool (RITIS) for Reporting Segment TTI Values for Washington County, MD

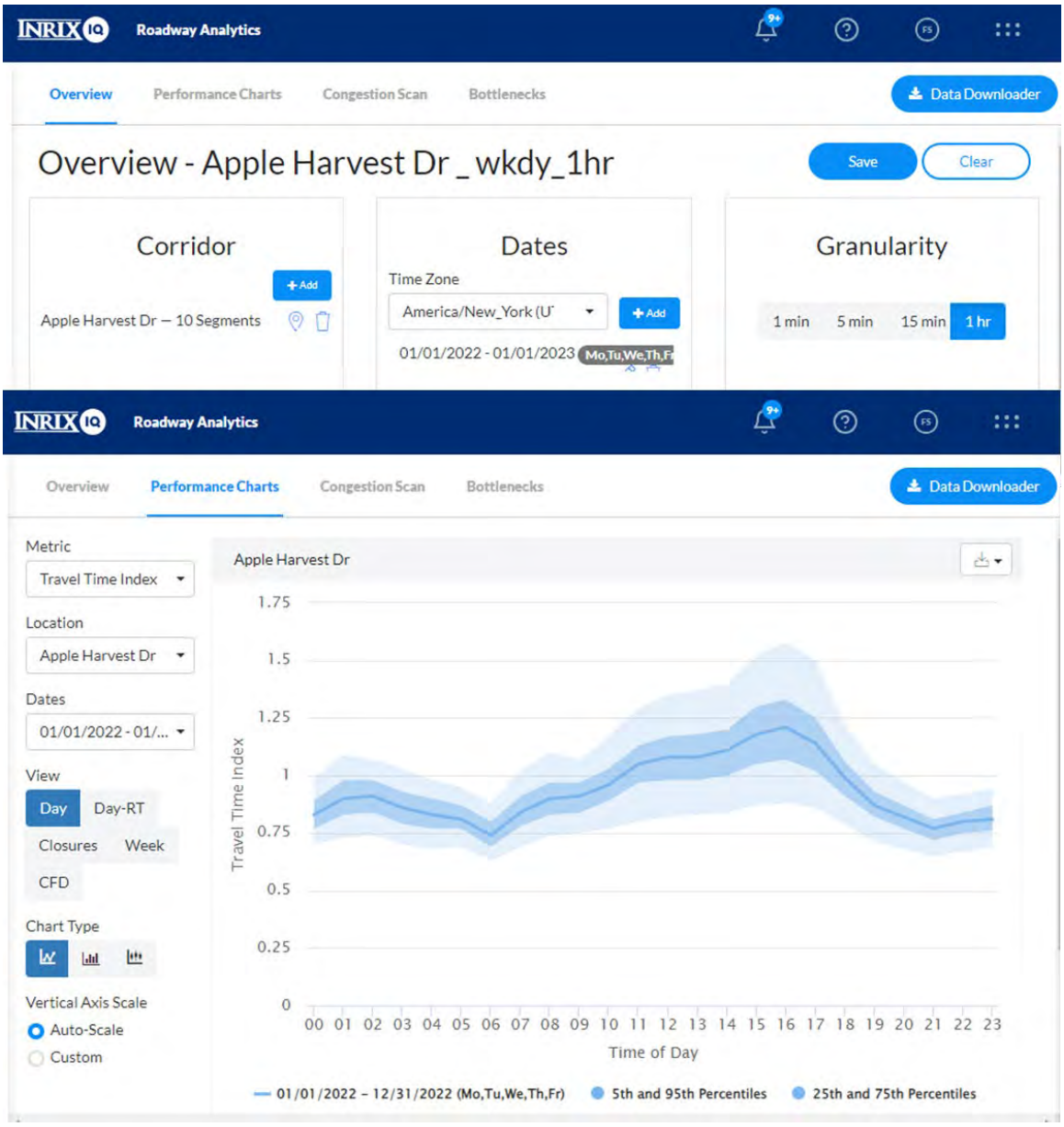


Figure 23: Sample Inputs to the Road Analytics Tool (INRIX IQ) for Reporting Segment TTI Values for WV Counties

DATA MAPPING PRODUCTS

The CMP includes developing an online map to store and visualize all collected data including the items provided in Table 1 and the CMP priority congestion locations. The data and corridor mapping will eventually be transitioned to the HEPMPO GIS system to support application to other planning products including the LRTP.

HEPMPO CMP DATA LAYERS MAP

Map Link: https://tmp-map.s3.amazonaws.com/hepmpo-cmp/hepmpo-cmp-corridors.html

This mapping database will be hosted by Michael Baker International until it may be transferred to HEPMPO staff. If this link is dead, the data can be sought by contacting Matt Mullenax (HEPMPO) at 240-313-2081.

This map as shown in Figure 24 provides access to a data layer map containing a summary of the 2024 CMP priority congestion locations and key data used to support the identification of those locations. Categories on the left side of the map provide access to the following data:

- **2024 CMP Priority Corridor Locations** - Correlates with Table 1 and allows visualization of the priority locations on an interactive map. The locations include both Interstate corridors and top congested intersections, each of which can be specified using the checkboxes provided.
- **MetroQuest Survey Results** - Provides the public responses to the 2024 HEPMPO CMP survey. The survey responses were an integral component in defining priority congestion locations in the region.
- **INRIX XD Weekday Travel Time Index (TTI) -** Provides the travel time data metrics used to evaluate regional congestion and to support identification of the CMP priority congestion locations. The metric is the Travel Time Index (TTI), which was defined in earlier sections of this report. Separate ranges of TTI can be checked to illustrate different congestion levels based on this measure. Generally, TTI values greater than 1.25 indicate

moderate and above levels of traffic congestion. Note this metric relates to the typical average congestion during weekday peak periods like the evening commute.

- **LRTP TomTom Travel Time Index (2018)** - Provides the travel time data metrics used to evaluate regional congestion during HEPMPO LRTP assessment and to aid in as a guidance to identify the CMP priority congestion locations.
- **LRTP Direction 2050 Projects** – Provides current TIP, planned CMAQ projects, and existing and committed project layers.
- **MDOT SHA Priority Corridors** – Priority Corridors established by MDOT SHA for D6 that are recommended for review and also accessibility and mobility need locations within Washington County.
- **High Volume Retail Locations** – Provides retail locations that attract trips within the HEPMPO region.
- **O/D Vehicle Probe Data** - Provides 2022 trip origins and destinations estimated by Michael Baker International using information from the Replica-HQ web platform. Information is provided for regional hexagon geography.
- **Strava Trip Activity** – Bike Ped trip activities pulled from the Strava platform and presented in hexagon geography.
- **Crash Data** – Provides crash data within the HEPMPO region retrieved from DOTs.
- **HEPMPO Model Network** – Provides forecasted growth in 2050 for the HEPMPO region using travel demand modeling.
- **Land Use Data** – Provides 2022 Land use data retrieved from the Replica Data platform from their demography and employment data set.

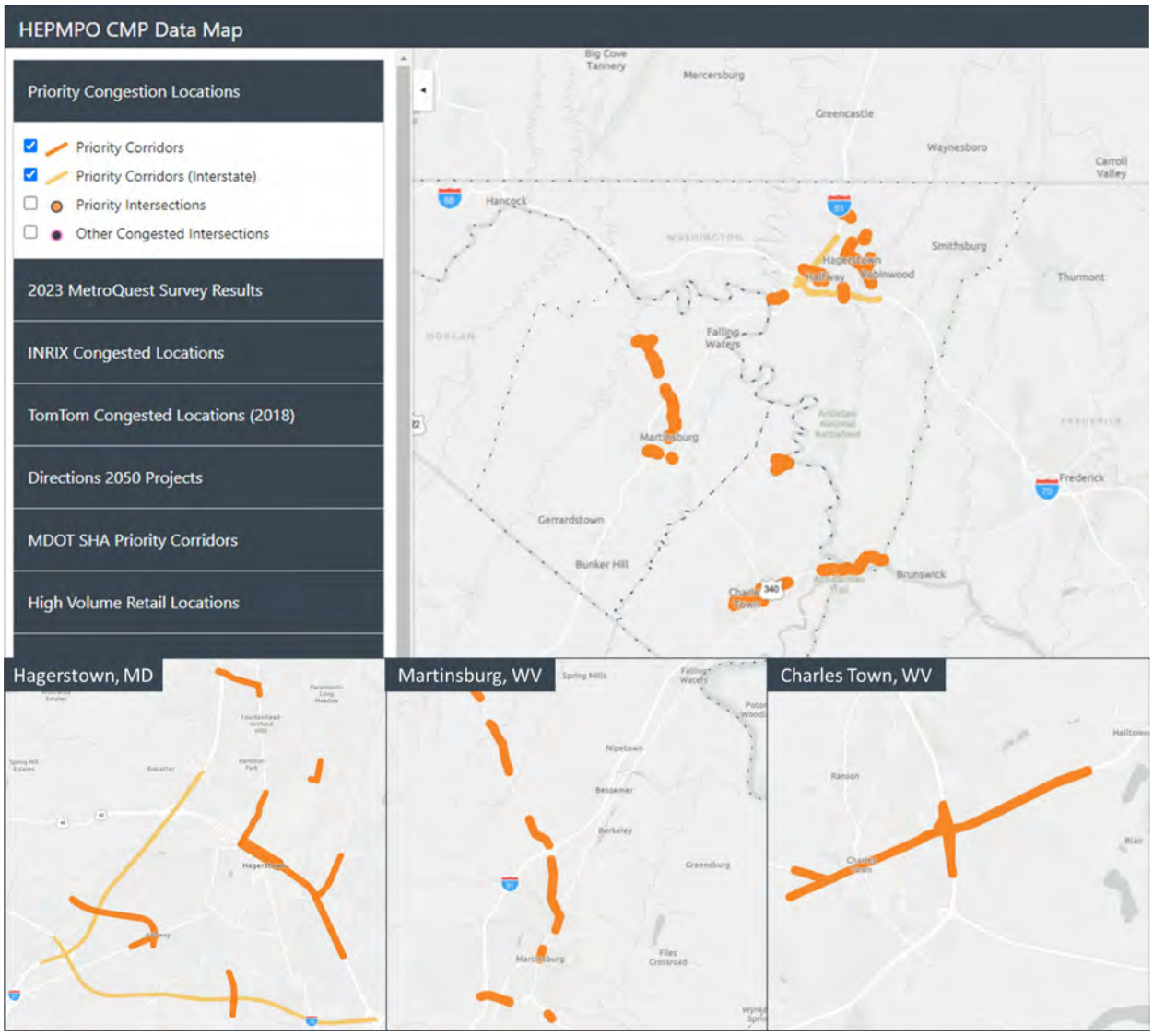


Figure 24: HEPMPO Interactive Data Map

The map provides additional features including the visualization of CMP congestion location details that can be enabled by selecting each of the locations individually. These location summary sheets are discussed in the following sections.

EVALUATION OF CMP LOCATIONS

For each of the CMP priority locations, additional corridor data has been summarized to support the evaluation of congestion causes, ranking or further prioritization of locations, and the identification of potential strategy categories applicable to each location. This additional information has been assembled into appendix tables indexed on the CMP location identification number provided in Figure 20 and included in the online maps.

Appendix B: CMP Location Programmed Project and Study Information

- Programmed projects for each CMP location based on projects from the *Direction 2050* LRTP.
- Provides past studies that address issues or needs related to the corridor. This includes information from the 2019 Regional Traffic Safety Study, 2021 WV PEL Study, 2021 WV 45 CVP, 2022 Dual Highway Speed Management Study, Washington Street (US 40), and WV 9 Safety Audits. Any referenced strategies that have been identified in these plans are highlighted for each location.

Appendix C: Additional Data Collected for CMP Locations in Cut Sheets

» Travel time metrics and volume data have been compiled for each CMP location. The data includes:
  - Maximum weekday Travel Time Index (TTI) at or along CMP locations
  - Average TTI values weighted by INRIX segment distances
  - The number of hours that TTI is greater than 1.25 (a defined threshold of higher congestion)
  - DOT total volume and HPMS truck percentages
  - The composite score was calculated by multiplying max travel time reliability with corridor VMT from a 250' buffer around each intersection. This measure for priority intersections
  - Aggregated traffic movement volume per intersection

- Roadway Configuration such as number of lanes, shoulder, and parking availability were retrieved from Google Street-View maps.
- Crash data by crash type has been compiled by CMP location to support the evaluation of congestion causes. This information includes total crashes, total fatalities, injury crashes, truck crashes, and bike/pedestrian crashes or fatalities.
- Land use and trip activity data abutting the CMP corridor or spot intersection location. Land use data has been extracted from Replica's demographic and employment database obtained from multiple public and private resources and aggregated by the Census Block group.
- Bike and Pedestrian activity sourced from Strava platform and roadway configurations and bike/ped infrastructure availability along the priority corridors from Google Street view maps to aid in potential strategies for high-activity locations.

Figure 25: Cut Sheet Example

Appendix D: Traffic Signal Data Collected for CMP Locations

» Traffic signal information from Signal Analytics within the INRIX IQ platform has been compiled to support the evaluation of potential operational strategies. This information includes relevant signal IDs and signal timing on each movement for each intersection.

Appendix E: Congestion Visuals for CMP Locations

» Congestion Heatmap Visuals for all priority corridors from the RITIS Congestion Scan tool to visualize congestion locations within each corridor.

ASSESSING STRATEGIES FOR CMP LOCATIONS

The identification and assessment of appropriate congestion mitigation strategies is a component of the CMP but often requires more detailed assessments through other studies and outreach.

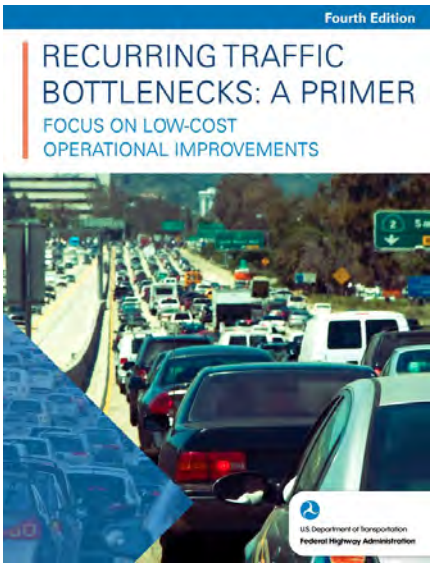
STRATEGY TOOLBOX

Figure 26 and Figure 27 provides a toolbox of strategies for consideration by policymakers and planners in the region. These strategies include:

- **Reducing demand (or demand management)** – These strategies attempt to address congestion at the root of the problem by reducing the number of vehicles on the road.
- **Managing capacity (or operational improvements) –** These efforts are intended to enhance the transportation system's operation and make it as efficient as possible. They may include signal technology and coordination projects or other Intelligent Transportation System (ITS) strategies like electronic message signs or incident response teams.
- **Building capacity (or capacity enhancements)** – These projects typically focus on the addition of lanes to existing roadways or the construction of new roads. While there is still an important need for the strategic addition

of new capacity, the HEPMPO acknowledges that it is not possible to solve all congestion issues through major additions of capacity due to environmental and land use sensitivity and limited funding. Strategic capacity enhancements, designed in the context of the community, may include interchange improvements, the implementation of turn lanes to improve congestion and safety at critical intersections, the development of multimodal corridors, and improved street connectivity.

All strategies should be consistent with regional and state LRTPs. Lower-cost solutions are emphasized as a primary congestion mitigation strategy and may include those provided in FHWA's Recurring Traffic Bottlenecks: A Primer Focus on Low-Cost Operational Improvements.



FUTURE STRATEGY ASSESSMENTS

As part of the 2024 CMP, HEPMPO has not formally developed recommended specific strategies for each CMP location. Information has been compiled to identify potential strategy categories and to support future assessments. Techniques for evaluating and selecting strategies include the use of committees or group consensus, the refinement of strategies based on local characteristics, and staff-level technical analysis. Information collected through monitoring of implemented strategies can help evaluate the success of individual strategies and target specific strategies to applications where they have demonstrated success. This feedback loop provides a continuous refinement of the strategies considered for congestion management in different situations. Figure 28 highlights a potential process for recommending CMP location strategies.

Figure 26: CMP Corridor Strategy Toolbox

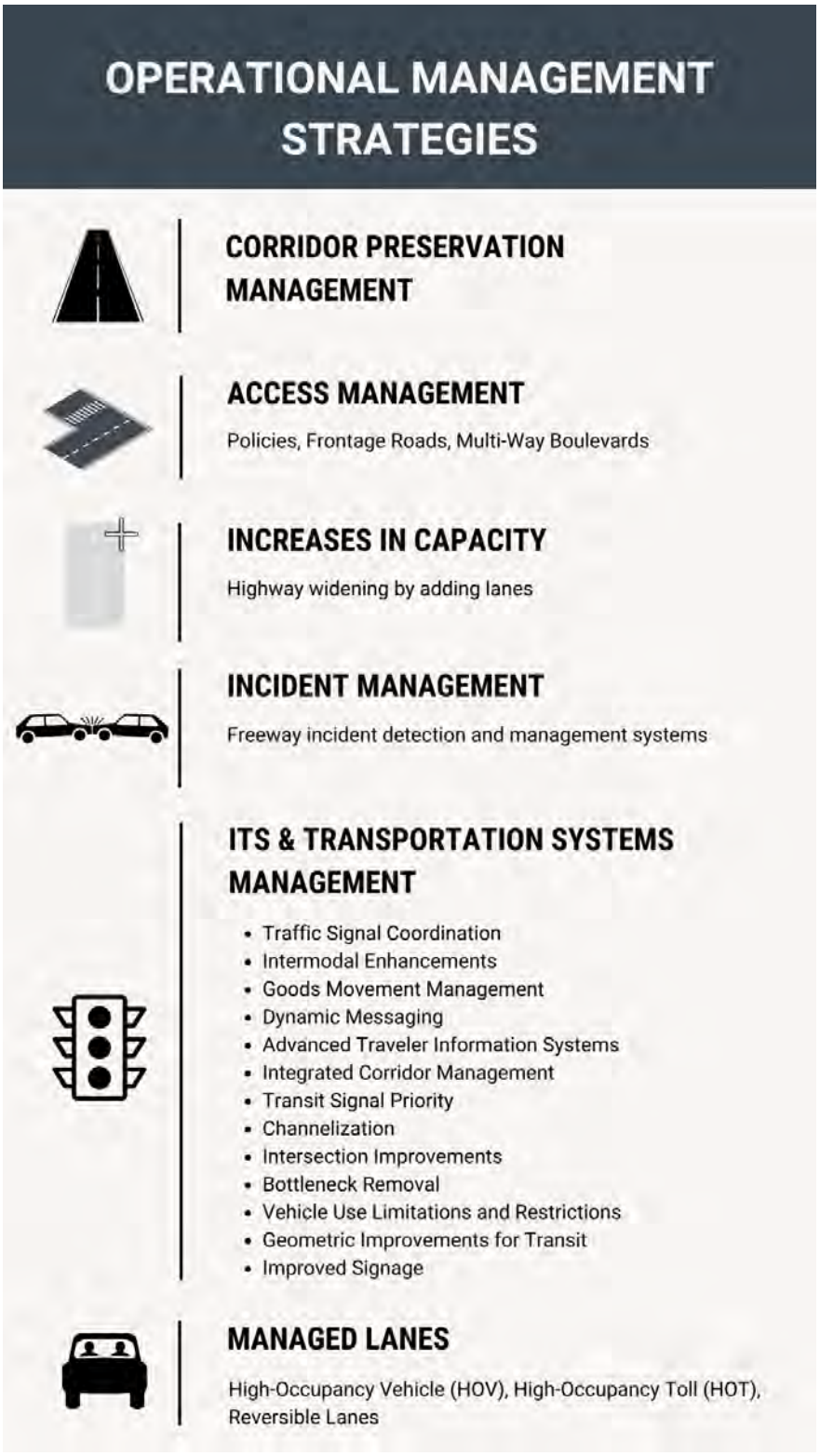


Figure 27: CMP Corridor Strategy Toolbox Continued

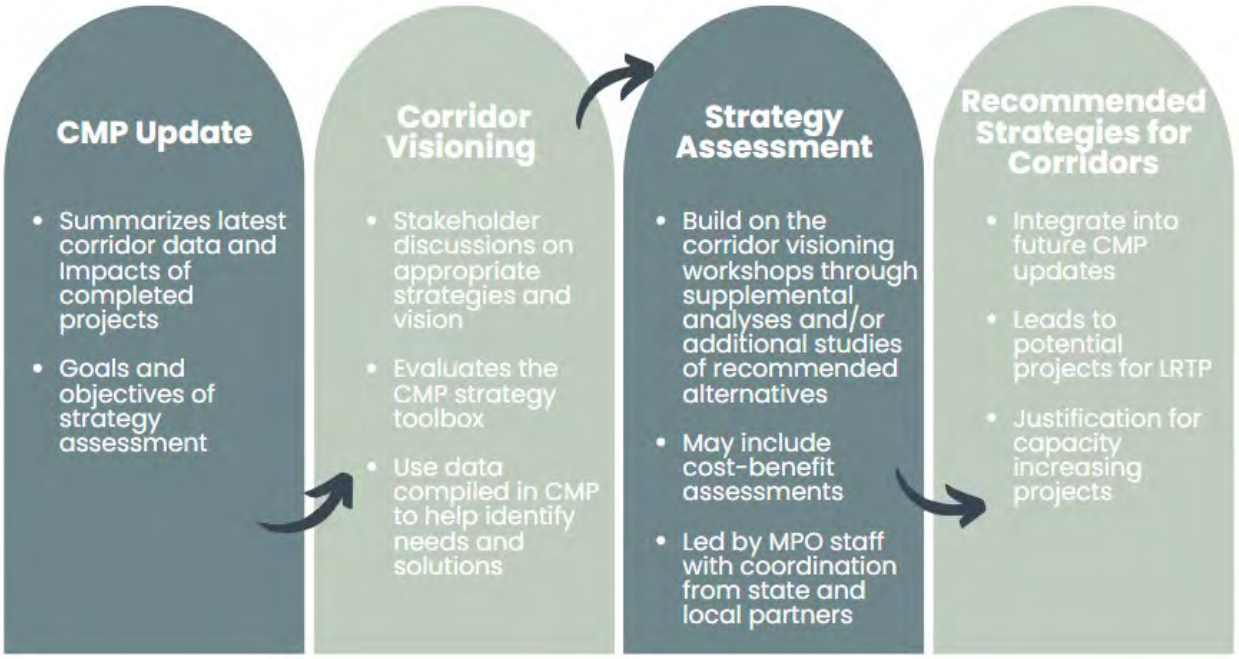


Figure 28: Process for Recommending CMP Strategies

The CMP strategy evaluation process is designed to assess the effectiveness of various congestion management strategies. A key aspect of this evaluation will be to pinpoint specific locations where the implementation of capacity enhancement projects is imperative. This determination is based on a comprehensive analysis that considers the ineffectiveness of alternative strategies in alleviating congestion at these critical points. Such an analysis may be conducted under a supporting corridor or project study. The process is instrumental in guiding future strategy selection and ensuring that resources are allocated to strategies that demonstrably improve traffic flow and reduce congestion.

EVALUATING COMPLETED PROJECTS

In future updates to the CMP, the HEPMPO is committed to monitoring the impacts of major transportation investments based on available data. Through the analysis of travel time data, HEPMPO can review traffic conditions before and after project implementation to assess whether the improvements have

effectively addressed congestion issues. This process involves comparing key metrics such as travel times to gauge the success of each project. The findings not only measure a project's impact but also guide the selection of future congestion management strategies.

WV 51 (Gerrardstown Road) in Inwood, WV was previously identified as a key area of congestion in past LRTP cycles, especially between I-81 and US 11. The Inwood Bypass project was under construction for a number of years. In late 2023, Phase 2 of the project was completed adding multiple roundabouts between I-81 and Pilgrim Street. HEPMPO has evaluated this corridor using available data from the INRIX-IQ platform. Note information is only available from the beginning of 2022, which most likely included construction delays. However, since the project's completion in 2023, key congestion metrics like travel time index have been much improved, as illustrated in Figure 29 (red indicates higher levels of congestion). This corridor is no longer listed as a priority congestion location for the region.

Figure 29: Illustration of Travel Time Index Values by Year for WV 51

FUTURE CMP ENHANCEMENTS AND INTEGRATION

Within the overall transportation planning process, the CMP provides quantitative congestion information that can be used by decision-makers at the MPO, local government, and DOT levels. The CMP is a critical element of an objectives-driven, performance-based planning approach, and the integration of the CMP data with the TIP and LRTP is an important part of project decision-making (Figure 29).

Figure 30: Importance of the CMP

Across the country, MPOs have developed unique methods of implementing the CMP. Some have integrated the CMP with the long-range planning process to the extent that the CMP is not identifiable as a standalone process. In many cases, the CMP data and performance measures directly influence project prioritization. The HEPMPO will directly integrate the CMP priority congestion locations into the TIP and LRTP process. These locations will also be key locations that support additional studies and strategy assessment coordination.

The HEPMPO is always looking for ways to make the CMP better. This includes learning from what other communities are doing across the nation and using new data sources as they become more readily available. Future CMP updates will be coordinated with ongoing corridor studies including the interstate TSMO studies, ongoing efforts to develop better data for assessing congestion causes, and local and regional efforts related to corridor visioning and strategy assessments. Additional emphasis can also be placed on better quantifying the impacts of completed projects. Currently, historical data is limited (especially for West Virginia counties) to conduct such analyses.

The CMP is anticipated to be updated regularly to support coordination with the TIP and LRTP. The HEPMPO will continue to monitor the region's status concerning TMA designation, which will ultimately make the CMP a requirement with formal federal review (Figure 30).

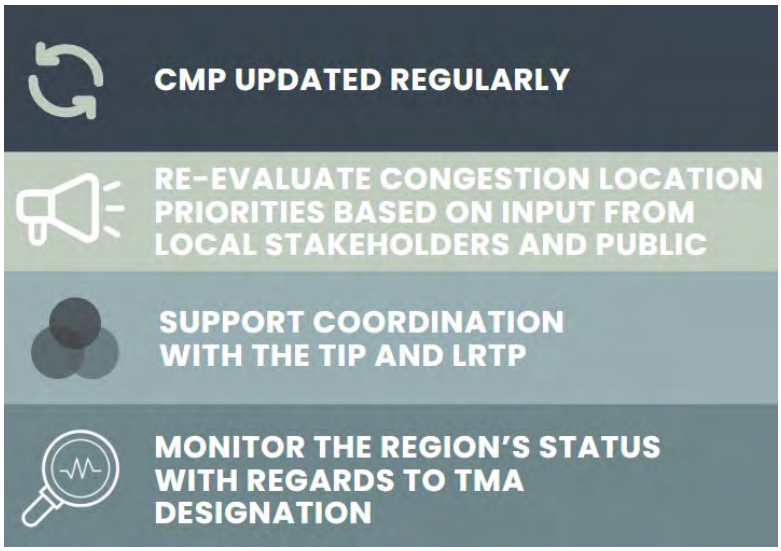
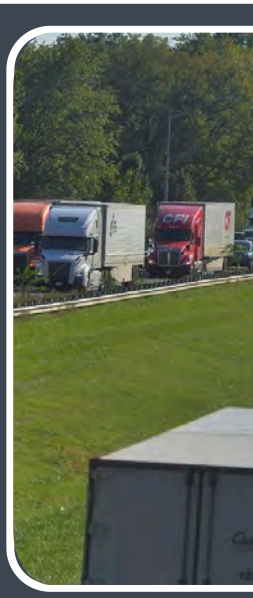


Figure 31: Integrating CMP and Next Steps

In the ongoing effort to refine the CMP, the HEPMPO remains committed to engaging with local stakeholders and the public to identify and address critical congestion locations. During the recent update cycle, we received numerous public insights regarding congestion concerns. Some of these concerns were not designated as top priorities in the current CMP iteration, primarily due to travel time data not substantiating these locations as the most congested within the region. Nonetheless, the HEPMPO acknowledges the importance of these observations and the limitations of the available data and will incorporate them into future corridor studies and planning assessments. We are dedicated to continual monitoring and reassessment of these areas as fresh data emerges, ensuring that our congestion management strategies and project initiatives are data-driven and community-focused. As part of the next LRTP update, HEPMPO expects to re-evaluate these congestion priorities to better serve our region's needs.

APPENDIX A
PUBLIC MEETINGS



APPENDIX A: PUBLIC MEETINGS

The public meetings were announced via public notice and social media postings. The draft document was made available on the HEPMPO website. Details regarding the public comment period, including a copy of the press release, articles, and public comments and responses to those comments are below.

SOCIAL MEDIA

FACEBOOK

Screenshots to go here.

LINKEDIN

YOUTUBE

PRESS RELEASE

LOCAL NEWS

Regional growth in Eastern Panhandle, Hagerstown brings traffic planners together to manage congestion

by: Steven Cohen
Posted: Nov 28, 2023 / 05:47 PM EST
Updated: Nov 28, 2023 / 05:47 PM EST

SHARE

MARTINSBURG, W.Va. (DC News Now) — Regional planners in the eastern panhandle area are facing challenges from growth — namely, the spike in traffic congestion.

They are hoping public input from drivers may help make things easier on the roads for drivers.

The Hagerstown Eastern Panhandle Metropolitan Planning Organization (HEPMPO) is working on a regional Safety Action Plan and Congestion Management Plan to address traffic concerns in Berkeley and Jefferson counties in West Virginia along with Washington County in Maryland

Navigating the roads has Hagerstown City Engineer, James Bender, working overtime.

"Every community has its idiosyncrasies when it comes to the road network, and in Hagerstown, we have a lot of one-way streets that tend to complicate traffic patterns," Bender said.

Bender is focused on dangerous intersections and the need to add more lanes to Interstate 81 in Washington County.

Matt Mullenax with HEPMPO has been gauging the public on the region's traffic challenges. He said that drivers have more concerns than just engineering.

"A lot of comments we are receiving are more focused on driver behavior than say, engineering improvements," Mullenax said. "I'm hearing concerns about people running red lights, looking at their phones while driving, aggressive driving and speeding."

Bender points to the challenge of Dual Highway, Route 40, in Hagerstown serving both local and regional traffic and the high volume of traffic on both Interstates 81 and 70 in Washington County.

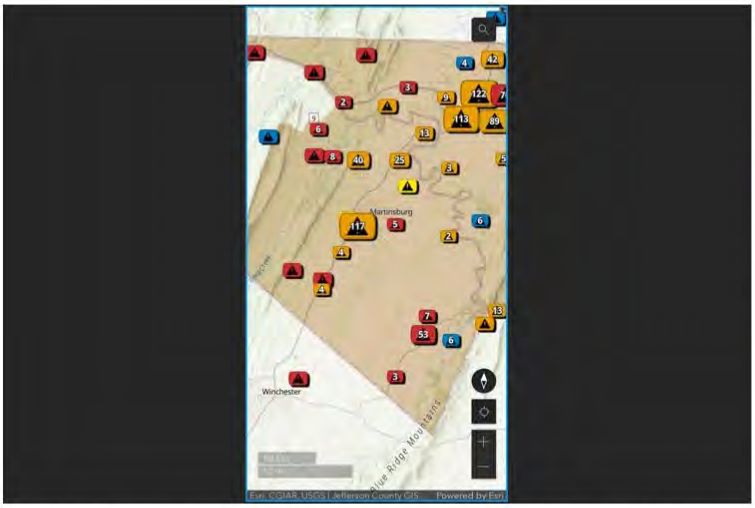
"We have all the traffic and congestion and delays that come with those two interstates to deal with," Bender said.

Mullenax wants to hear directly from drivers and is collecting citizen comments **online** to help with the planning process. Citizens can weigh in by Dec. 15 and participate in public meetings next spring.

Article linked here.

HEPMPO seeks public input for traffic safety study

By Angela F. Durkin adurkin@journal-news.net Nov 30, 2023



A image from the Hagerstown/Eastern Panhandle Metropolitan Planning Organization shows a draft mapping dashboard created by the first wave of public input for a public safety survey. HEPMPO has had 361 responses providing 980 map markers and comments.

Submitted photo

HAGERSTOWN, Md. — Hagerstown/Eastern Panhandle Metropolitan Planning Organization (HEPMPO) Executive Director Matthew Mullenax would like to remind members of the public that their voice is needed for the organization's public safety survey, which is open through Dec. 15.

HEPMPO is the federally designated regional transportation planning body for the urbanized area covering Berkeley County, Jefferson County, Washington County, Maryland and a small portion of Franklin County, Pennsylvania. There are eight metropolitan planning organizations in the state.

The HEPMPO Safety Action Plan and Congestion Management Plan public survey asks members of the public to rank the region's top safety priorities, identify locations of safety concerns and congestion areas, near misses, suggestions and improvement ideas.

Mullenax said, "So far, we have had 361 responses providing 980 map markers and comments."

Participants are asked to rank their top five safety concerns in the region. HEPMPO lists the following options: Unsafe Intersections; Distracted Driving, Lack of Crosswalks, Poor Road Maintenance, Traffic Congestion, Lack of Bike Lanes, Vehicle Maintenance, Construction Work Zones, Aggressive Driving, Incident Clearing Times, Commercial Vehicles and Drunk Driving.

Another section of the survey is targeted toward bike/pedestrian safety, driver safety and traffic congestion. There is also a space to provide any other safety concerns or comments.

The survey also includes an interactive section to drag and drop markers on a map to identify specific areas with safety and congestion issues as well as any improvement ideas for the region. Participants can identify safety issues, congestion areas and improvement ideas. There is also a near miss marker for places where drivers can indicate places and times when the incident almost occurred.

The final section of the survey is optional, however if participants choose to provide an email, they will receive the full findings of the study as they become available.

Mullenax explained the results of this survey will be an important way to help HEPMPO advocate for future road improvements. He said HEPMPO is required to complete a long-range plan every five years, but safety studies do not have the same requirement. He said the last safety study was completed in 2018, so HEPMPO wanted to complete the assessment.

According to Mullenax, when the Bipartisan Infrastructure Law was passed, it stabbed the Safe Streets and Roads for All (SS4A) discretionary program with $5 million in appropriated funds over five years, 2022-2026.

"It is a new federal grant program that is only open to local and regional governments, so state Department of Transportation can't apply for these dollars," he said. "One of the requirements is that you have to have a project identified and a locally approved safety action plan. So, one of the out comes of this effort is that we want to, essentially, check that box for any local governments that would be interested in pursuing construction for safety projects in their jurisdiction."

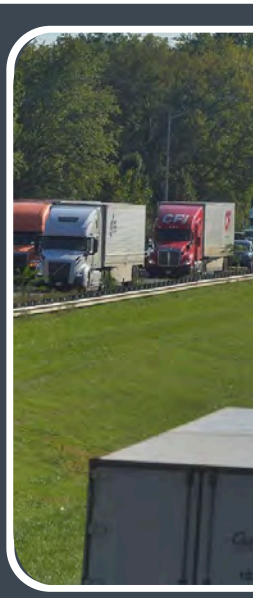
In addition to SS4A, Mullenax said there are a plethora of other new federal discretionary grants. As a result, state Department of Transportation (DOT) are constantly looking for new projects they can apply for. Millenax said one of the first things a state DOT will do is ask MPO's if they had a big project for them to consider. The chances are better, he said, if planning and public outreach work has been completed.

To complete the HEPMPO survey, visit https://metroquestsurvey.com/q5o0a.

Article linked here.

SIGN-IN SHEETS

APPENDIX B
CMP LOCATION PROGRAMMED PROJECT & STUDY INFORMATION



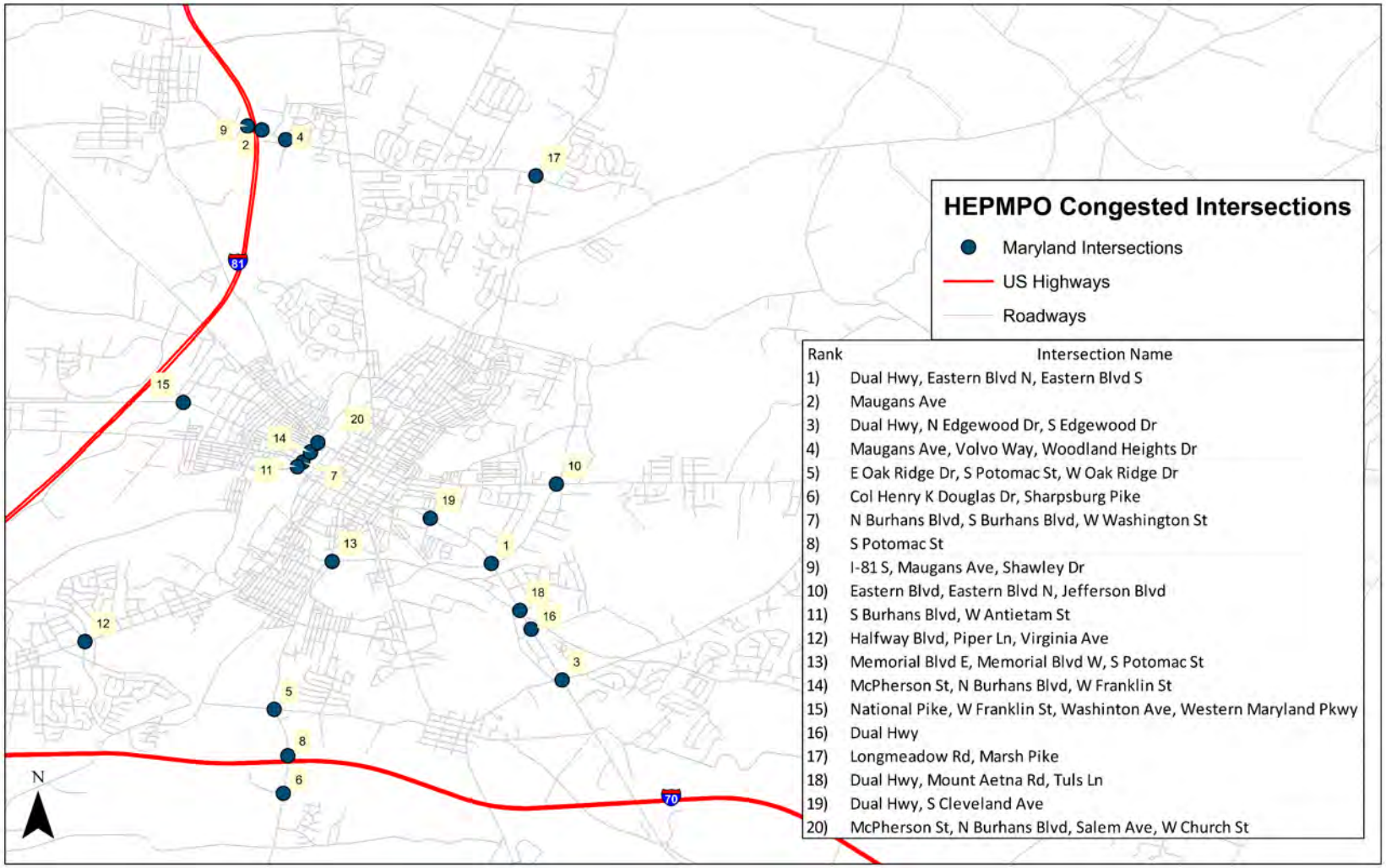
LRTP *Direction 2050*

Top Congested Corridors

County	Facility	From	To
Washington	Eastern Blvd	US 40	N of MD 64
	I-70	Exit 32	W of MD 63
	MD 65	N of Oak Ridge Drive	Poffenberger Road
	US 40	US 11	MD 64
	US 40	Eastern Blvd	Edgewood Dr
	I-68	I-70	Rt 144
	Maugans Avenue	I-81	US 11
Berkeley	Apple Harvest Dr	I-81 SB Offramp	US 11
	WV 9	N of Hedgesville	WV 45
	I-81	Exit 20	Weaver Ln
	WV 9	State Circle	WV 45
	WV 51	West of I-81 SB Offramp	US 11
Jefferson	US 340	W of Jefferson Ave	E of Patrick Henry Way
	WV 51	Co Route 13	Church St
	WV45, CR230, CR17/1	W of Potomac Farms Dr	Mill Street

LRTP *Direction 2050*

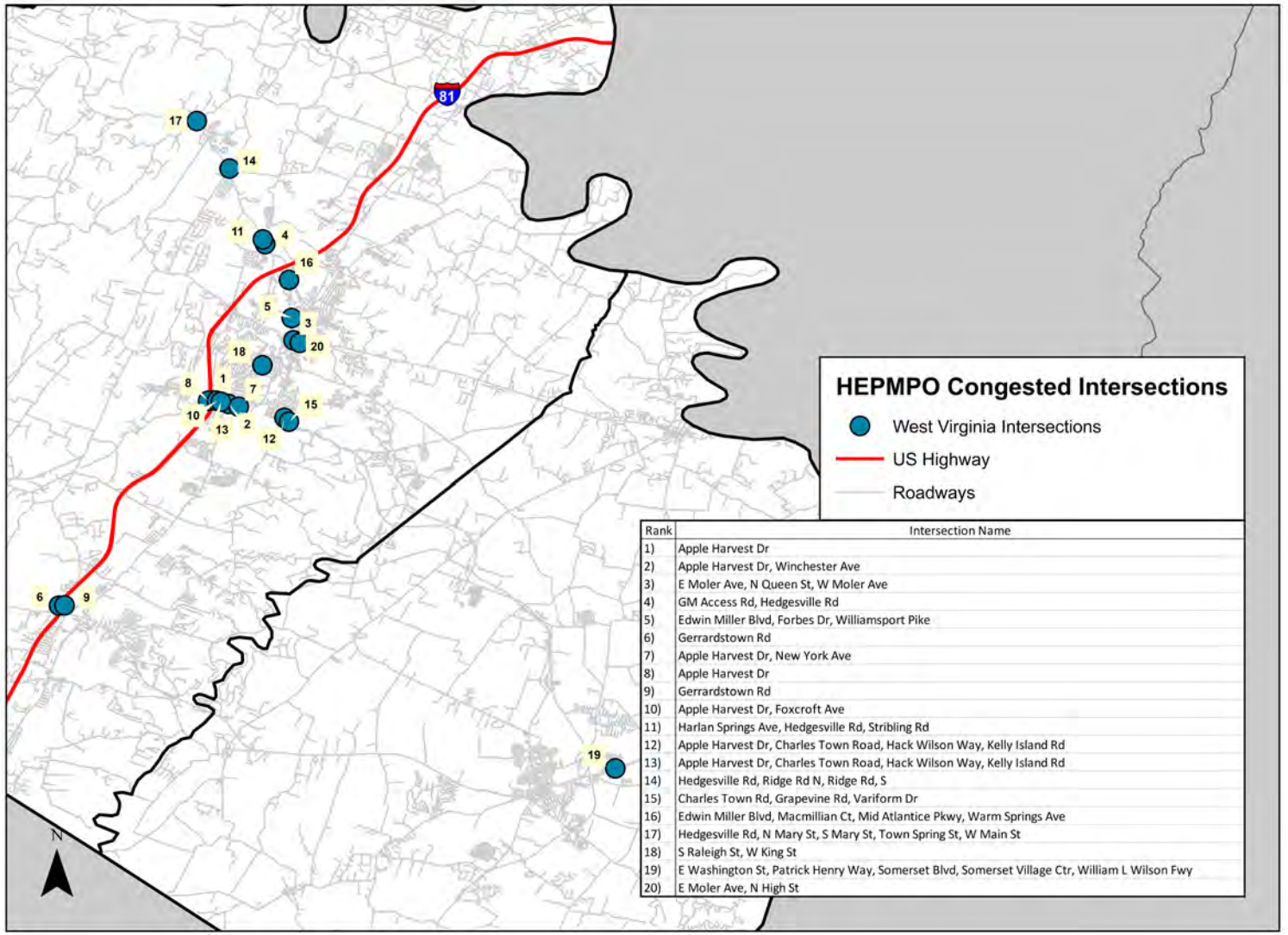
Top Congested Intersections (MD)



Rank	Intersection Name
1)	Dual Hwy, Eastern Blvd N, Eastern Blvd S
2)	Maugans Ave
3)	Dual Hwy, N Edgewood Dr, S Edgewood Dr
4)	Maugans Ave, Volvo Way, Woodland Heights Dr
5)	E Oak Ridge Dr, S Potomac St, W Oak Ridge Dr
6)	Col Henry K Douglas Dr, Sharpsburg Pike
7)	N Burhans Blvd, S Burhans Blvd, W Washington St
8)	S Potomac St
9)	I-81 S, Maugans Ave, Shawley Dr
10)	Eastern Blvd, Eastern Blvd N, Jefferson Blvd
11)	S Burhans Blvd, W Antietam St
12)	Halfway Blvd, Piper Ln, Virginia Ave
13)	Memorial Blvd E, Memorial Blvd W, S Potomac St
14)	McPherson St, N Burhans Blvd, W Franklin St
15)	National Pike, W Franklin St, Washinton Ave, Western Maryland Pkwy
16)	Dual Hwy
17)	Longmeadow Rd, Marsh Pike
18)	Dual Hwy, Mount Aetna Rd, Tuls Ln
19)	Dual Hwy, S Cleveland Ave
20)	McPherson St, N Burhans Blvd, Salem Ave, W Church St

LRTP *Direction 2050*

Top Congested Intersections (WV)



Rank	Intersection Name
1)	Apple Harvest Dr
2)	Apple Harvest Dr, Winchester Ave
3)	E Moler Ave, N Queen St, W Moler Ave
4)	GM Access Rd, Hedgesville Rd
5)	Edwin Miller Blvd, Forbes Dr, Williamsport Pike
6)	Gerrardstown Rd
7)	Apple Harvest Dr, New York Ave
8)	Apple Harvest Dr
9)	Gerrardstown Rd
10)	Apple Harvest Dr, Foxcroft Ave
11)	Harlan Springs Ave, Hedgesville Rd, Stribling Rd
12)	Apple Harvest Dr, Charles Town Road, Hack Wilson Way, Kelly Island Rd
13)	Apple Harvest Dr, Charles Town Road, Hack Wilson Way, Kelly Island Rd
14)	Hedgesville Rd, Ridge Rd N, Ridge Rd, S
15)	Charles Town Rd, Grapevine Rd, Variform Dr
16)	Edwin Miller Blvd, Macmillian Ct, Mid Atlantice Pkwy, Warm Springs Ave
17)	Hedgesville Rd, N Mary St, S Mary St, Town Spring St, W Main St
18)	S Raleigh St, W King St
19)	E Washington St, Patrick Henry Way, Somerset Blvd, Somerset Village Ctr, William L Wilson Fwy
20)	E Moler Ave, N High St

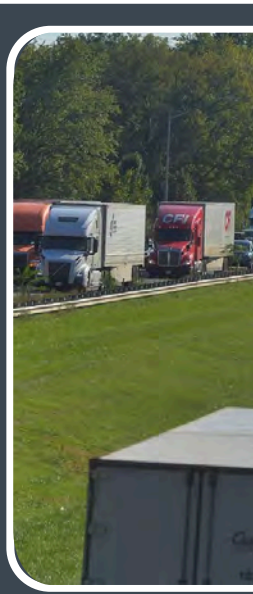
List of Previous Studies

by Priority Corridors Located

Priority Corridors	Previous Studies							
	LRTP *Direction 2050*	Regional Traffic Study (2019)	I-81 and I-70 TSMO Study (2020)	WV 45 Traffic Operations and Safety Study (2016)	WV PEL Study (2021)	Washington Street RSA (2018)	Dual Highway Speed Management Study (2022)	Hagerstown Bicycle And Pedestrian Priority Area Plan (2020)
MD 65 (Col Henry K Douglas Dr to W Oak Ridge Dr)	Y	Y						
Washington St (Burhans Blvd to N Cannon Avenue)		Y				Y		Y
Franklin St (Burhans Blvd to N Cannon Avenue)		Y						Y
N Burhans Blvd (Washington St to Pennsylvania Avenue)		Y						Y
Eastern Blvd (Dual Highway to Jefferson Blvd)	Y	Y						
Dual Highway (N Cannon Avenue to Edgewood Dr)	Y	Y					Y	
Maugans Ave (I-81 to Pennsylvania Ave)	Y	Y						
Halfway Blvd (Hopewell Rd to Halfway Blvd/Virginia Avenue Intersection)		Y						
Leitersburg Pike (Leitersburg Pike/Northern Avenue Intersection)		Y						
US 11 (N Clifton Dr to S Commerce St)		Y						
US 340 (Frederick County Line to Washington St)		Y						
I-81 (I-70 to Salem Ave)			Y					
I-70 (I-81 to US 40)			Y					
Apple Harvest Drive (I-81 to New York Ave)	Y	Y		Y				
Hedgesville Rd (W Main St/N Mary St Intersection/School House Dr)	Y	Y			Y			
Hedgesville Rd (Roaring Lions Dr to Severna Parkway)	Y	Y			Y			
Apple Harvest Dr (Kelly Island Road to Grapevine Road)		Y		Y				
Edwin Miller Blvd (South of I-81 Interchange to E. Moler Ave)	Y	Y						
Hedgesville Rd (Harlan Springs Rd to North of I-81 Interchange)	Y	Y			Y			
Queen St (E King St to W Race St)		Y						
US 340 (Flowing Springs Rd to Halltown Rd)	Y	Y						
Washington St (Flowing Springs Rd to Naples Way)	Y	Y						
Martinsburg Pike (Martinsburg Pike/Duke St Intersection)		Y						

APPENDIX C

ADDITIONAL DATA COLLECTED FOR CMP LOCATIONS



MD 65 (Col Henry K Douglas Drive to W Oak Ridge Drive)

Washington County, MD

Projects Planned on TIP/LRTP:

- I-70 Interchange (*Completed*)
- I-70 MD 65 and CSX Bridges Rehabilitation (*Completed*)
- Col Henry K. Douglas Dr Ph-1 (*Completed*)

Traffic Demand:

- AADT (26,023) & Truck 2%
- Projected traffic growth: High

Road/Intersection Characteristics:

- 4 lanes with shoulders, 6 Signals
- Part of a Coordinated Signal System

Multi-Modal:

- Transit Line: Premium Outlet Route

Current Land Use:

- Office and Residential
- Trip Activity Level: High

Performance Measures:

- Average Weighted TTI: 1.22
- Peak Segment-level TTI: 1.71
- 9 hours of day congested
- Number of public comments: 17

Initial Strategy Evaluation

Signal Coordination and Optimization

Channelization (Trucks)

Traffic Monitoring

Washington Street
(Burhans Boulevard to N Cannon Avenue)

Washington County, MD

Traffic Demand:
- AADT (10,460) & Truck 2%

Road/Intersection Characteristics:
- 2 lanes, 9 Signals
- Parking available

Multi-Modal:
- Transit Line: Multiple Routes
- Sidewalk infrastructure exists

Current Land Use:
- Residential, Retail & Industrial
- Trip Activity Level: High
- Key commercial centers with access

Performance Measures:
- Average Weighted TTI: 1.42
- Peak Segment-level TTI: 2.15
- 14 hours of day congested
- Crashes /Crash Rate: 287/75.53
- Number of public comments: 11

Initial Strategy Evaluation

Signal Coordination and Optimization

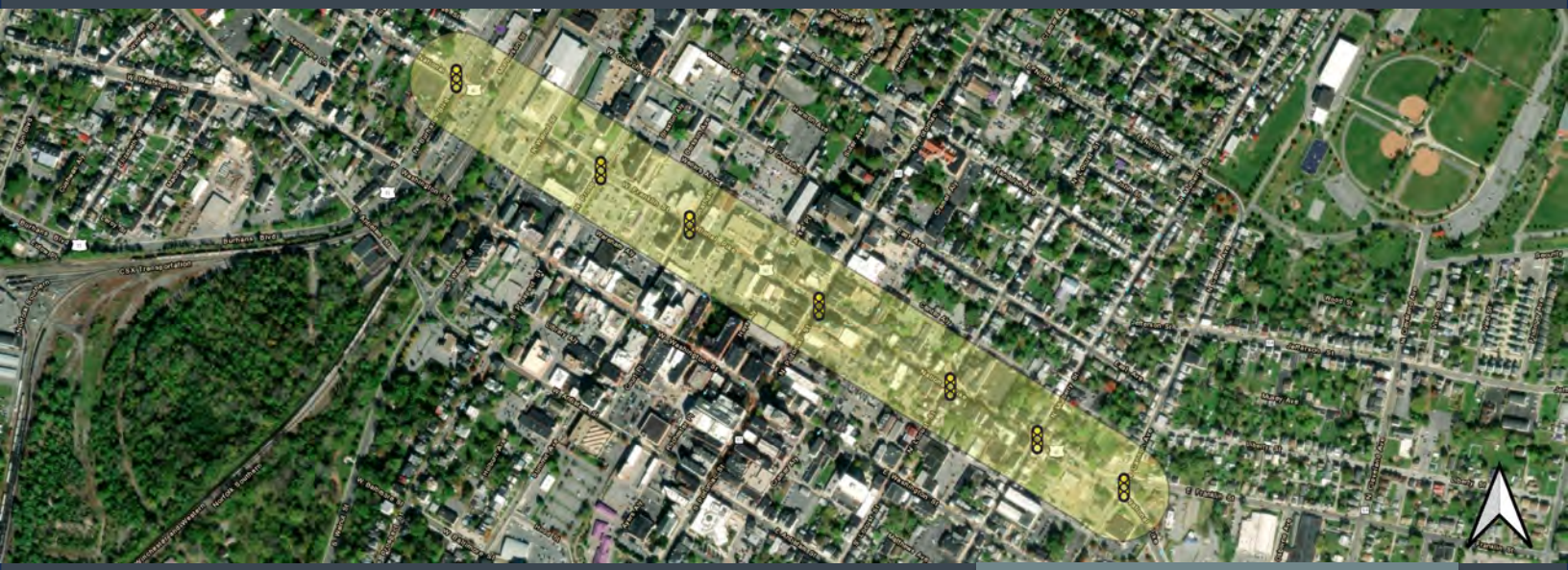
Improved Safety on Existing Facilities

Improved Signage

Parking Management

Franklin Street
(Burhans Boulevard to N Cannon Avenue)

Washington County, MD



Traffic Demand:

- AADT (10,490) & Truck 2%
- Projected traffic growth: Medium

Road/Intersection Characteristics:

- 2 lanes, 7 Signals
- Parking available

Multi-Modal:

- Transit Line: Multiple Routes
- Sidewalk infrastructure exists
- Bike/Walk pedestrian activity: Low/High

Current Land Use:

- Residential, Retail & Industrial
- Trip Activity Level: High
- Key commercial centers with access

Performance Measures:

- Average Weighted TTI: 1.73
- Peak Segment-level TTI: 2.51
- 16 hours of day congested
- Crashes /Crash Rate: 286/75.26
- Number of public comments: 9

Initial Strategy Evaluation

Signal Coordination and Optimization

Improved Safety on Existing Facilities

Improved Signage

Parking Management

N Burhans Boulevard (Washington Street to Pennsylvania Avenue)

Washington County, MD

Traffic Demand:
- AADT (11,020) & Truck 3%

Road/Intersection Characteristics:
- 4 lanes, 5 Signals

Multi-Modal:
- Transit Line: Multiple Routes
- Sidewalk infrastructure exists
- Bike/Pedestrian activity: Low/High

Current Land Use:
- Residential, Retail & Industrial
- Trip Activity Level: High
- Key commercial / business centers with access

Performance Measures:
- Average Weighted TTI: 1.16
- Peak Segment-level TTI: 2.15
- 18 hours of day congested
- Crashes /Crash Rate: 197/37.88
- Number of public comments: 7

Initial Strategy Evaluation

Signal Coordination and Optimization

Improved Signage

Eastern Boulevard (Dual Highway to Jefferson Boulevard)

Washington County, MD

Traffic Demand:
- AADT (21,485) & Truck 3%
- Projected traffic growth: Medium

Road/Intersection Characteristics:
- 4 lanes, 5 Signals

Multi-Modal:
- Transit Line: Long Meadow E Route
- Sidewalk infrastructure exists

Current Land Use:
- Residential, Retail & Office
- Trip Activity Level: High
- Key commercial / business centers with access

Performance Measures:
- Average Weighted TTI: 1.14
- Peak Segment-level TTI: 1.49
- 4 hours of day congested
- Number of public comments: 10

Initial Strategy Evaluation

Signal Coordination and Optimization

Traffic Monitoring

Dual Highway (N Cannon Avenue to Edgewood Drive)

Washington County, MD

Traffic Demand:
- AADT (32,650) & Truck 3%
- Projected traffic growth: High

Road/Intersection Characteristics:
- 4 lanes with shoulder, 8 Signals

- **Multi-Modal:**
- Transit Line: Multiple Routes
- Sidewalk infrastructure exists

Current Land Use:
- Residential, Retail & Office
- Trip Activity Level: High
- Key commercial centers with access

Performance Measures:
- Average Weighted TTI: 1.12
- Peak Segment-level TTI: 1.78
- Crashes /Crash Rate: 431/20.82
- Number of public comments: 18

Initial Strategy Evaluation

Signal Coordination and Optimization

Improved Signage

Improved Safety on Existing Facilities

Maugans Avenue (I-81 to Pennsylvania Avenue)

Washington County, MD

Projects Planned on TIP/LRTP:

- I-81 Phase 4A (*Under Construction*)

Traffic Demand:

- AADT (23,721) & Truck 4%
- Projected traffic growth: High

Road/Intersection Characteristics:

- 4 lanes, 5 Signals

Current Land Use:

- Residential, Retail & Office
- Trip Activity Level: High
- Key commercial centers/business access

Performance Measures:

- Average Weighted TTI: 1.2
- Peak Segment-level TTI: 2.44

Initial Strategy Evaluation

Traffic Monitoring

Halfway Boulevard (Hopewell Road to Halfway Boulevard/Virginia Avenue Intersection)

Washington County, MD

Projects Planned on TIP/LRTP:

- Halfway Boulevard Bridges (*Under Construction*)

Traffic Demand:

- AADT (19,731) & Truck 22%

Road/Intersection Characteristics:

- 4 lanes, 5 Signals

Multi-Modal:

- Transit Line: Multiple Routes

Current Land Use:

- Retail & Residential
- Trip Activity Level: High
- Key commercial centers with access

Performance Measures:

- Average Weighted TTI: 1.1
- Peak Segment-level TTI: 1.78
- Crashes /Crash Rate: 432/19.59
- Number of public comments: 14

Initial Strategy Evaluation

Traffic Monitoring

Leitersburg Pike (Leitersburg Pike/Northern Avenue Intersection)

Washington County, MD

Traffic Demand:
- AADT (16,640) & Truck 2%

Road/Intersection Characteristics:
- 4 lanes, 4 Signals

Multi-Modal:
- Transit Line: Multiple Routes
- Sidewalk infrastructure exists
- Bike/Pedestrian activity: Low/High

Current Land Use:
- Residential
- Trip Activity Level: High

Performance Measures:
- Average Weighted TTI: 1.35
- Peak Segment-level TTI: 1.74
- 11 hours of day congested

Initial Strategy Evaluation

Signal Coordination and Optimization

Traffic Monitoring

US 11 (N Clifton Drive to S Commerce Street)

Washington County, MD

Traffic Demand:
- AADT (8,000) & Truck 4%

Road/Intersection Characteristics:
- 2 lanes, 3 Signals
- Parking available

Multi-Modal:
- Transit Line: Williamsport Route
- Sidewalk infrastructure exists
- Bike/Pedestrian activity: High

Current Land Use:
- Residential
- Trip Activity Level: High

Performance Measures:
- Average Weighted TTI: 1.4
- Peak Segment-level TTI: 1.85
- 15 hours of day congested

Initial Strategy Evaluation

Traffic Signal Coordination

Complete Street

US 340 (Frederick County Line to Washington Street)

Washington County, MD

Projects Planned on TIP/LRTP:

- US 340 - Ph.1 -Operational Improvements (J102.1)
- US 340 Signing (J2023-05)

Traffic Demand:

- AADT (22,400) & Truck 14%
- Projected traffic growth: High

Road/Intersection Characteristics:

- 2 lanes with Shoulder, 1 Signal

Multi-Modal:

- No Sidewalk infrastructure exists
- Bike/Pedestrian activity: High

Current Land Use:

- Residential & Retail

Performance Measures:

- Average Weighted TTI: 1.08
- Peak Segment-level TTI: 1.45

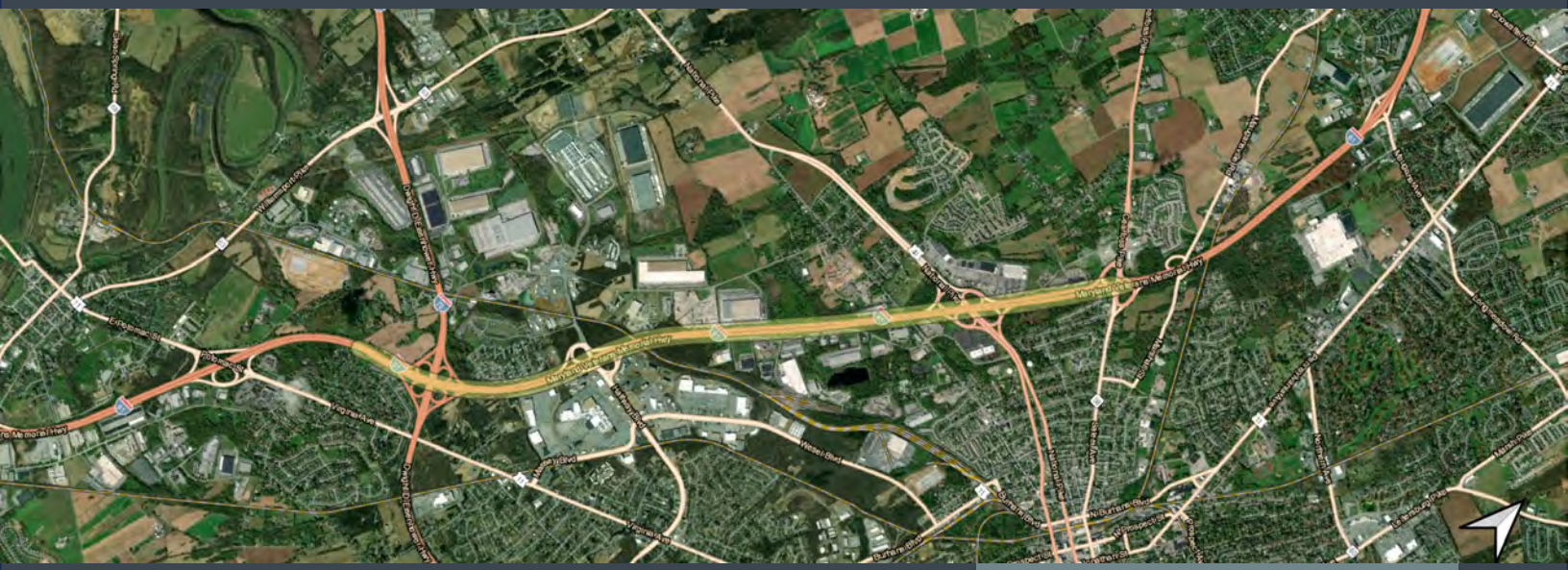
Initial Strategy Evaluation

Improved Signage

Traffic Monitoring

I-81 (I-70 to Salem Ave)

Washington County, MD



Projects Planned on TIP/LRTP:

- I-81 Ph 2 & 3 Hwy Reconstruction (W2017-10)
- I-81 SB Resurfacing & Auxiliary Lane Construction (W2016-02)

Traffic Demand:

- AADT (86,810) & Truck 25%
- Projected traffic growth: High

Road/Intersection Characteristics:

- 4 lanes with Shoulder, 4 Interchanges

Current Land Use:

- Retail, Industrial, Office and Residential

Performance Measures:

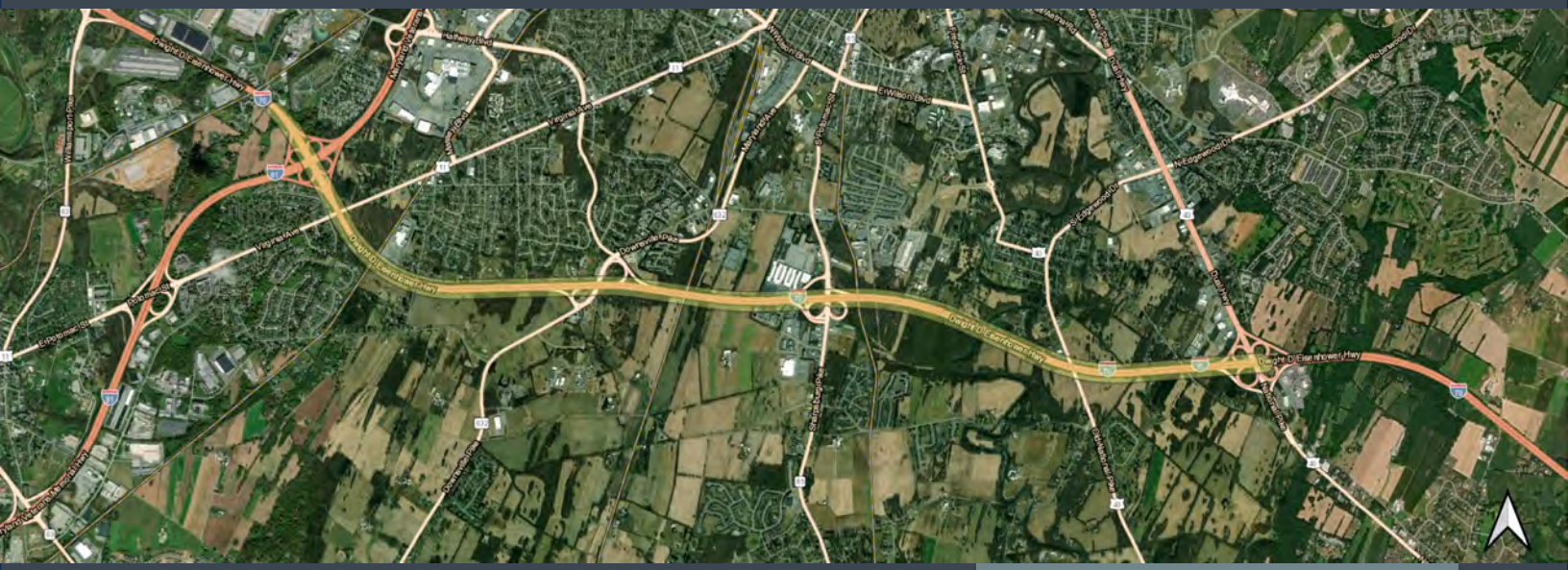
- Average Weighted TTI: 1.12
- Peak Segment-level TTI: 1.33

Initial Strategy Evaluation

Traffic Monitoring

I-70 (I-81 to US 40)

Washington County, MD



Projects Planned on TIP/LRTP:

- I-70 Roadway and Bridge Improvements (*Completed*)
- I-70 MD 65 and CSX Bridges Rehabilitation (*Completed*)

Traffic Demand:

- AADT (65,911) & Truck 17%
- Projected traffic growth: High

Road/Intersection Characteristics:

- 4 lanes with Shoulder, 4 Interchanges

Current Land Use:

- Industrial, Residential and Retail

Performance Measures:

- Average Weighted TTI: 1.08
- Peak Segment-level TTI: 1.34

Initial Strategy Evaluation

Traffic Monitoring

Apple Harvest Drive (I-81 to New York Avenue)

Berkeley County, WV

Projects Planned on TIP/LRTP:

- Apple Harvest Dr (Under Construction)

Traffic Demand:

- AADT (26,700) & Truck 4%
- Projected traffic growth: High

Road/Intersection Characteristics:

- 4 lanes, 7 Signals
- Part of Martinsburg WV 45 signal system

Multi-Modal:

- Transit Line: Most EPTA Routes

Current Land Use:

- Retail and Residential
- Trip Activity Level: High

Performance Measures:

- Average Weighted TTI: 1.19
- Peak Segment-level TTI: 2.16
- 6 hours of day congested
- Crashes/Crash Rate: 581/105.64
- Number of survey comments: 20+

Initial Strategy Evaluation

Signal Coordination and Optimization

Interchange Improvement

Hedgesville Road (W Main Street/N Mary Street Intersection/School House Drive)

Berkeley County, WV

Projects Planned on TIP/LRTP:
- Hedgesville Rd (B2022-01 & B2021-17)

Traffic Demand:
- AADT (12,900) & Truck 7%
- Projected traffic growth: Medium

Road/Intersection Characteristics:
- 2 lanes, 1 Signal

Current Land Use:
- Residential & Retail
- Trip Activity Level: High

Performance Measures:
- Average Weighted TTI: 1.12
- Peak Segment-level TTI: 1.55
- 3 hours of day congested

Initial Strategy Evaluation

Signal Coordination and Optimization

Intersection Improvement

Hedgesville Rd (Roaring Lions Dr to Severna Parkway)

Berkeley County, WV

Projects Planned on TIP/LRTP/LRTP:
- Hedgesville Rd (B2021-17)

Traffic Demand:
- AADT (14,500) & Truck 7%
- Projected traffic growth: Medium

Road/Intersection Characteristics:
- 2 lanes with CTL, 3 Signals

Multi-Modal:
- Transit Line: EPTA Routes 12 & 19

Current Land Use:
- Residential & Retail
- Trip Activity Level: High

Performance Measures:
- Average Weighted TTI: 1.09

Initial Strategy Evaluation

Highway Widening by Adding Lanes

Intersection Improvement

Apple Harvest Drive
(Kelly Island Road to Grapevine Road)

Berkeley County, WV

Traffic Demand:
- AADT (24,600) & Truck 7%
- Projected traffic growth: Medium

Road/Intersection Characteristics:
- 4 lanes, 2 Signals and 1 rail-crossing
- Part of a WV 9 Variform signal system

Multi-Modal:
- Transit Line: EPTA Routes 11, 16 & 25

Current Land Use:
- Residential & Retail

Performance Measures:
- Average Weighted TTI: 1.12
- Crashes /Crash Rate: 140/96.55

Initial Strategy Evaluation

Traffic Monitoring

Edwin Miller Boulevard (South of I-81 Interchange to E. Moler Avenue)

Berkeley County, WV

Projects Planned on TIP/LRTP:

- Hedgesville Road (B2015-07)
- Nichols Overhead (B2021-19)
- Queen St at Moler Ave (B2024-11)

Traffic Demand:

- AADT (21,500) & Truck 7%
- Includes a priority freight corridor

Road/Intersection Characteristics:

- 2 lanes with CTL, 6 Signals
- Shoulder available

Multi-Modal:

- Transit Line: EPTA Routes 12 & 19

Current Land Use:

- Retail, Residential and Utilities
- Trip Activity Level: High

Performance Measures:

- Average Weighted TTI: 1.16
- Peak Segment-level TTI: 1.54
- Crashes /Crash Rate: 595/52.19
- Number of survey comments: 13

Initial Strategy Evaluation

Intersection Improvement

Traffic Monitoring

Hedgesville Road
(Harlan Springs Road to North of I-81 Interchange)

Berkeley County, WV

Projects Planned on TIP/LRTP/LRTP:
- Hedgesville Road (B2015-07)

Traffic Demand:
- AADT (21,500) & Truck 7%
- Projected traffic growth: High
- Includes a priority freight corridor

Road/Intersection Characteristics:
- 4 lanes with CTL, 3 Signals

Multi-Modal:
- Transit Line: EPTA Routes 12 & 19

Current Land Use:
- Industrial & Single Family Residential
- Trip Activity Level: High

Performance Measures:
- Average Weighted TTI: 1.05
- Crashes /Crash Rate: 174/40.47

Initial Strategy Evaluation

Improved Signage

Intersection Improvement

Queen Street (E King Street to W Race Street)

Berkeley County, WV

Projects Planned on TIP/LRTP/LRTP:
- Martinsburg Signal System(B2016-04)
- Martinsburg N Queen St (B2022-18)

Traffic Demand:
- AADT (17,700) & Truck 4%
- Projected traffic growth: Medium

Road/Intersection Characteristics:
- 2 lanes, 4 Signals
- Part of Martinsburg CBD Signal System
- Parking available

Multi-Modal:
- Transit Line: Most EPTA Routes

Current Land Use:
- Residential
- Trip Activity Level: High

Performance Measures:
- Average Weighted TTI: 1.29
- Peak Segment-level TTI: 1.57
- 9 hours of day congested

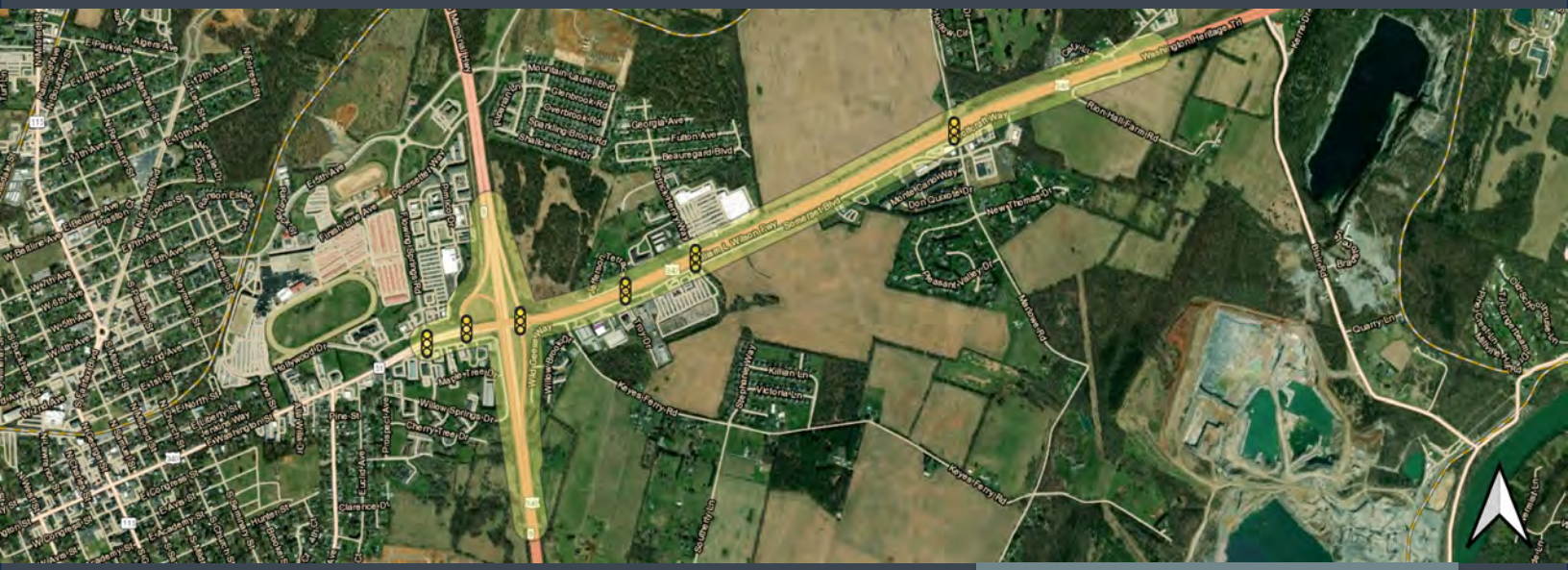
Initial Strategy Evaluation

Traffic Signal Coordination

Parking Management

US 340
(Flowing Springs Road to Halltown Road)

Jefferson County, WV



Projects Planned on TIP/LRTP:

- I/C Design Study (J2023-04)
- US 340 Signing (J2023-05)

Traffic Demand:

- AADT (16,800) & Truck 14%
- Projected traffic growth: Medium
- Includes a priority freight corridor

Road/Intersection Characteristics:

- 4 lanes with shoulders, 6 Signals

Multi-Modal:

- Transit Line: EPTA Route 20
- Bike/Pedestrian activity: Low/High

Current Land Use:

- Retail & Residential
- Trip Activity Level: High
- Key commercial centers with access

Performance Measures:

- Average Weighted TTI: 1.05
- Peak Segment-level TTI: 1.78
- Crashes /Crash Rate: 614/16.66
- Number of public comments: 18

Initial Strategy Evaluation

Improved Signage

Complete Street

Washington Street
(Flowing Springs Rd to Naples Way)

Jefferson County, WV

Projects Planned on TIP/LRTP:
- W Washington Street (J2024-09)
- Charles Town CBD System (J2016-02)

Traffic Demand:
- AADT (18,300) & Truck 4%

Road/Intersection Characteristics:
- 2 lanes with shoulder, 7 Signals
- Parking available

Multi-Modal:
- Transit Line: EPTA Route 16 & 20
- Sidewalk infrastructure exists
- Bike/Pedestrian activity: Low/High

Current Land Use:
- Retail, Non-Retail & Residential
- Trip Activity Level: High
- Key commercial centers with access

Performance Measures:
- Average Weighted TTI: 1.3
- Peak Segment-level TTI: 1.88
- 14 hours of day congested
- Number of public comments: 10

Initial Strategy Evaluation

Improved Signage

Complete Street

Martinsburg Pike (Martinsburg Pike/Duke Street Intersection)

Jefferson County, WV

Projects Planned on TIP/LRTP:

- Ridge Road-Morgan Grove (J2024-02)
- Old Martinsburg St-Duke St (J2015-04)
- Duke St (J2016-05)
- Shepherdstown Bike Path (J2014-05)

Traffic Demand:

- AADT (5,518) & Truck 5%

Road/Intersection Characteristics:

- 4 lanes, 6 Signals
- Parking available

Multi-Modal:

- Sidewalk infrastructure exists
- Bike/Pedestrian activity: Low/High

Current Land Use:

- Residential, Retail & Education
- Trip Activity Level: High
- Key commercial centers with access

Performance Measures:

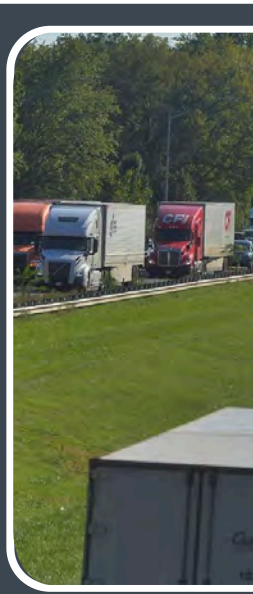
- Average Weighted TTI: 1.16
- Peak Segment-level TTI: 2.02
- 15 hours of day congested*

Initial Strategy Evaluation

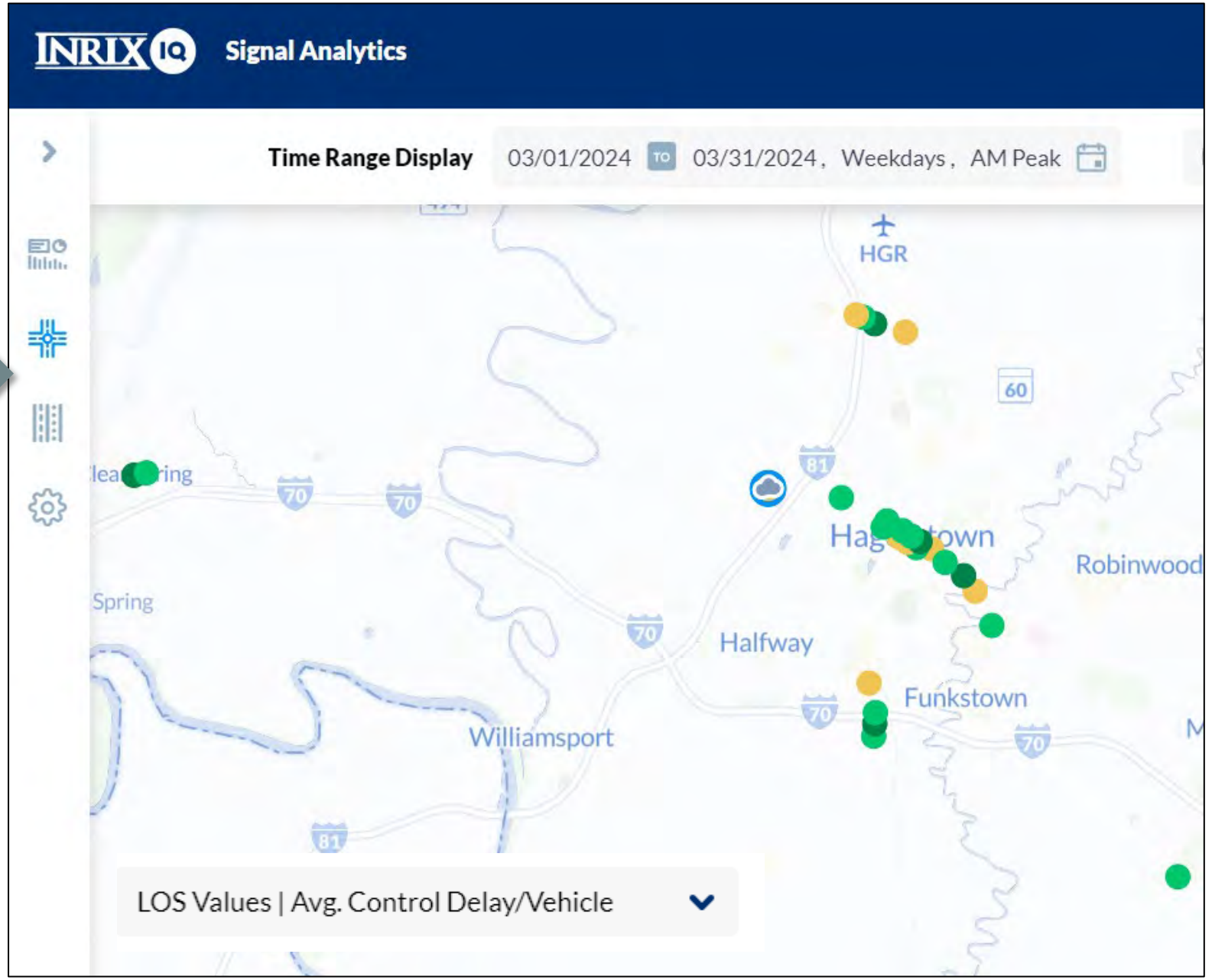
Traffic Monitoring

APPENDIX D

TRAFFIC SIGNAL DATA COLLECTED FOR CMP LOCATIONS



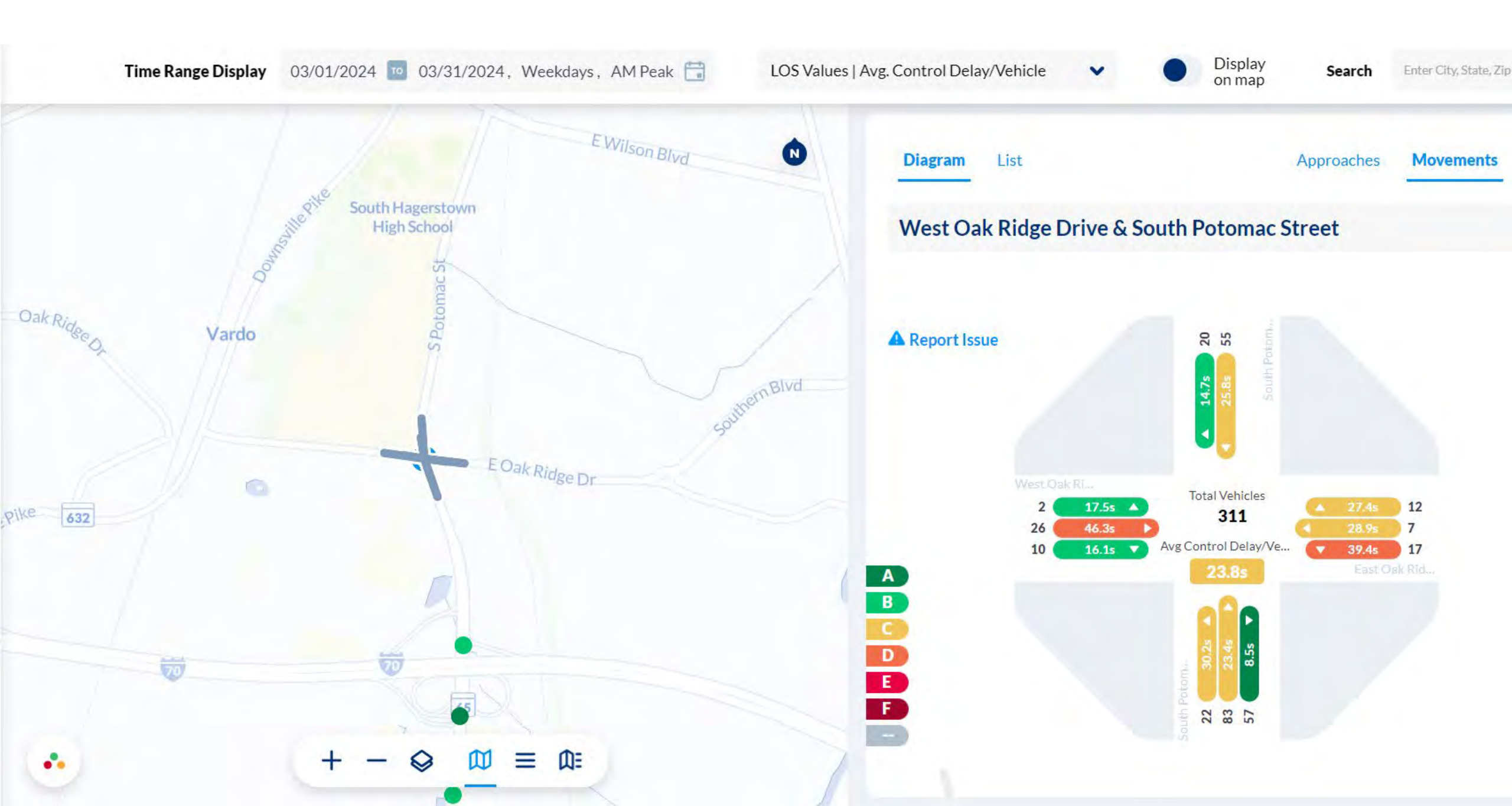
Locations Currently Available in Signal Analytics



Additional Washington County Locations <u>Recommended</u> to Be Added:

- Halfway Blvd/ Virginia Ave
- National Pike / Garland Groh Blvd
- Eastern Blvd / Potomac Avenue
- Northern Ave / Hamilton Blvd
- Dual Highway / Edgewood Drive
- Eastern Blvd/ Jefferson Blvd

MD 65
(Col Henry K Douglas Dr to W Oak Ridge Dr)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LOS Values | Avg. Control Delay/Vehicle
Display on map
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Enter City, State, Zip
E Wilson Blvd
Downsville Pike
South Hagerstown High School
S Potomac St
Oak Ridge Dr
Vardo
Southern Blvd
E Oak Ridge Dr
632
70
Diagram
List
Approaches
Movements
West Oak Ridge Drive & South Potomac Street
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14.7s
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South Potom...
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Total Vehicles
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Avg Control Delay/Ve...
23.8s
27.4s
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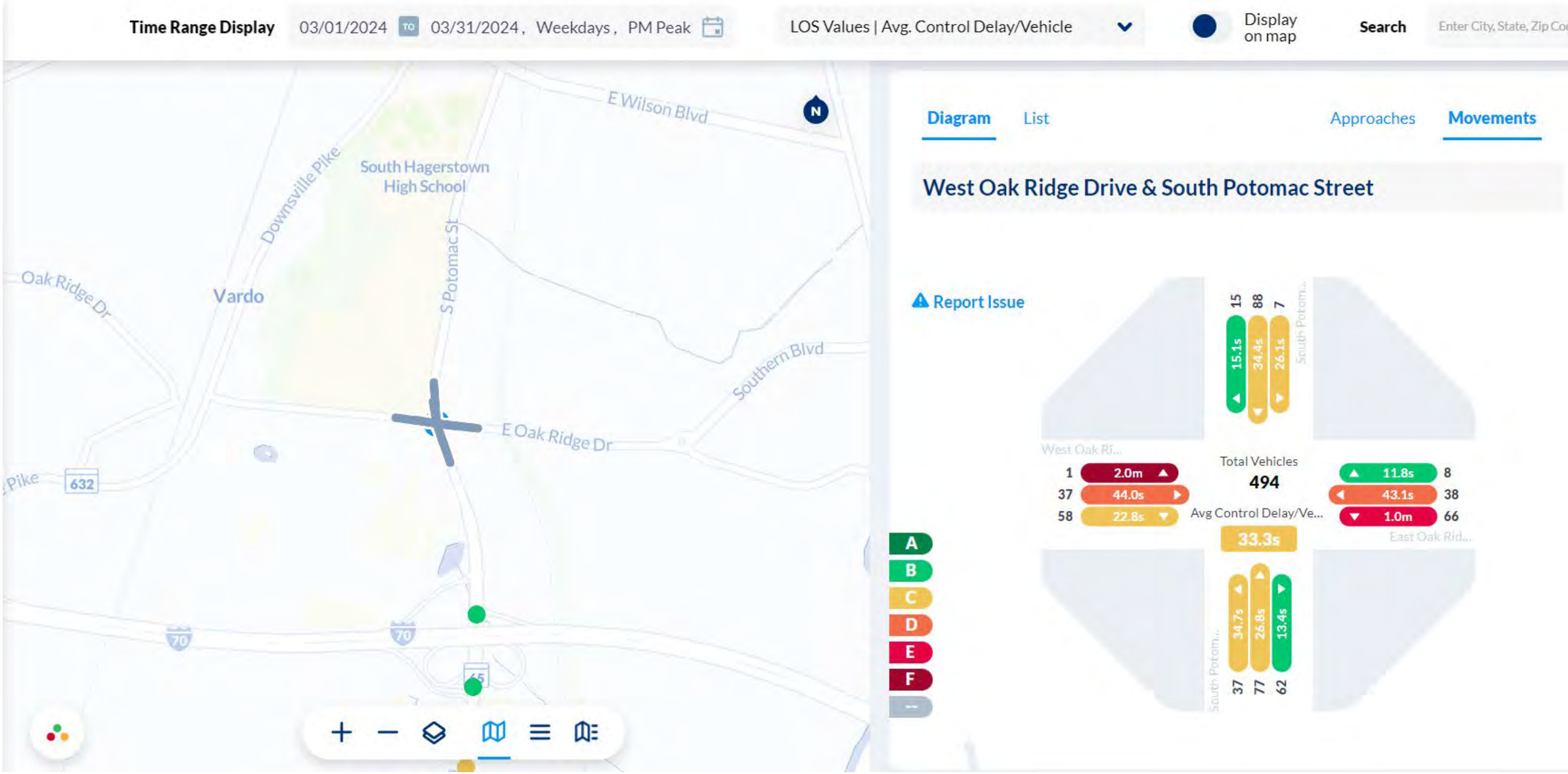
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Avg Control Delay/Ve...
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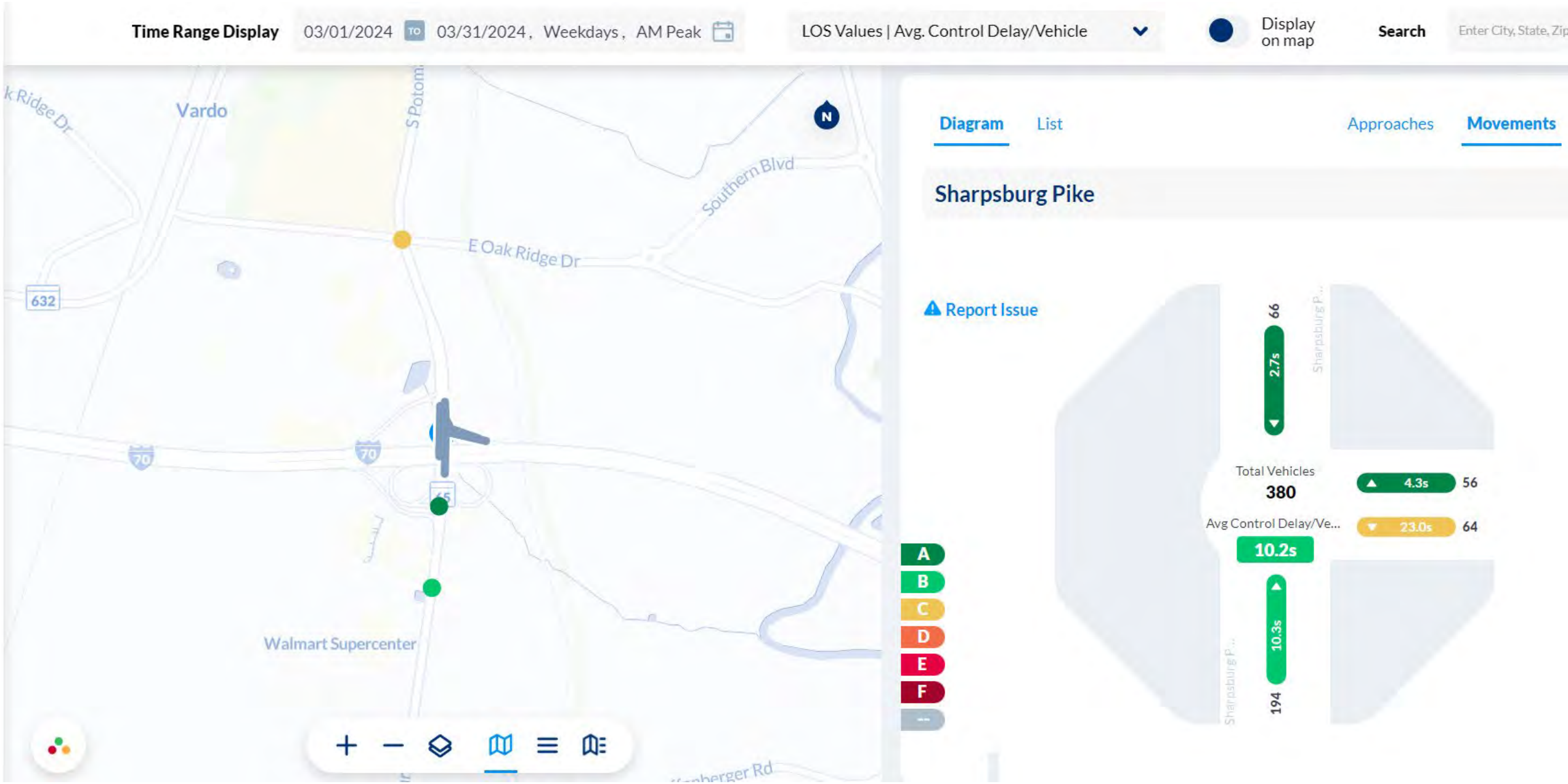
77
62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10.3s
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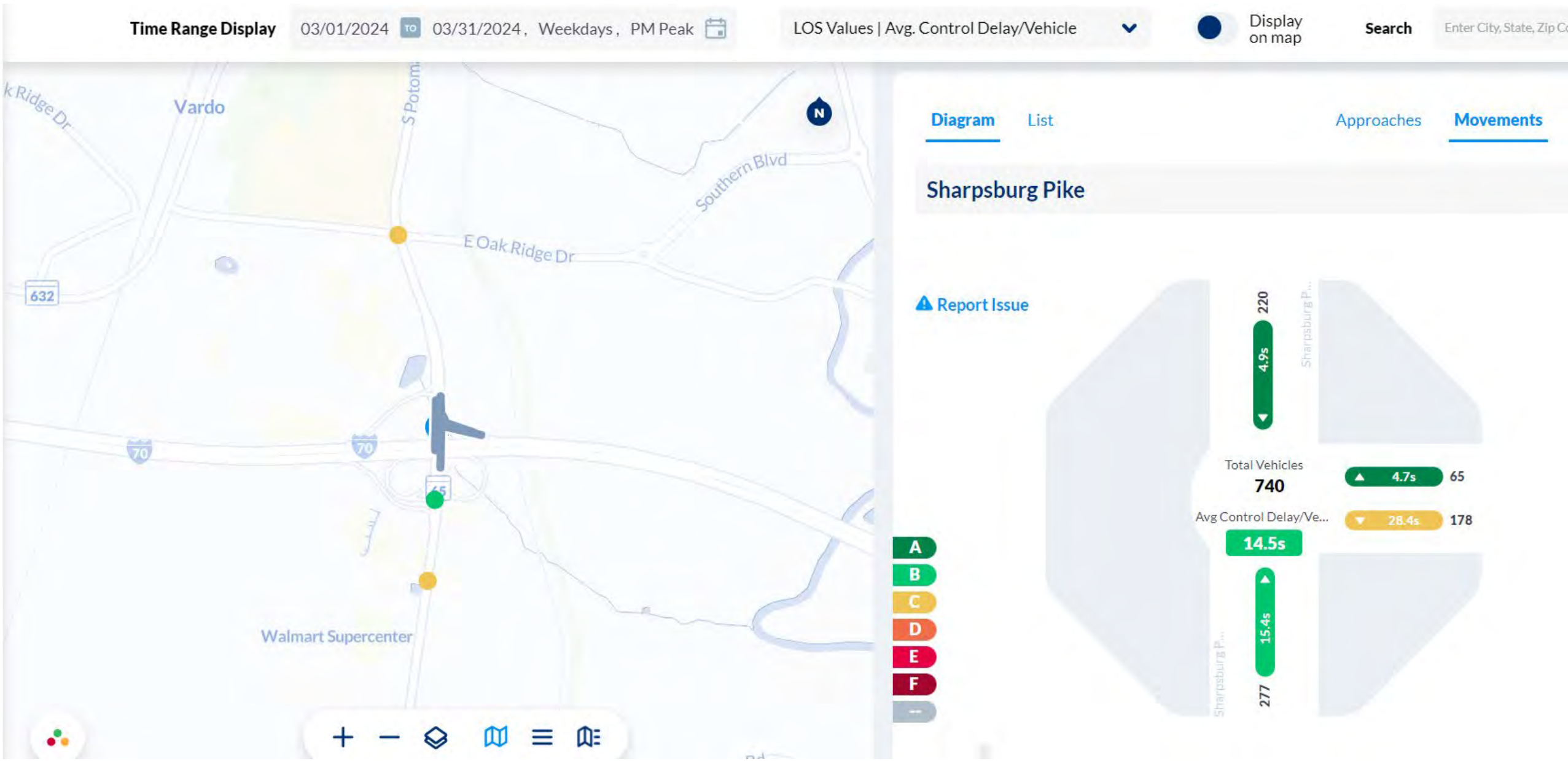
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Total Vehicles
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14.5s
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15.4s
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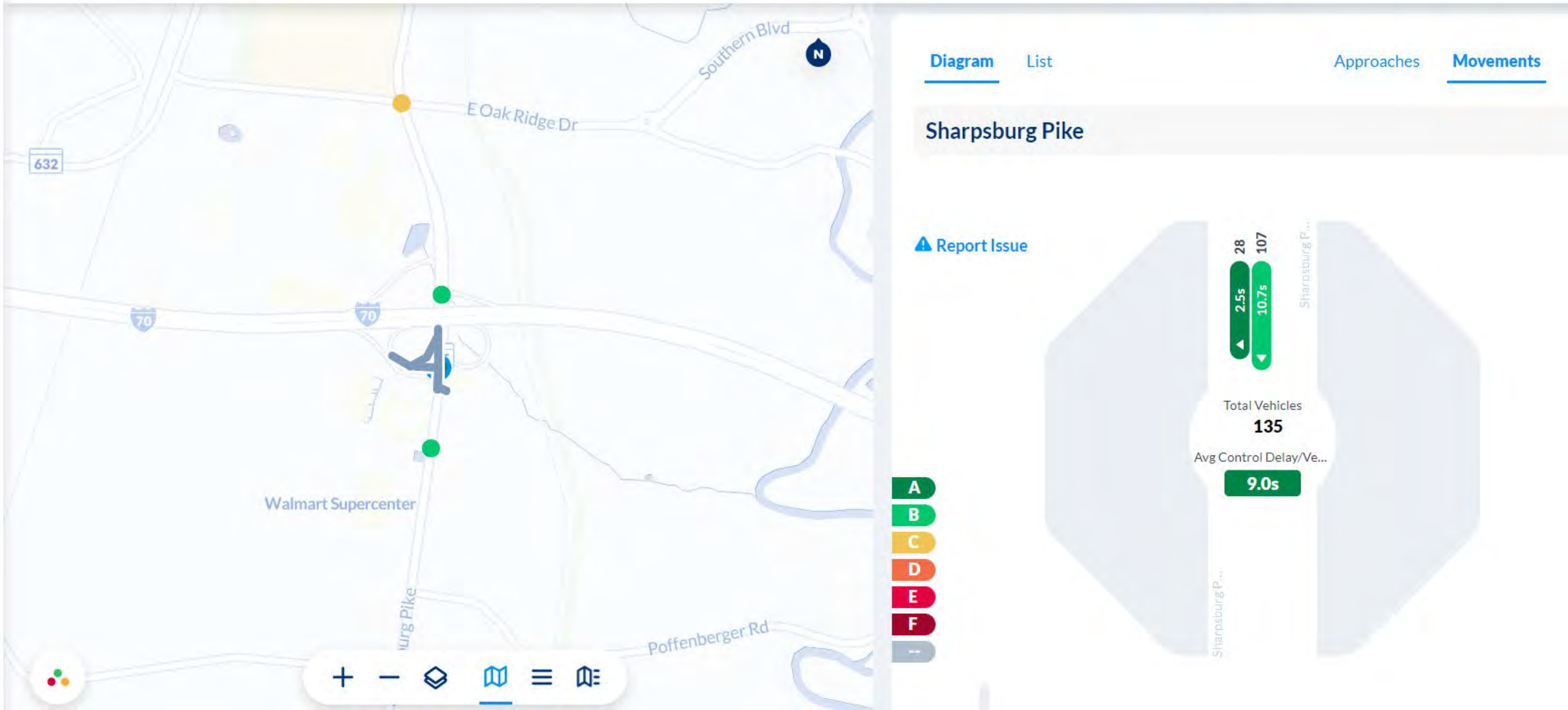
Sharpsburg P...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Approaches
Movements
Sharpsburg Pike
Report Issue
28
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2.5s
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Total Vehicles
135
Avg Control Delay/Ve...
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Southern Blvd
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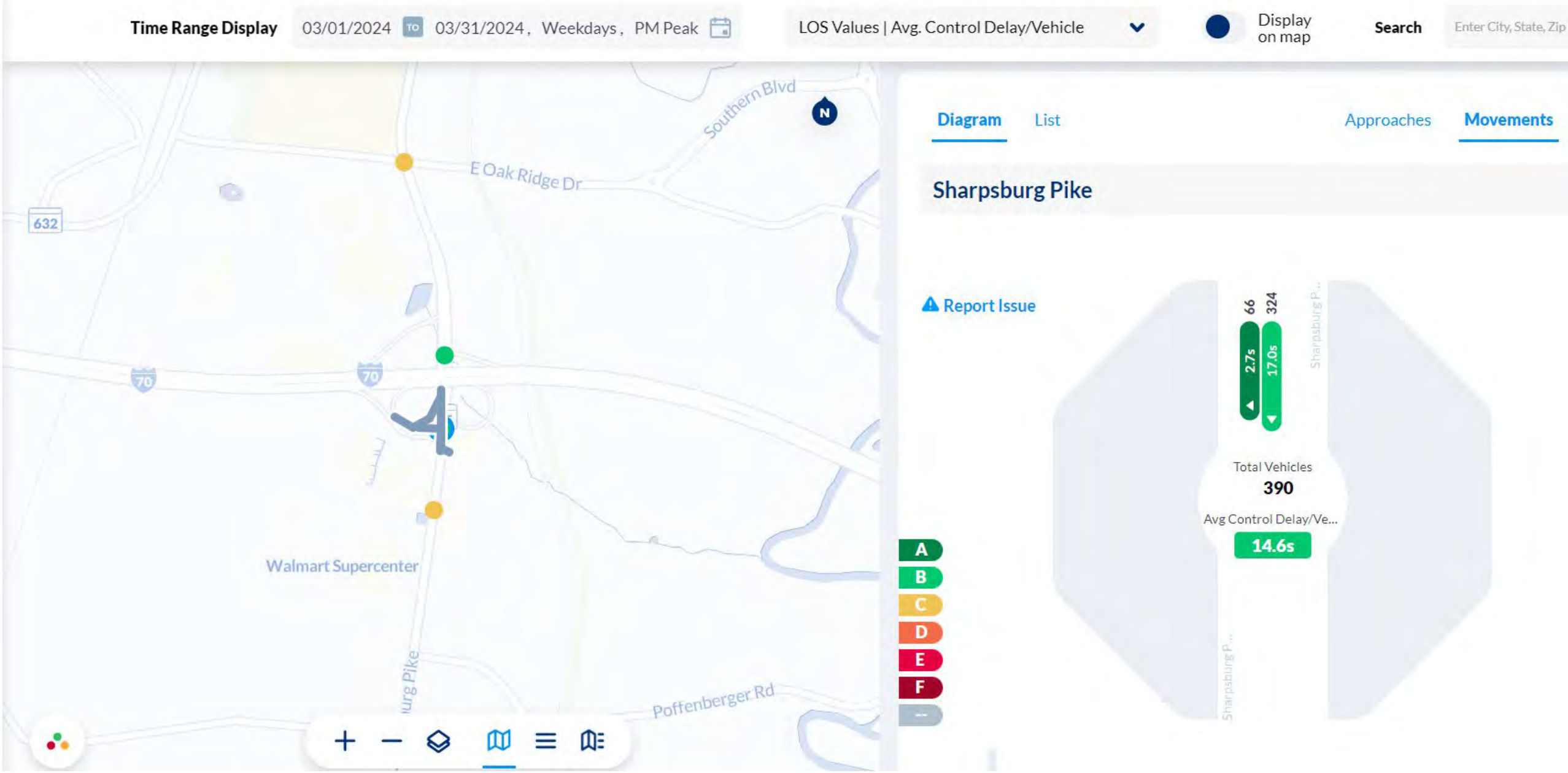
Walmart Supercenter
Poffenberger Rd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Sharpsburg Pike
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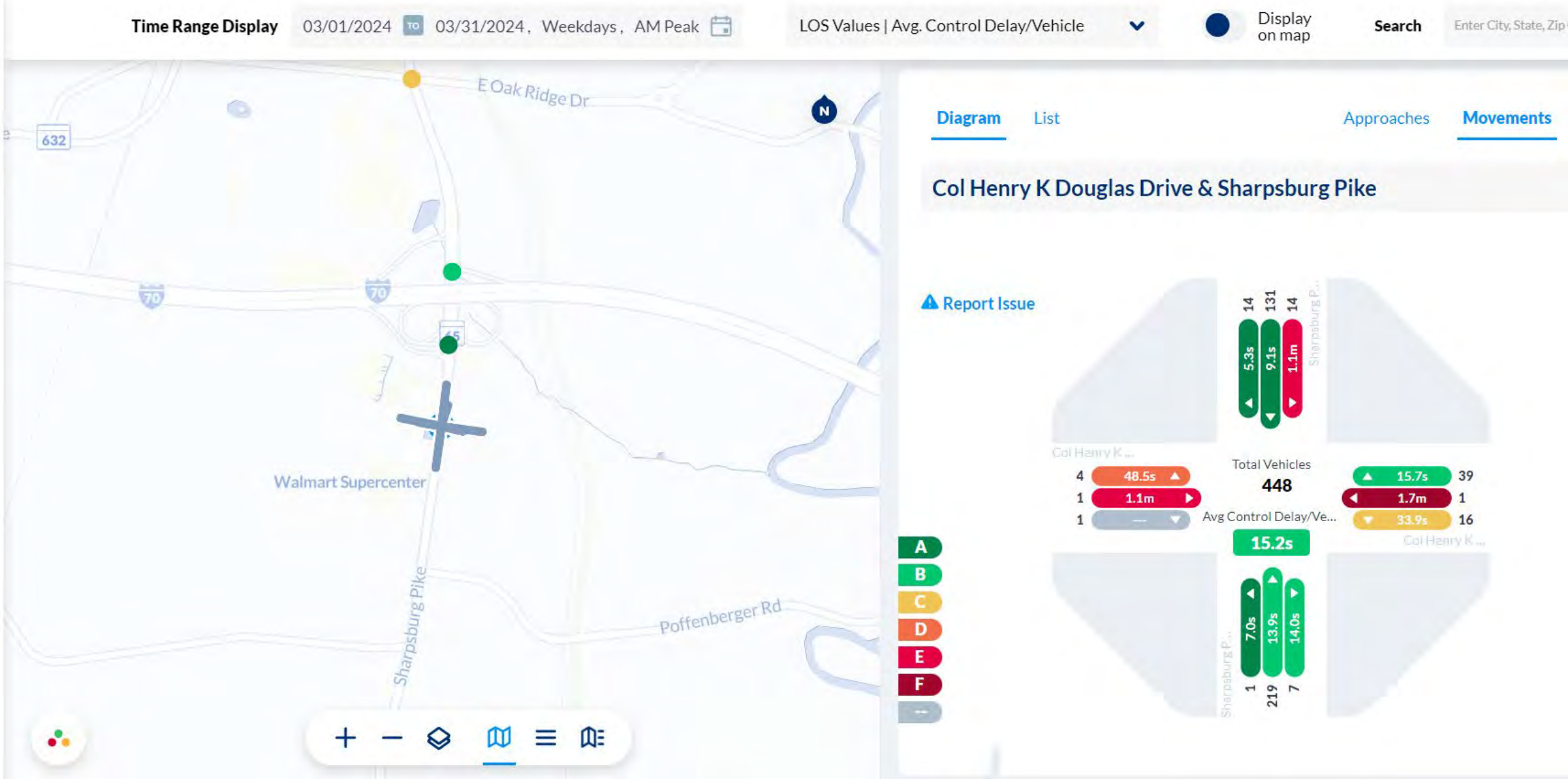
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Walmart Supercenter
Sharpsburg Pike
Poffenberger Rd
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Diagram
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Approaches
Movements
Col Henry K Douglas Drive & Sharpsburg Pike
Report Issue
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48.5s
1
1.1m
1

Total Vehicles
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Avg Control Delay/Ve...
15.2s
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1.7m
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33.9s
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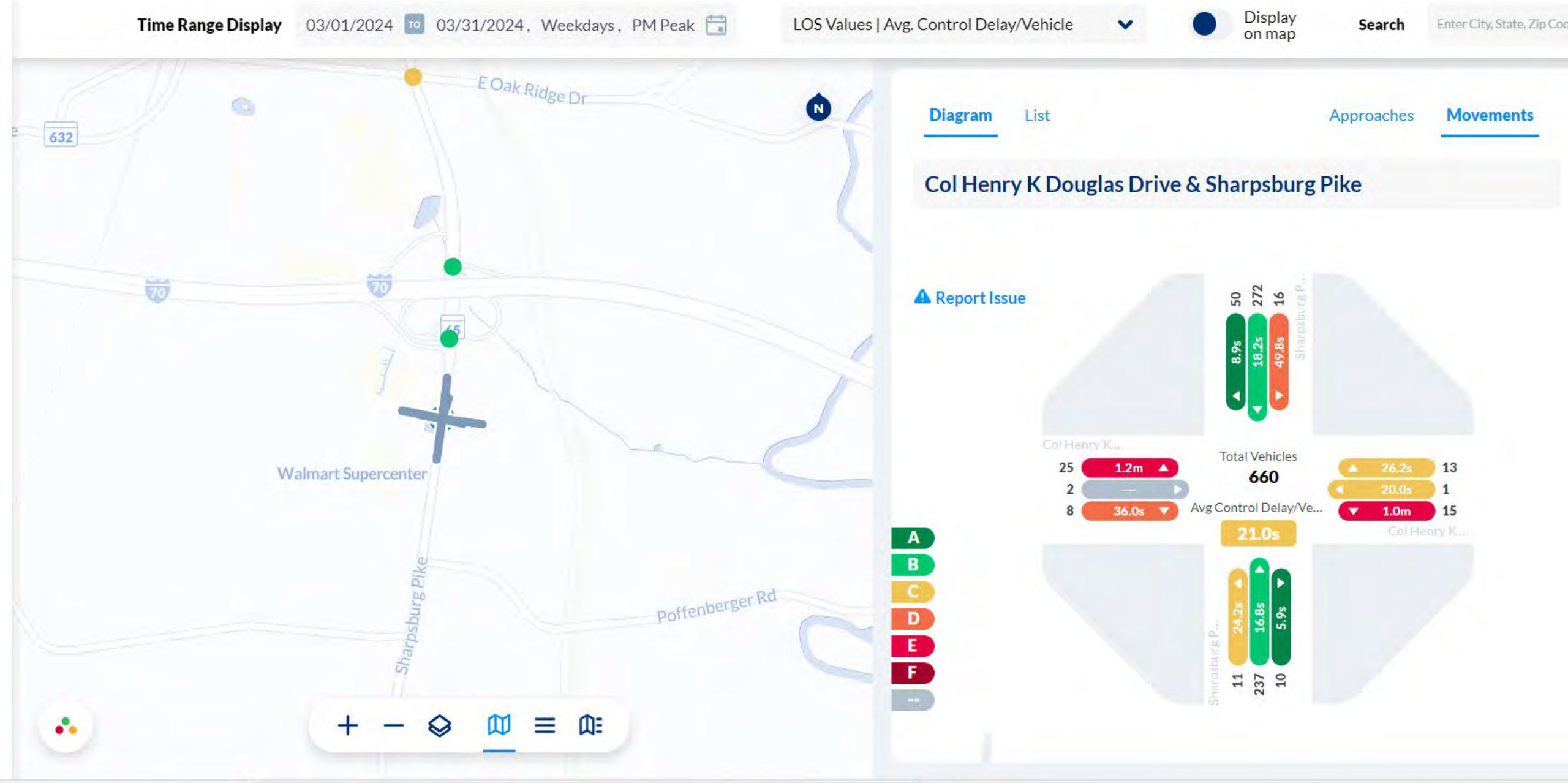
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LOS Values | Avg. Control Delay/Vehicle
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Sharpsburg Pike
Poffenberger Rd
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8.9s
18.2s
49.8s
Sharpsburg P...
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1.2m
2
8
36.0s
Total Vehicles
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Avg Control Delay/Ve...
21.0s
26.2s
13
20.0s
1
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24.2s
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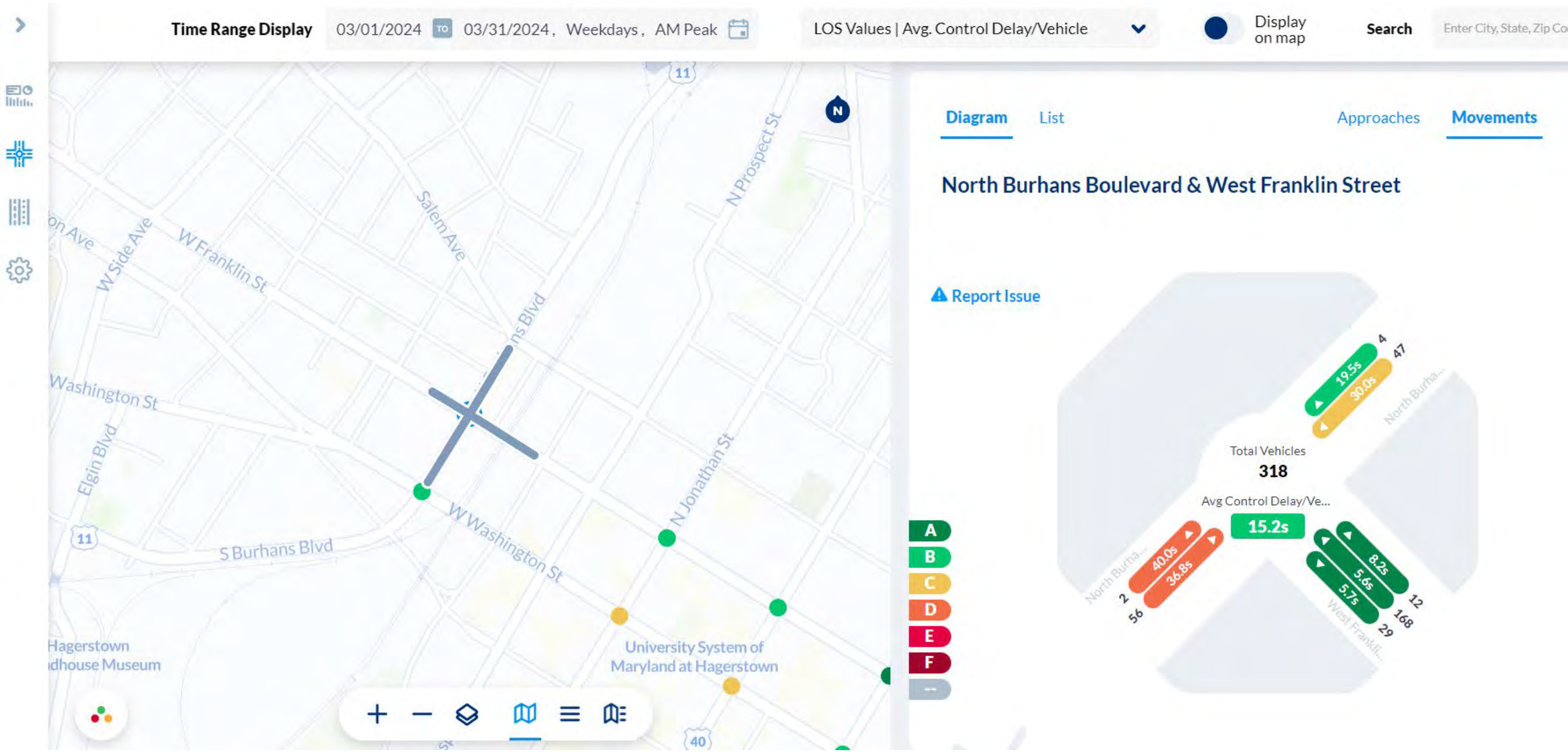
N Burhans Blvd

(Washington St to Pennsylvania Avenue)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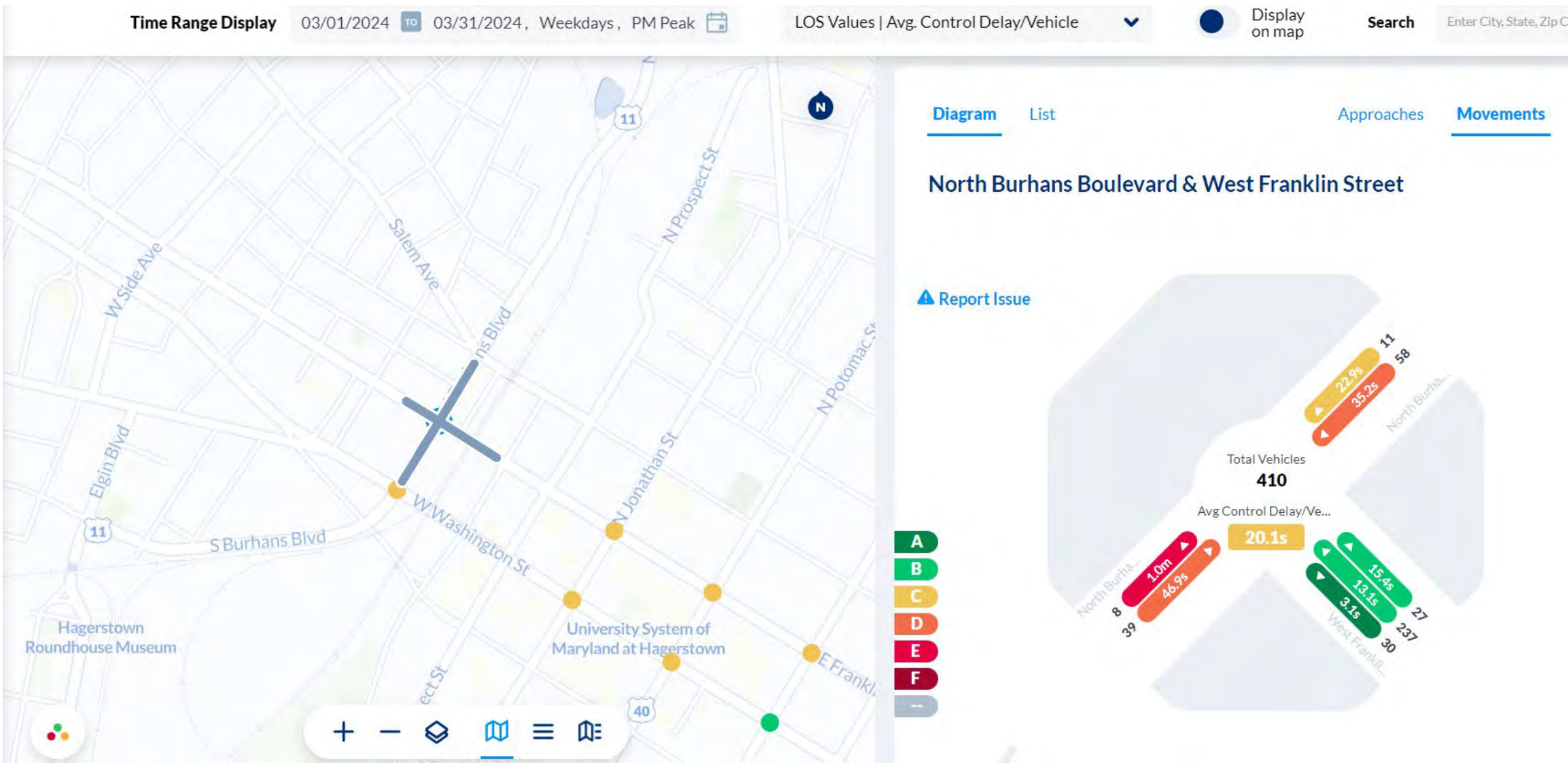
Approaches
Movements
North Burhans Boulevard & West Franklin Street
Report Issue
Total Vehicles
318
Avg Control Delay/Ve...
15.2s
19.5s
30.0s
4
47
40.0s
36.8s
2
56
8.2s
5.6s
5.7s
12
168
29
A
B
C
D
E
F
--
W Franklin St
W Side Ave
Salem Ave
N Prospect St
Washington St
Elgin Blvd
S Burhans Blvd
W Washington St
N Jonathan St
University System of Maryland at Hagerstown
Hagerstown
dhouse Museum
11
40


Time Range Display
03/01/2024 TO 03/31/2024 , Weekdays , PM Peak
LOS Values | Avg. Control Delay/Vehicle
Display on map
Search
Enter City, State, Zip C
Diagram
List
Approaches
Movements
North Burhans Boulevard & West Franklin Street
Report Issue
Total Vehicles
410
Avg Control Delay/Ve...
20.1s
A
B
C
D
E
F
--
W Side Ave
Salem Ave
N Prospect St
Elgin Blvd
S Burhans Blvd
W Washington St
N Jonathan St
N Potomac St
Hagerstown Roundhouse Museum
University System of Maryland at Hagerstown
11
40
N

Time Range Display 03/01/2024 TO 03/31/2024 , Weekdays , AM Peak

LOS Values | Avg. Control Delay/Vehicle

Display on map

Search Enter City, State, Zip

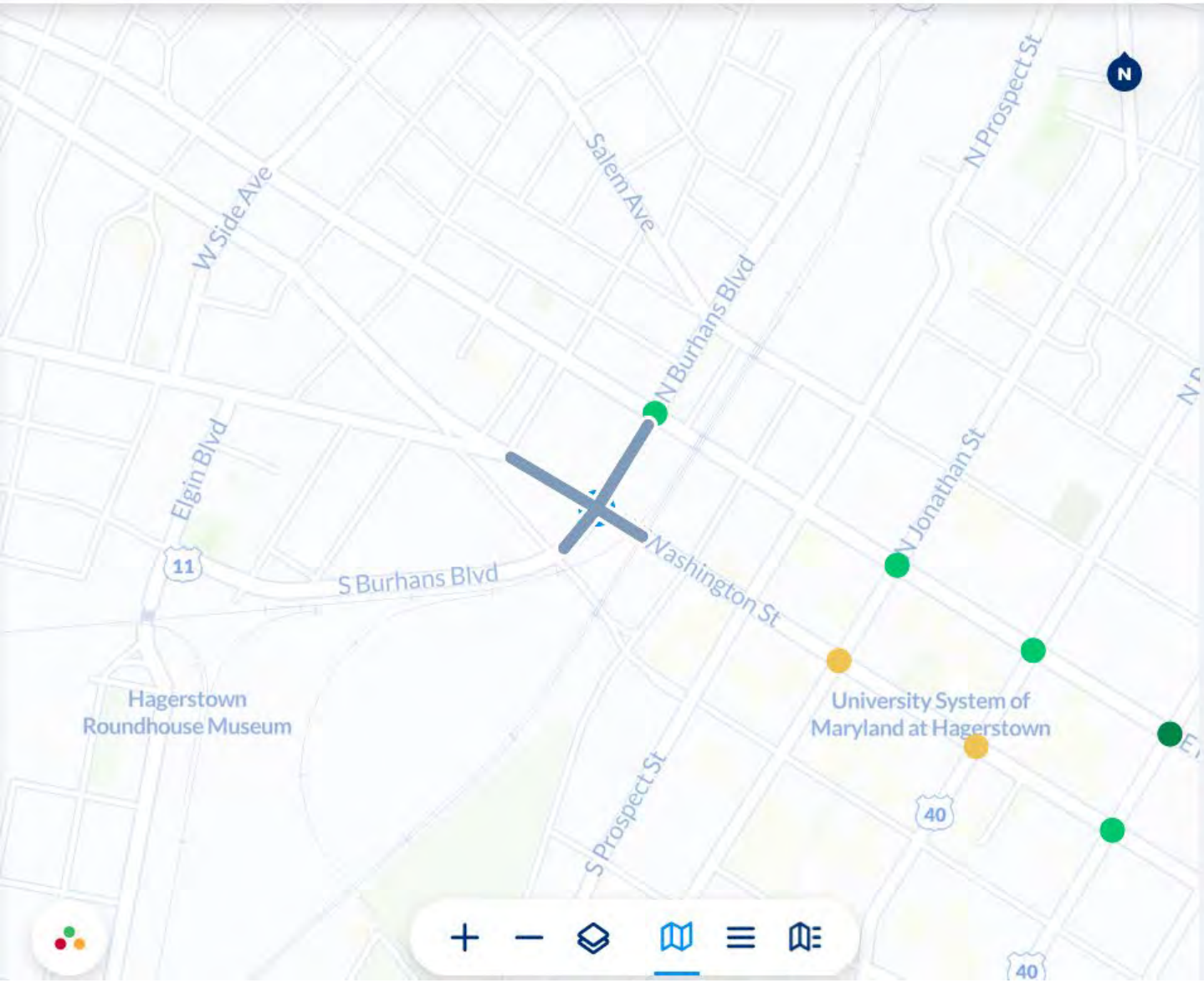
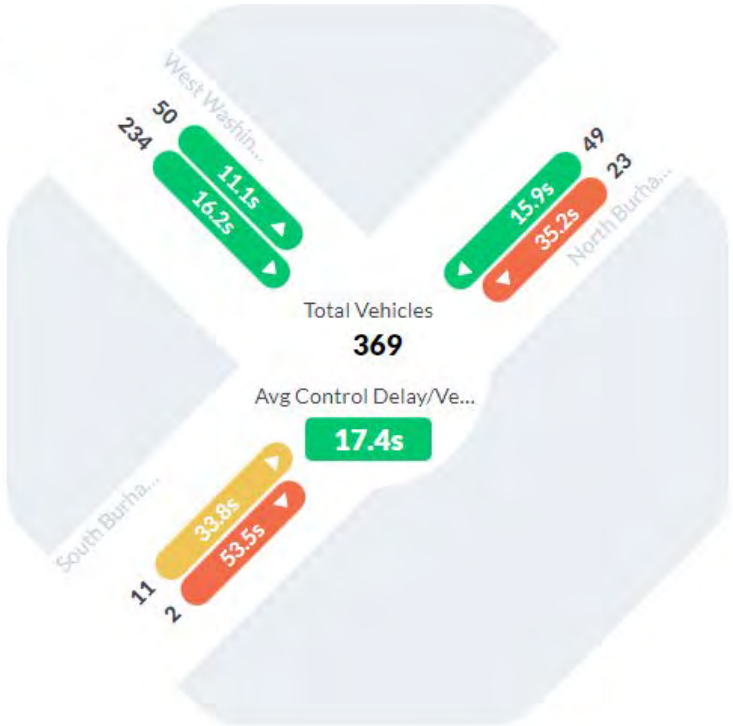


Diagram List Approaches Movements

West Washington Street & South Burhans Boulevard

Report Issue



A
B
C
D
E
F
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Time Range Display 03/01/2024 TO 03/31/2024, Weekdays, PM Peak

LOS Values | Avg. Control Delay/Vehicle

Display on map

Search Enter City, State, Zip C

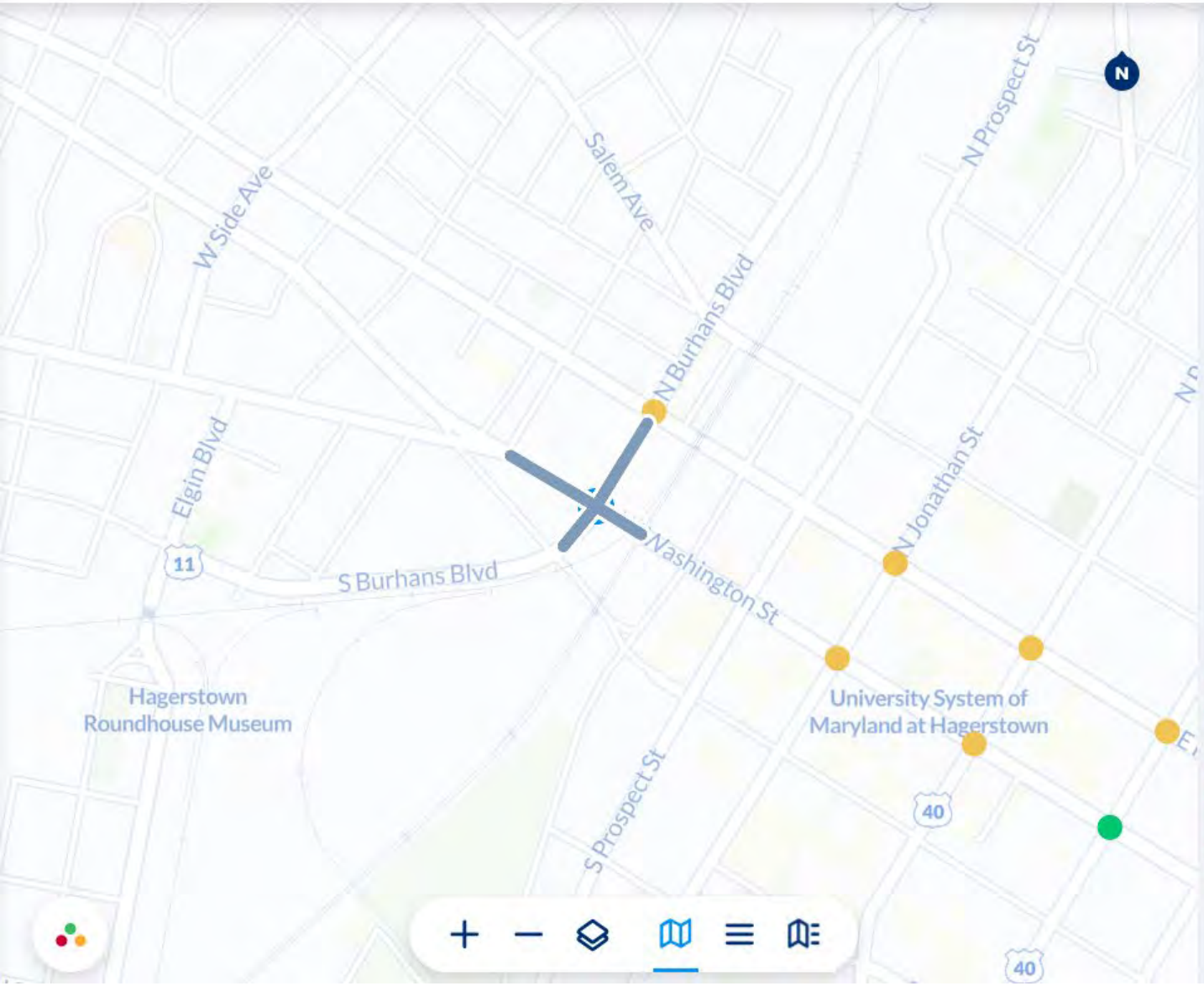
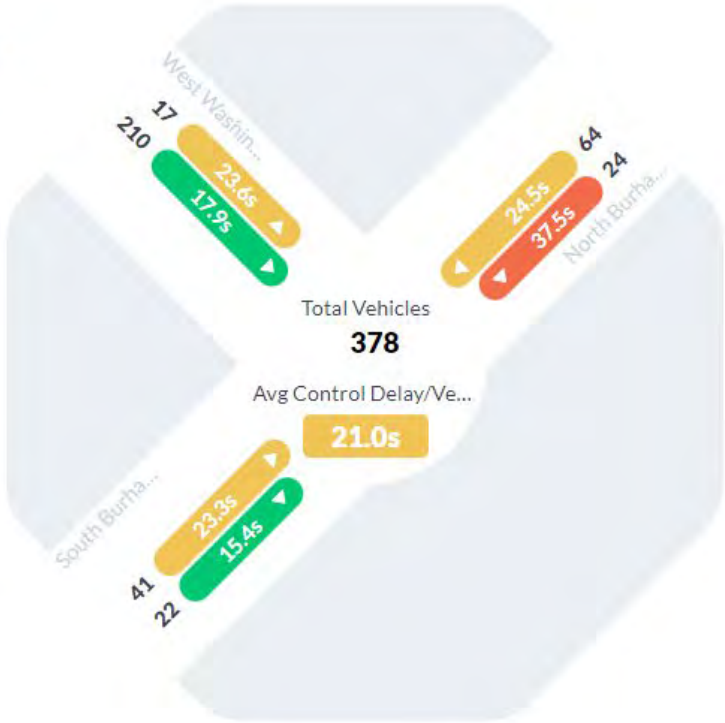


Diagram List Approaches Movements

West Washington Street & South Burhans Boulevard

Report Issue



A
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C
D
E
F
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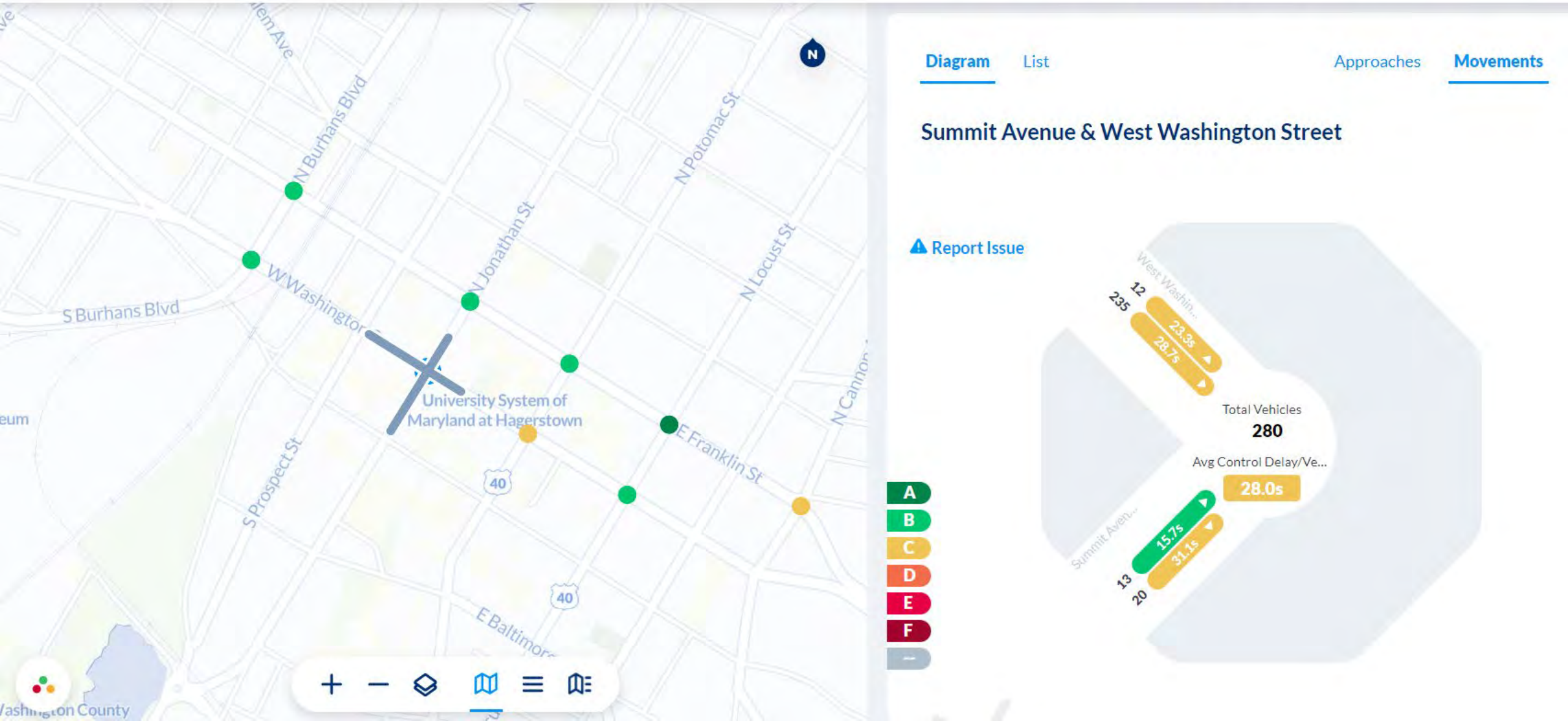
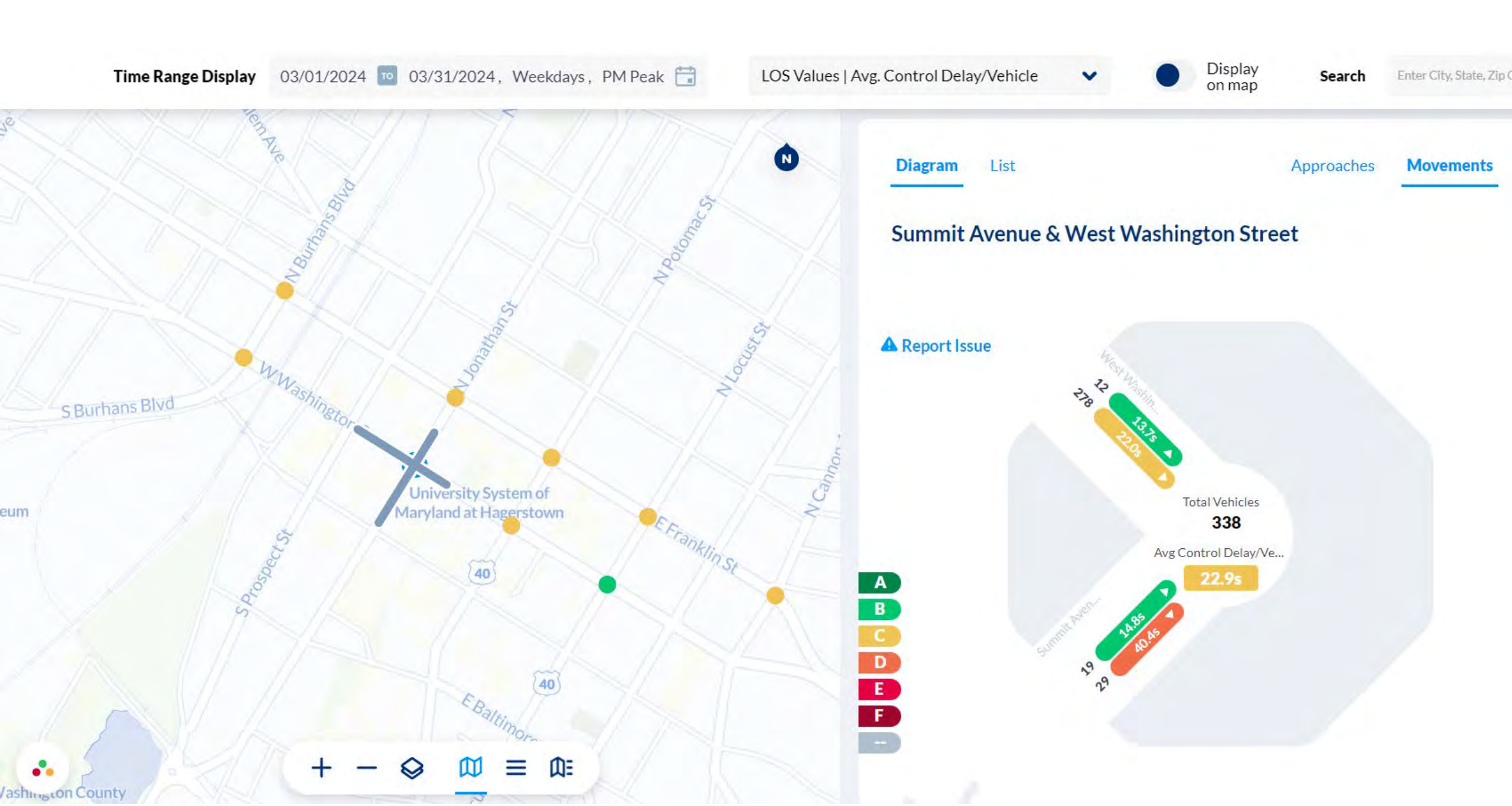
Washington St

(Burhans Blvd to N Cannon Avenue)


Time Range Display
03/01/2024 TO 03/31/2024 , Weekdays , AM Peak
LOS Values | Avg. Control Delay/Vehicle
Display on map
Search
Enter City, State, Zip C
Diagram
List
Approaches
Movements
Summit Avenue & West Washington Street
Report Issue
N Burhans Blvd
N Potomac St
N Jonathan St
N Locust St
W Washington
S Burhans Blvd
University System of Maryland at Hagerstown
E Franklin St
S Prospect St
E Baltimore
40
A
B
C
D
E
F
12
235
23.3s
28.7s
Total Vehicles
280
Avg Control Delay/Ve...
28.0s
15.7s
31.1s
13
20


Time Range Display
03/01/2024 TO 03/31/2024 , Weekdays , PM Peak
LOS Values | Avg. Control Delay/Vehicle
Display on map
Search
Enter City, State, Zip C
Diagram
List
Approaches
Movements
Summit Avenue & West Washington Street
Report Issue
N Burhans Blvd
S Burhans Blvd
N Jonathan St
N Potomac St
N Locust St
E Franklin St
S Prospect St
E Baltimore
University System of Maryland at Hagerstown
40
A
B
C
D
E
F
--
West Washin...
12
278
13.7s
22.0s
Total Vehicles
338
Avg Control Delay/Ve...
22.9s
Summit Aven...
14.8s
40.4s
19
29

Time Range Display 03/01/2024 TO 03/31/2024, Weekdays, AM Peak

LOS Values | Avg. Control Delay/Vehicle

Display on map

Search Enter City, State, Zip Co

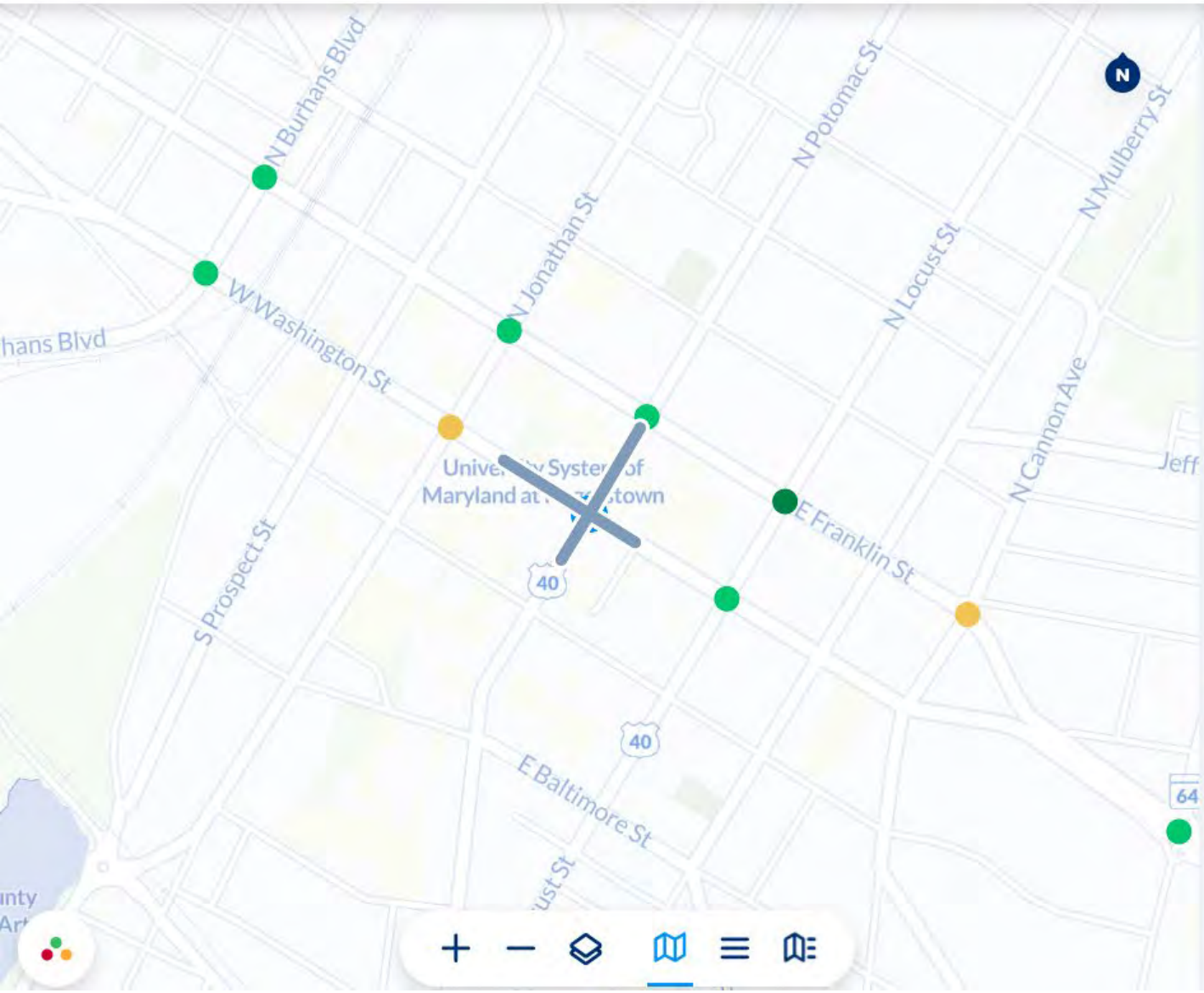
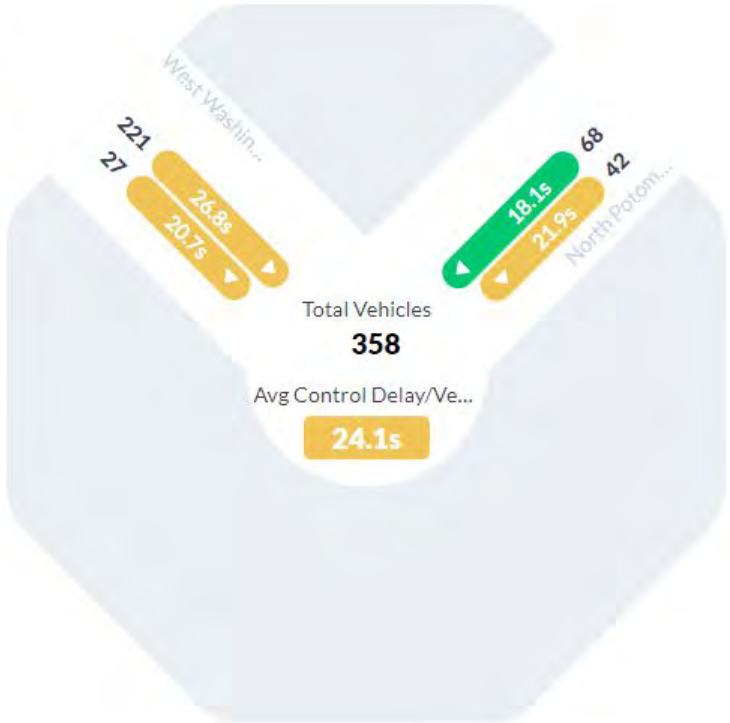


Diagram | List | Approaches | **Movements**

West Washington Street & South Potomac Street

Report Issue



A
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D
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F
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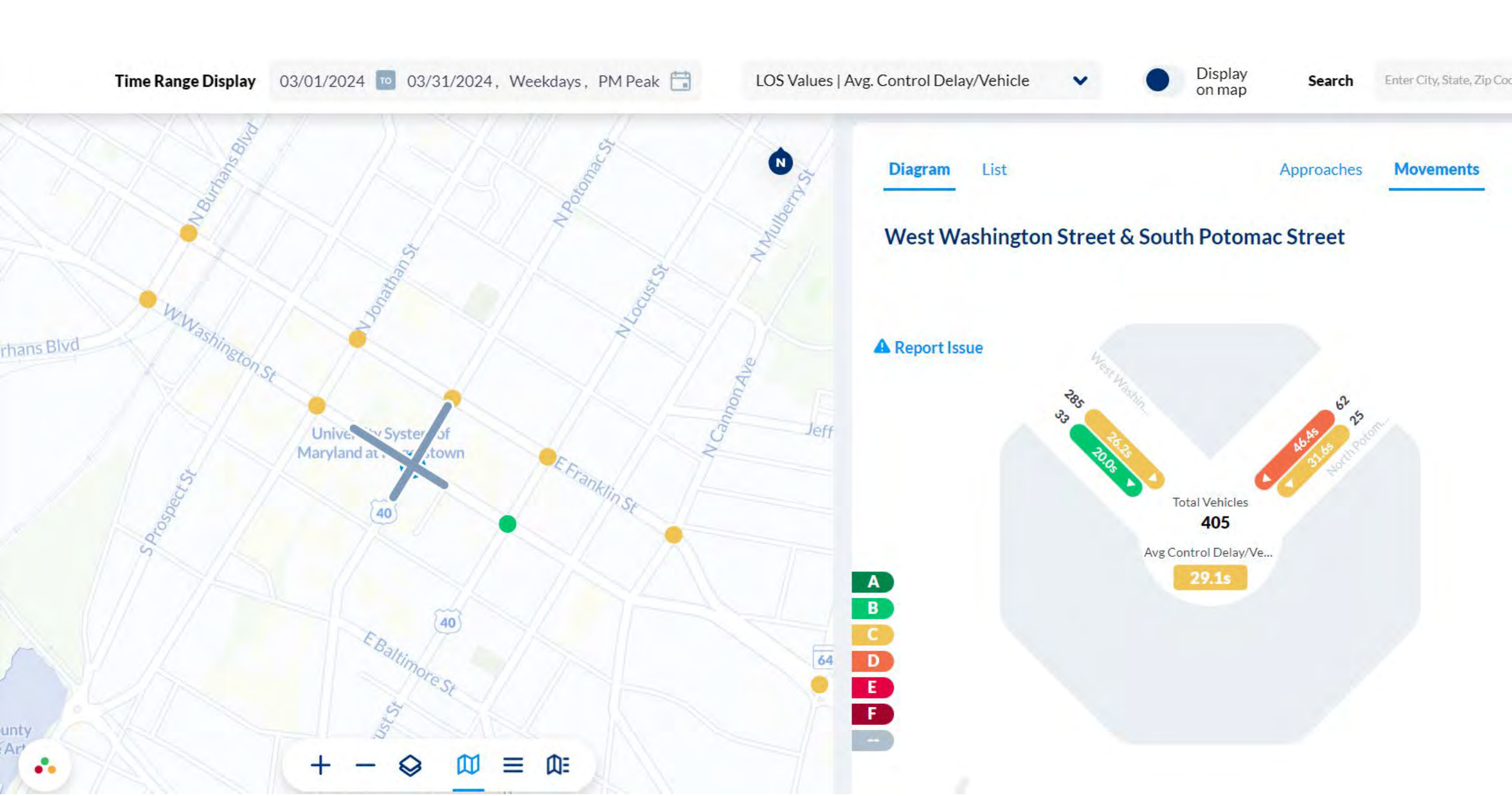
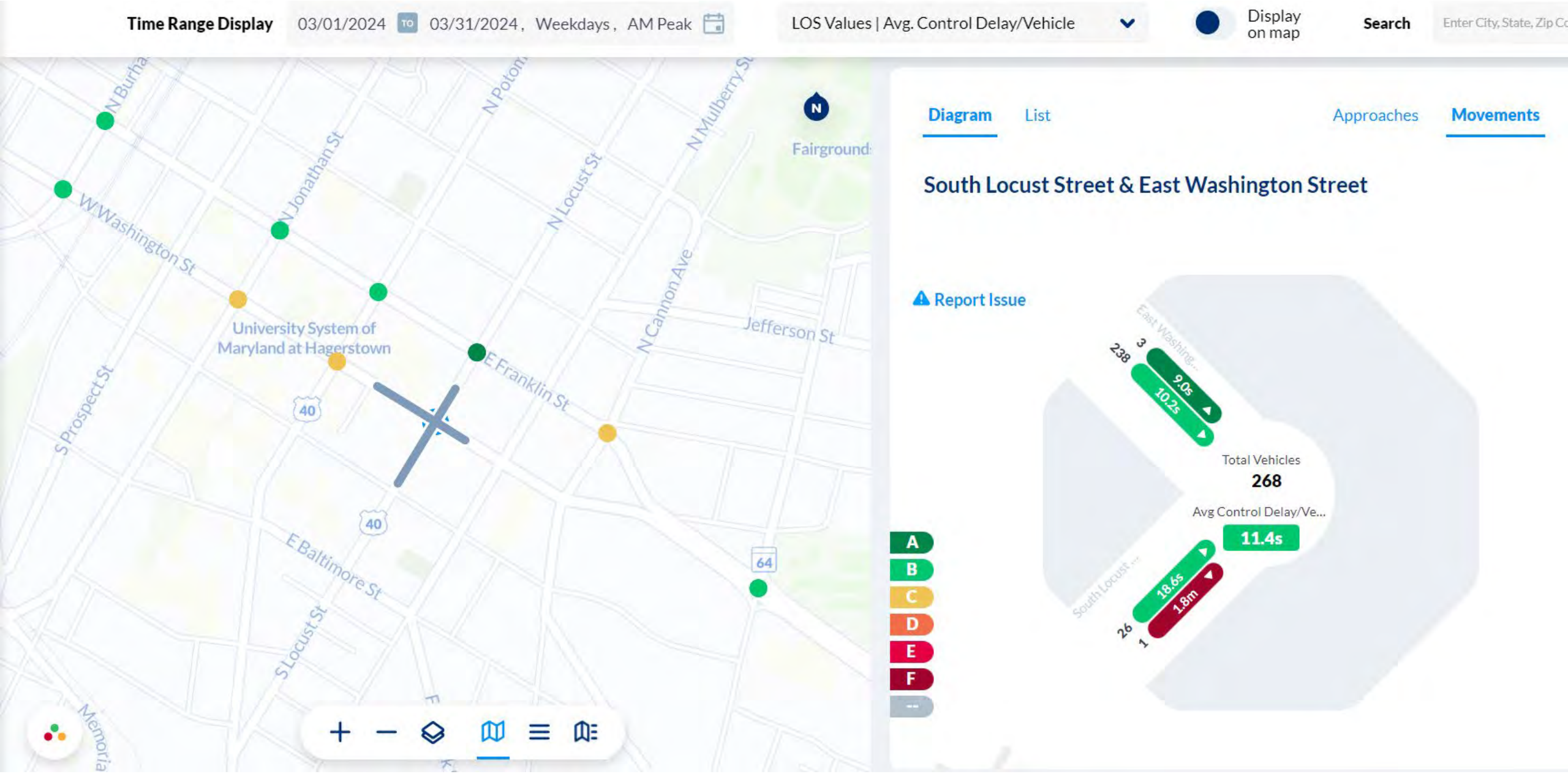

Time Range Display
03/01/2024 TO 03/31/2024 , Weekdays , PM Peak
LOS Values | Avg. Control Delay/Vehicle
Display on map
Search
Enter City, State, Zip Coc
N Burhans Blvd
W Washington St
N Jonathan St
N Potomac St
N Locust St
N Mulberry St
N Cannon Ave
E Franklin St
S Prospect St
E Baltimore St
40
64
Diagram
List
Approaches
Movements
West Washington Street & South Potomac Street
Report Issue
285
33
26.2s
20.0s
62
25
46.4s
31.6s
Total Vehicles
405
Avg Control Delay/Ve...
29.1s
A
B
C
D
E
F


Time Range Display
03/01/2024 TO 03/31/2024, Weekdays, AM Peak
LOS Values | Avg. Control Delay/Vehicle
Display on map
Search
Enter City, State, Zip Co
Diagram
List
Approaches
Movements
South Locust Street & East Washington Street
Report Issue
Total Vehicles
268
Avg Control Delay/Ve...
11.4s
A
B
C
D
E
F
--
University System of Maryland at Hagerstown
W Washington St
N Jonathan St
N Locust St
N Mulberry St
N Cannon Ave
Jefferson St
E Franklin St
S Prospect St
E Baltimore St
S Locust St
Fairground
40
64

Time Range Display 03/01/2024 TO 03/31/2024 , Weekdays , PM Peak

LOS Values | Avg. Control Delay/Vehicle

Display on map

Search Enter City, State, Zip Coc

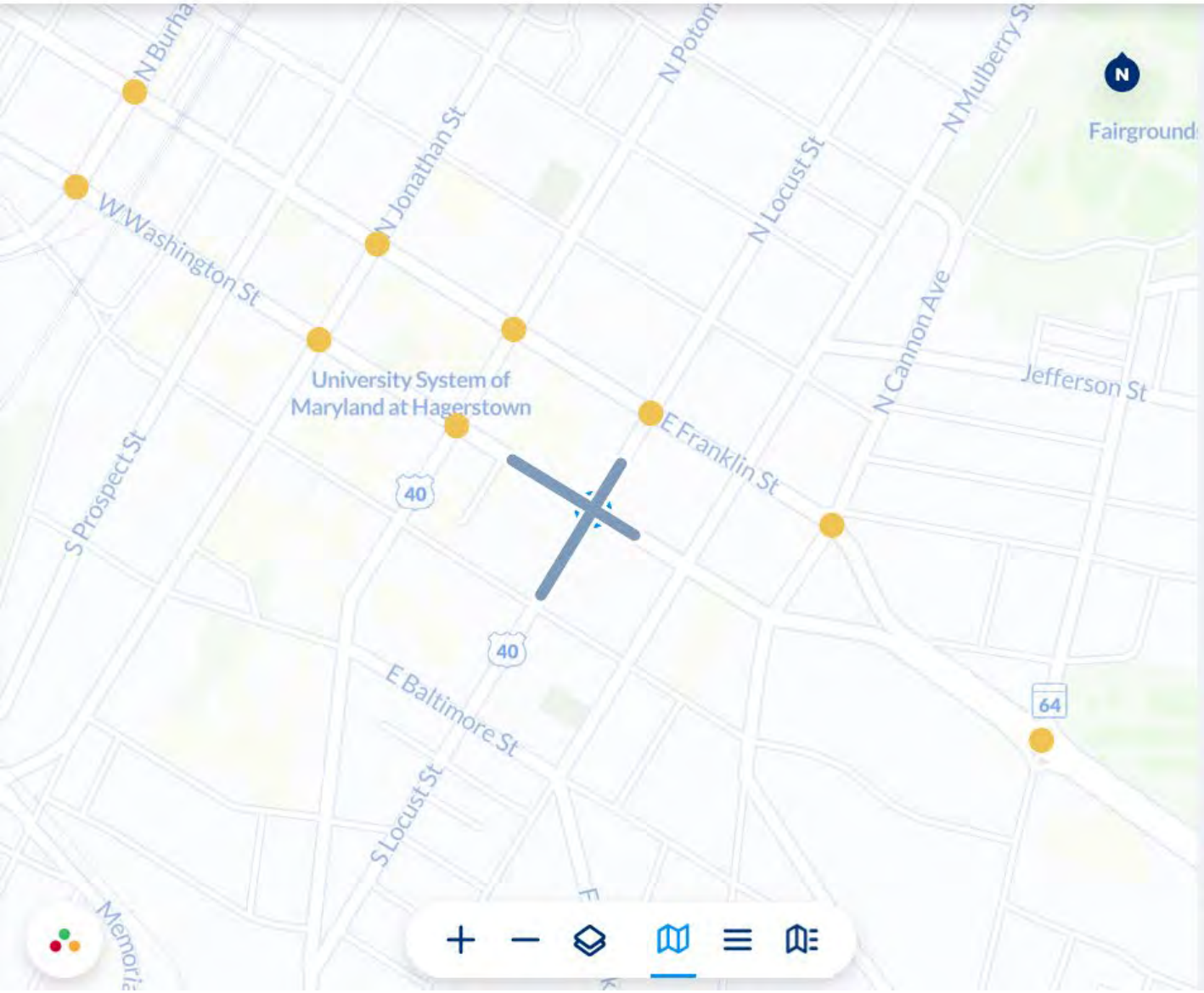
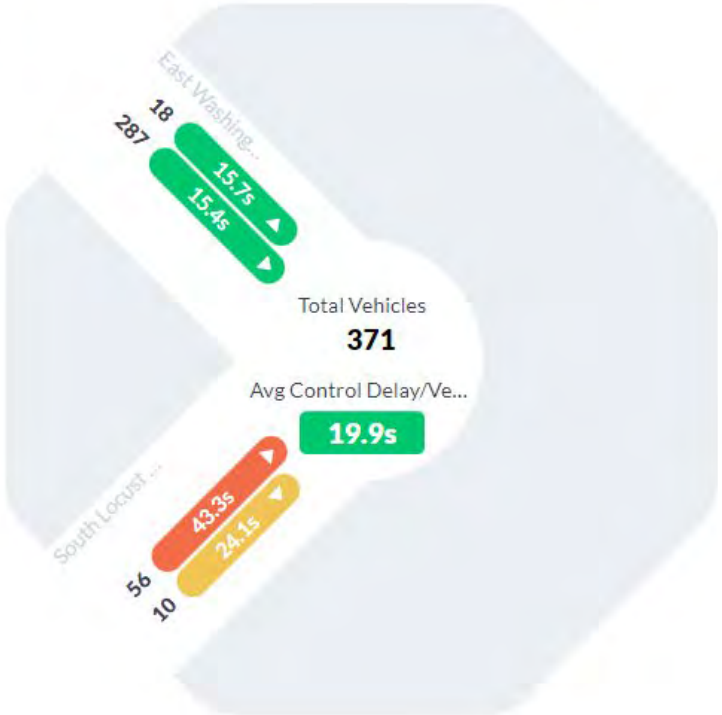


Diagram List Approaches **Movements**

South Locust Street & East Washington Street

Report Issue



A
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Franklin St

(Burhans Blvd to N Cannon Avenue)

Time Range Display 03/01/2024 TO 03/31/2024 , Weekdays , AM Peak

LOS Values | Avg. Control Delay/Vehicle

Display on map

Search Enter City, State, Zip Co

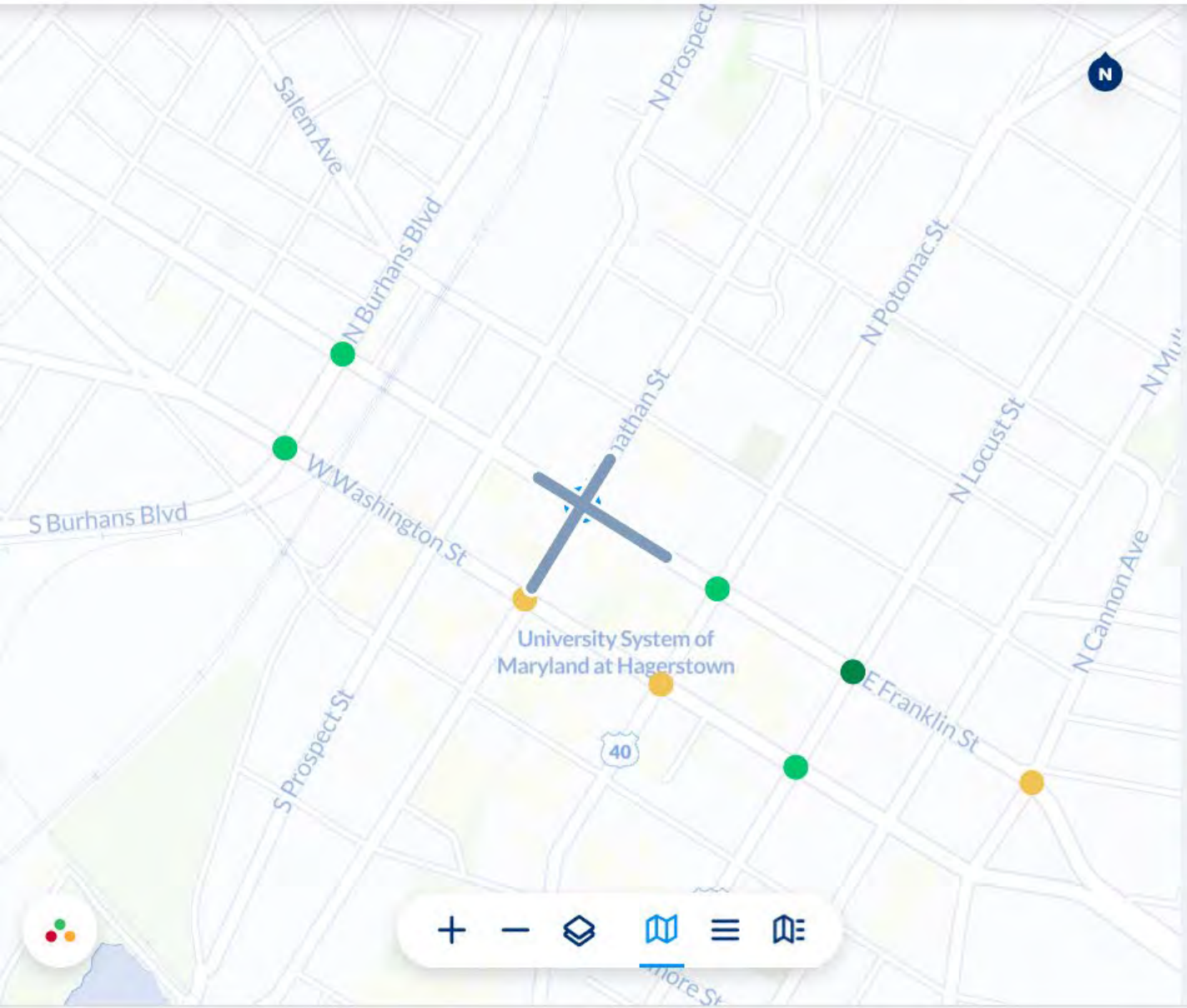
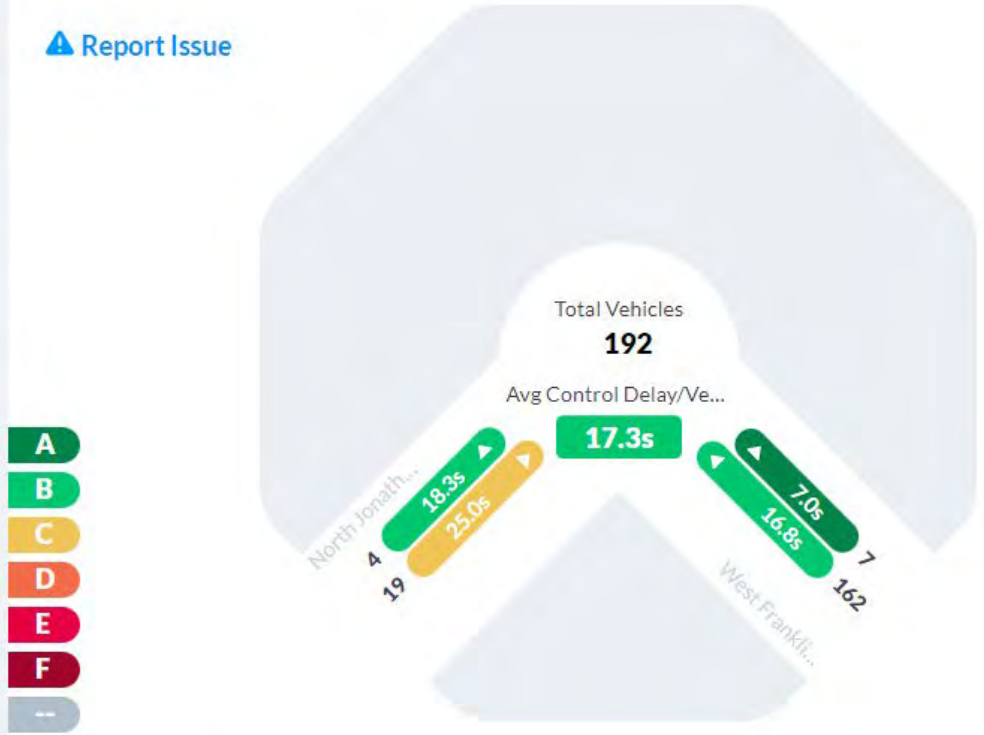


Diagram List Approaches Movements

West Franklin Street & North Jonathan Street

Report Issue



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Time Range Display 03/01/2024 TO 03/31/2024, Weekdays, PM Peak

LOS Values | Avg. Control Delay/Vehicle

Display on map

Search Enter City, State, Zip Co

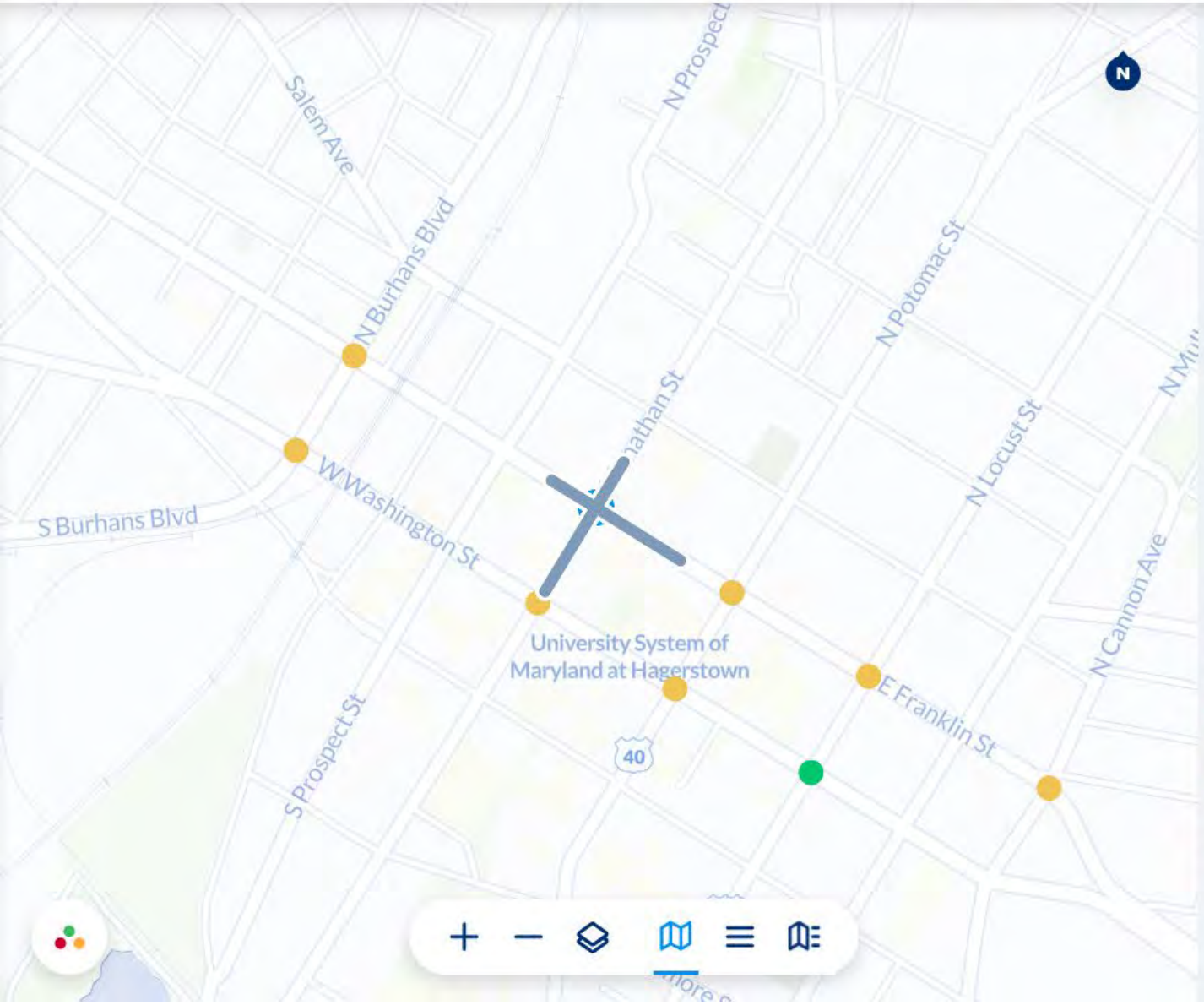

Diagram List Approaches Movements

West Franklin Street & North Jonathan Street

Report Issue

A
B
C
D
E
F
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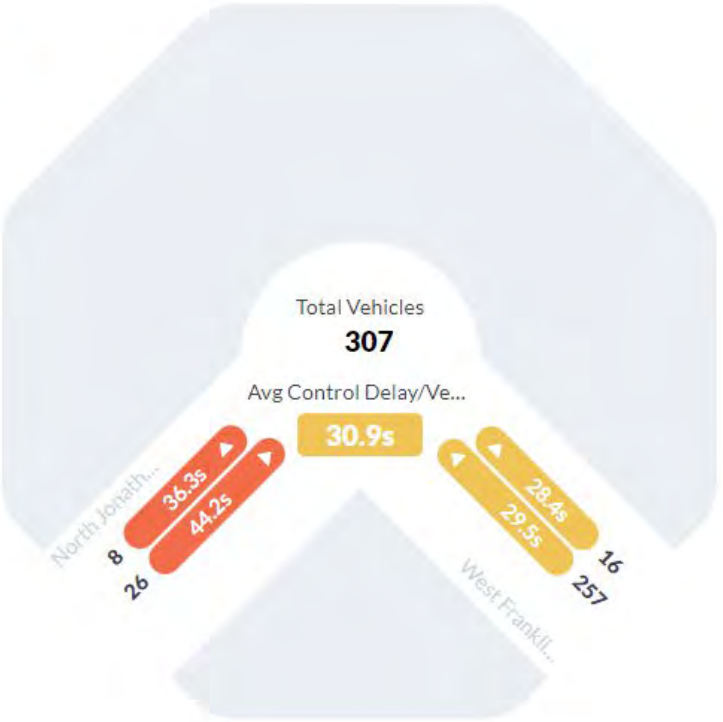


Time Range Display 03/01/2024 TO 03/31/2024, Weekdays, AM Peak

LOS Values | Avg. Control Delay/Vehicle

Display on map

Search Enter City, State, Zip

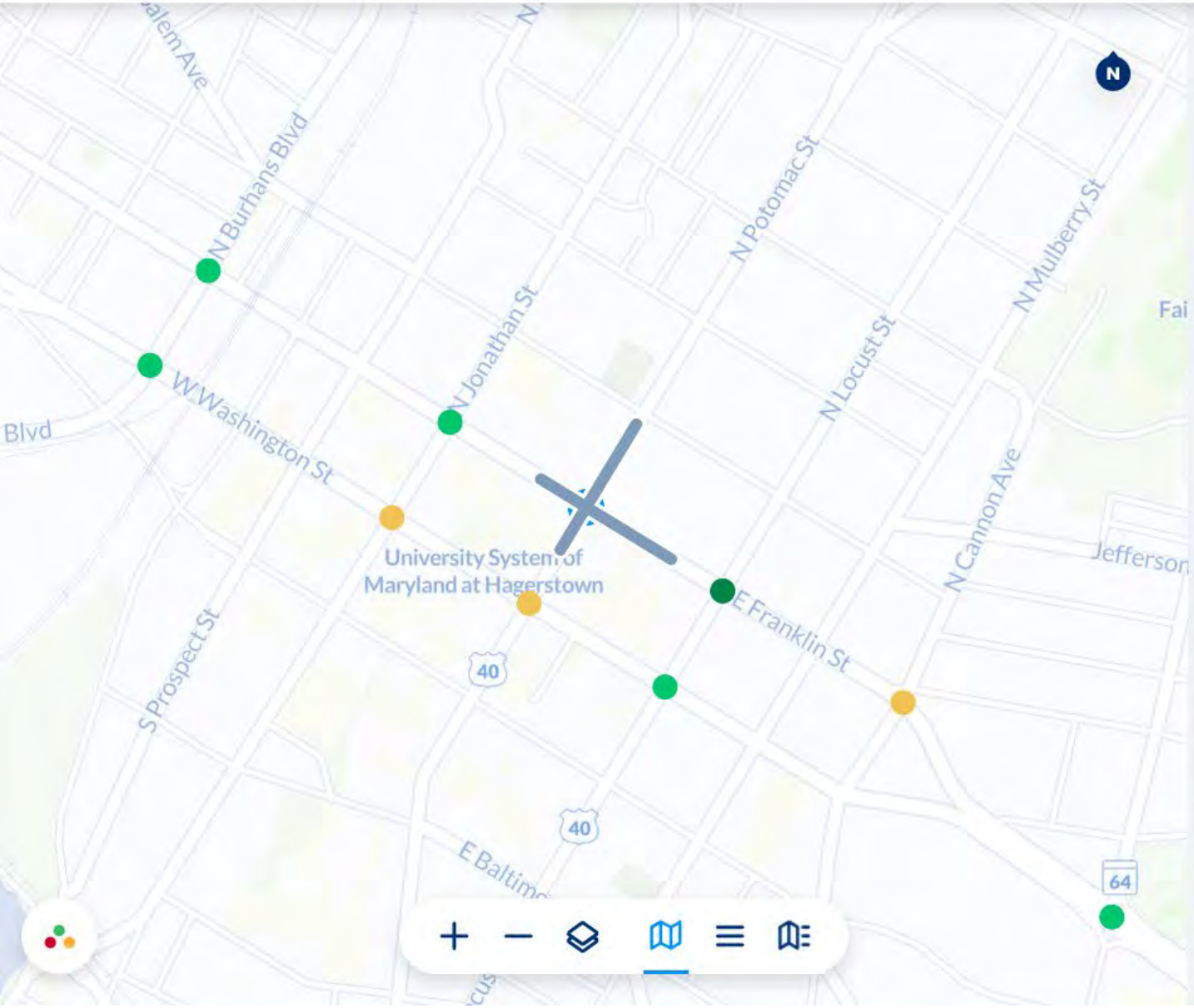
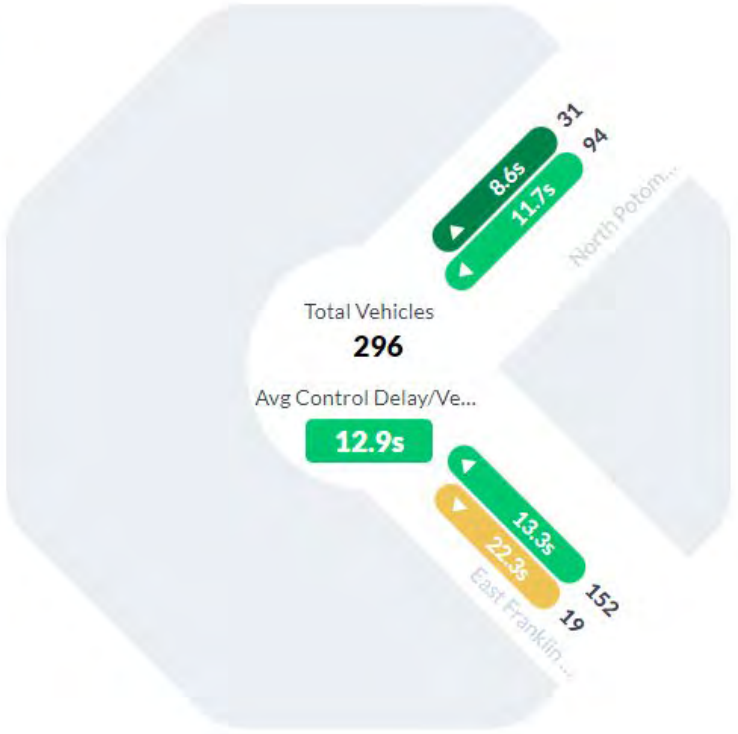


Diagram | List | Approaches | **Movements**

North Potomac Street & West Franklin Street

Report Issue



A
B
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D
E
F
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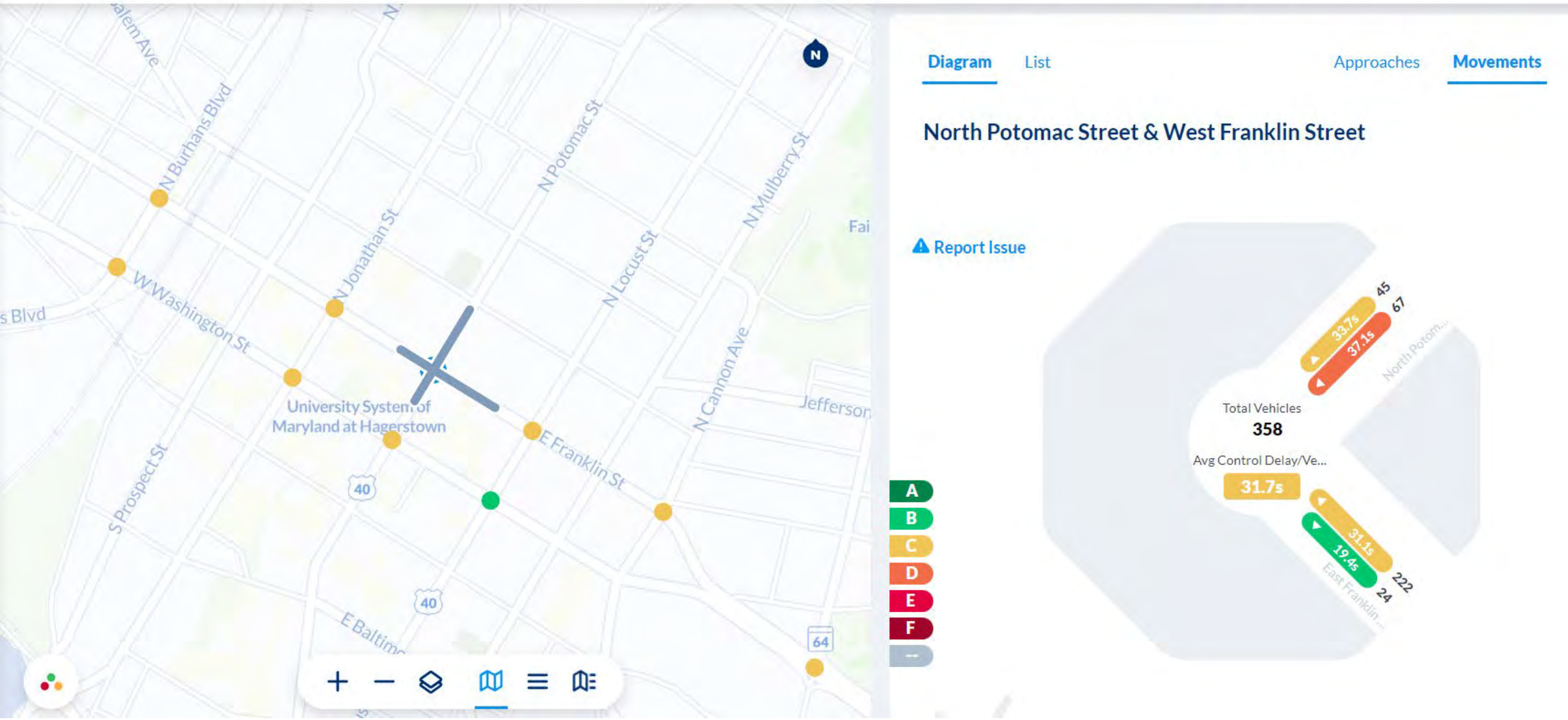
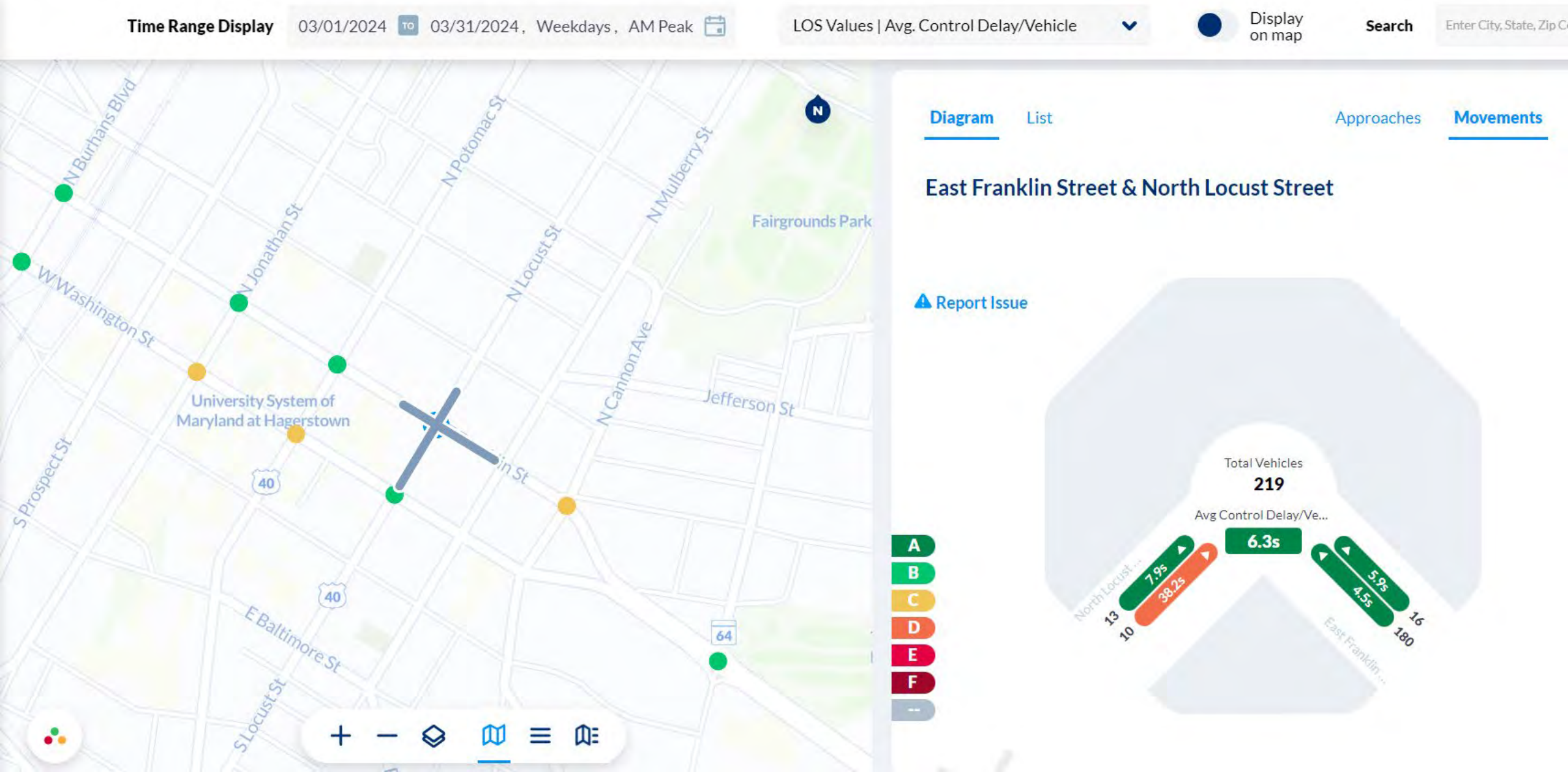

Time Range Display
03/01/2024 TO 03/31/2024 , Weekdays , PM Peak
LOS Values | Avg. Control Delay/Vehicle
Display on map
Search
Enter City, State, Zip Co
Diagram
List
Approaches
Movements
North Potomac Street & West Franklin Street
Report Issue
N Burhans Blvd
N Potomac St
N Jonathan St
N Locust St
N Mulberry St
N Cannon Ave
W Washington St
E Franklin St
S Prospect St
University System of Maryland at Hagerstown
Jefferson
40
64
A
B
C
D
E
F
45
67
33.7s
37.1s
Total Vehicles
358
Avg Control Delay/Ve...
31.7s
31.1s
19.4s
222
24


Time Range Display
03/01/2024 TO 03/31/2024 , Weekdays , AM Peak
LOS Values | Avg. Control Delay/Vehicle
Display on map
Search
Enter City, State, Zip C
N Burhans Blvd
N Potomac St
N Mulberry St
N Jonathan St
N Locust St
Fairgrounds Park
W Washington St
N Cannon Ave
Jefferson St
University System of Maryland at Hagerstown
S Prospect St
40
64
E Baltimore St
S Locust St
Diagram
List
Approaches
Movements
East Franklin Street & North Locust Street
Report Issue
Total Vehicles
219
Avg Control Delay/Ve...
6.3s
7.9s
38.2s
5.9s
4.5s
13
10
16
180
A
B
C
D
E
F
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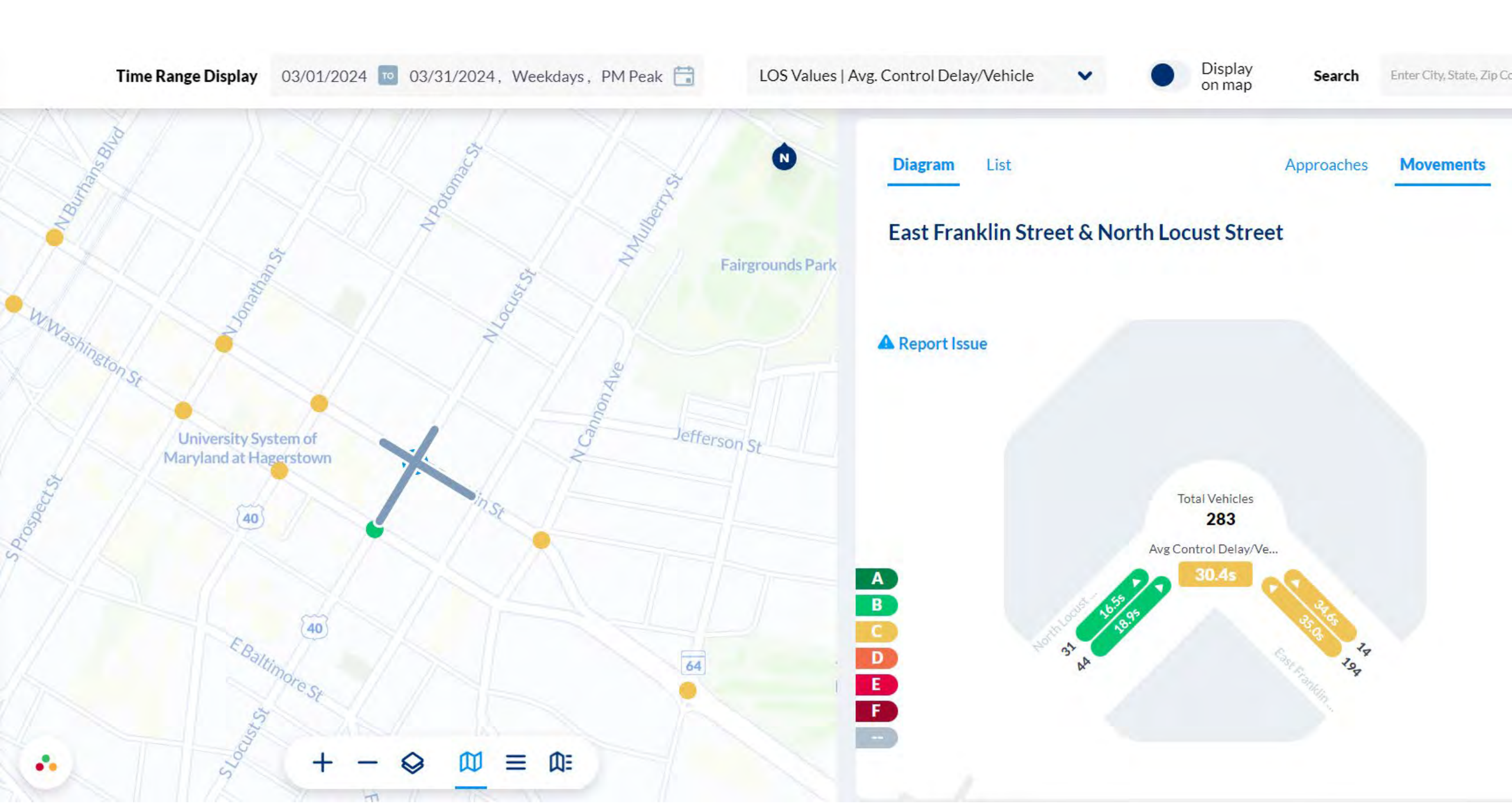

Time Range Display
03/01/2024 TO 03/31/2024 , Weekdays , PM Peak
LOS Values | Avg. Control Delay/Vehicle
Display on map
Search
Enter City, State, Zip Co
N Burhans Blvd
N Potomac St
N Mulberry St
N Jonathan St
N Locust St
W Washington St
Fairgrounds Park
N Cannon Ave
Jefferson St
University System of Maryland at Hagerstown
S Prospect St
40
E Baltimore St
64
S Locust St
Diagram
List
Approaches
Movements
East Franklin Street & North Locust Street
Report Issue
A
B
C
D
E
F
--
Total Vehicles
283
Avg Control Delay/Ve...
30.4s
16.5s
18.9s
34.6s
35.0s
31
44
14
194
North Locust ...
East Franklin ...

Time Range Display 03/01/2024 TO 03/31/2024, Weekdays, AM Peak

LOS Values | Avg. Control Delay/Vehicle

Display on map

Search Enter City, State, Zip

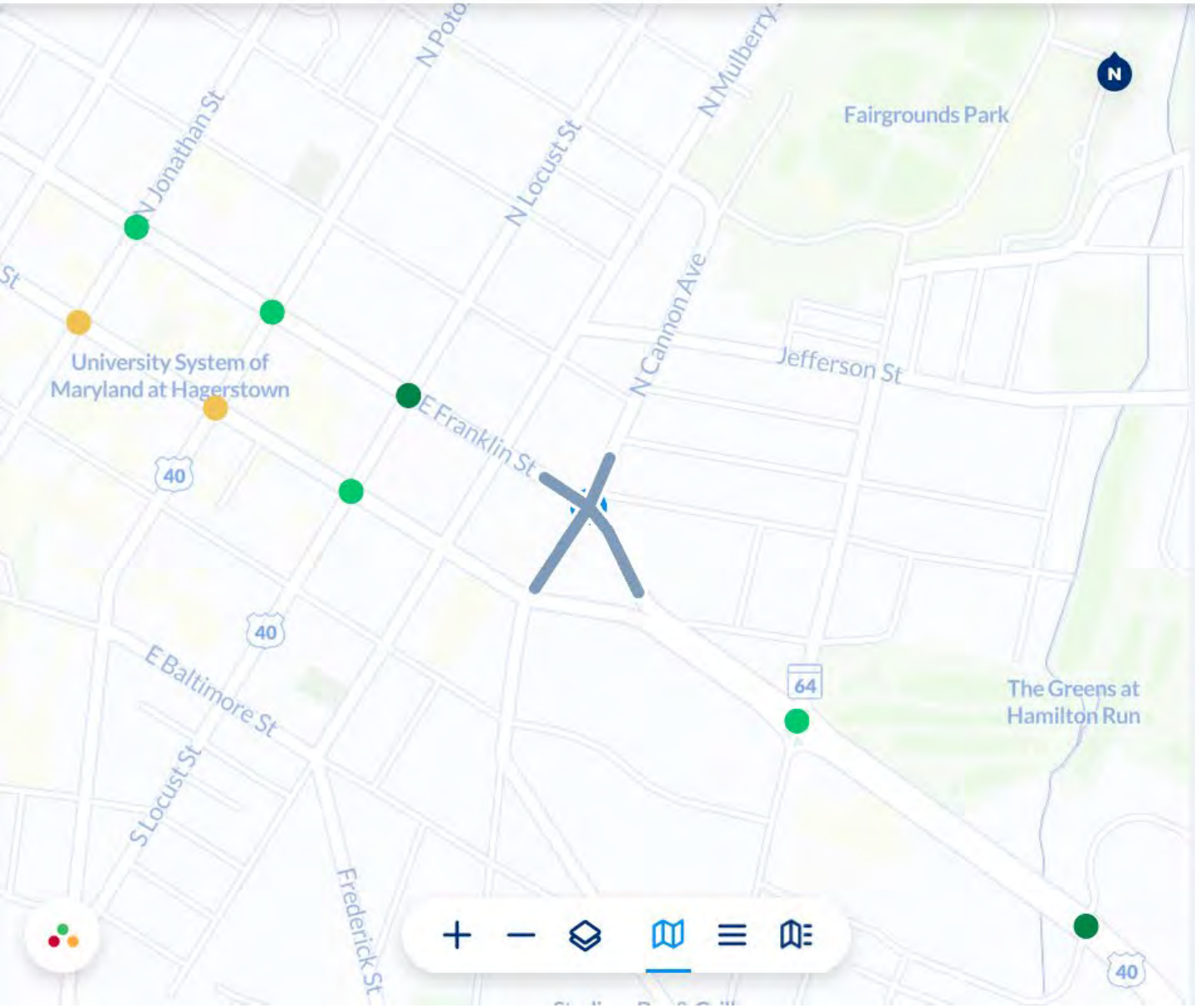
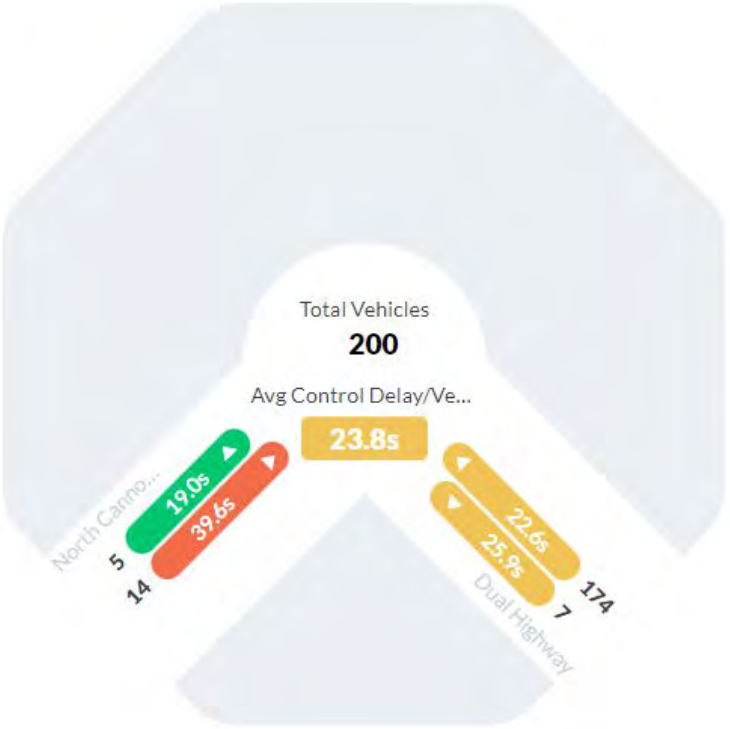


Diagram List Approaches **Movements**

Dual Highway & North Cannon Avenue

Report Issue



A
B
C
D
E
F
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Time Range Display 03/01/2024 TO 03/31/2024, Weekdays, PM Peak

LOS Values | Avg. Control Delay/Vehicle

Display on map

Search Enter City, State, Zip

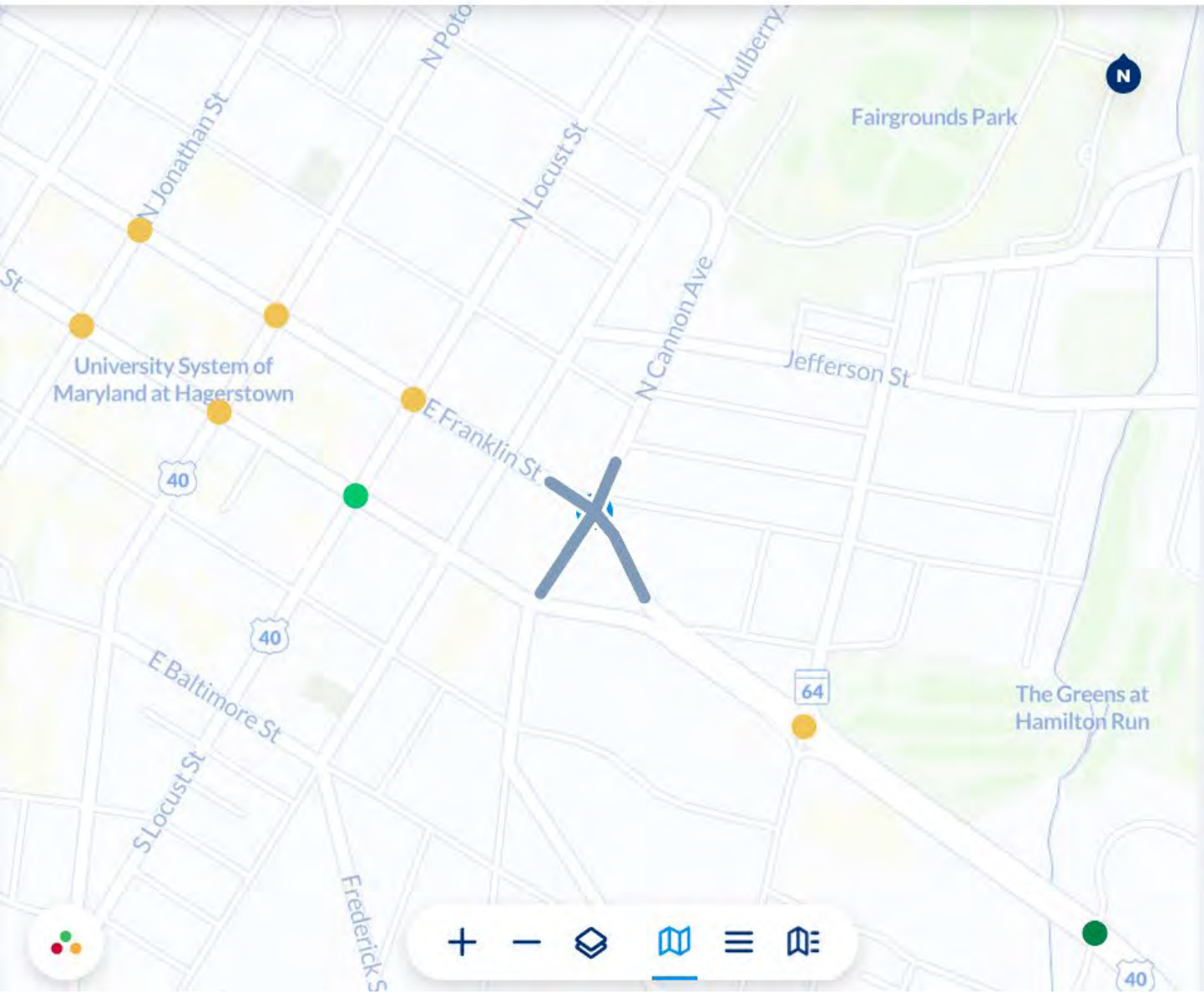
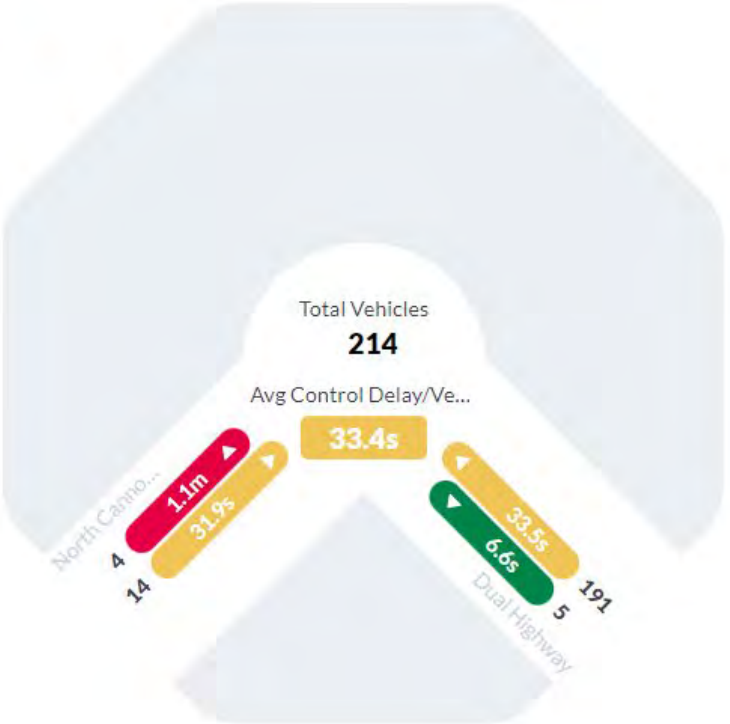


Diagram List Approaches Movements

Dual Highway & North Cannon Avenue

Report Issue



A
B
C
D
E
F
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Eastern Blvd

(Dual Highway to Jefferson Blvd)

Time Range Display 03/01/2024 TO 03/31/2024, Weekdays, AM Peak

LOS Values | Avg. Control Delay/Vehicle

Display on map

Search Enter City, State, Zip C

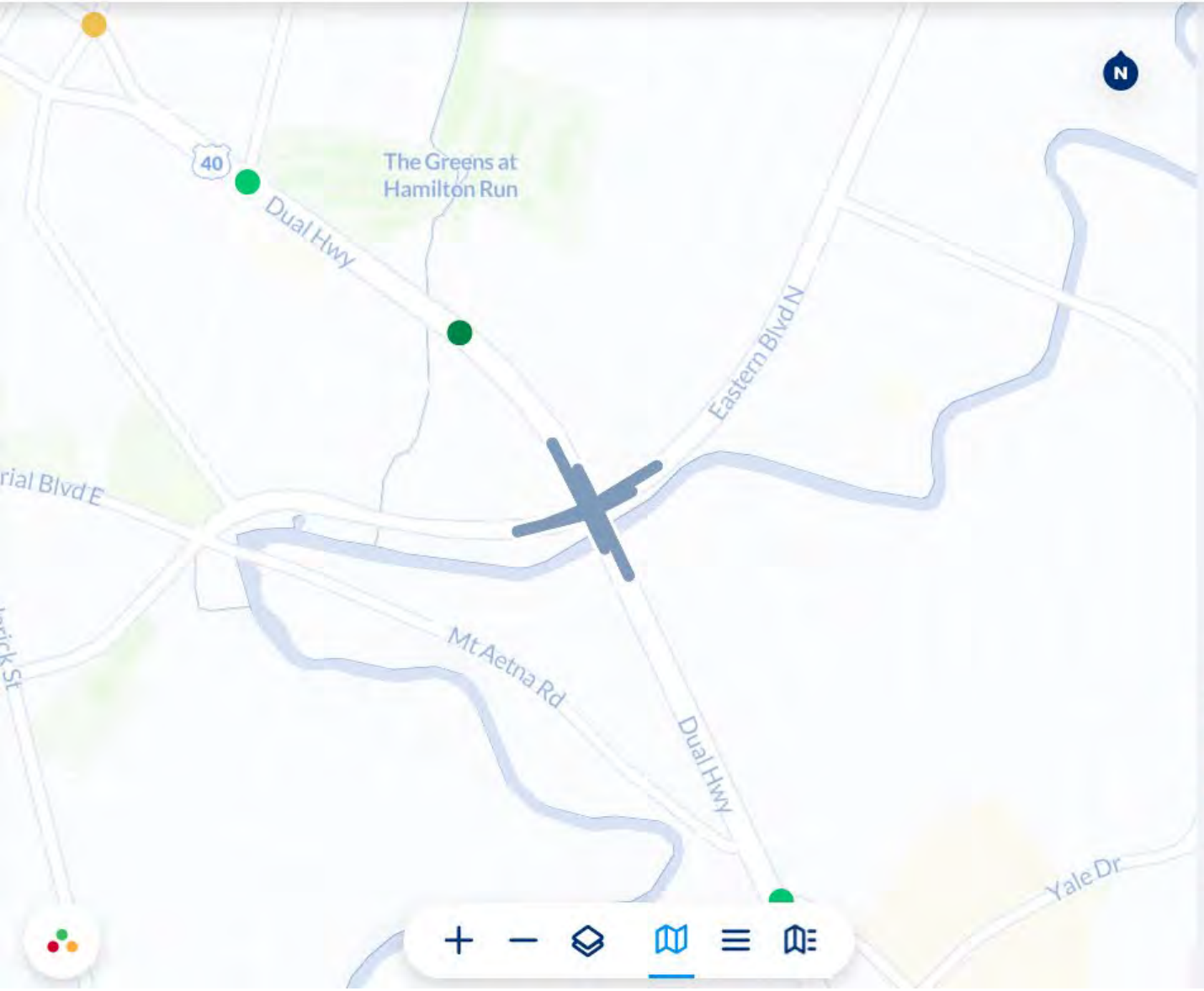
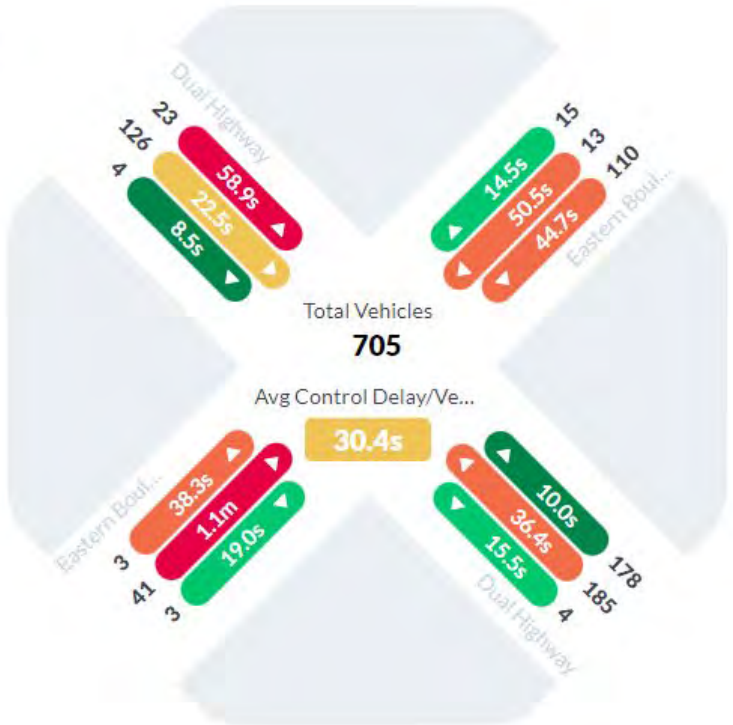


Diagram List Approaches Movements

Eastern Boulevard South & Dual Highway

Report Issue



A
B
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D
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Time Range Display 03/01/2024 TO 03/31/2024, Weekdays, PM Peak

LOS Values | Avg. Control Delay/Vehicle

Display on map

Search Enter City, State, Zip Co

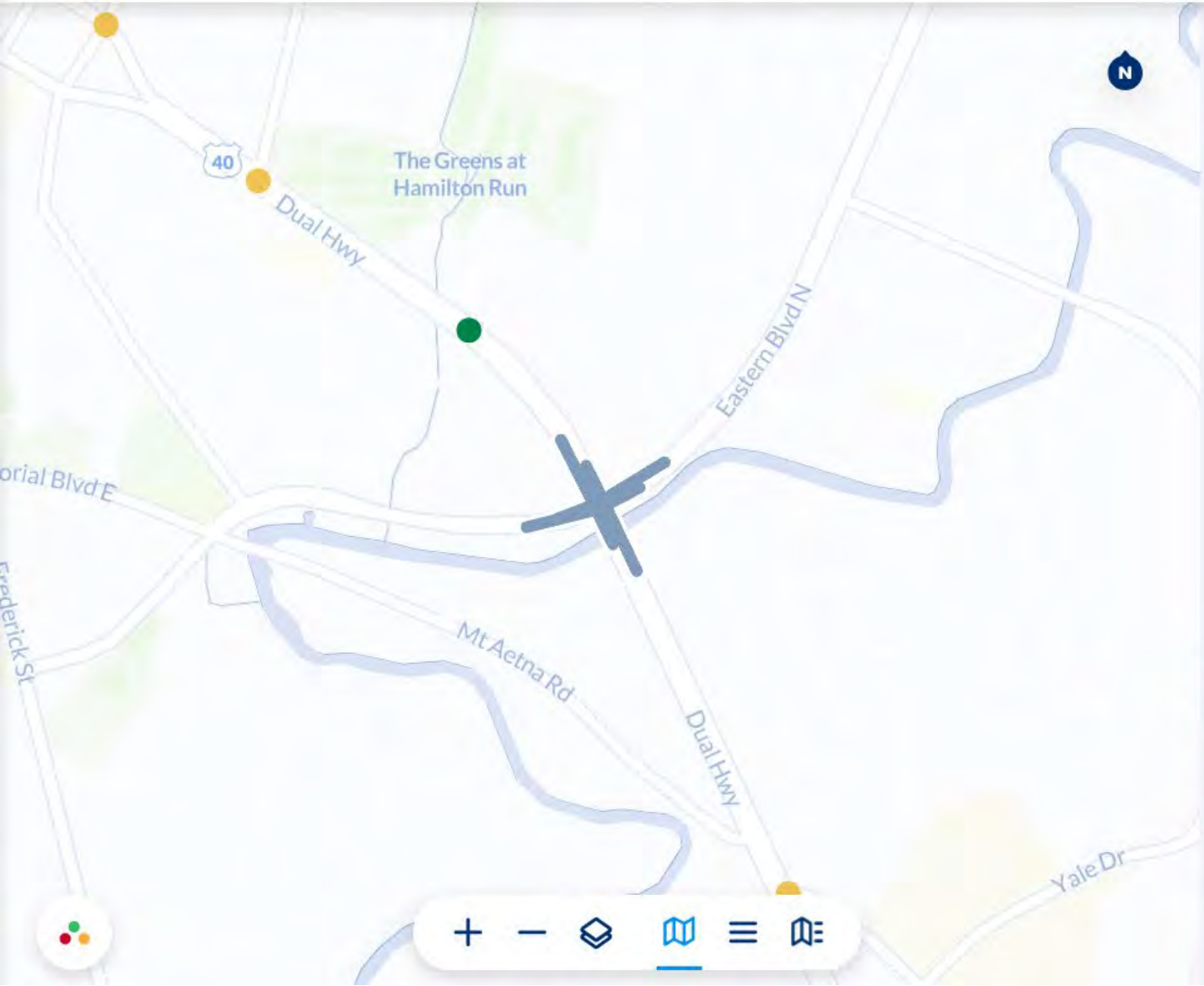
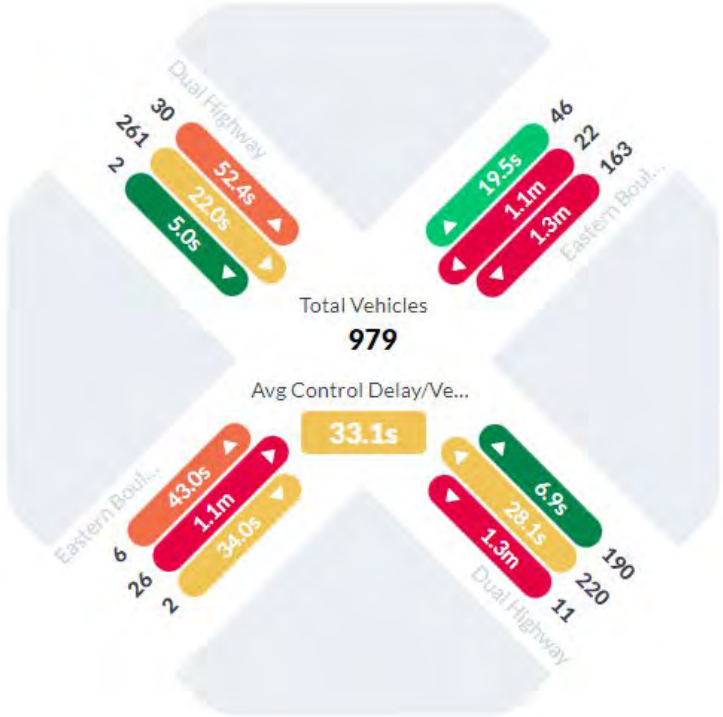


Diagram List Approaches Movements

Eastern Boulevard South & Dual Highway

Report Issue



A
B
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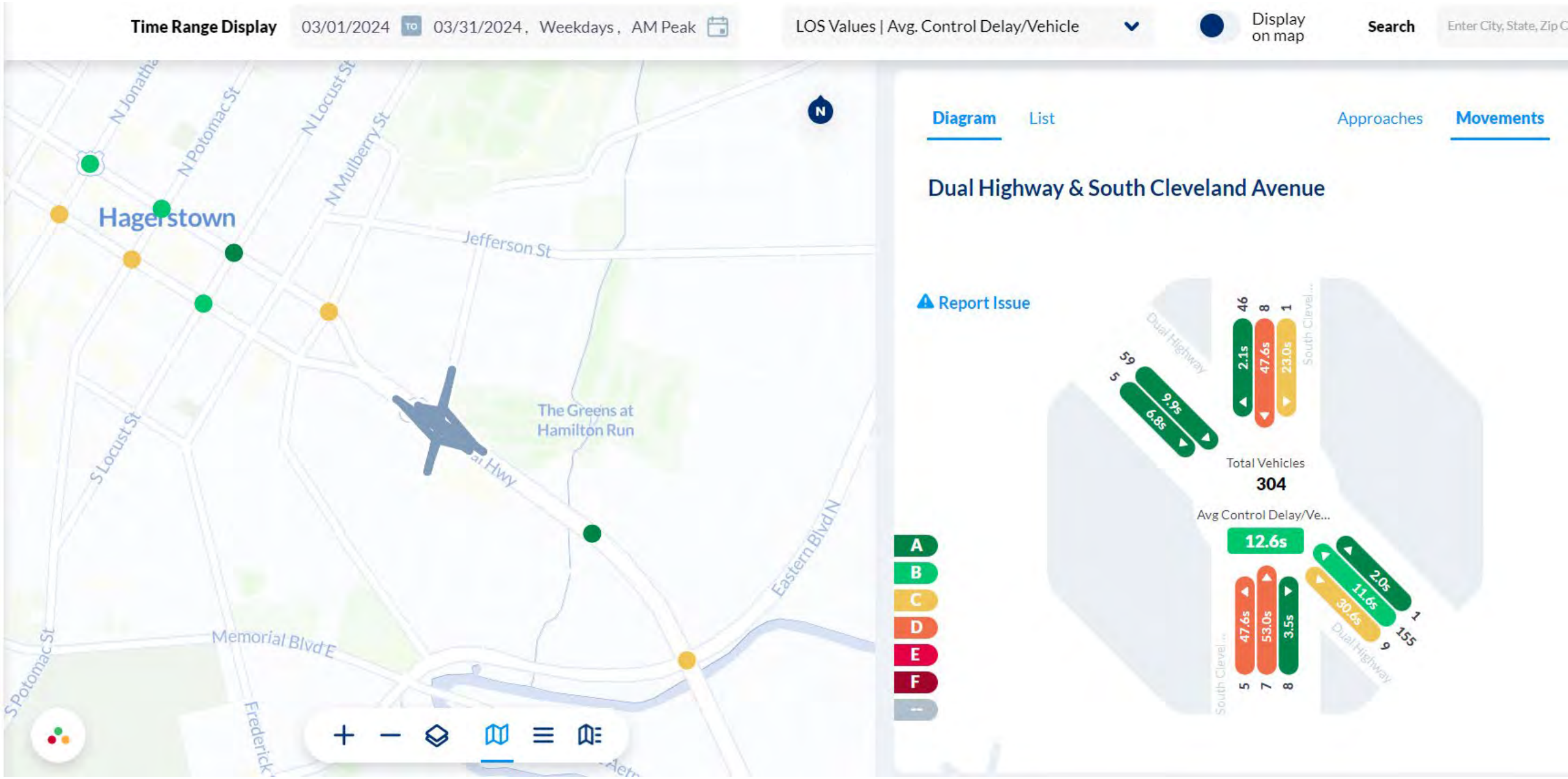
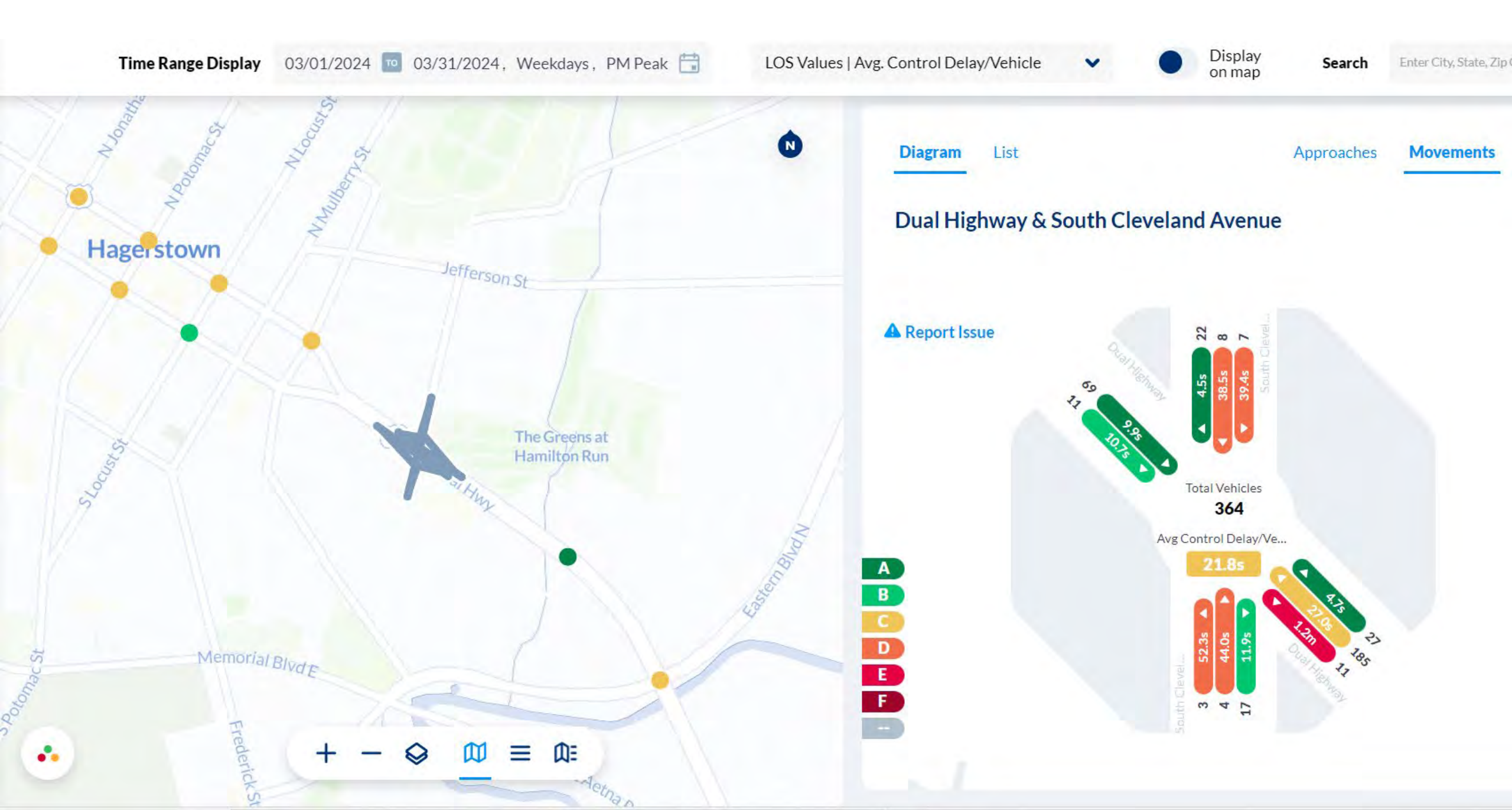
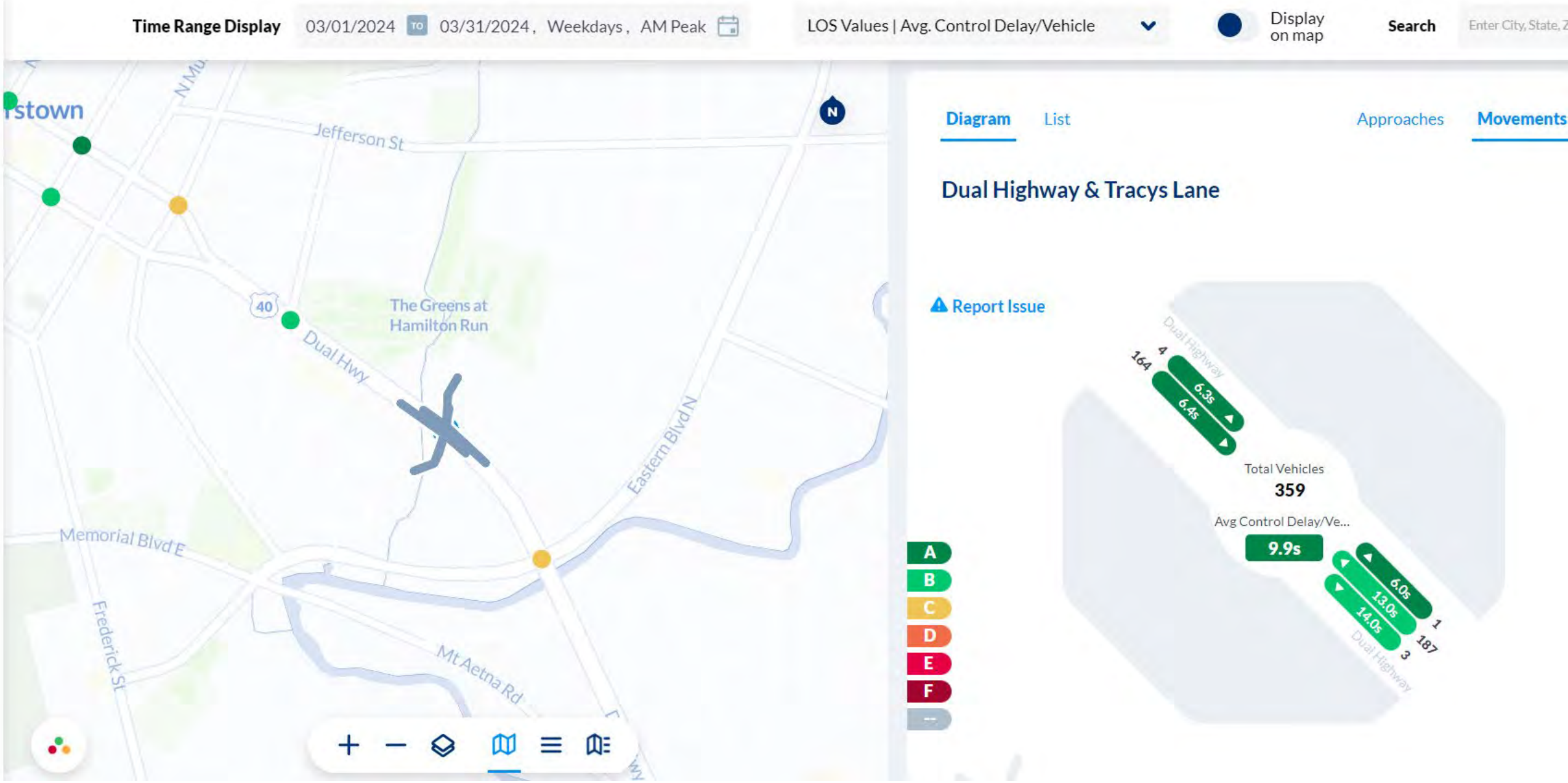
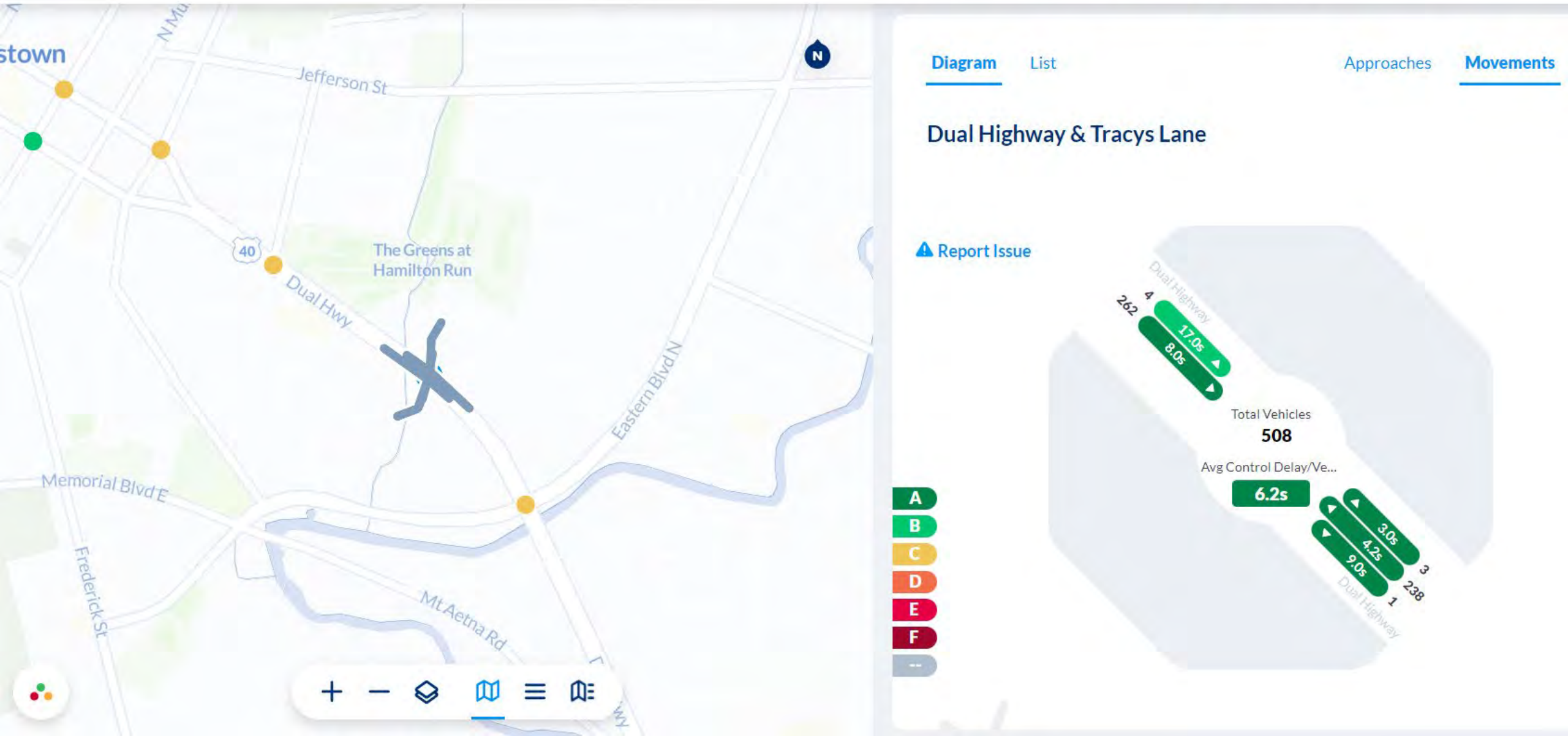
Dual Highway

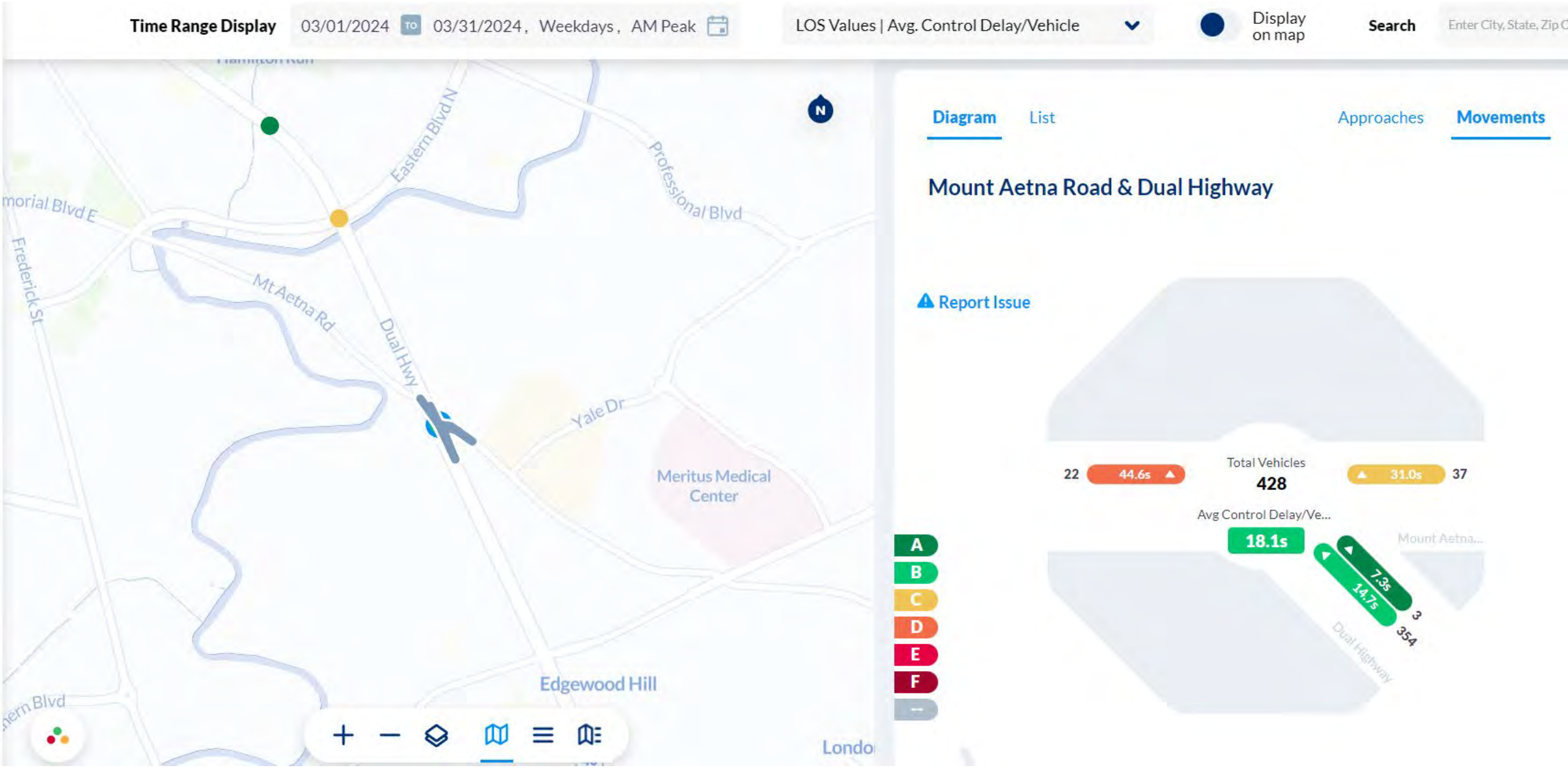
(N Cannon Avenue to Edgewood Dr)


Time Range Display
03/01/2024 TO 03/31/2024, Weekdays, AM Peak
LOS Values | Avg. Control Delay/Vehicle
Display on map
Search
Enter City, State, Zip C
Hagerstown
N Potomac St
N Locust St
N Mulberry St
Jefferson St
S Locust St
The Greens at Hamilton Run
Eastern Blvd N
Memorial Blvd E
S Potomac St
Diagram
List
Approaches
Movements
Dual Highway & South Cleveland Avenue
Report Issue
A
B
C
D
E
F
Total Vehicles
304
Avg Control Delay/Ve...
12.6s


Time Range Display
03/01/2024 TO 03/31/2024 , Weekdays , PM Peak
LOS Values | Avg. Control Delay/Vehicle
Display on map
Search
Enter City, State, Zip
Diagram
List
Approaches
Movements
Dual Highway & South Cleveland Avenue
Report Issue
Hagerstown
Jefferson St
N Potomac St
N Locust St
N Mulberry St
S Locust St
The Greens at Hamilton Run
Eastern Blvd N
Memorial Blvd E
Frederick St
Dual Highway
South Clevel...
22
8
7
4.5s
38.5s
39.4s
69
11
9.9s
10.7s
Total Vehicles
364
Avg Control Delay/Ve...
21.8s
A
B
C
D
E
F
--
52.3s
44.0s
11.9s
3
4
17
4.7s
27.0s
1.2m
27
185
11


Time Range Display
03/01/2024 TO 03/31/2024 , Weekdays , AM Peak
LOS Values | Avg. Control Delay/Vehicle
Display on map
Search
Enter City, State, Z
Diagram
List
Approaches
Movements
Dual Highway & Tracys Lane
Report Issue
Jefferson St
40
The Greens at Hamilton Run
Dual Hwy
Eastern Blvd N
Memorial Blvd E
Frederick St
Mt Aetna Rd
Dual Highway
4
164
6.3s
6.4s
Total Vehicles
359
Avg Control Delay/Ve...
9.9s
6.0s
13.0s
14.0s
1
187
3
A
B
C
D
E
F
--


Time Range Display
03/01/2024 TO 03/31/2024 , Weekdays , PM Peak
LOS Values | Avg. Control Delay/Vehicle
Display on map
Search
Enter City, State, Zip
Diagram
List
Approaches
Movements
Dual Highway & Tracys Lane
Report Issue
Jefferson St
40
The Greens at Hamilton Run
Dual Hwy
Eastern Blvd N
Memorial Blvd E
Frederick St
Mt Aetna Rd
Dual Highway
4
262
17.0s
8.0s
Total Vehicles
508
Avg Control Delay/Ve...
6.2s
3.0s
4.2s
9.0s
3
238
1
A
B
C
D
E
F
--


Time Range Display
03/01/2024 TO 03/31/2024 , Weekdays , AM Peak
LOS Values | Avg. Control Delay/Vehicle
Display on map
Search
Enter City, State, Zip C
Diagram
List
Approaches
Movements
Mount Aetna Road & Dual Highway
Report Issue
Eastern Blvd N
Professional Blvd
Mt Aetna Rd
Dual Hwy
Yale Dr
Meritus Medical Center
Edgewood Hill
Frederick St
A
B
C
D
E
F
Total Vehicles
428
22
44.6s
31.0s
37
Avg Control Delay/Ve...
18.1s
7.3s
14.7s
3
354
Mount Aetna...
Dual Highway

Time Range Display 03/01/2024 TO 03/31/2024, Weekdays, PM Peak

LOS Values | Avg. Control Delay/Vehicle

Display on map

Search Enter City, State, Zip Co

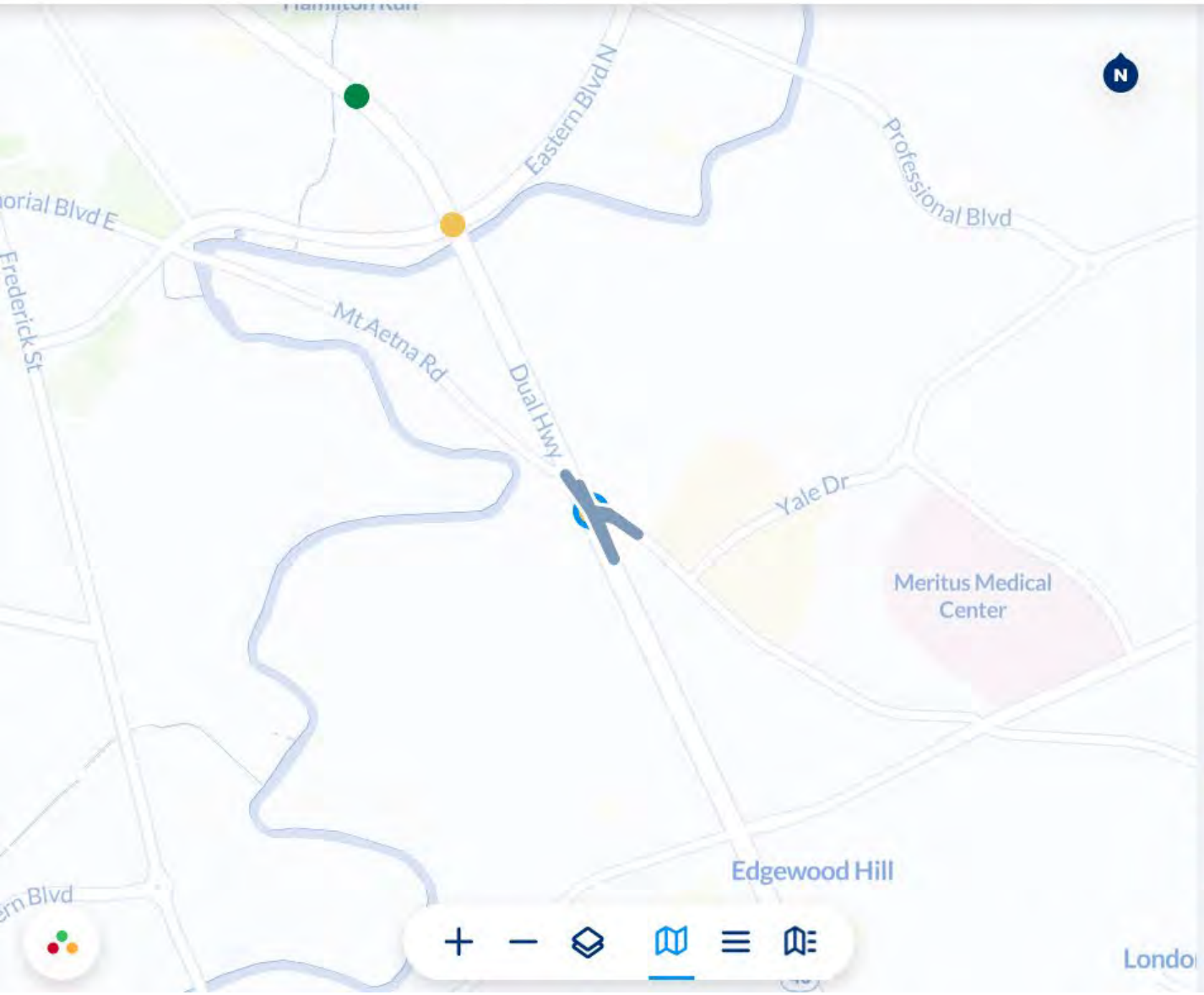
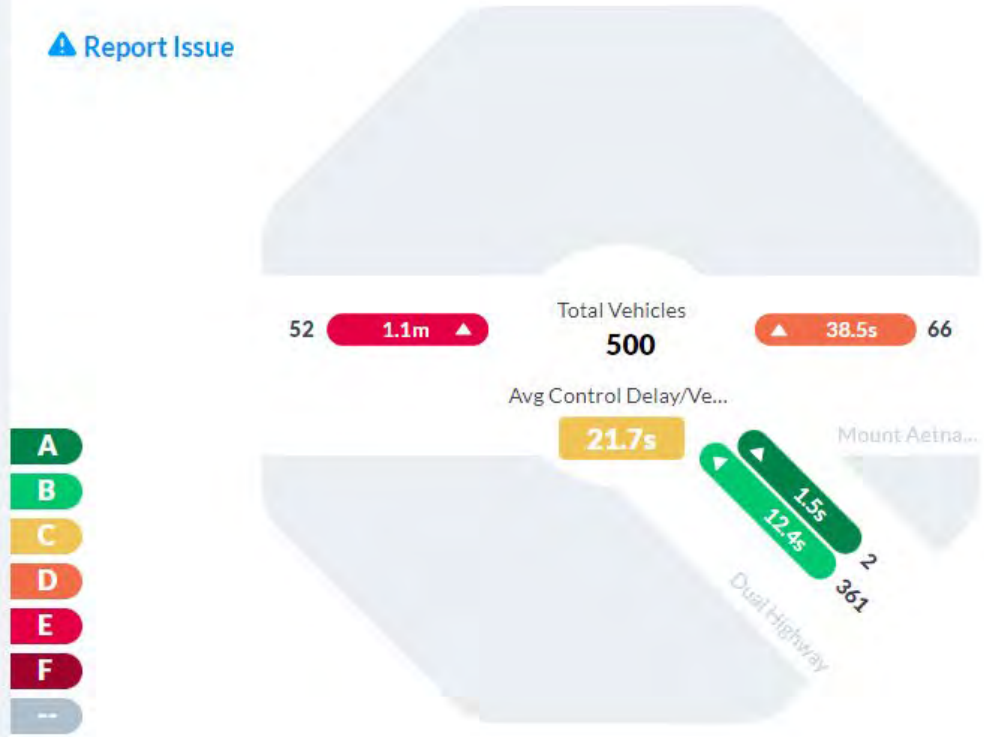


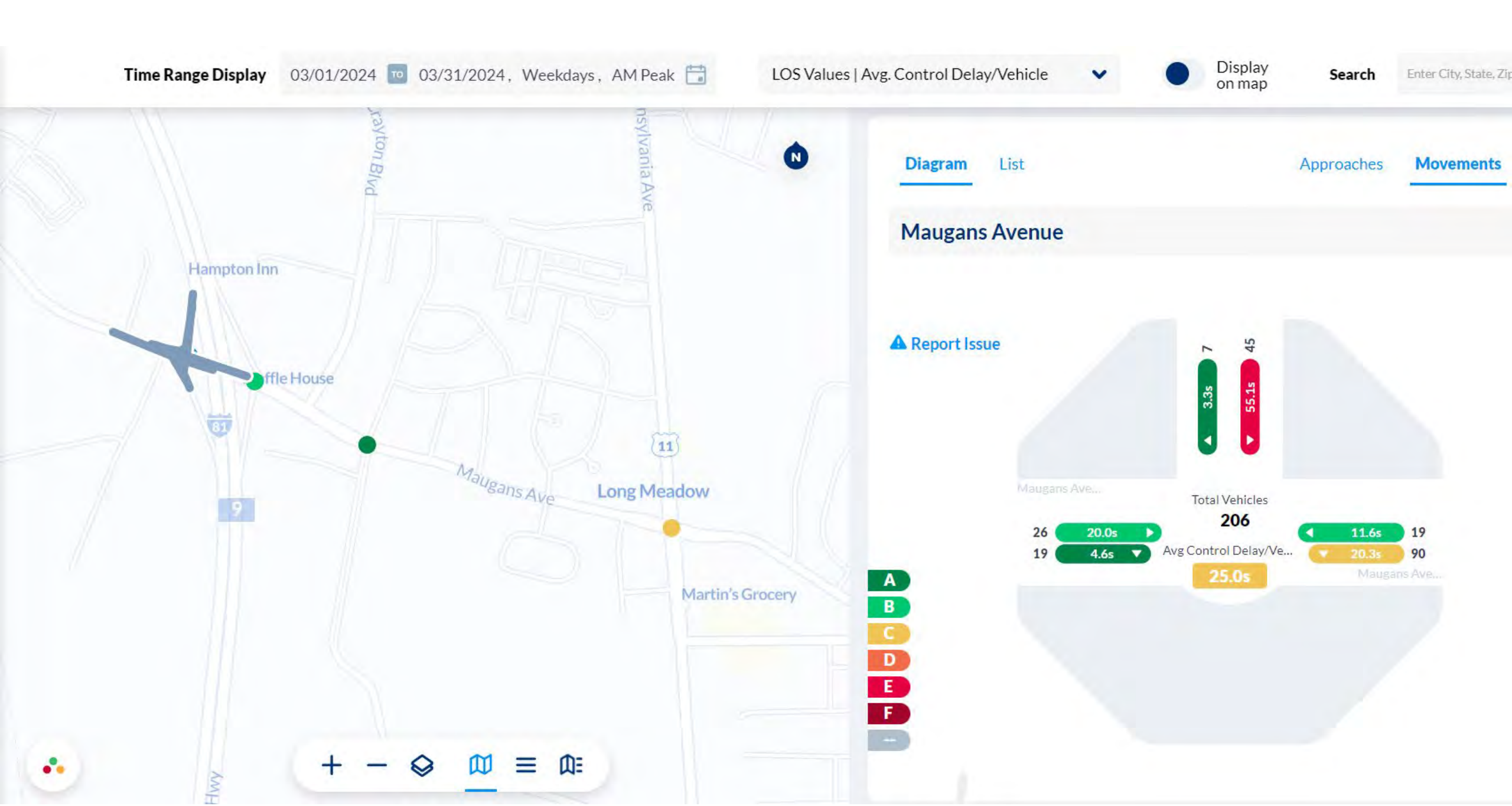
Diagram List Approaches Movements

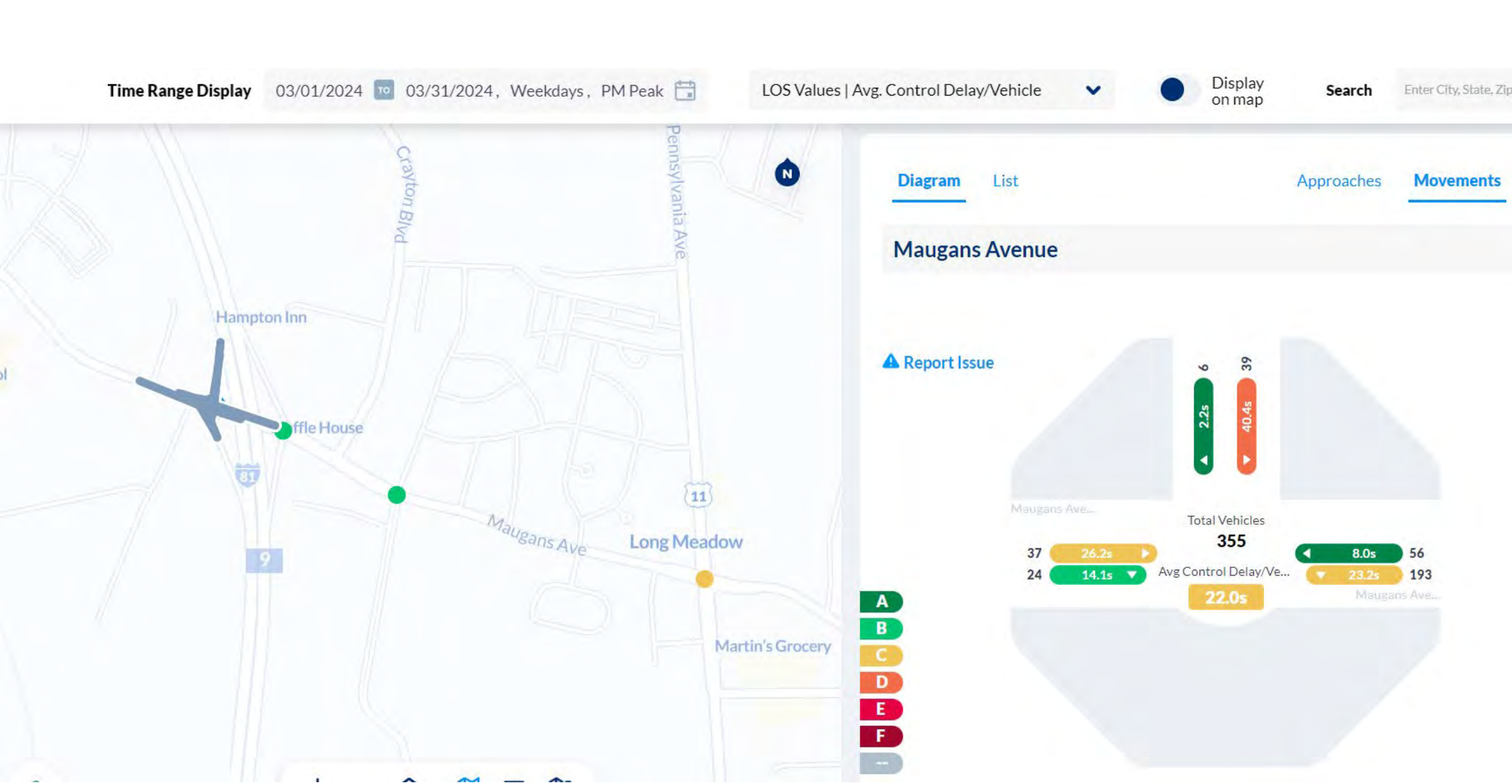
Mount Aetna Road & Dual Highway

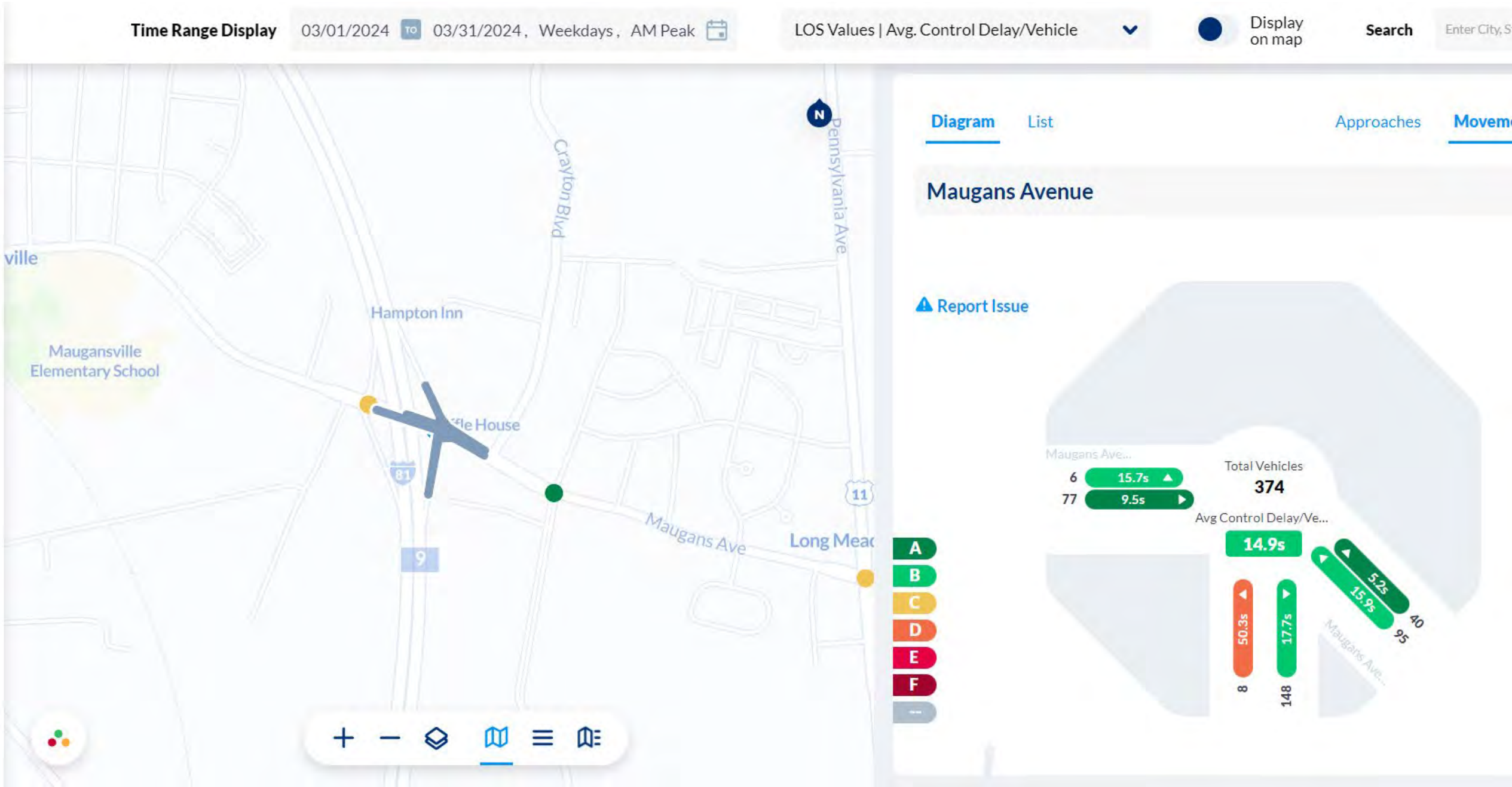
Report Issue

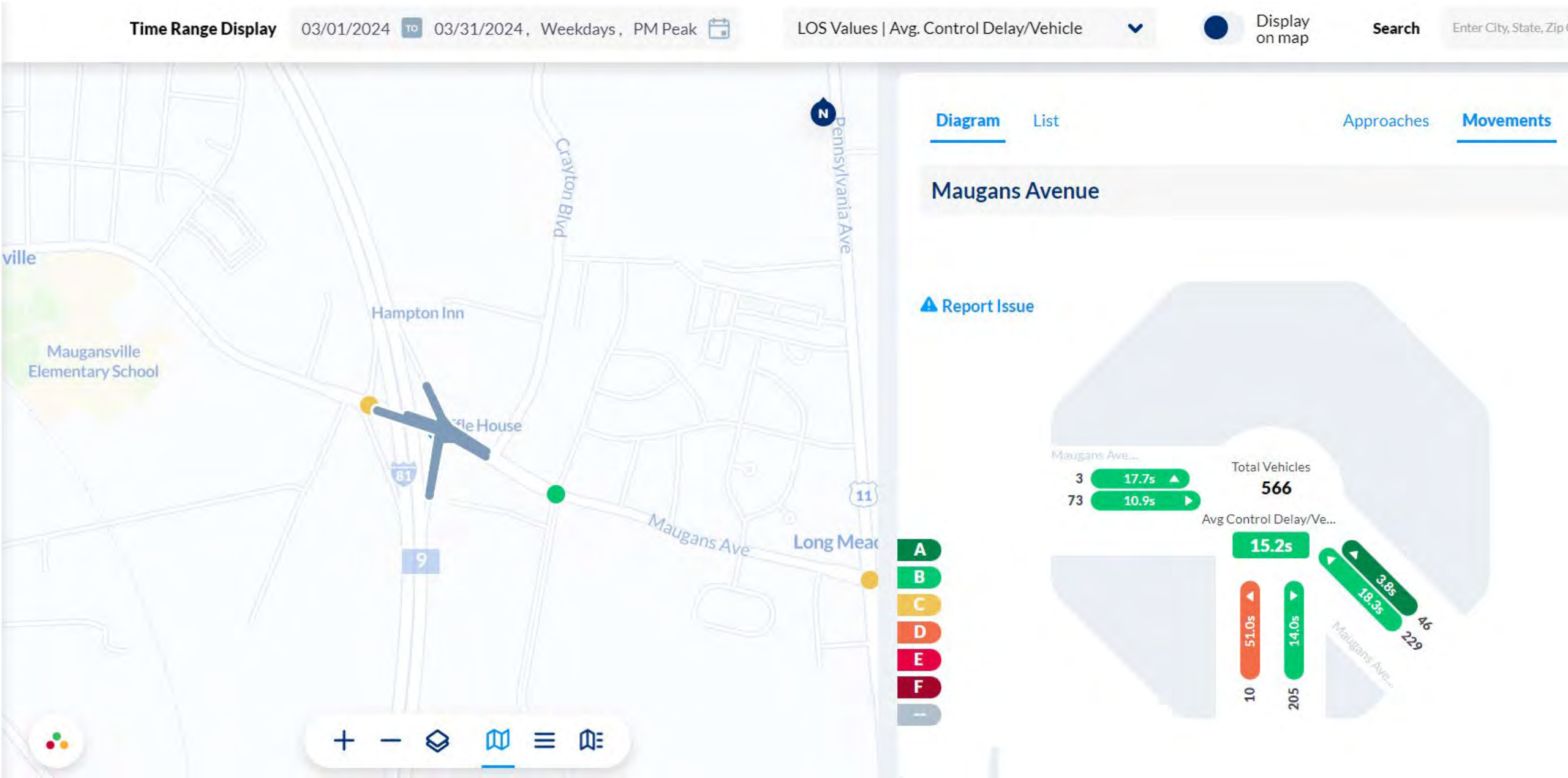


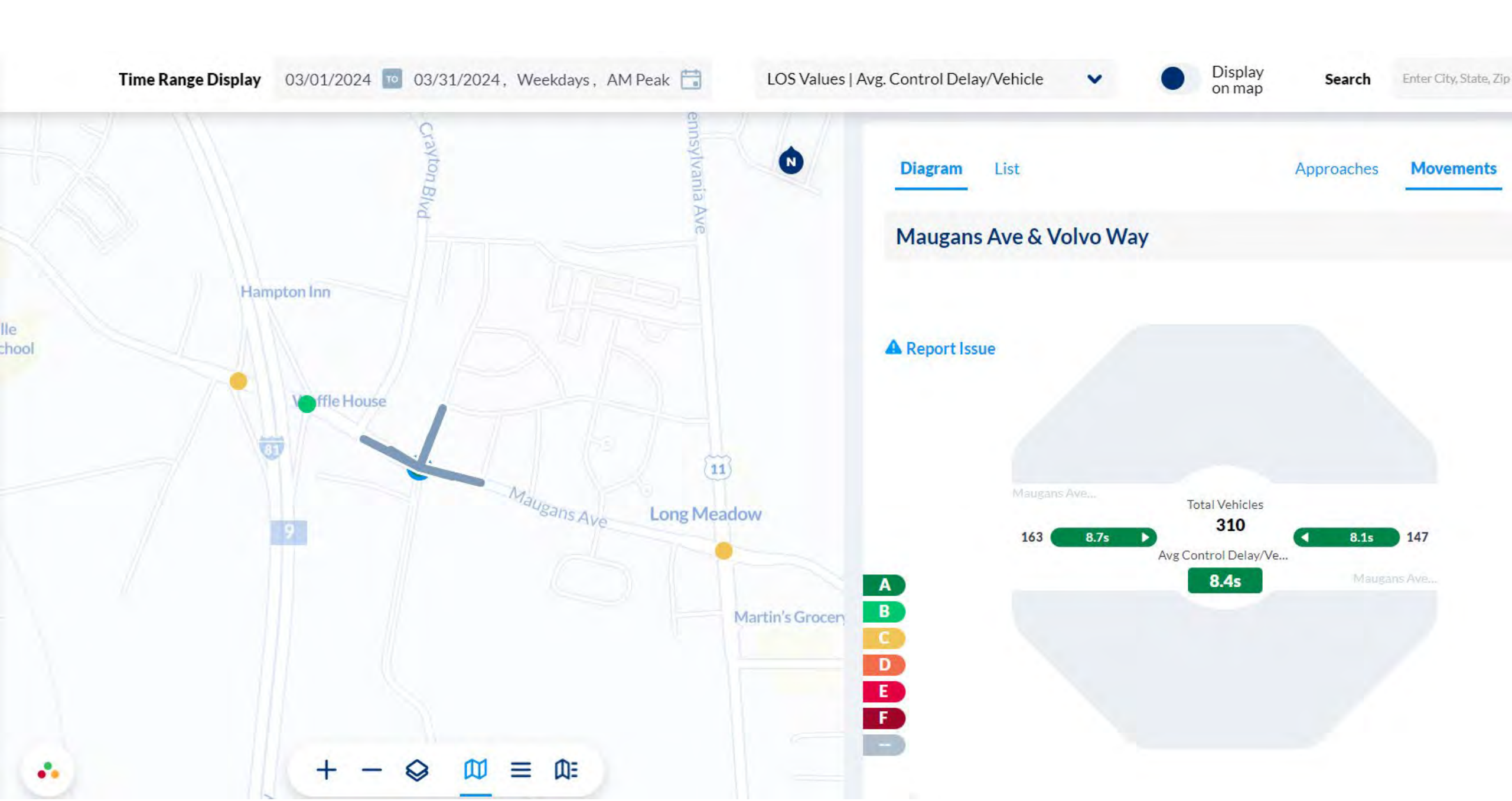
Maugans Ave
(I-81 to Pennsylvania Ave)


Time Range Display
03/01/2024 TO 03/31/2024 , Weekdays , AM Peak
LOS Values | Avg. Control Delay/Vehicle
Display on map
Search
Enter City, State, Zip
Diagram
List
Approaches
Movements
Maugans Avenue
Report Issue
Hampton Inn
Waffle House
Maugans Ave
Long Meadow
Martin's Grocery
81
11
9
N
7
45
3.3s
55.1s
Maugans Ave...
Total Vehicles
206
26
20.0s
19
4.6s
Avg Control Delay/Ve...
25.0s
11.6s
19
20.3s
90
Maugans Ave...
A
B
C
D
E
F


Time Range Display
03/01/2024 TO 03/31/2024 , Weekdays , PM Peak
LOS Values | Avg. Control Delay/Vehicle
Display on map
Search
Enter City, State, Zip
Diagram
List
Approaches
Movements
Maugans Avenue
Report Issue
Crayton Blvd
Pennsylvania Ave
Hampton Inn
ffle House
81
11
9
Maugans Ave
Long Meadow
Martin's Grocery
N
A
B
C
D
E
F
--
6
39
2.2s
40.4s
Maugans Ave...
Total Vehicles
355
37
26.2s
24
14.1s
Avg Control Delay/Ve...
22.0s
8.0s
56
23.2s
193
Maugans Ave...


Time Range Display
03/01/2024 TO 03/31/2024 , Weekdays , AM Peak
LOS Values | Avg. Control Delay/Vehicle
Display on map
Search
Enter City, S
Diagram
List
Approaches
Movem
Maugans Avenue
Report Issue
Crayton Blvd
Pennsylvania Ave
Hampton Inn
Maugansville Elementary School
Maugans Ave
Long Mead
81
9
11
N
A
B
C
D
E
F
Maugans Ave...
6
15.7s
77
9.5s
Total Vehicles
374
Avg Control Delay/Ve...
14.9s
50.3s
8
17.7s
148
5.2s
15.9s
40
95
Maugans Ave...


Time Range Display
03/01/2024 TO 03/31/2024 , Weekdays , PM Peak
LOS Values | Avg. Control Delay/Vehicle
Display on map
Search
Enter City, State, Zip
Diagram
List
Approaches
Movements
Maugans Avenue
Report Issue
Crayton Blvd
Pennsylvania Ave
Hampton Inn
Maugansville Elementary School
Maugans Ave
Long Mead
81
9
11
N
A
B
C
D
E
F
Maugans Ave...
3
17.7s
73
10.9s
Total Vehicles
566
Avg Control Delay/Ve...
15.2s
51.0s
10
14.0s
205
3.8s
18.3s
46
229


Time Range Display
03/01/2024 TO 03/31/2024 , Weekdays , AM Peak
LOS Values | Avg. Control Delay/Vehicle
Display on map
Search
Enter City, State, Zip
Crayton Blvd
ennsylvania Ave
Hampton Inn
Waffle House
81
11
9
Maugans Ave
Long Meadow
Martin's Grocery
N
Diagram
List
Approaches
Movements
Maugans Ave & Volvo Way
Report Issue
Maugans Ave...
Total Vehicles
310
163
8.7s
8.1s
147
Avg Control Delay/Ve...
8.4s
Maugans Ave...
A
B
C
D
E
F

Time Range Display 03/01/2024 TO 03/31/2024 , Weekdays , PM Peak

LOS Values | Avg. Control Delay/Vehicle

Display on map

Search Enter City, State, Zip C

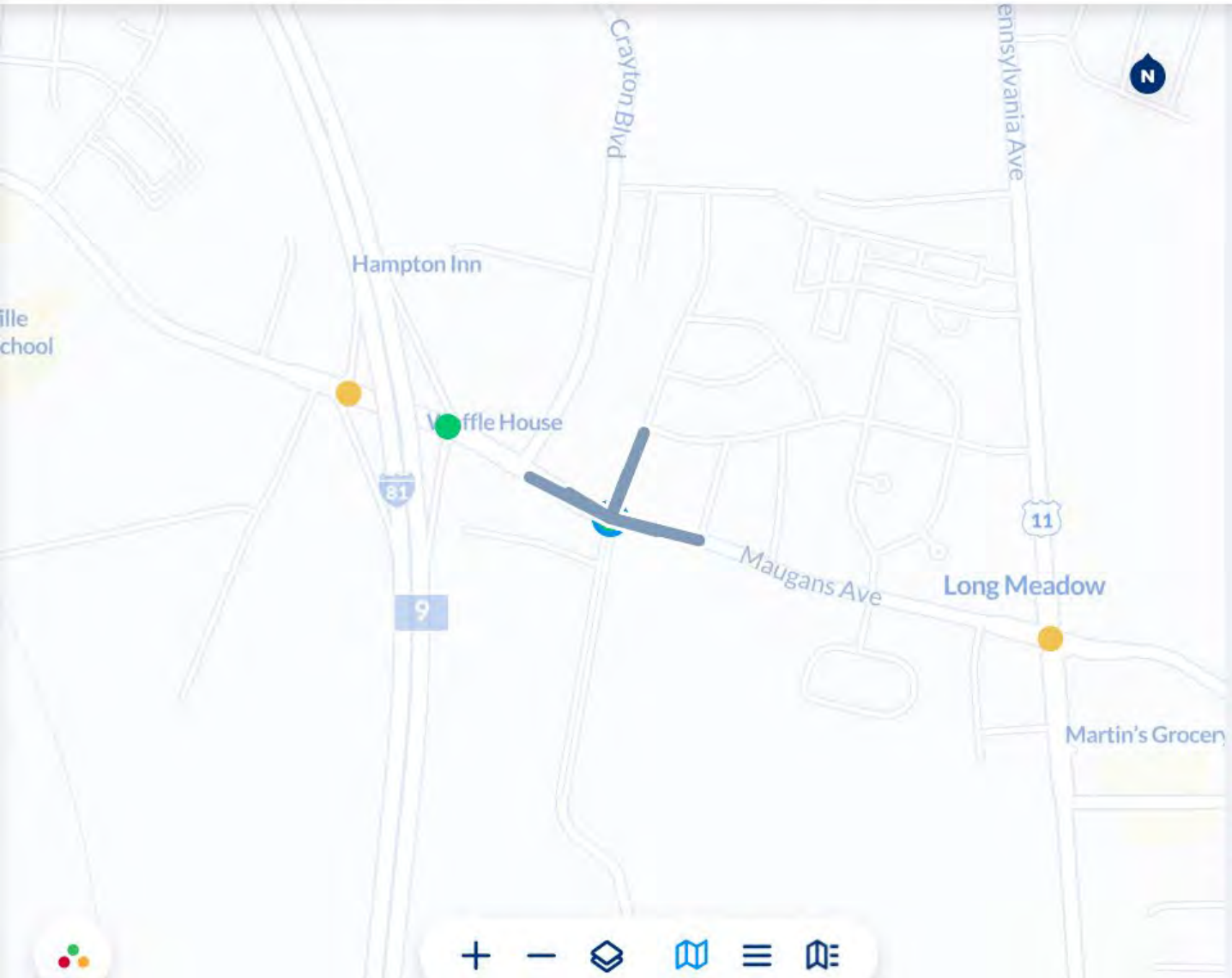
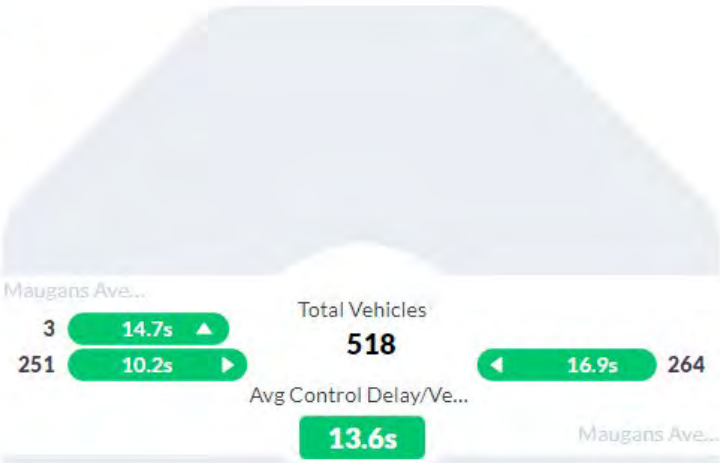


Diagram | List | Approaches | **Movements**

Maugans Ave & Volvo Way

Report Issue



A
B
C
D
E
F
--

Time Range Display 03/01/2024 TO 03/31/2024, Weekdays, AM Peak

LOS Values | Avg. Control Delay/Vehicle

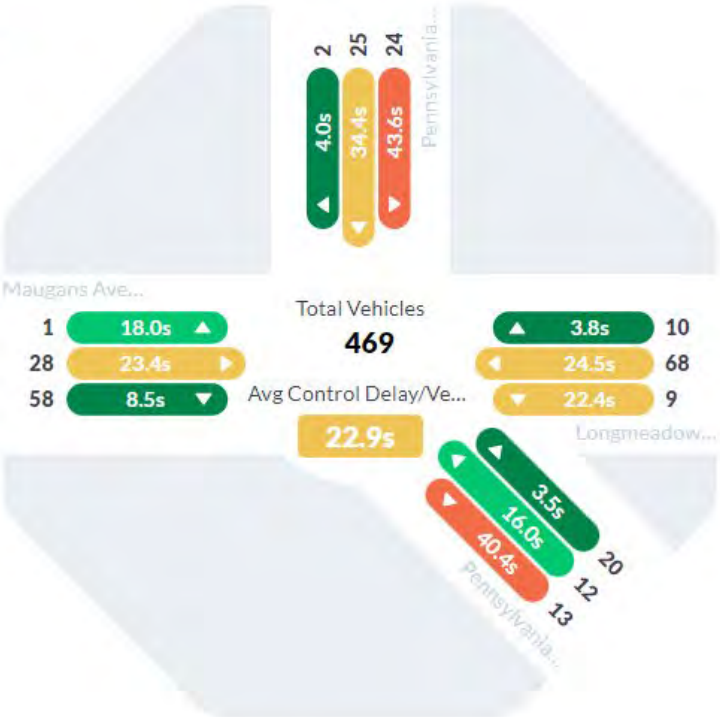
Display on map

Search Enter City, State, Zip C

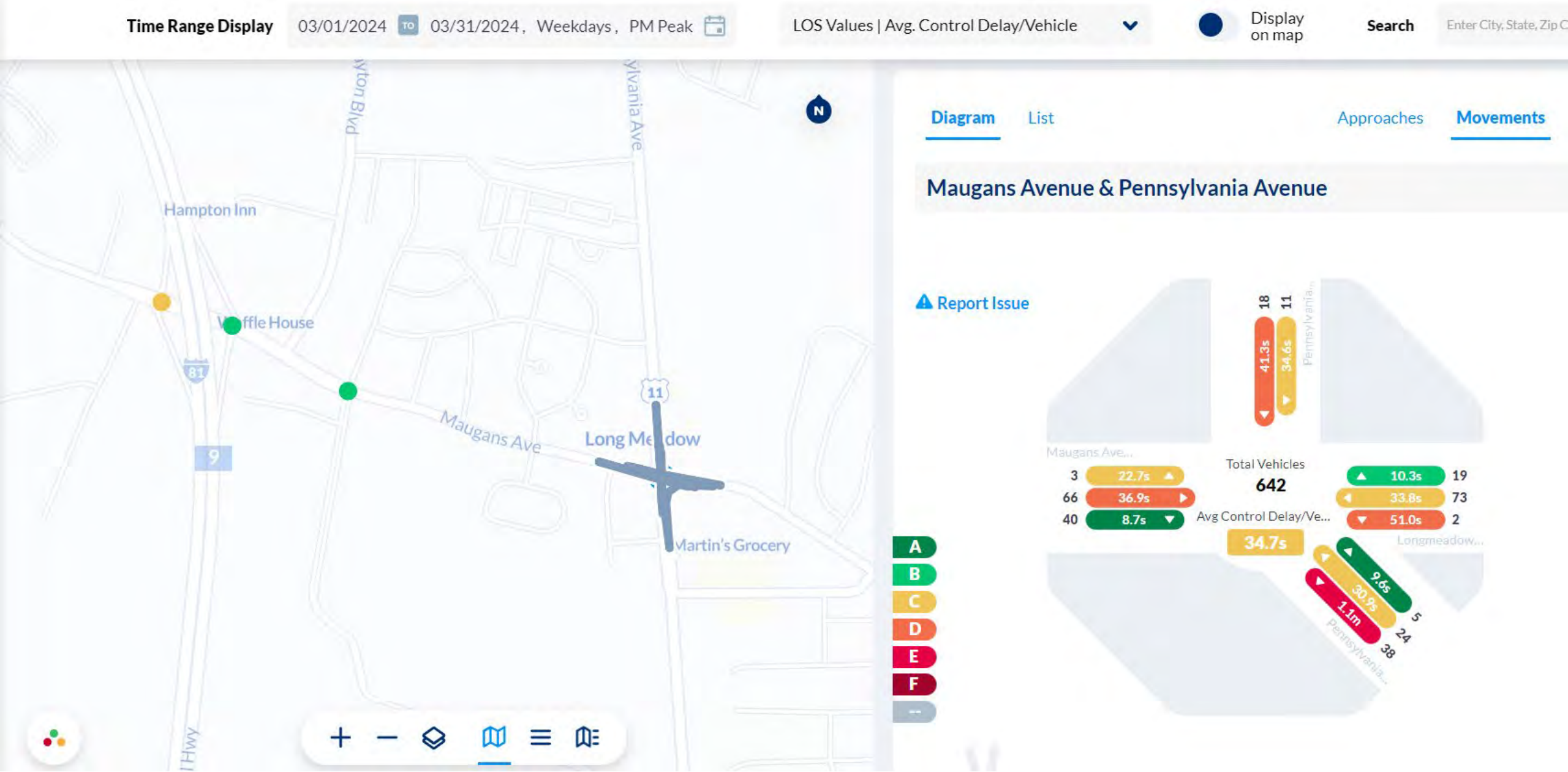
Diagram List Approaches Movements

Maugans Avenue & Pennsylvania Avenue

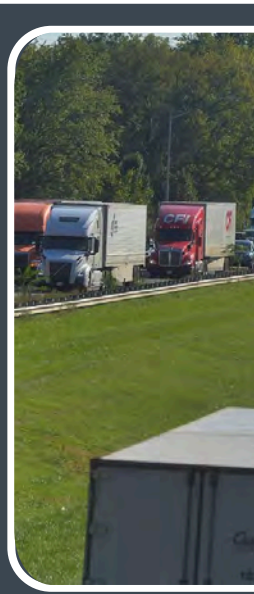
Report Issue



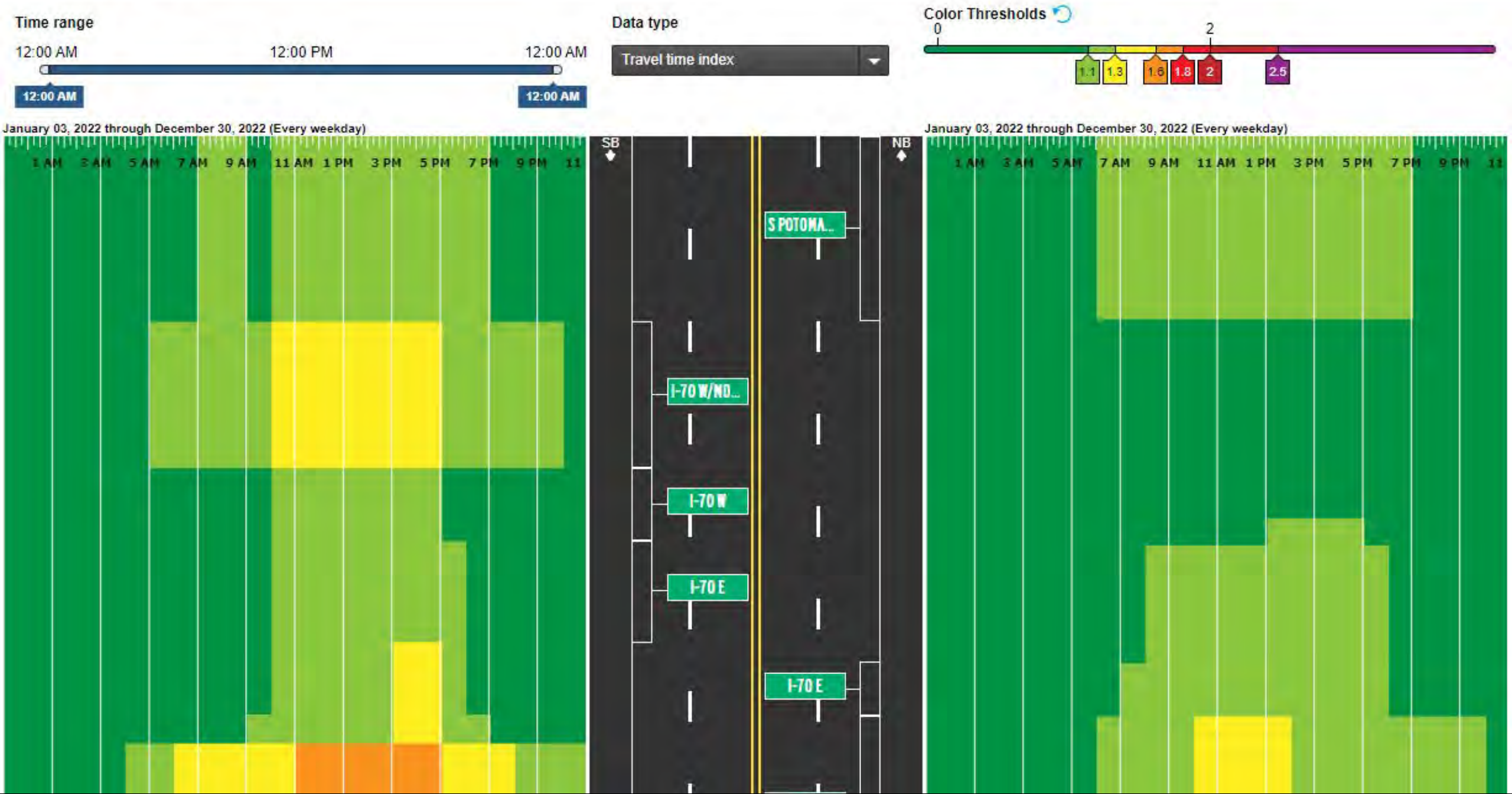
A
B
C
D
E
F

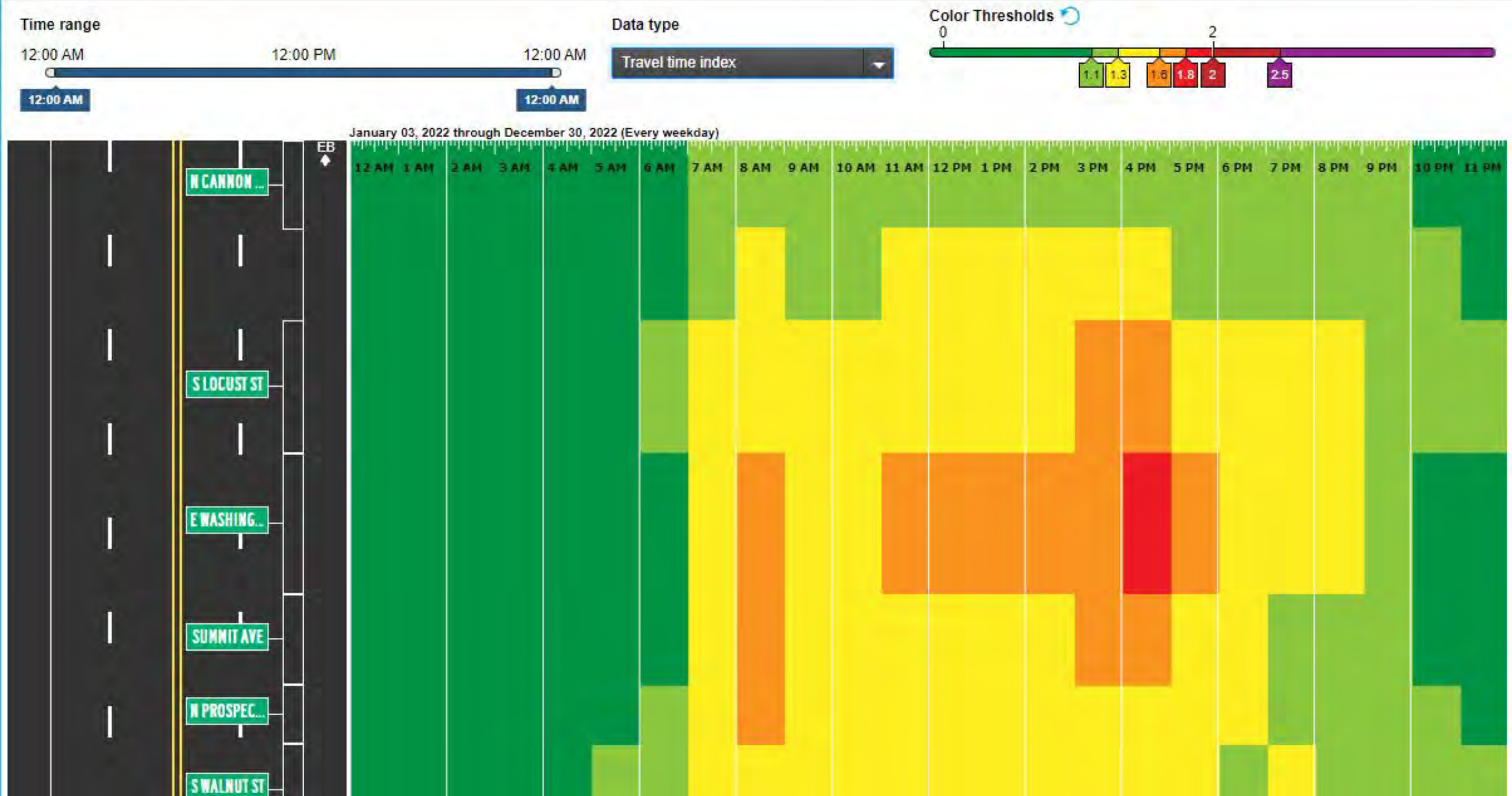

Time Range Display
03/01/2024 TO 03/31/2024 , Weekdays , PM Peak
LOS Values | Avg. Control Delay/Vehicle
Display on map
Search
Enter City, State, Zip C
Diagram
List
Approaches
Movements
Maugans Avenue & Pennsylvania Avenue
Report Issue
Hampton Inn
Waffle House
Maugans Ave
Long Meadow
Martin's Grocery
Pennsylvania Ave
Total Vehicles
642
Avg Control Delay/Ve...
34.7s
A
B
C
D
E
F

APPENDIX E
CONGESTION VISUALS FOR CMP LOCATIONS



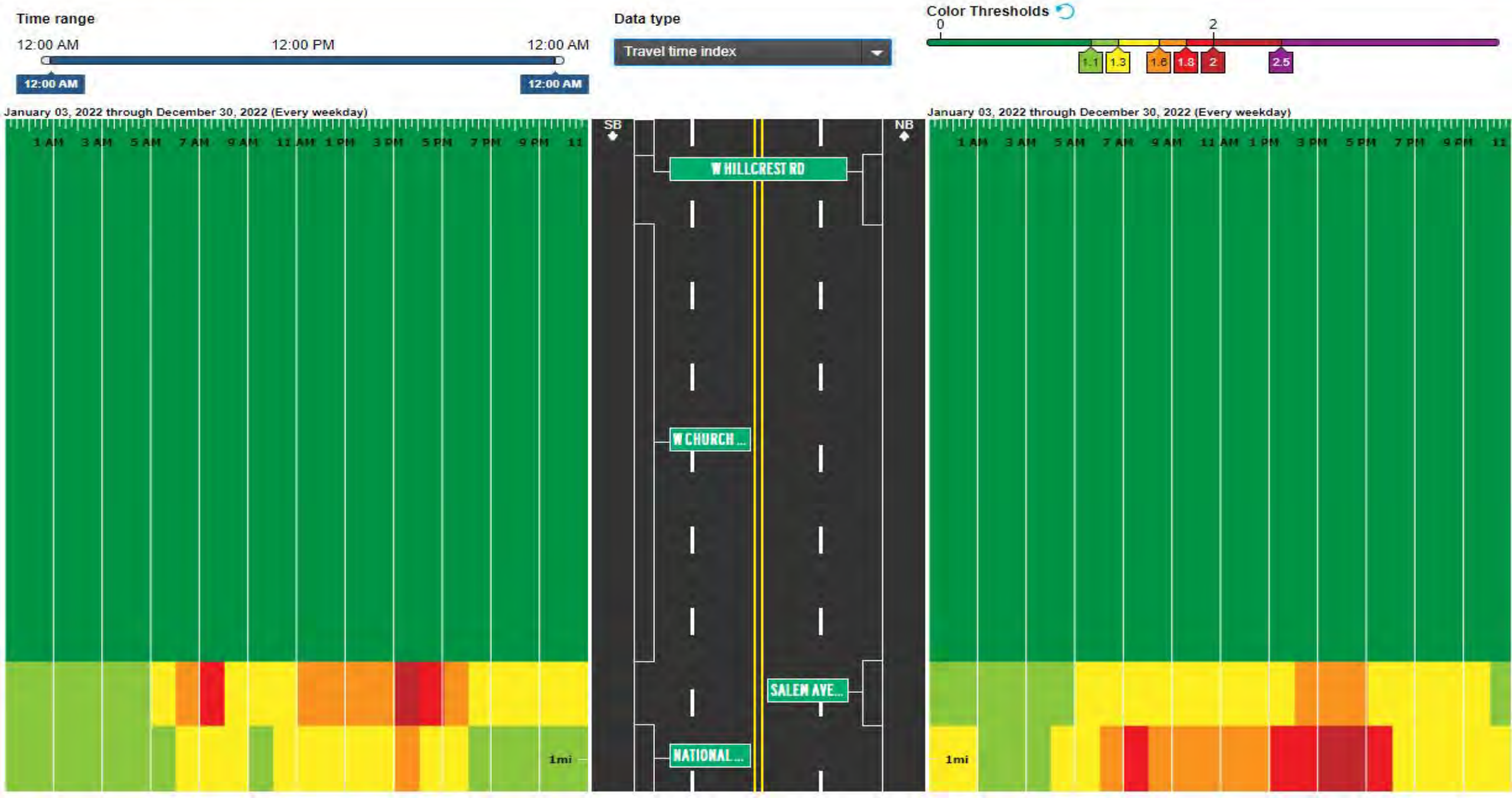
MD 65 (Col Henry K Douglas Dr to W Oak Ridge Dr)



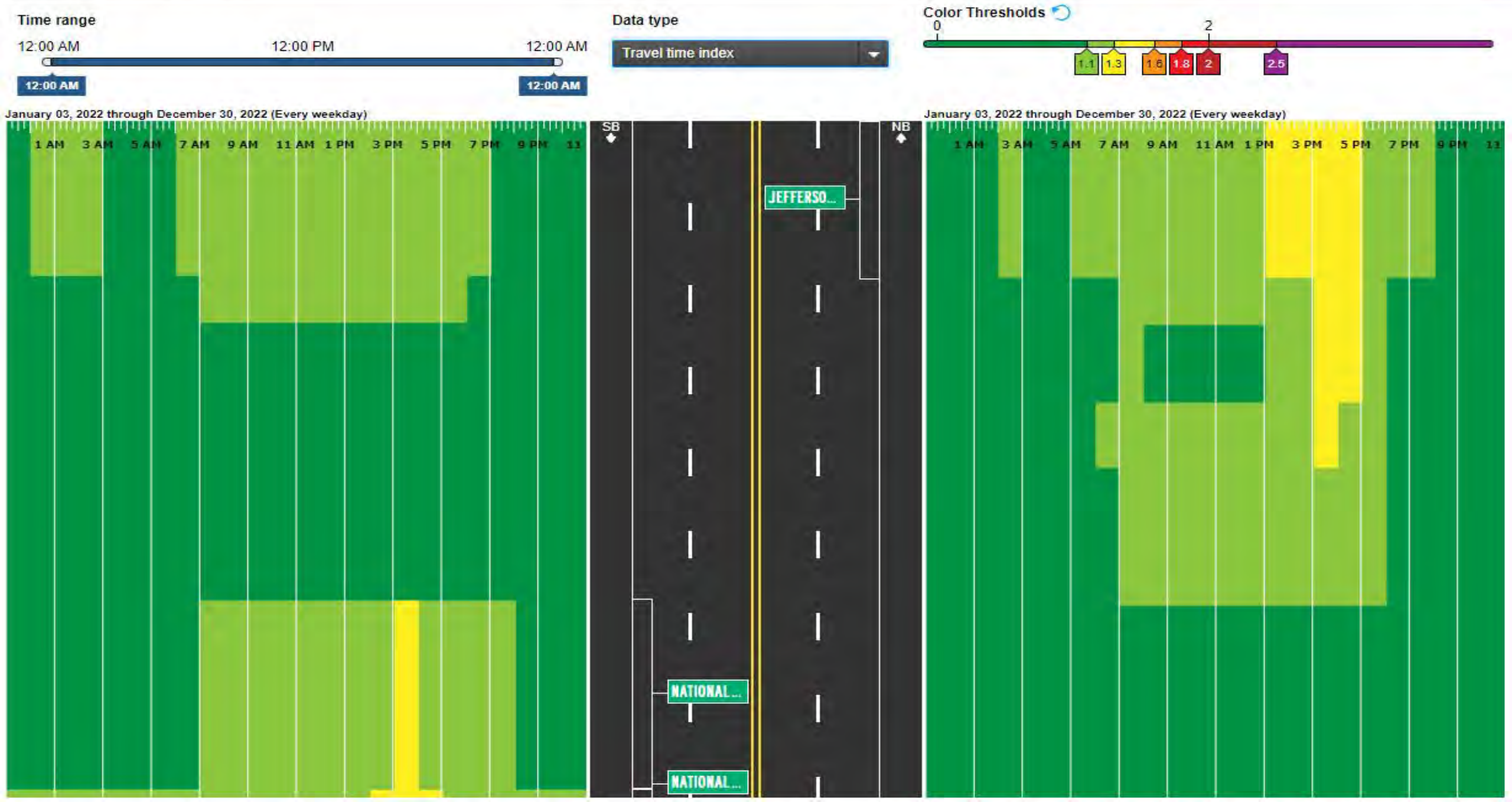

Time range
12:00 AM
12:00 PM
12:00 AM
12:00 AM
12:00 AM
Data type
Travel time index
Color Thresholds
0
2
1.1
1.3
1.6
1.8
2
2.5
January 03, 2022 through December 30, 2022 (Every weekday)
EB
N CANNON ...
S LOCUST ST
E WASHING...
SUMMIT AVE
N PROSPEC...
S WALNUT ST
12 AM 1 AM 2 AM 3 AM 4 AM 5 AM 6 AM 7 AM 8 AM 9 AM 10 AM 11 AM 12 PM 1 PM 2 PM 3 PM 4 PM 5 PM 6 PM 7 PM 8 PM 9 PM 10 PM 11 PM

Franklin St (Burhans Blvd to N Cannon Avenue)

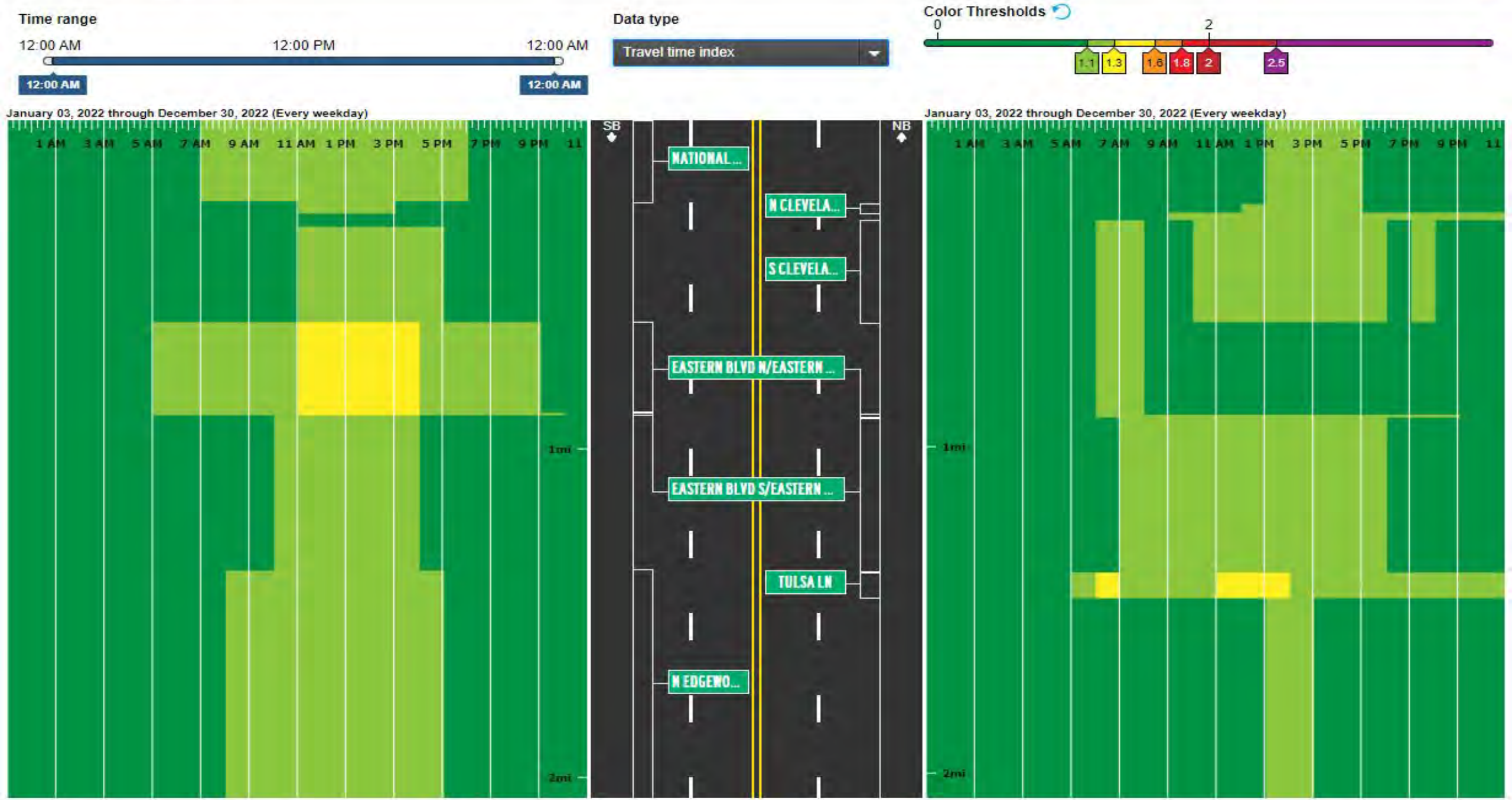
N Burhans Blvd (Washington St to Pennsylvania Avenue)

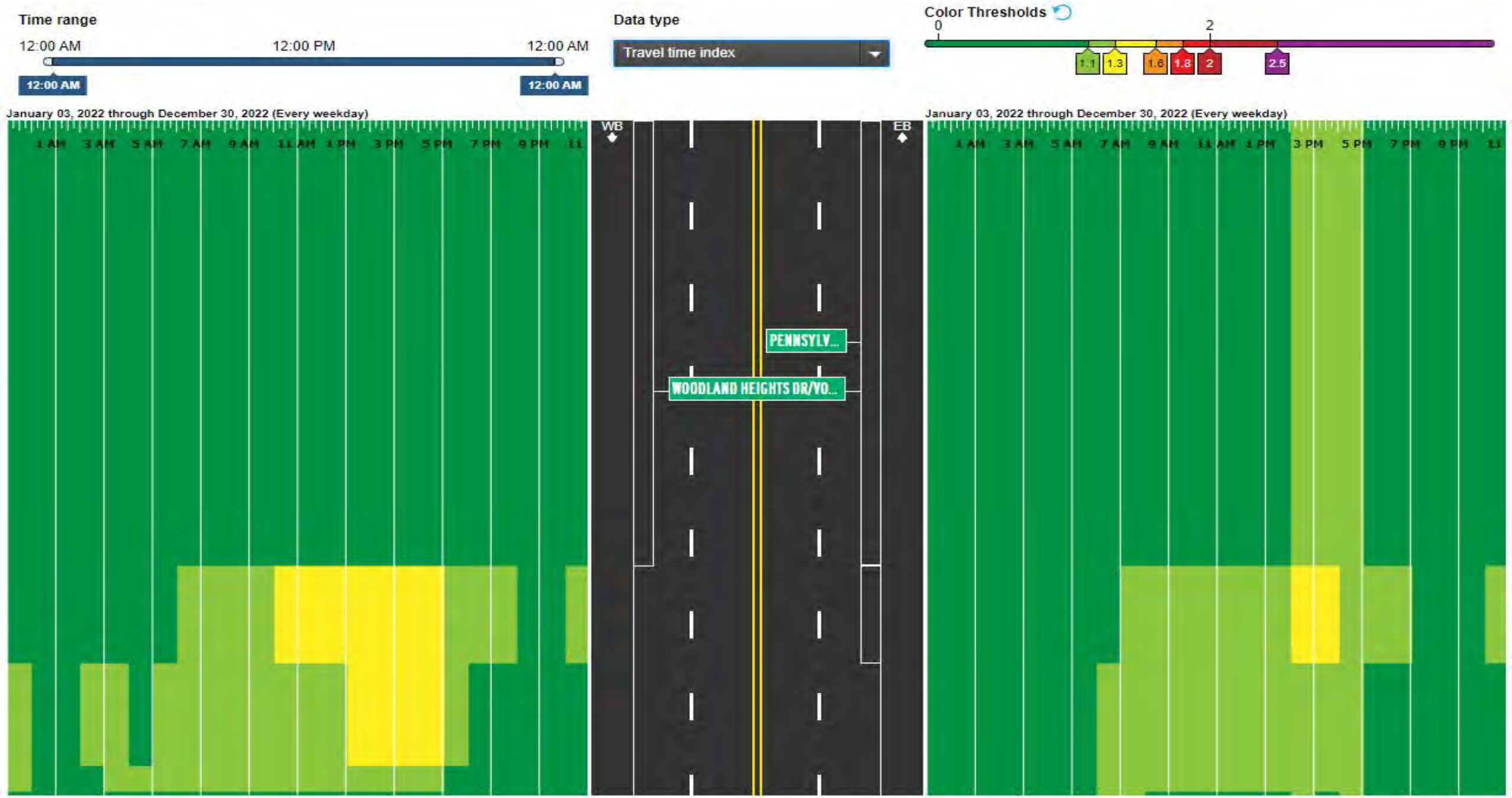


Eastern Blvd (Dual Highway to Jefferson Blvd)

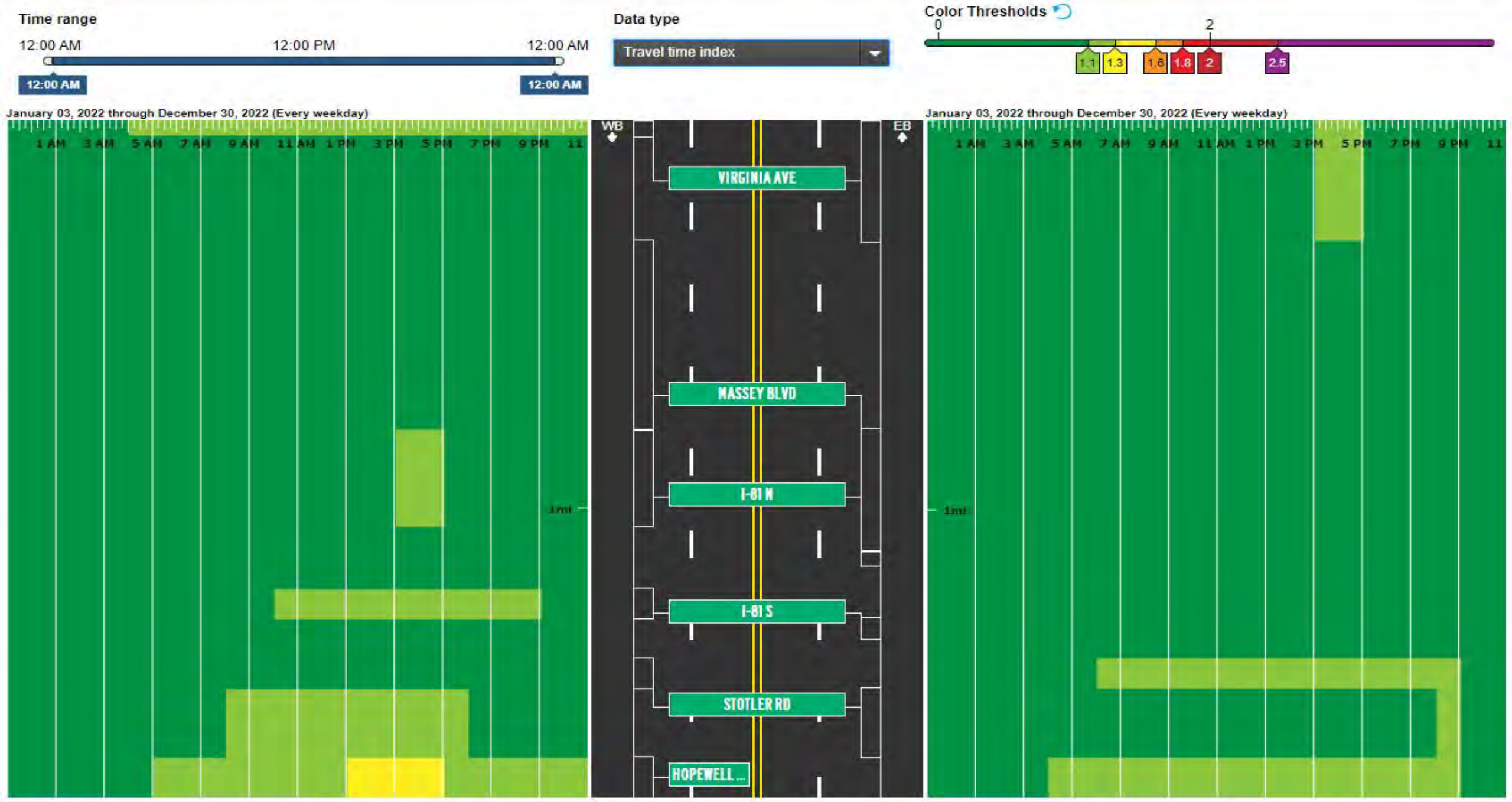


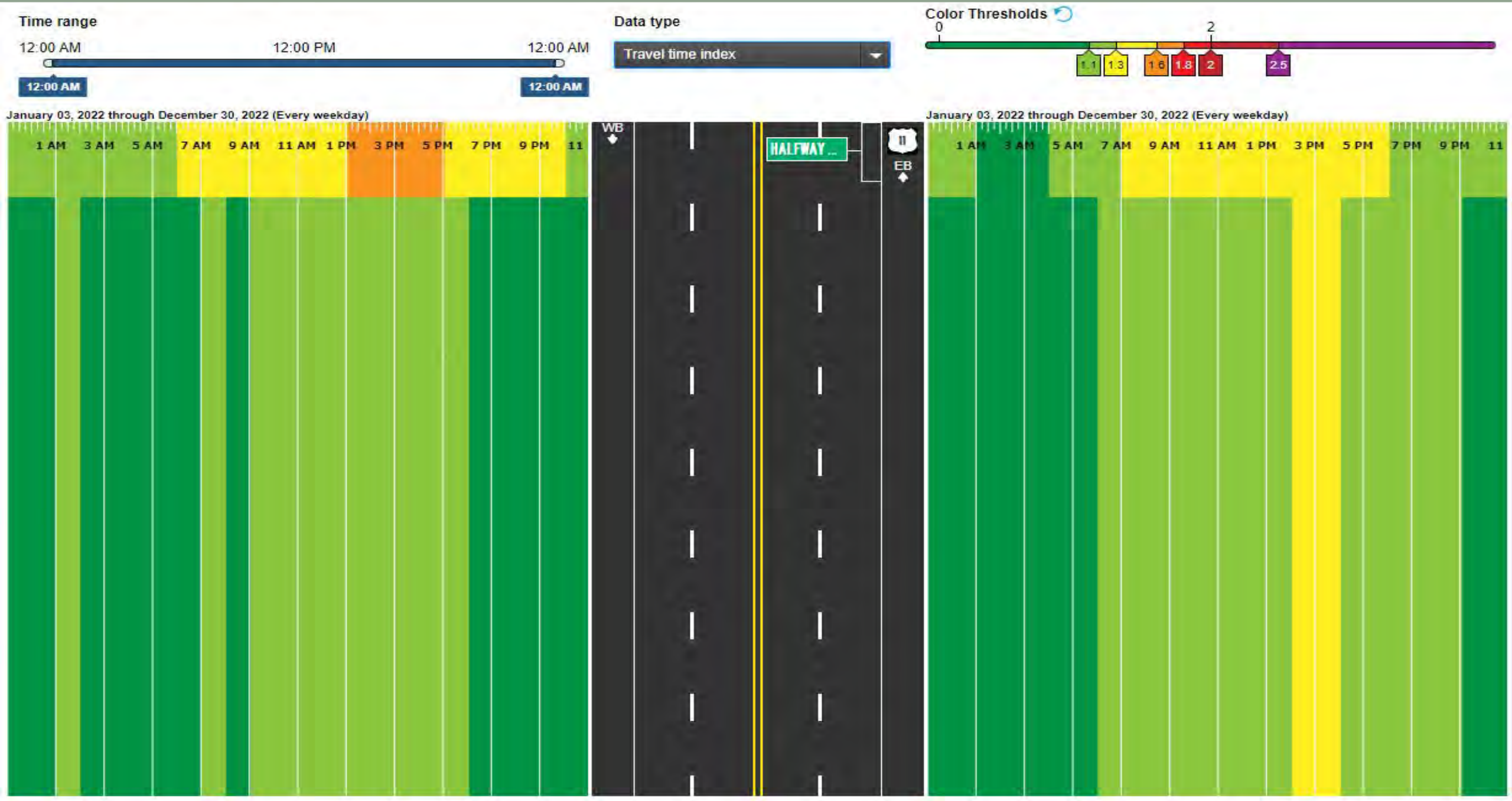
Dual Highway (N Cannon Avenue to Edgewood Dr)

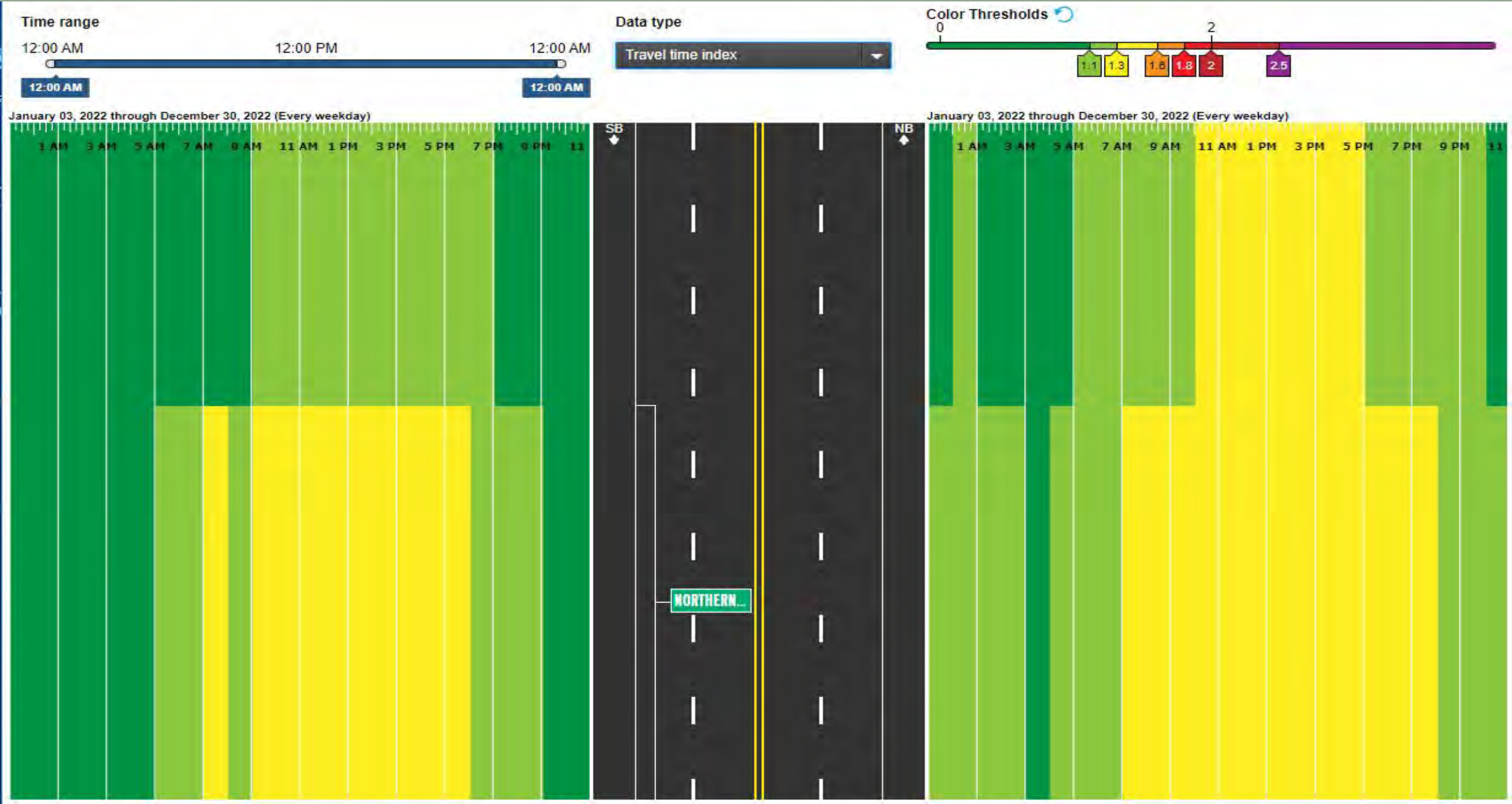


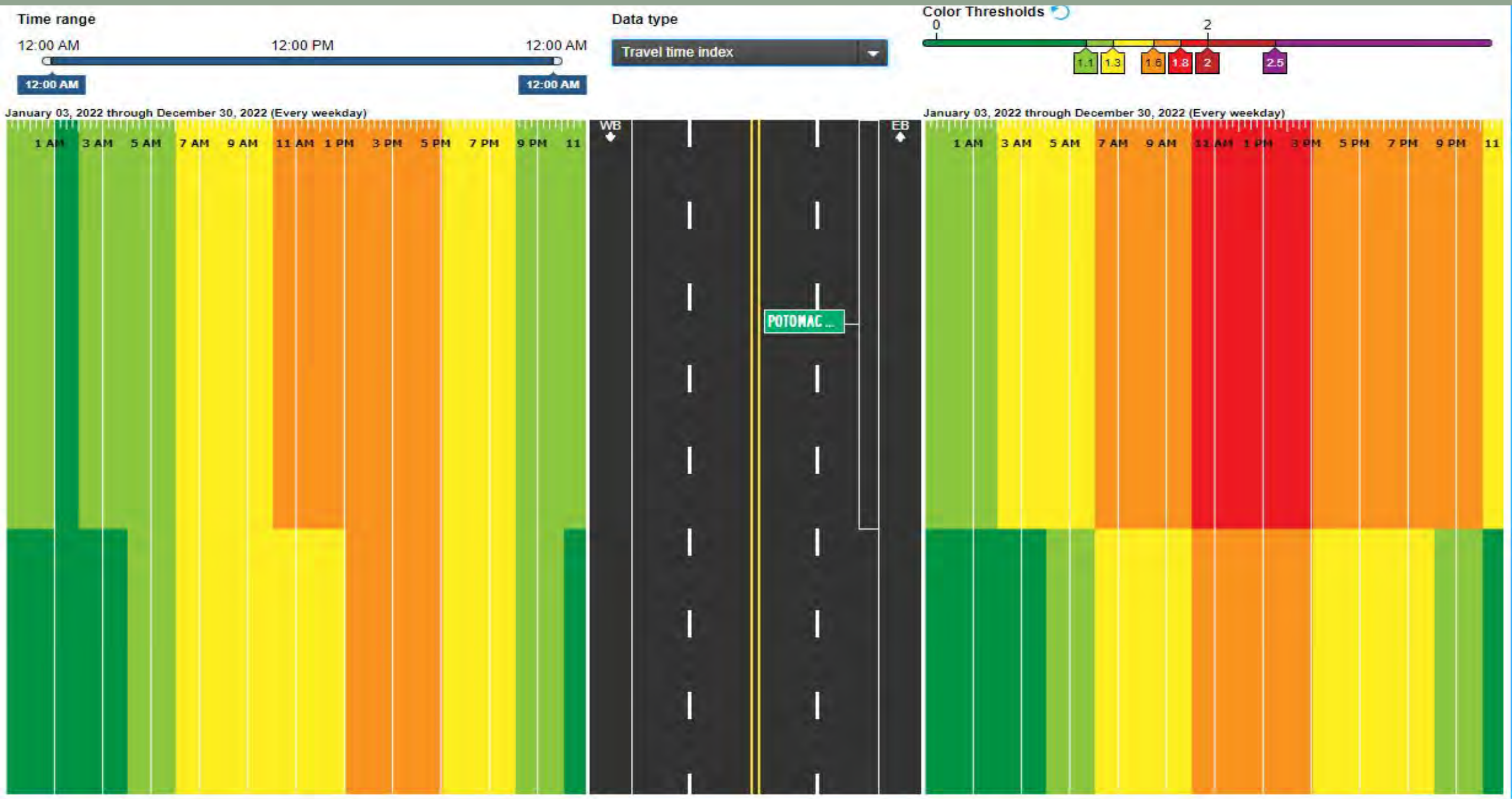

Time range
12:00 AM
12:00 PM
12:00 AM
12:00 AM
12:00 AM
Data type
Travel time index
Color Thresholds
0
2
1.1
1.3
1.6
1.8
2
2.5
January 03, 2022 through December 30, 2022 (Every weekday)
1 AM
3 AM
5 AM
7 AM
9 AM
11 AM
1 PM
3 PM
5 PM
7 PM
9 PM
11
WB
EB
PENNSYLV...
WOODLAND HEIGHTS DR/VO...
January 03, 2022 through December 30, 2022 (Every weekday)
1 AM
3 AM
5 AM
7 AM
9 AM
11 AM
1 PM
3 PM
5 PM
7 PM
9 PM
11

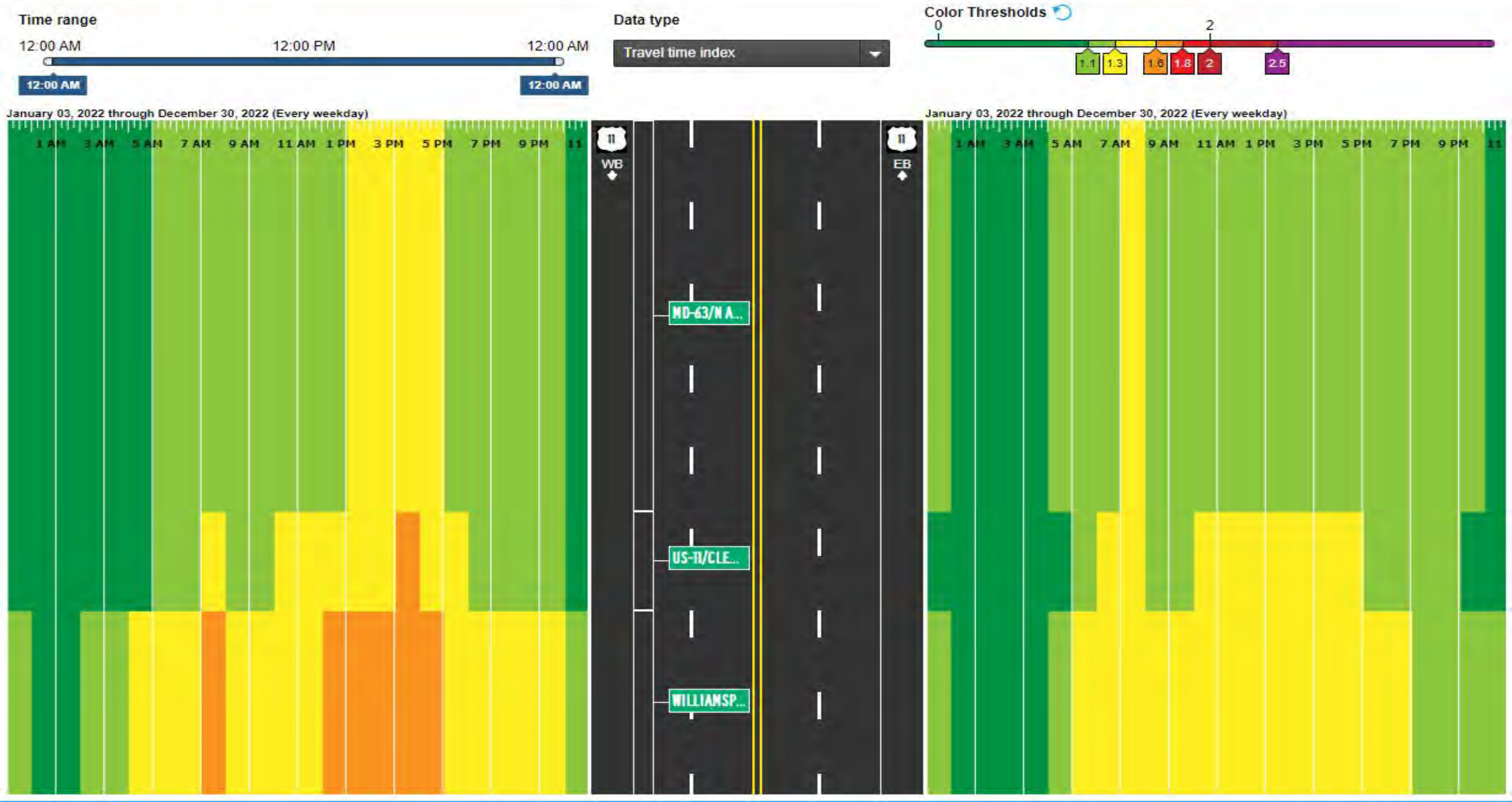
Halfway Blvd (Hopewell Rd to Halfway Blvd/Virginia Avenue Intersection)

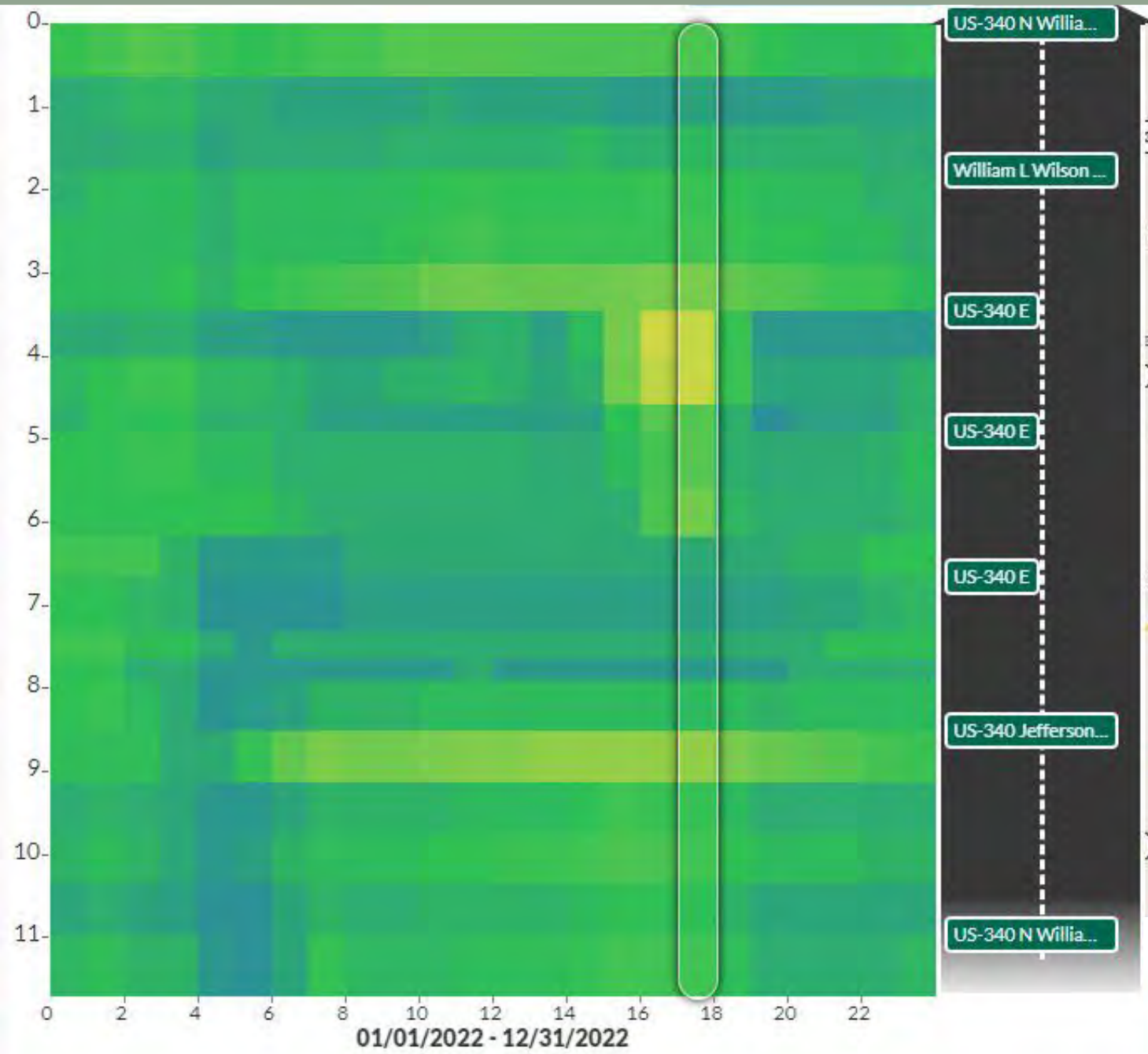


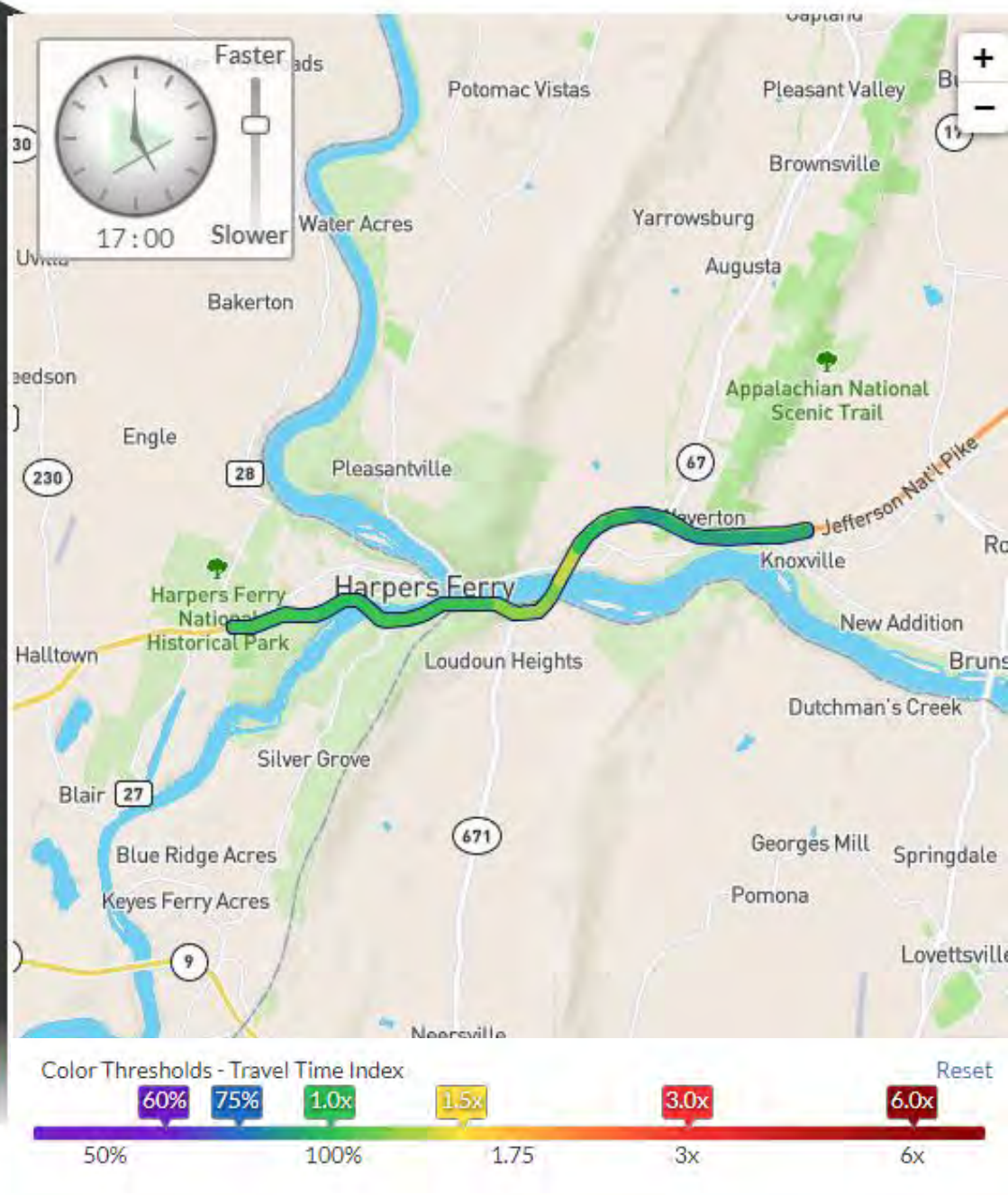

Time range
12:00 AM
12:00 PM
12:00 AM
12:00 AM
12:00 AM
Data type
Travel time index
Color Thresholds
0
2
1.1
1.3
1.6
1.8
2
2.5
January 03, 2022 through December 30, 2022 (Every weekday)
1 AM
3 AM
5 AM
7 AM
9 AM
11 AM
1 PM
3 PM
5 PM
7 PM
9 PM
11
WB
HALFWAY ...
11
EB
January 03, 2022 through December 30, 2022 (Every weekday)
1 AM
3 AM
5 AM
7 AM
9 AM
11 AM
1 PM
3 PM
5 PM
7 PM
9 PM
11


Time range
12:00 AM
12:00 PM
12:00 AM
12:00 AM
12:00 AM
Data type
Travel time index
Color Thresholds
0
2
1.1
1.3
1.6
1.8
2
2.5
January 03, 2022 through December 30, 2022 (Every weekday)
1 AM
3 AM
5 AM
7 AM
9 AM
11 AM
1 PM
3 PM
5 PM
7 PM
9 PM
11
SB
NB
NORTHERN...
January 03, 2022 through December 30, 2022 (Every weekday)
1 AM
3 AM
5 AM
7 AM
9 AM
11 AM
1 PM
3 PM
5 PM
7 PM
9 PM
11

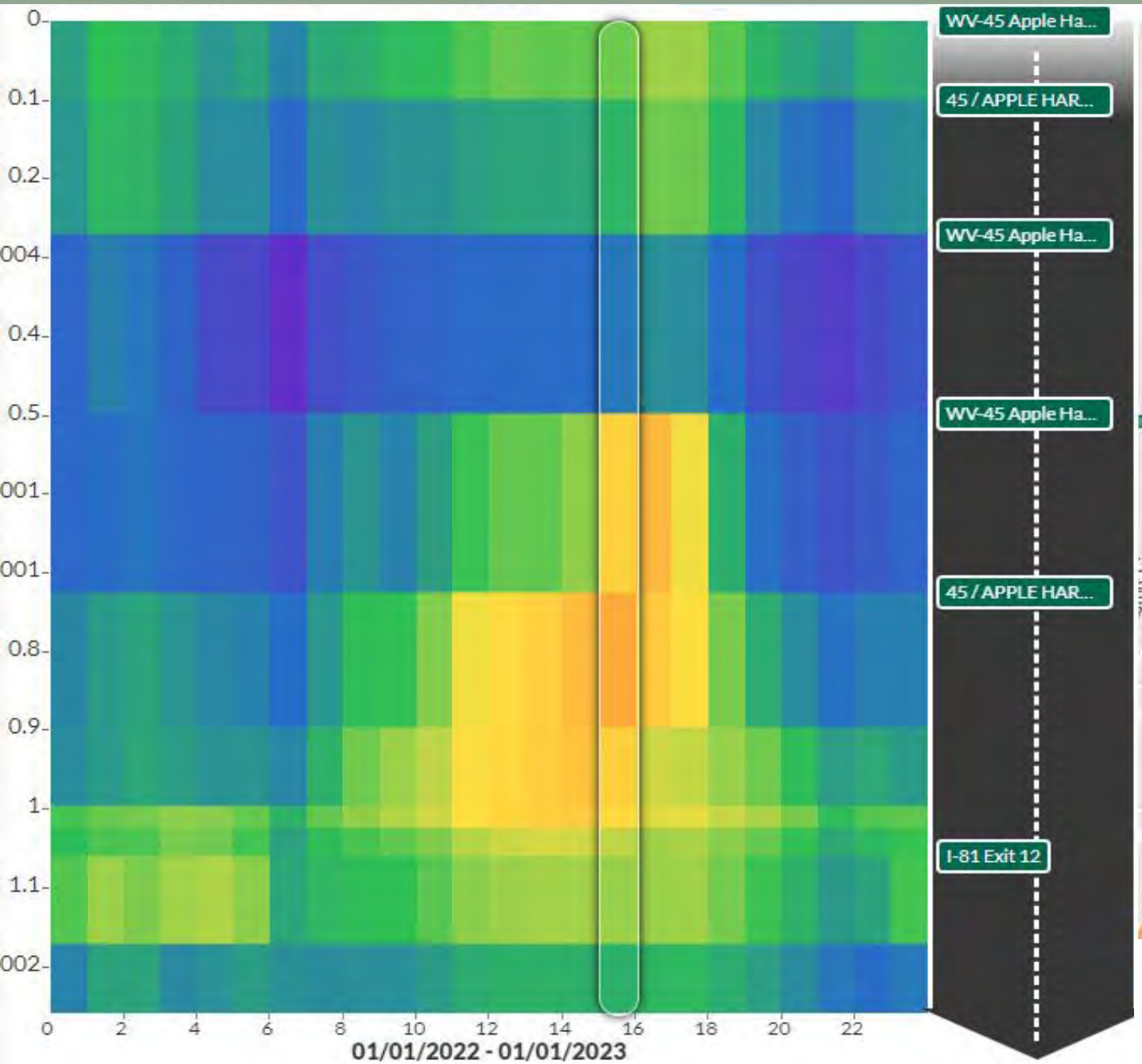

Time range
12:00 AM
12:00 PM
12:00 AM
12:00 AM
12:00 AM
Data type
Travel time index
Color Thresholds
0
2
1.1
1.3
1.6
1.8
2
2.5
January 03, 2022 through December 30, 2022 (Every weekday)
1 AM
3 AM
5 AM
7 AM
9 AM
11 AM
1 PM
3 PM
5 PM
7 PM
9 PM
11
WB
EB
POTOMAC ...
January 03, 2022 through December 30, 2022 (Every weekday)
1 AM
3 AM
5 AM
7 AM
9 AM
11 AM
1 PM
3 PM
5 PM
7 PM
9 PM
11

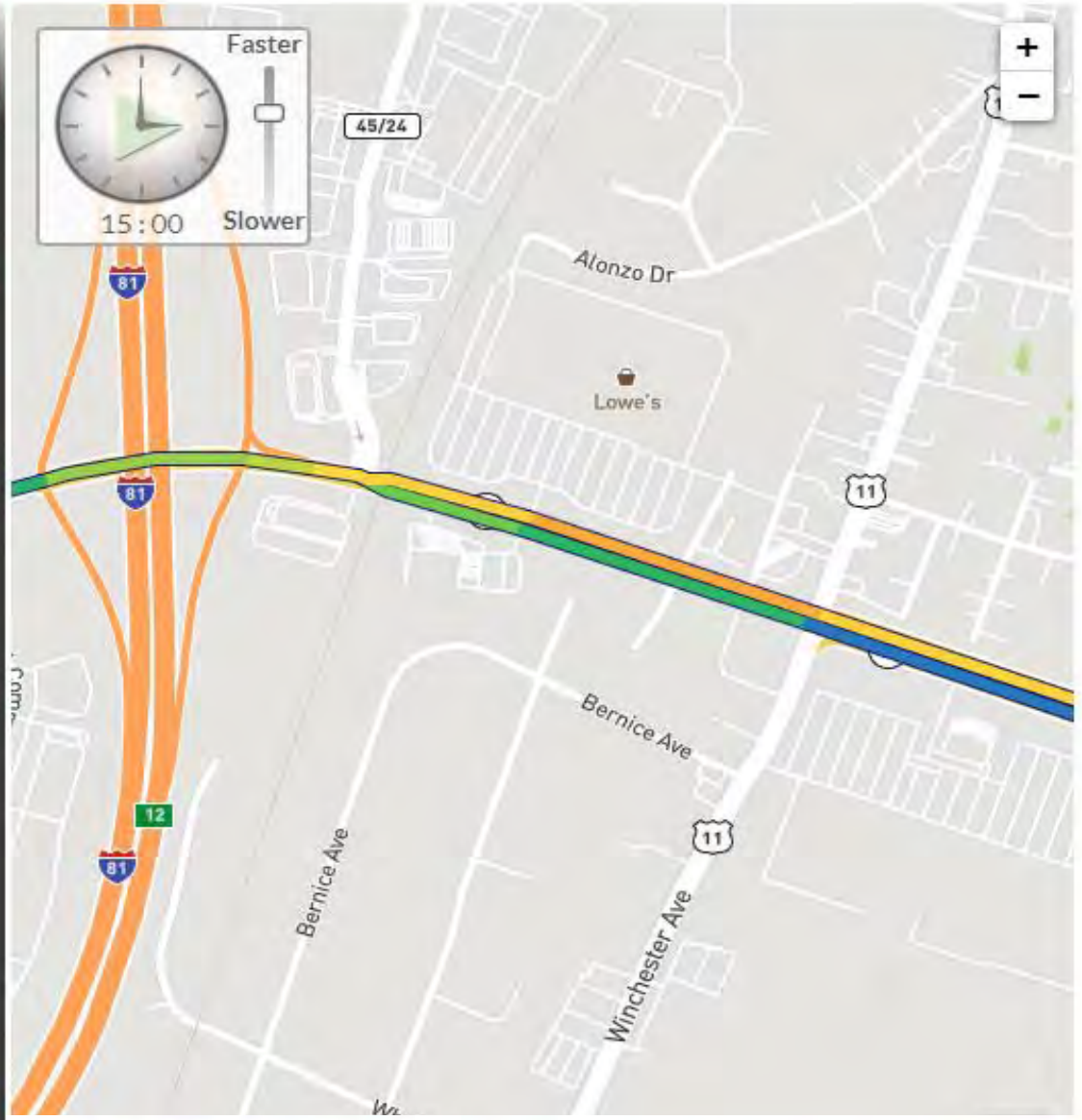

Time range
12:00 AM
12:00 PM
12:00 AM
12:00 AM
12:00 AM
Data type
Travel time index
Color Thresholds
0
2
1.1
1.3
1.6
1.8
2
2.5
January 03, 2022 through December 30, 2022 (Every weekday)
1 AM
3 AM
5 AM
7 AM
9 AM
11 AM
1 PM
3 PM
5 PM
7 PM
9 PM
11
WB
EB
MD-63/N A...
US-11/CLE...
WILLIAMSP...
January 03, 2022 through December 30, 2022 (Every weekday)

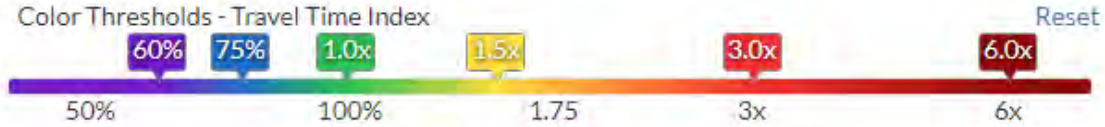

0
1
2
3
4
5
6
7
8
9
10
11
0
2
4
6
8
10
12
14
16
18
20
22
01/01/2022 - 12/31/2022
US-340 N Willia...
William L Wilson ...
US-340 E
US-340 E
US-340 E
US-340 Jefferson...
US-340 N Willia...

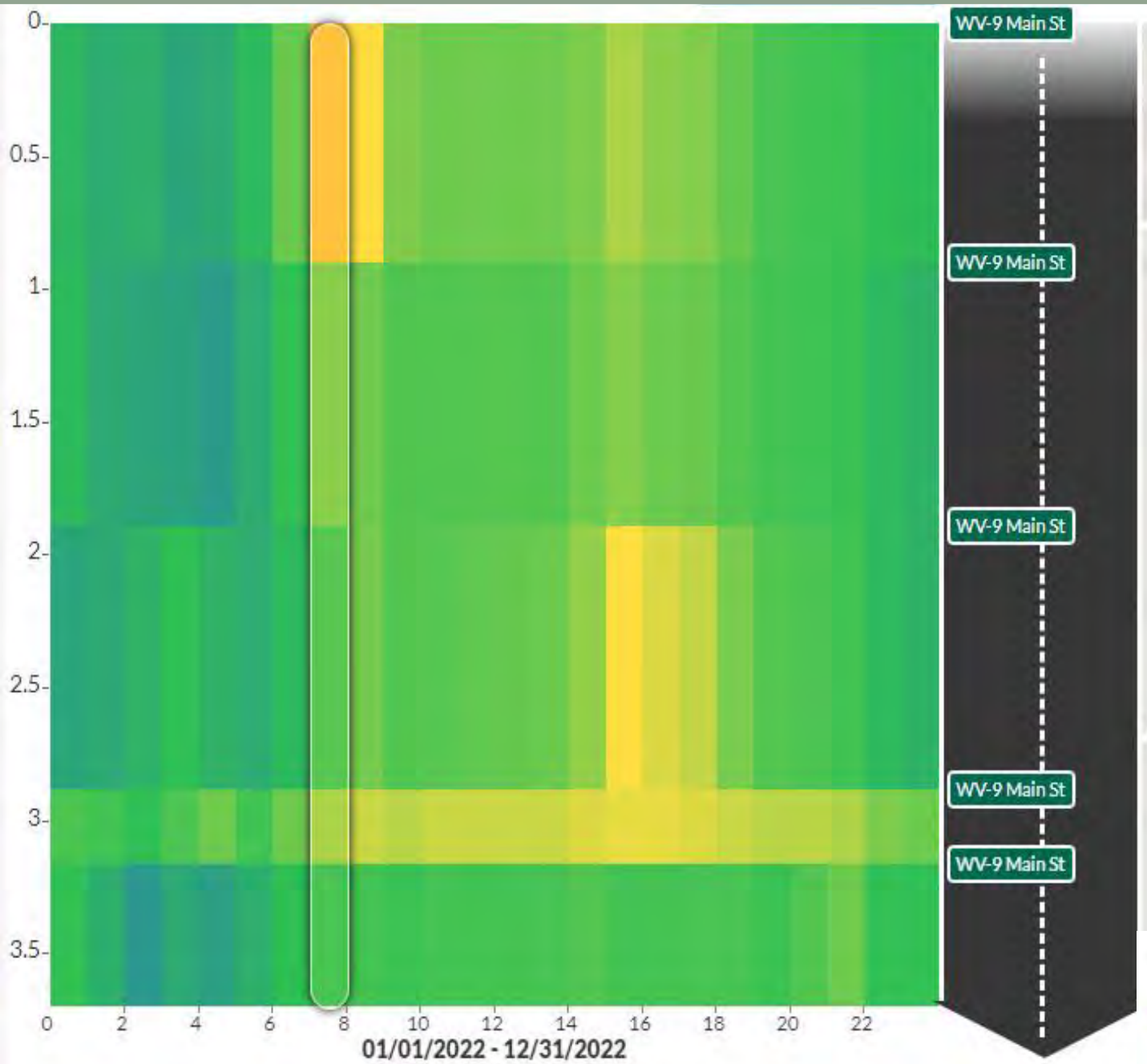

Faster
17:00
Slower
Potomac Vistas
Pleasant Valley
Brownsville
Water Acres
Yarrowsburg
Augusta
Bakerton
Appalachian National Scenic Trail
Engle
Pleasantville
Jefferson Nat'l Pike
Knoxville
Harpers Ferry
Harpers Ferry National Historical Park
New Addition
Halltown
Loudoun Heights
Dutchman's Creek
Silver Grove
Blair
Blue Ridge Acres
Keyes Ferry Acres
Georges Mill
Springdale
Pomona
Color Thresholds - Travel Time Index
Reset
60%
75%
1.0x
1.5x
3.0x
6.0x
50%
100%
1.75
3x
6x

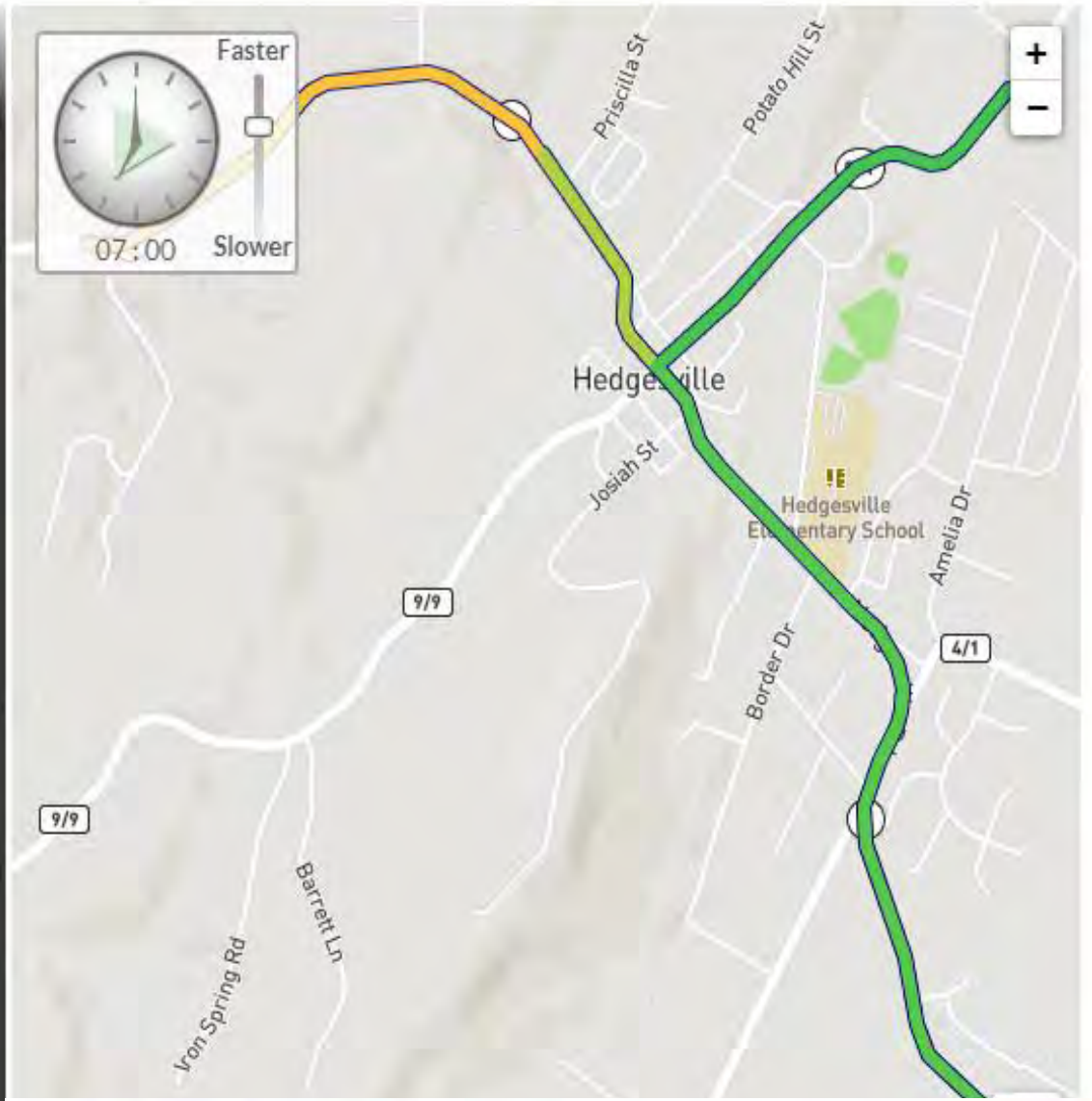
Apple Harvest Drive (I-81 to New York Ave)







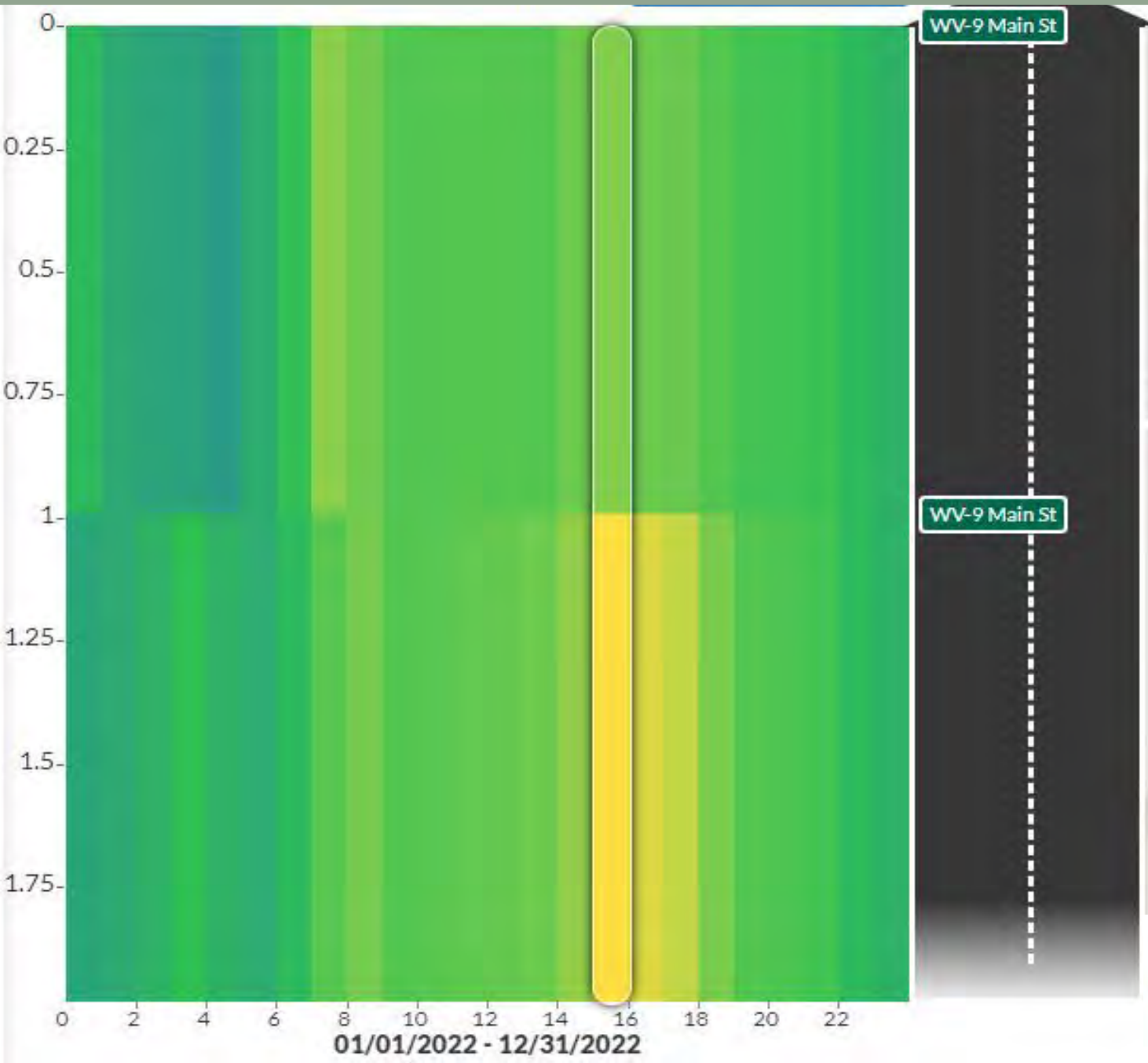




Color Thresholds - Travel Time Index Reset

60% 75% 1.0x 1.5x 3.0x 6.0x

50% 100% 1.75 3x 6x


0
0.25
0.5
0.75
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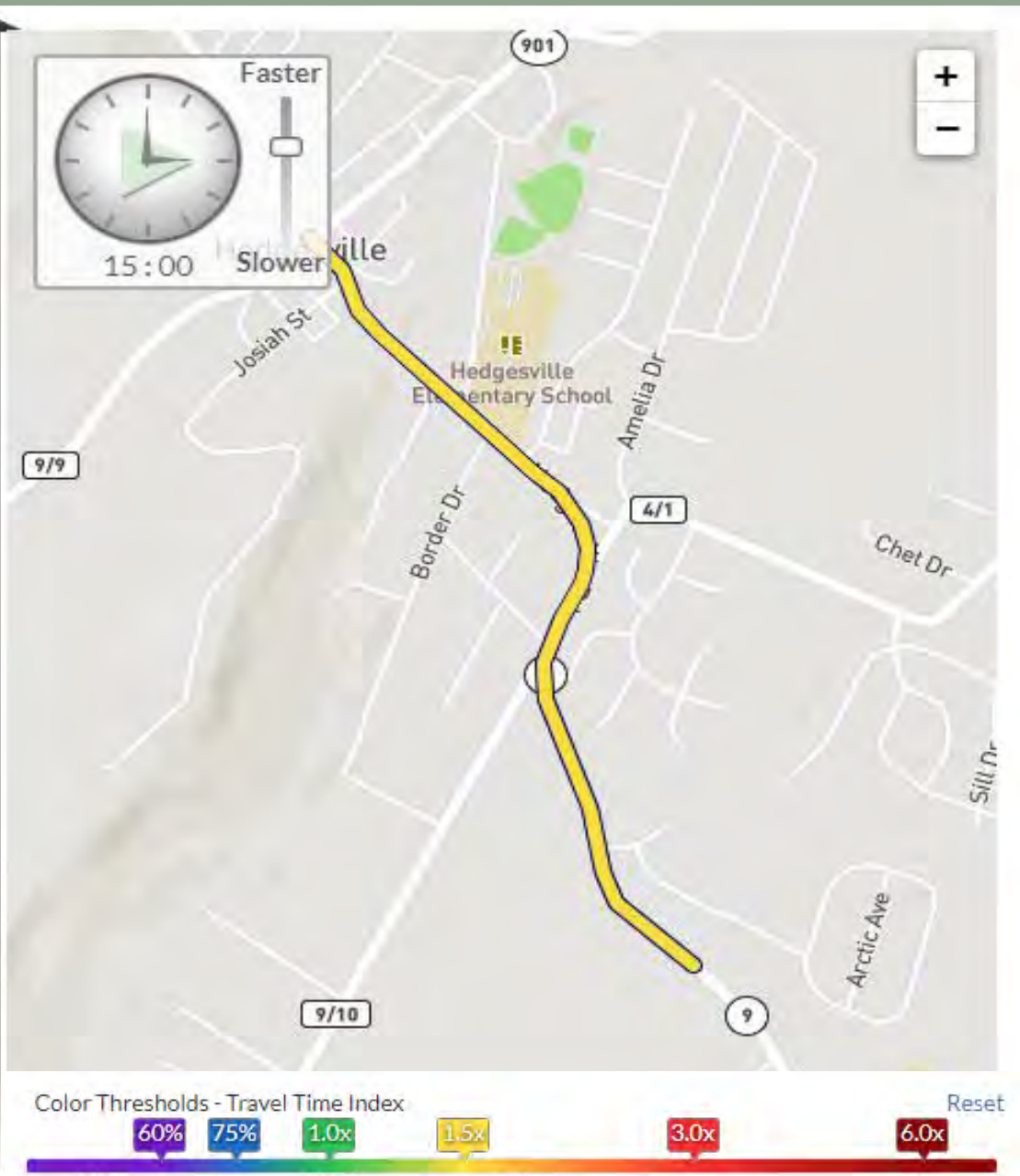
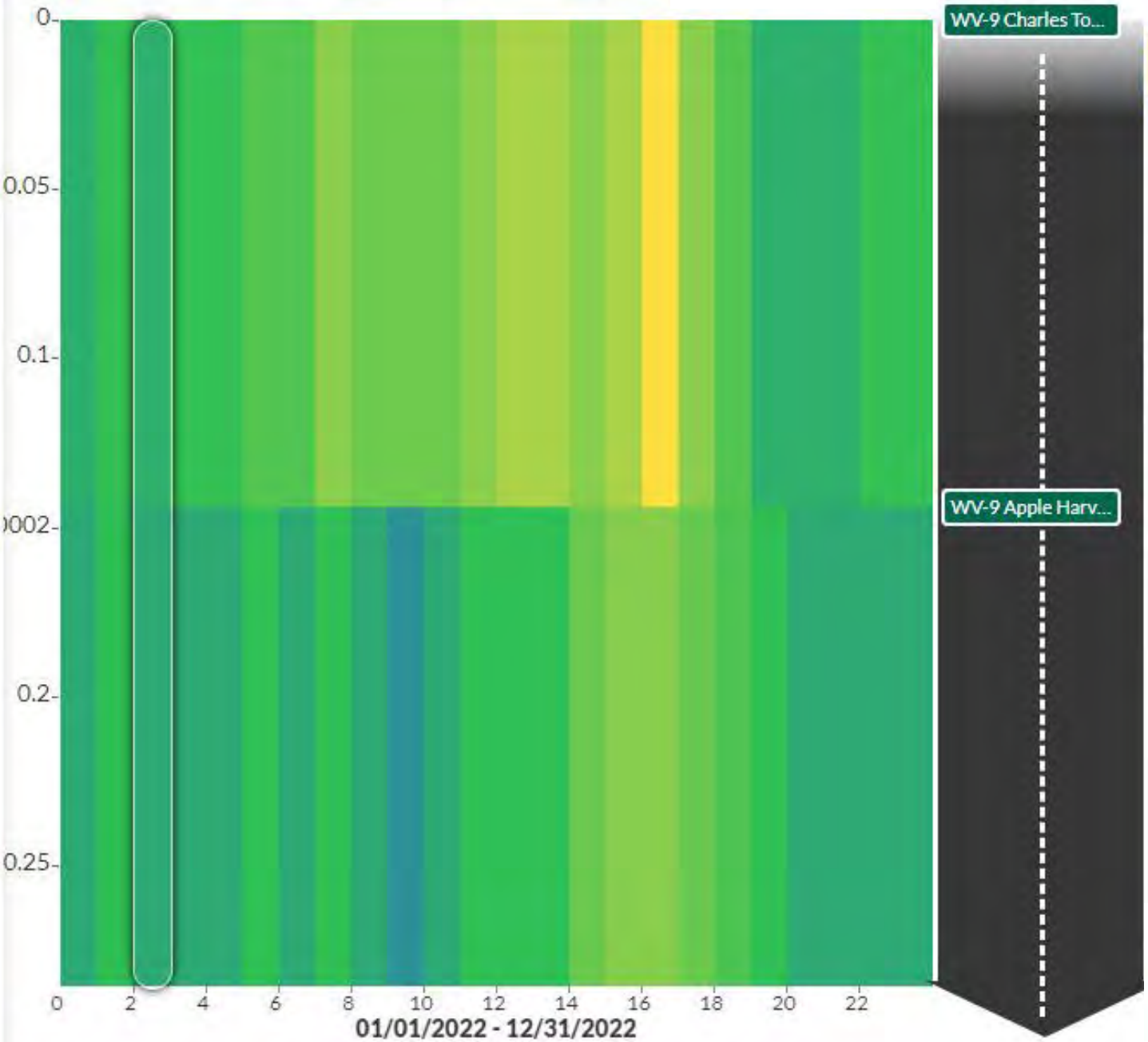
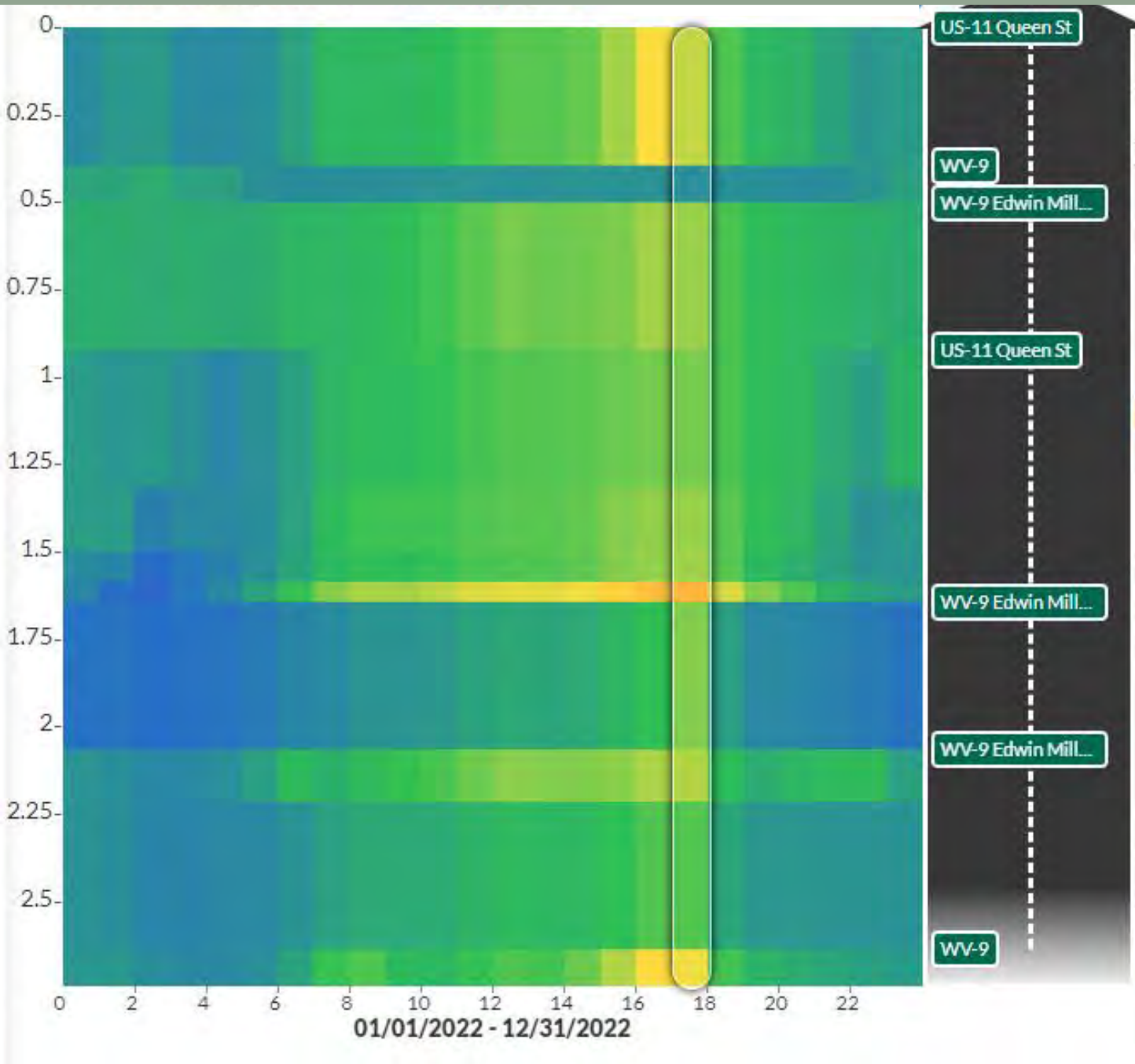
0 2 4 6 8 10 12 14 16 18 20 22
01/01/2022 - 12/31/2022

WV-9 Main St
WV-9 Main St


Faster
15:00
Slower
901
Josiah St
Hedgesville
Elementary School
Amelia Dr
9/9
Border Dr
4/1
Chet Dr
9/10
9
Arctic Ave
Color Thresholds - Travel Time Index
Reset
60%
75%
1.0x
1.5x
3.0x
6.0x
50%
100%
1.75
3x
6x


0
0.05
0.1
0002
0.2
0.25
0
2
4
6
8
10
12
14
16
18
20
22
01/01/2022 - 12/31/2022
WV-9 Charles To...
WV-9 Apple Harv...


Faster
02 : 00
Slower
ROCS Local Market
9/14
Color Thresholds - Travel Time Index
Reset
60%
75%
1.0x
1.5x
3.0x
6.0x
50%
100%
1.75
3x
6x


0
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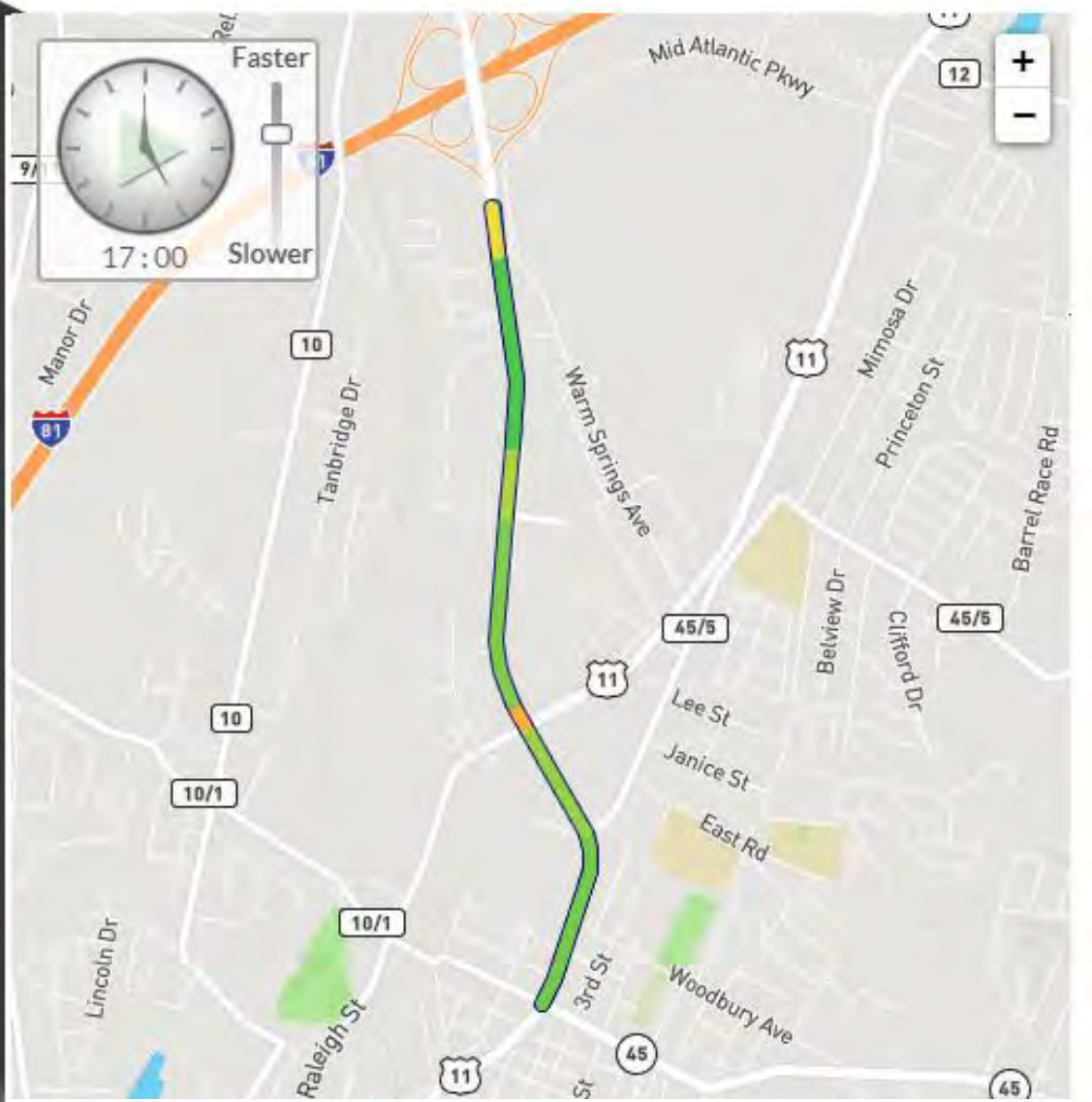
0.75
1
1.25
1.5
1.75
2
2.25
2.5
0
2
4
6
8
10
12
14
16
18
20
22
01/01/2022 - 12/31/2022

US-11 Queen St
WV-9
WV-9 Edwin Mill...
US-11 Queen St
WV-9 Edwin Mill...
WV-9 Edwin Mill...
WV-9


Faster
17:00
Slower
Mid Atlantic Pkwy
Manor Dr
Tanbridge Dr
Warm Springs Ave
Mimosa Dr
Princeton St
Barrel Race Rd
Belview Dr
Clifford Dr
Lee St
Janice St
East Rd
Lincoln Dr
Raleigh St
3rd St
Woodbury Ave
81
10
11
12
45/5
10/1
45


Color Thresholds - Travel Time Index
Reset
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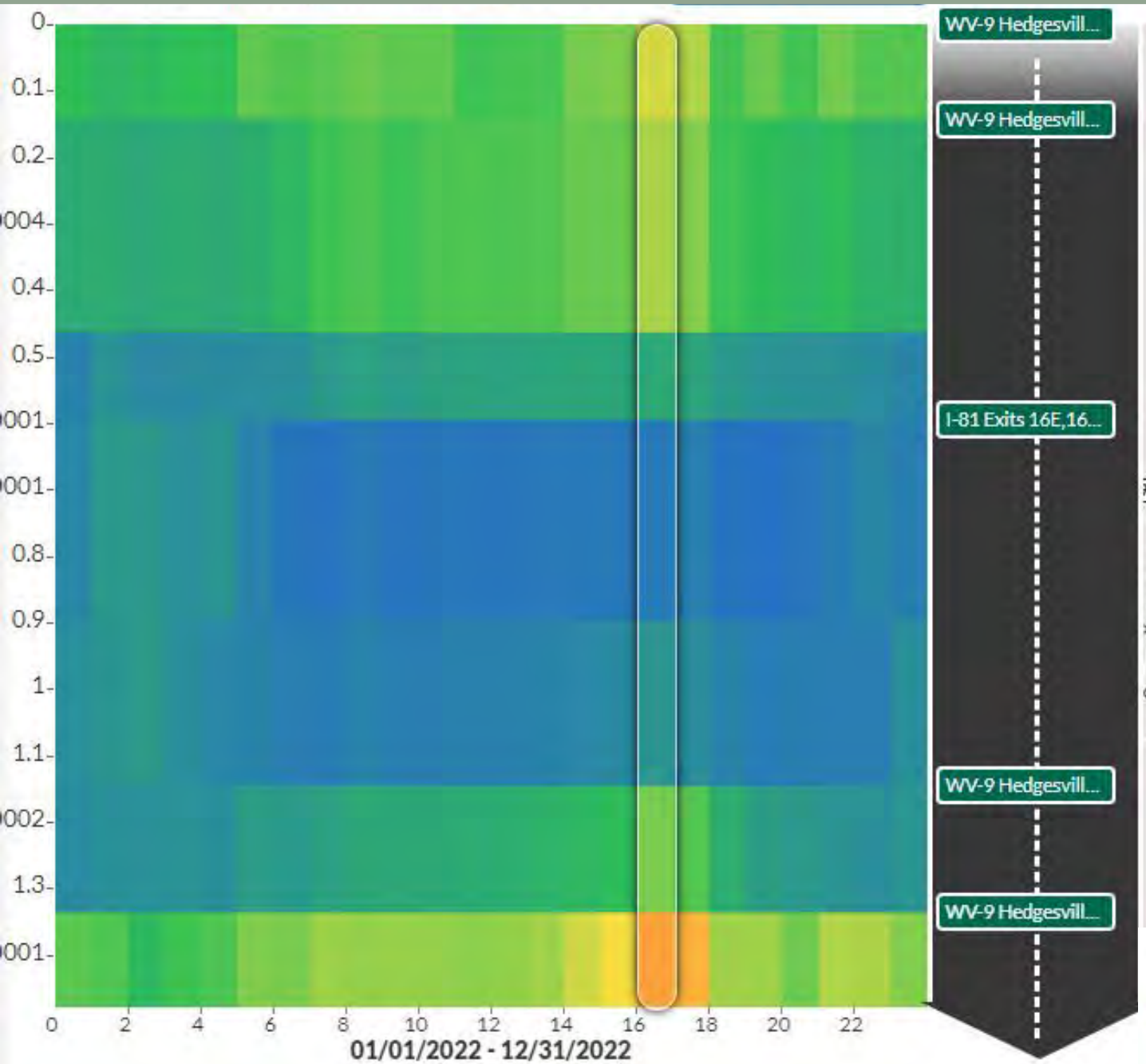
75%
1.0x
1.5x
3.0x
6.0x
50%
100%
1.75
3x
6x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0.1
0.2
004
0.4
0.5
001
001
0.8
0.9
1
1.1
002
1.3
001
0
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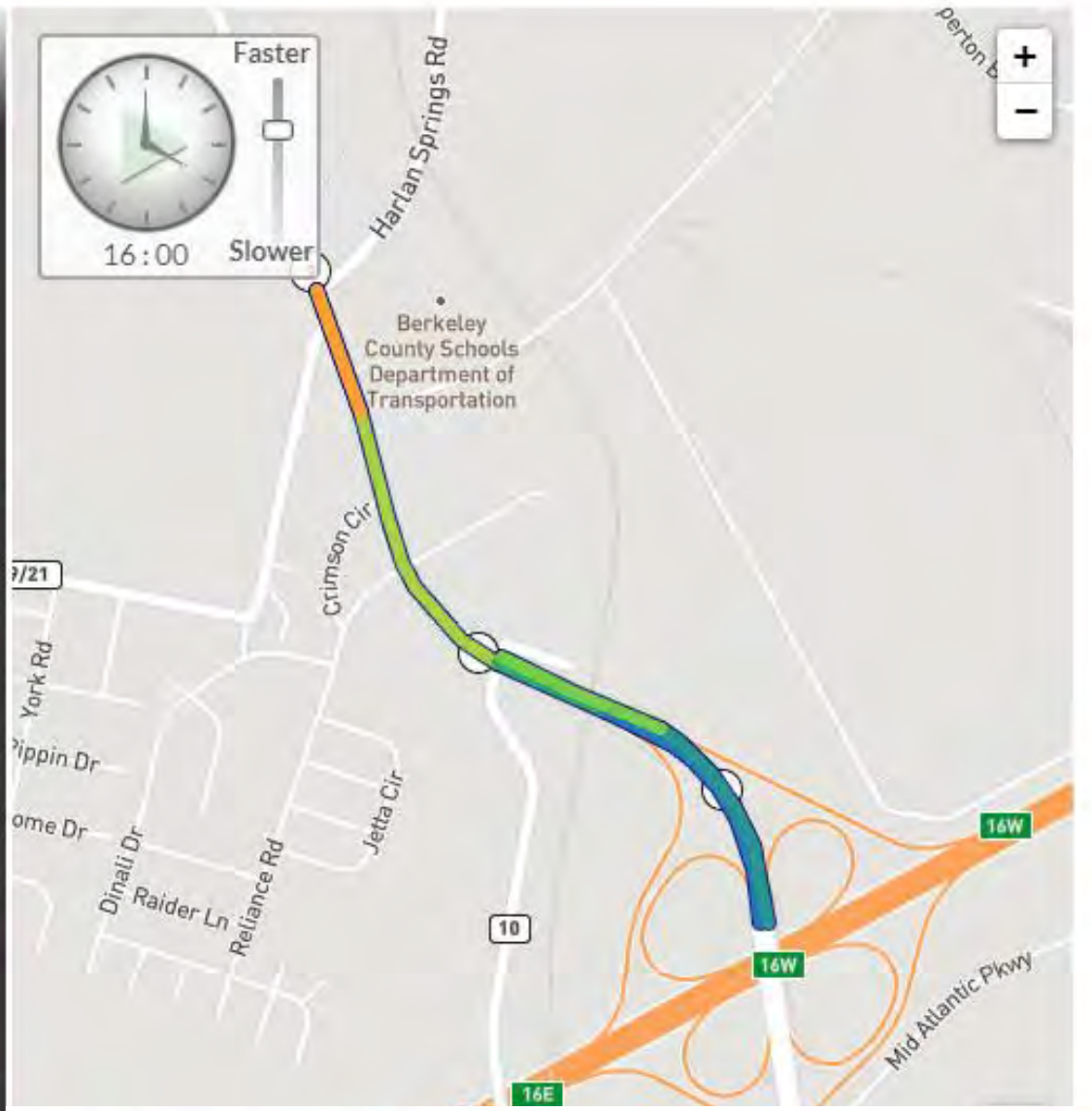
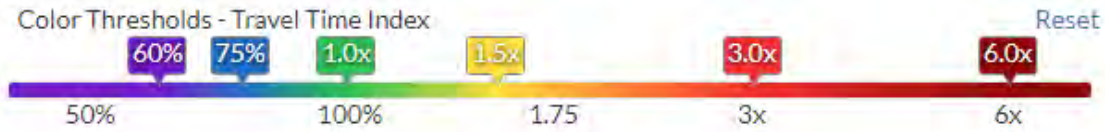
4
6
8
10
12
14
16
18
20
22
01/01/2022 - 12/31/2022
WV-9 Hedgesvill...
WV-9 Hedgesvill...
I-81 Exits 16E,16...
WV-9 Hedgesvill...
WV-9 Hedgesvill...


Faster
16:00
Slower
Harlan Springs Rd
Berkeley County Schools Department of Transportation
Crimson Cir
York Rd
Dinali Dr
Raider Ln
Reliance Rd
Jetta Cir
10
16W
16W
16E
Mid Atlantic Pkwy


Color Thresholds - Travel Time Index
Reset
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75%
1.0x
1.5x
3.0x
6.0x
50%
100%
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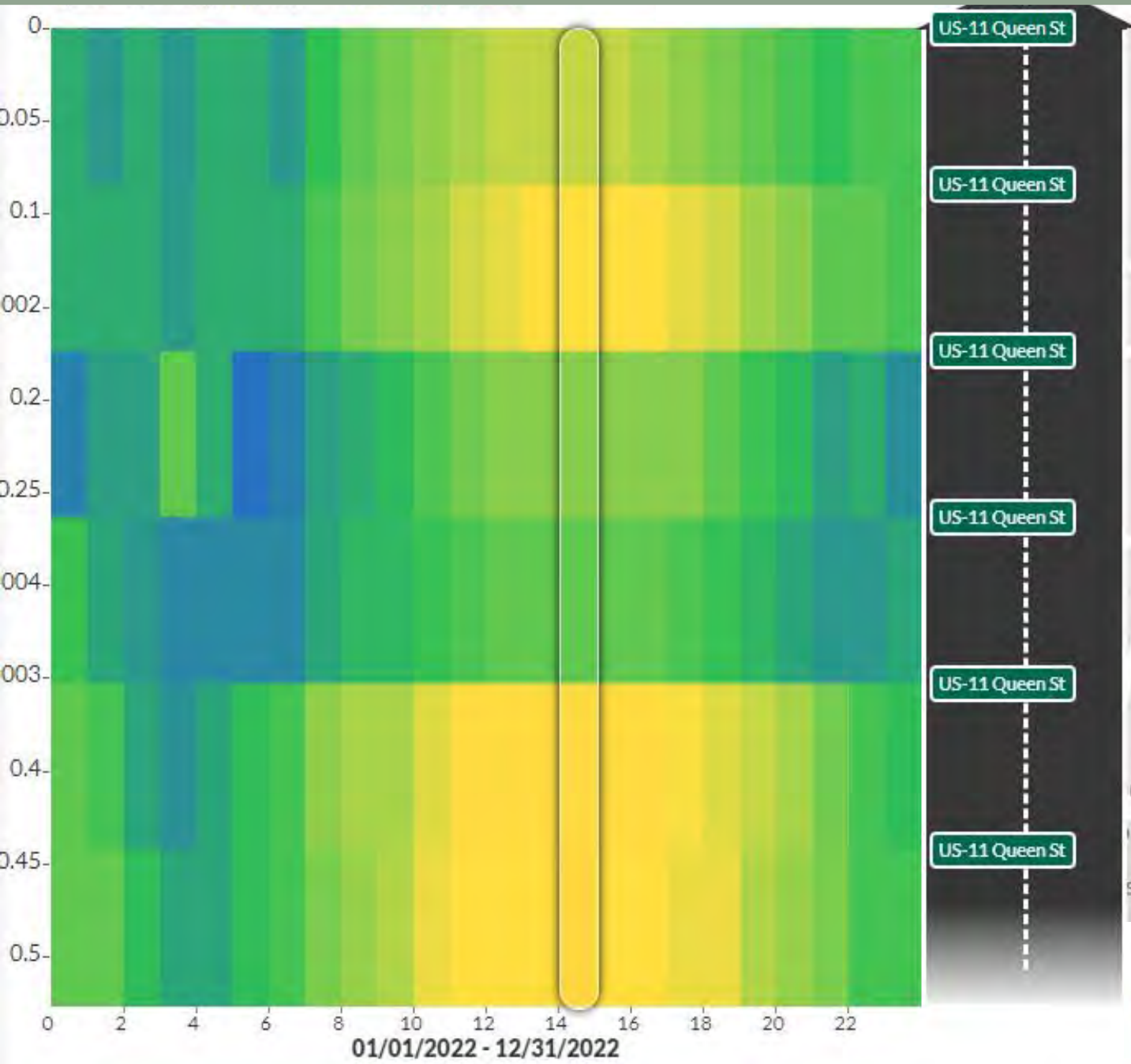
6x


0
0.05
0.1
002
0.2
0.25
004
003
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0.45
0.5
0
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12
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18
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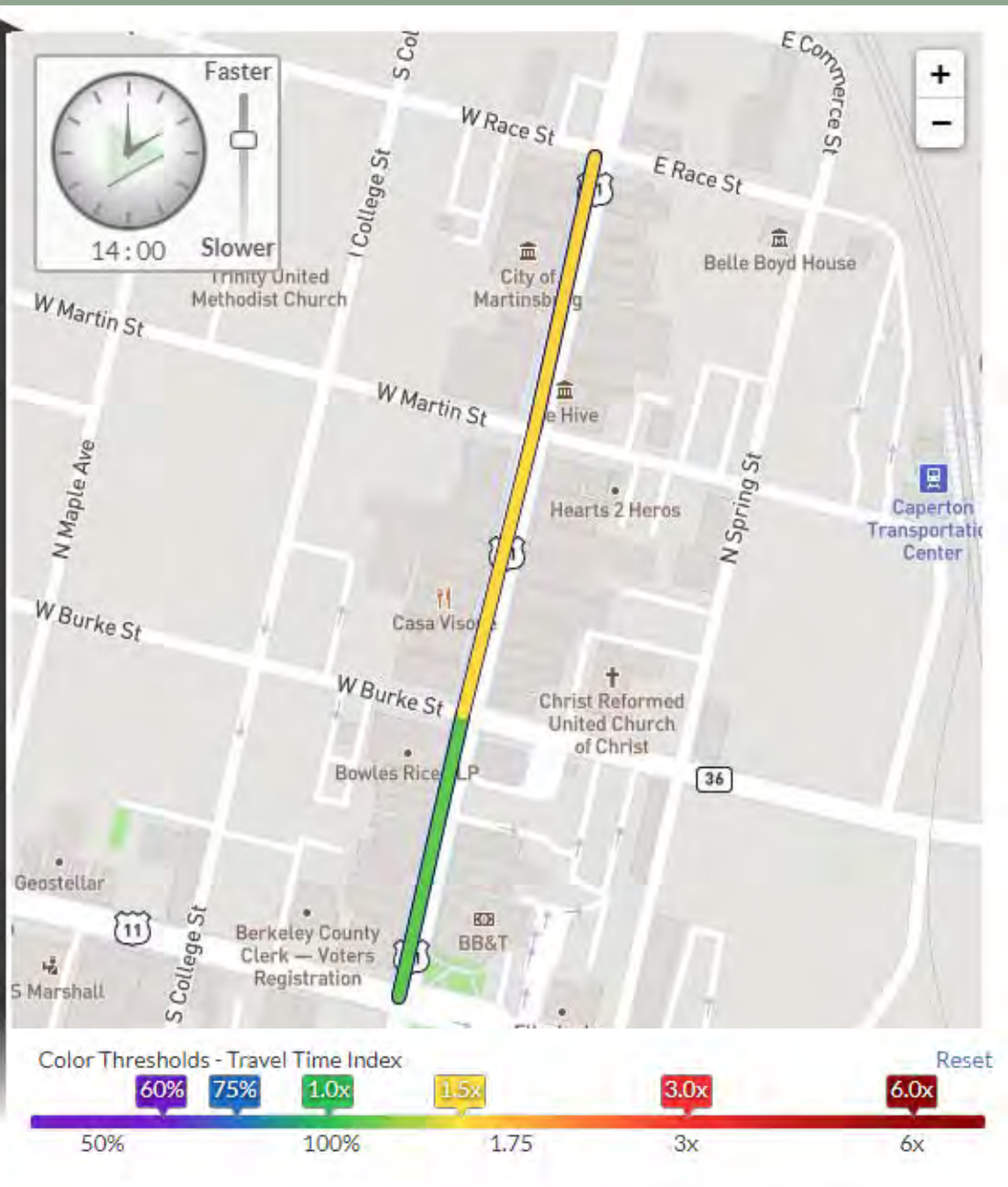
22
01/01/2022 - 12/31/2022

US-11 Queen St
US-11 Queen St
US-11 Queen St
US-11 Queen St
US-11 Queen St
US-11 Queen St


Faster
14:00
Slower
W Race St
E Race St
E Commerce St
College St
Belle Boyd House
Trinity United Methodist Church
W Martin St
Hearts 2 Heros
N Maple Ave
N Spring St
Caperton Transportation Center
W Burke St
Christ Reformed United Church of Christ
Bowles Rice LLP
36
Geostellar
11
S College St
Berkeley County Clerk — Voters Registration
BB&T
Color Thresholds - Travel Time Index
Reset
60%
75%
1.0x
1.5x
3.0x
6.0x
50%
100%
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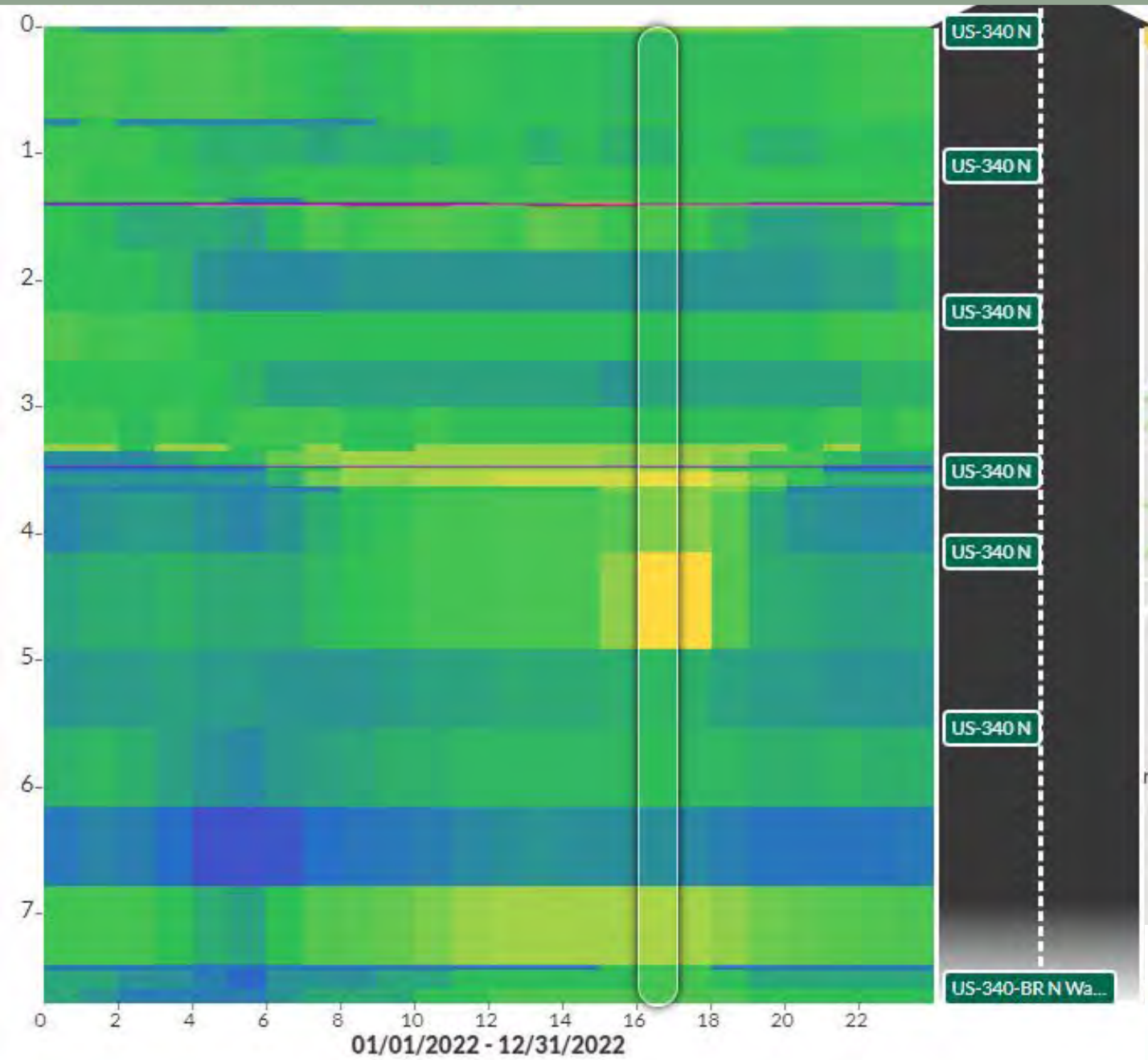
3x
6x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7
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12
14
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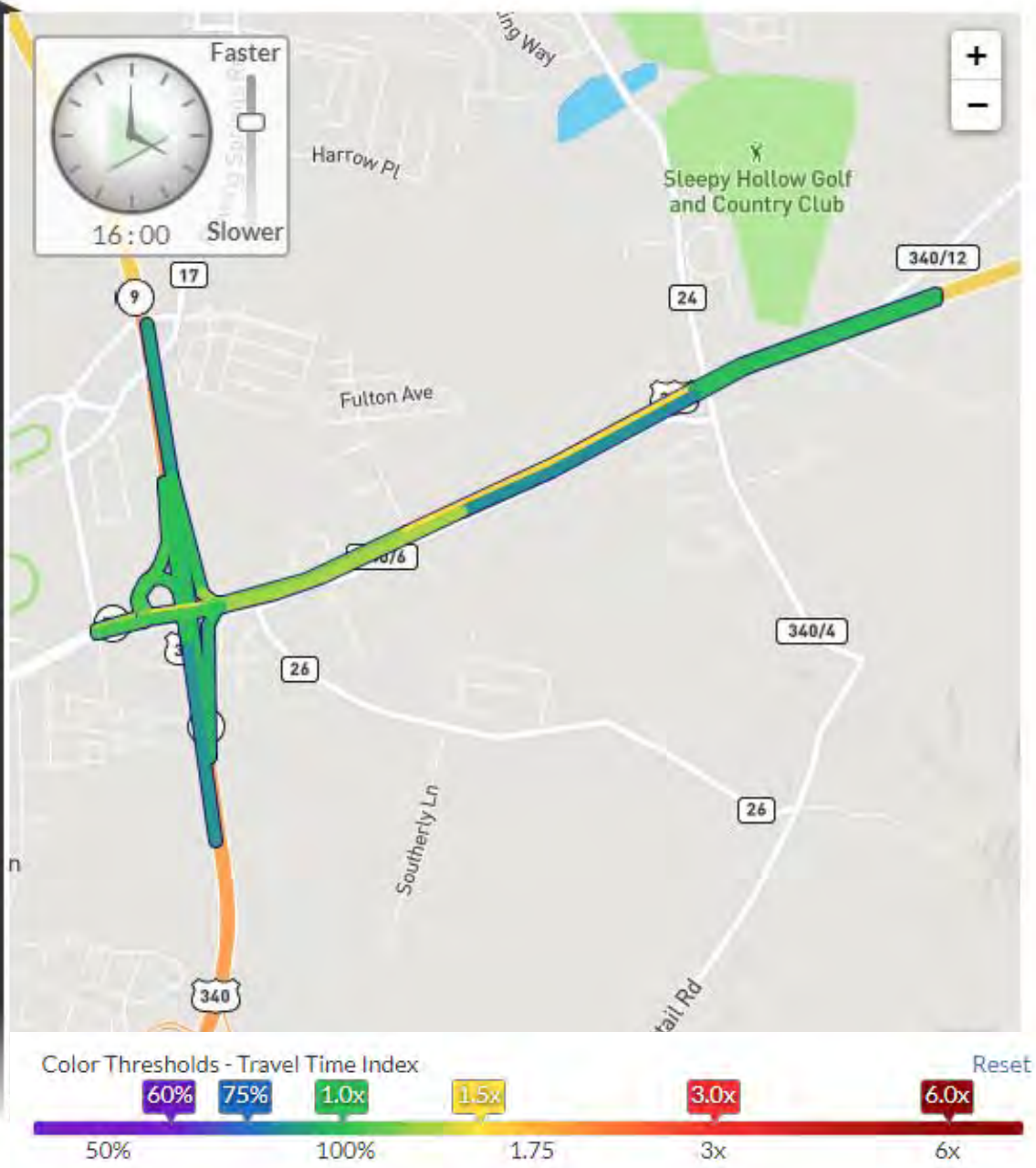
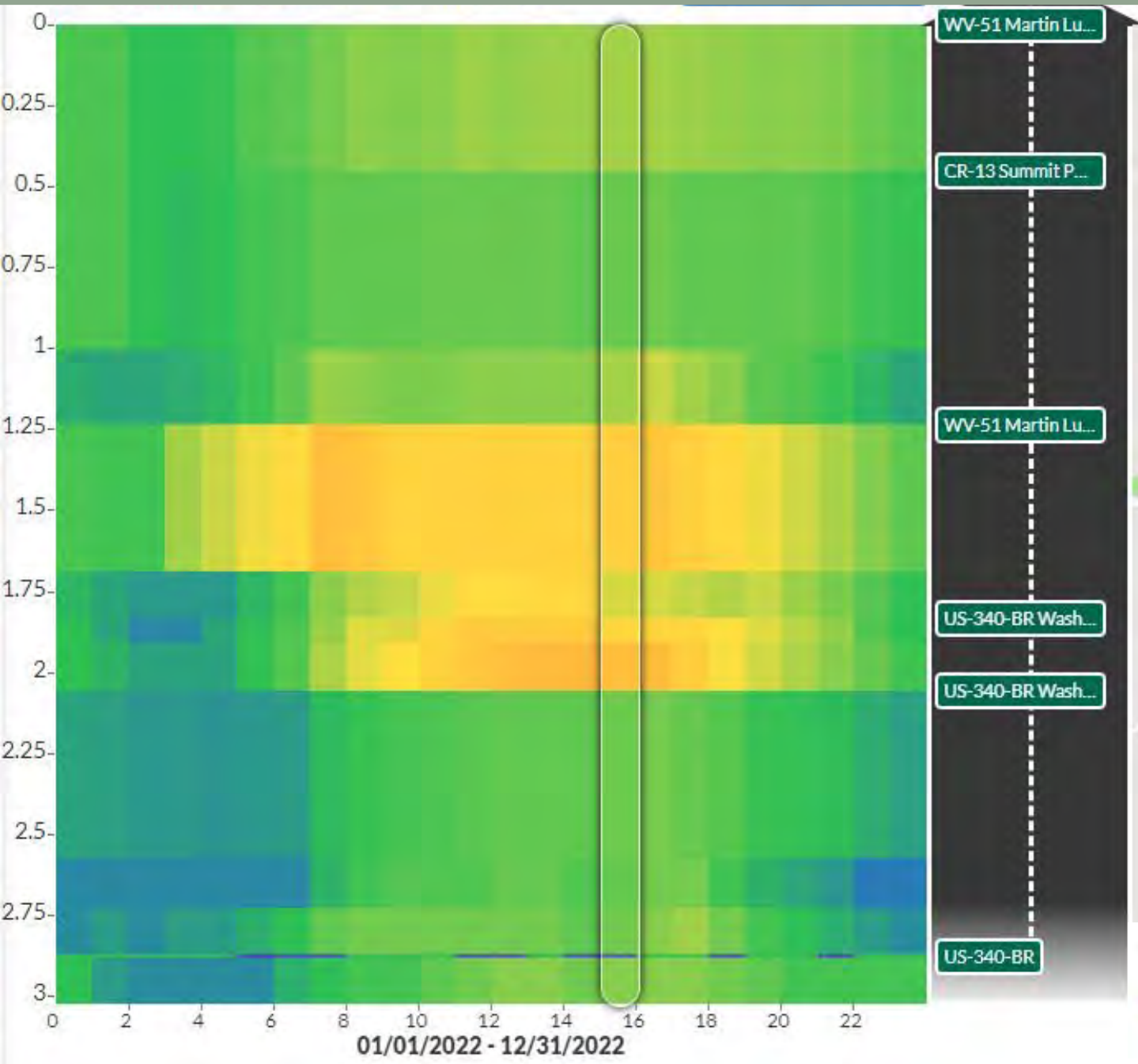
18
20
22
01/01/2022 - 12/31/2022
US-340 N
US-340 N
US-340 N
US-340 N
US-340 N
US-340 N
US-340-BR N Wa...


Faster
16:00
Slower
Harrow Pl
Sleepy Hollow Golf and Country Club
340/12
17
9
24
Fulton Ave
340/6
340/4
26
26
Southerly Ln
340
Color Thresholds - Travel Time Index
Reset
60%
75%
1.0x
1.5x
3.0x
6.0x
50%
100%
1.75
3x
6x


0
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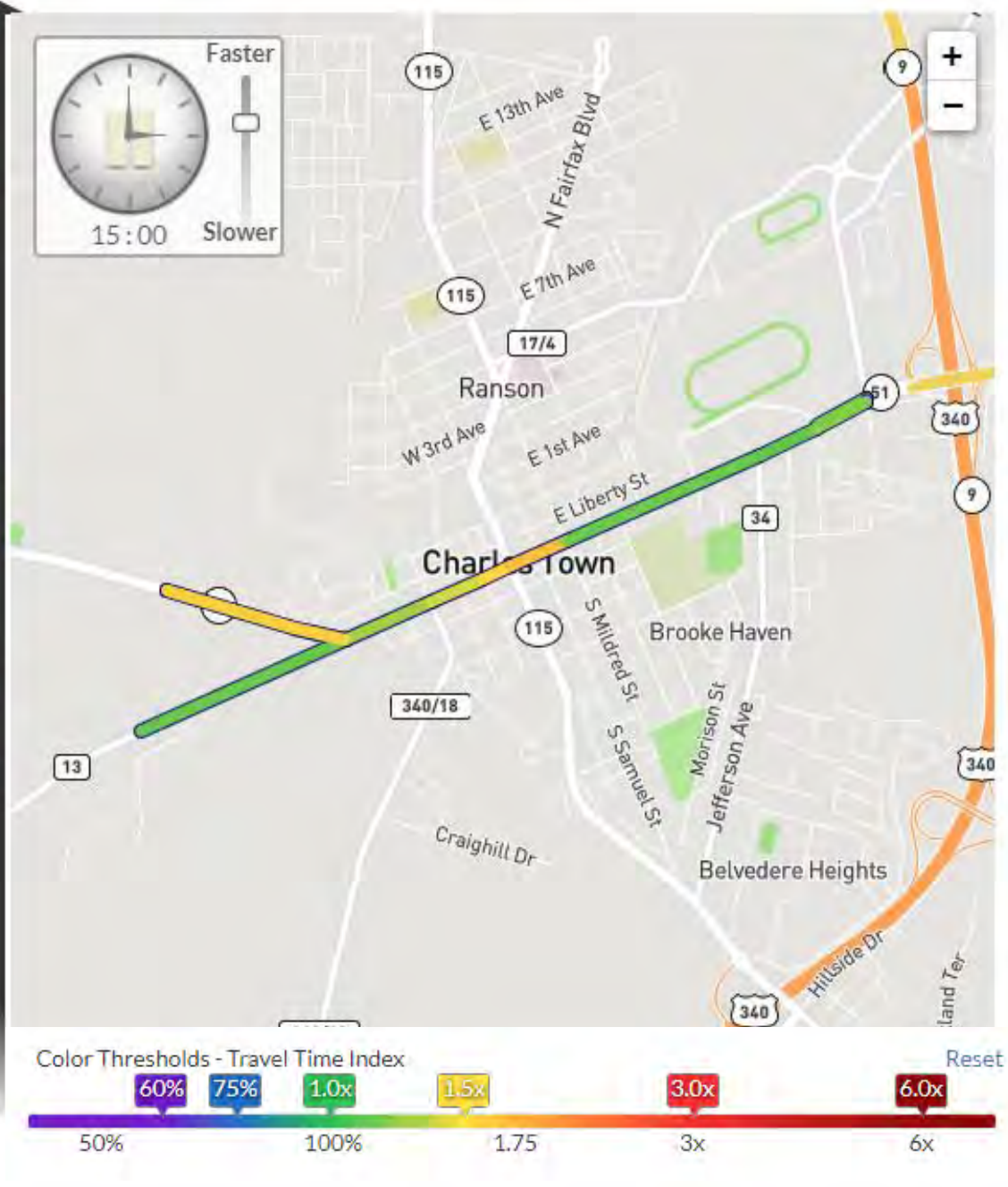
22
01/01/2022 - 12/31/2022
WV-51 Martin Lu...
CR-13 Summit P...
WV-51 Martin Lu...
US-340-BR Wash...
US-340-BR Wash...
US-340-BR


Faster
15 : 00
Slower
115
E 13th Ave
N Fairfax Blvd
9
115
E 7th Ave
17/4
Ranson
W 3rd Ave
E 1st Ave
E Liberty St
51
340
9
34
Charles Town
115
S Mildred St
Brooke Haven
340/18
13
S Samuel St
Morison St
Jefferson Ave
340
Craighill Dr
Belvedere Heights
Hillside Dr
340
Color Thresholds - Travel Time Index
Reset
60%
75%
1.0x
1.5x
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100%
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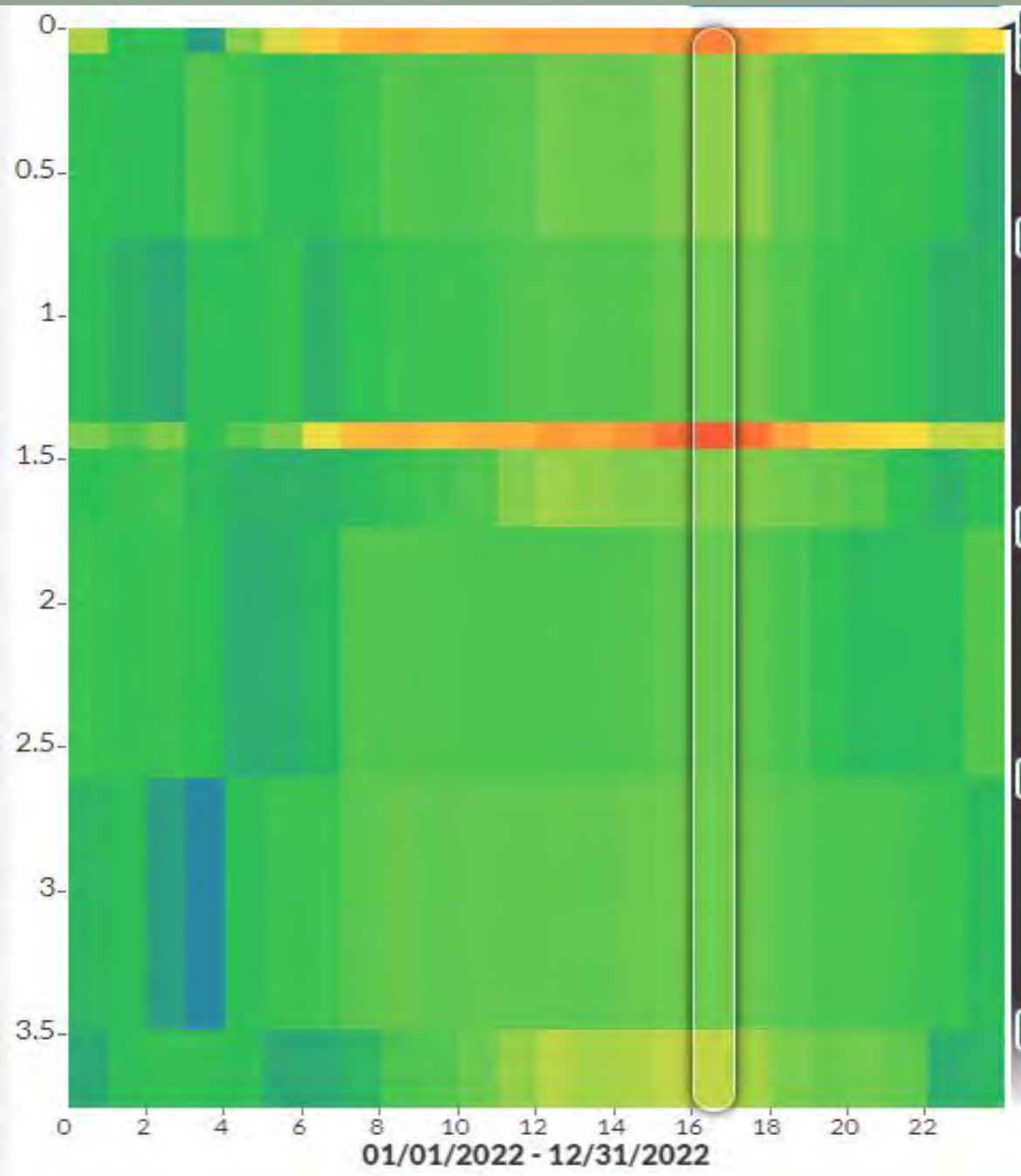
0
0.5
1
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3.5
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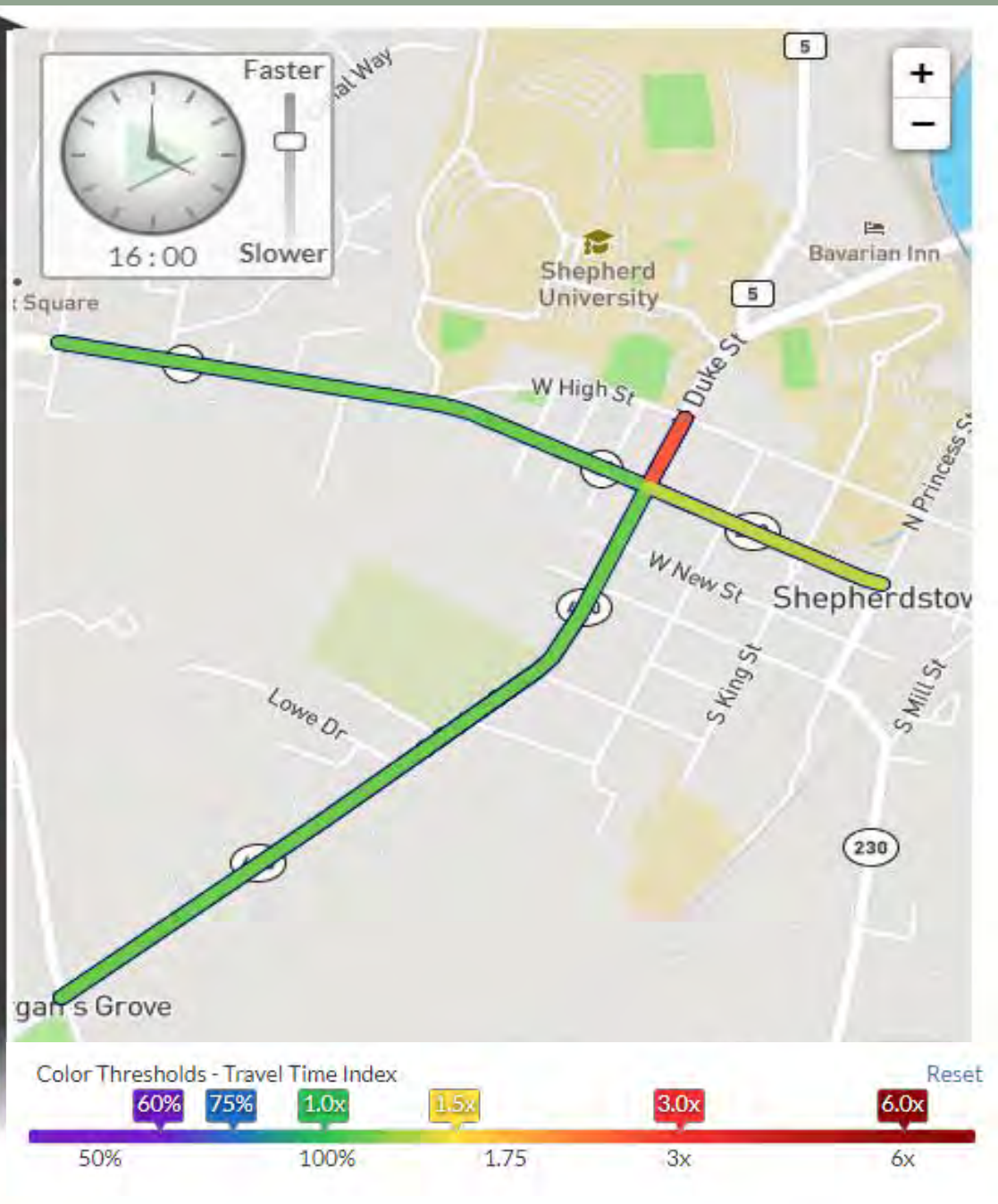
8
10
12
14
16
18
20
22
01/01/2022 - 12/31/2022


WV-45 German St
WV-45 German St
WV-45 German St
WV-480 Kearney...
WV-480 Kearney...
WV-230 German ...


Faster
16 : 00
Slower
Shepherd University
Bavarian Inn
W High St
Duke St
W New St
Shepherdstov
N Princess St
S King St
S Mill St
Lowe Dr
230
5
Color Thresholds - Travel Time Index
Reset
60%
75%
1.0x
1.5x
3.0x
6.0x
50%
100%
1.75
3x
6x