South Jersey Transportation Planning Organization

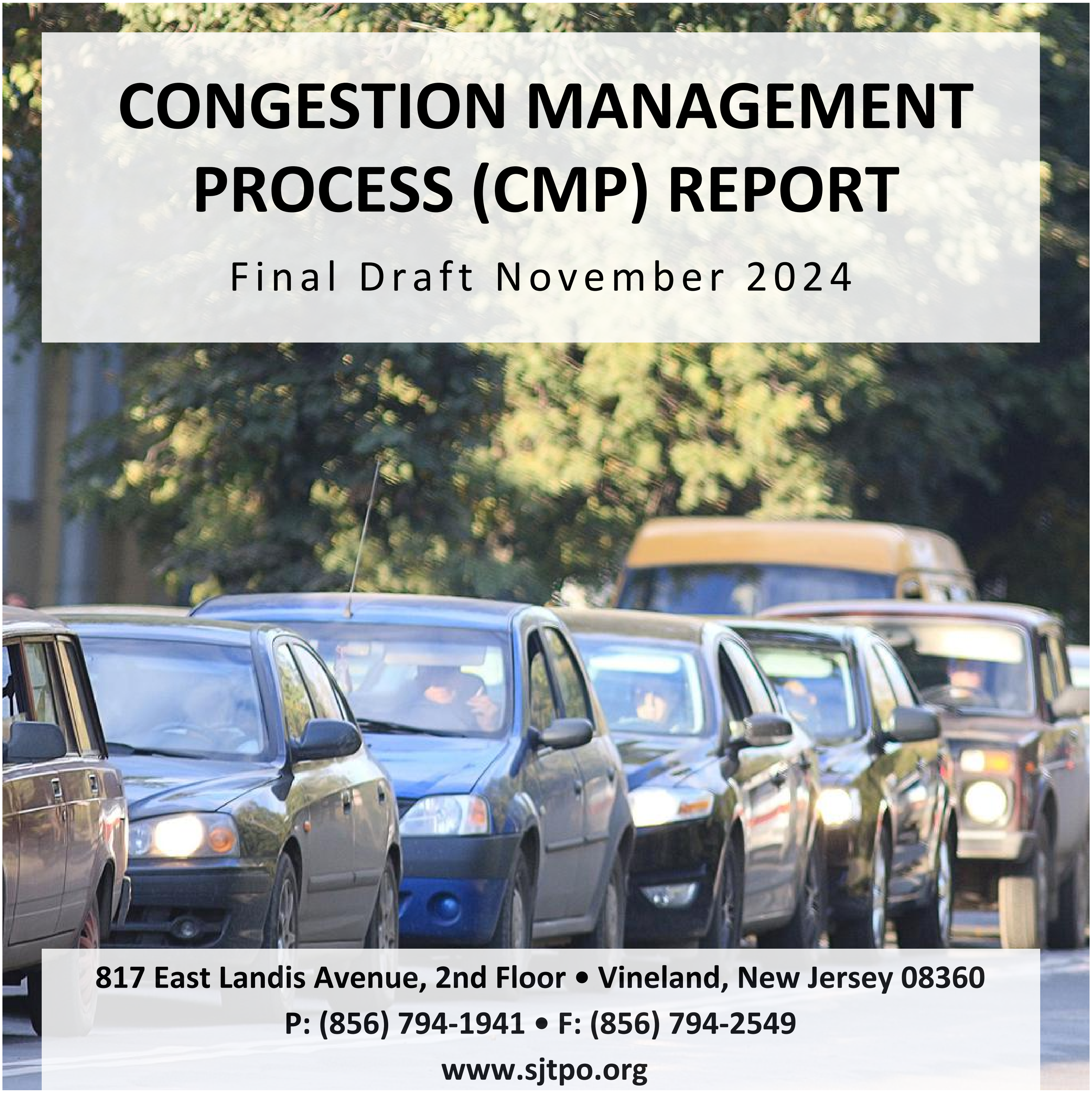
REGIONAL TRANSPORTATION PLAN (RTP)

APPENDIX D. CONGESTION MANAGEMENT PRCOCESS (CMP) REPORT

South Jersey Transportation Planning Organization

CONGESTION MANAGEMENT PROCESS (CMP) REPORT

Final Draft November 2024



817 East Landis Avenue, 2nd Floor • Vineland, New Jersey 08360

P: (856) 794-1941 • F: (856) 794-2549

www.sjtpo.org

Leonard Desiderio, Chairman • Jennifer Marandino, Executive Director

ENGLISH

Attention: If you wish to request this publication in another language other than English, or wish to contact SJTPO for our language assistance, please call (856) 794-1941 or email TitleVI@sjtpo.org. Additional charges may apply for reprint of our publications.

SPANISH / ESPAÑOL

Atención: Si desea solicitar esta publicación en otro idioma que no sea inglés, o desea comunicarse con SJTPO para recibir asistencia con nuestro idioma, llame al (856) 794-1941 o envíe un correo electrónico a TitleVI@sjtpo.org. Pueden aplicarse cargos adicionales por la reimpresión de nuestras publicaciones.

CHINESE / 中文

注意：如果您希望使用英语以外的其他语言来请求本出版物，或者希望与SJTPO联系以获取我们的语言帮助，请致电 (856) 794-1941 或发送电子邮件至 TitleVI@sjtpo.org. 重印我们的出版物可能需要支付额外费用.

VIETNAMESE / TIẾNG VIỆT

Lưu ý: Nếu bạn muốn yêu cầu xuất bản này bằng một ngôn ngữ khác không phải tiếng Anh, hoặc muốn liên hệ với SJTPO để được hỗ trợ ngôn ngữ của chúng tôi, vui lòng gọi (856) 794-1941 hoặc gửi email đến TitleVI@sjtpo.org. Các khoản phí bổ sung có thể áp dụng cho việc tái bản các ấn phẩm của chúng tôi.

GUJARATI / ગુજરાતી

ધ્યાન: જો તમે અંગ્રેજી સિવાયની અન્ય કોઈ ભાષામાં આ પ્રકાશનની વિનંતી કરવા માંગતા હો, અથવા અમારી ભાષા સહાય માટે એસજેટીપીઓનો સંપર્ક કરવા માંગતા હો, તો કૃપા કરીને (856) 794-1941 પર કોલકરો અથવા TitleVI@sjtpo.org પર ઇમેઇલ કરો. અમારા પ્રકાશનોને ફરીથી છાપવા માટે વધારાના શુલ્ક લાગુ થઈ શકે છે.

OTHER INDIC LANGUAGES:

BENGALI / বাংলা

মনোযোগ দিন: আপনি যদি এই প্রকাশনাকে ইংরেজি ব্যতীত অন্য কোনও ভাষায় অনুরোধ করতে চান বা আমাদের ভাষা সহায়তার জন্য SJTPO র সাথে যোগাযোগ করতে চান, তবে (856) 794-1941 কল করুন বা ইমেল TitleVI@sjtpo.org করুন। আমাদের প্রকাশনা পুনরায় মুদ্রণের জন্য অতিরিক্ত ফি প্রযোজ্য হতে পারে।

HINDI / हिंदी

ध्यान दें: यदि आप अंग्रेजी के अलावा किसी अन्य भाषा में इस प्रकाशन का अनुरोध करना चाहते हैं, या हमारी भाषा सहायता के लिए SJTPO से संपर्क करना चाहते हैं, तो कृपया (856) 794-1941 पर कॉल करें या TitleVI@sjtpo.org पर ईमेल करें। हमारे प्रकाशनों के पुनर्मुद्रण के लिए अतिरिक्त शुल्क लागू हो सकते हैं।

NEPALI / नेपाली

ध्यान दिनुहोस्: यदि तपाइँ यस प्रकाशनलाई अ other◌ग्रेजी बाहेक अर्को भाषामा अनुरोध गर्न चाहानुहुन्छ वा SJTPO लाई सम्पर्क गर्न चाहानुहुन्छ भने हाम्रो भाषा सहयोगका लागि (856) 794-1941 या ईमेल TitleVI@sjtpo.org मा कल गर्नुहोस्। थप शुल्कहरू हाम्रा प्रकाशनहरूको पुनः प्रिन्टको लागि लागू हुन सक्छ।

URDU / اردو

اشاعت اس میں زبان اور کسی علاوہ کے انگریزی آپ اگر :دھیان لئے کے امداد کی زبان ہماری یا ، ہیں چاہتے کرنا درخواست کی (856) کرم براہ ، تو ہیں چاہتے کرنا رابطہ سے او پی ٹی جے ایس ای پر TitleVI@sjtpo.org عنوان یا کریں کال پر 794-1941 کے اشاعت دوبارہ کے اشاعتوں ہماری چارجز اضافی کریں۔ میل ہیں۔ سکتے لگ لئے

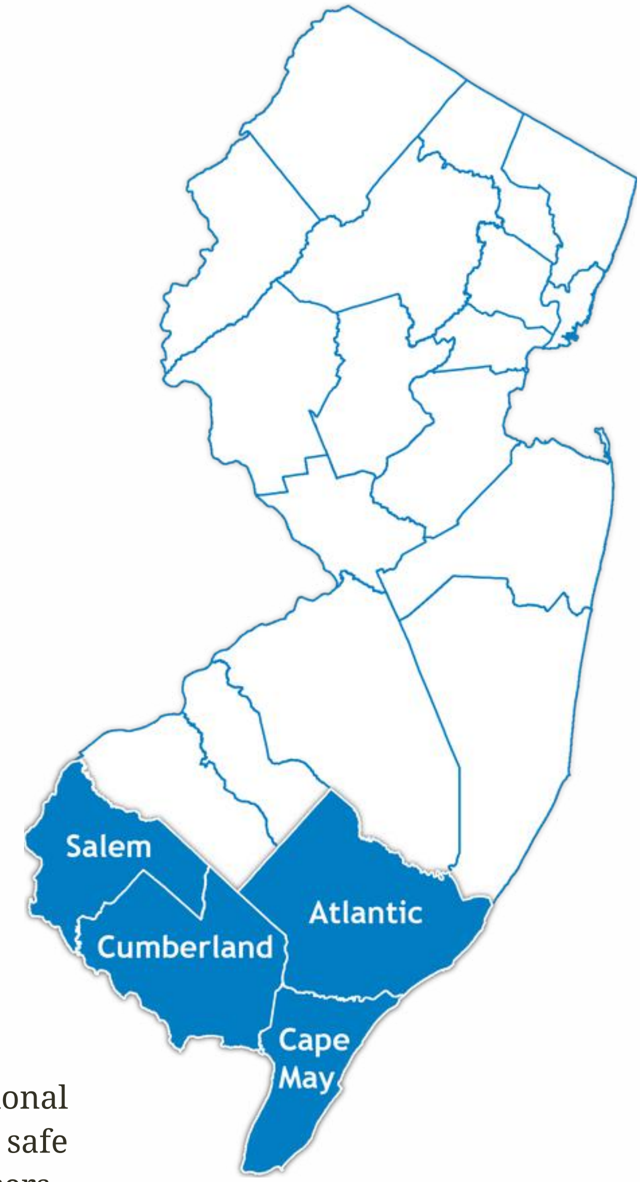
PUNJABI / ਪੰਜਾਬੀ

ਧਿਆਨ ਦਿਓ: ਜੇ ਤੁਸੀਂ ਇਸ ਪ੍ਰਕਾਸ਼ਨ ਨੂੰ ਅੰਗ੍ਰੇਜ਼ੀ ਤੋਂ ਇਲਾਵਾ ਕਿਸੇ ਹੋਰ ਭਾਸ਼ਾ ਵਿਚ ਬੇਨਤੀ ਕਰਨਾ ਚਾਹੁੰਦੇ ਹੋ, ਜਾਂ ਸਾਡੀ ਭਾਸ਼ਾ ਸਹਾਇਤਾ ਲਈ ਐਸ ਜੇ ਟੀ ਪੀ ਓ ਨਾਲ ਸੰਪਰਕ ਕਰਨਾ ਚਾਹੁੰਦੇ ਹੋ, ਤਾਂ ਕਿਰਪਾ ਕਰਕੇ (856) 794-1941 'ਤੇ ਕਾਲ ਕਰੋ ਜਾਂ ਈਮੇਲ TitleVI@sjtpo.org. ਸਾਡੇ ਪ੍ਰਕਾਸ਼ਨ ਦੁਬਾਰਾ ਛਾਪਣ ਲਈ ਵਾਧੂ ਖਰਚੇ ਲਾਗੂ ਹੋ ਸਕਦੇ ਹਨ.

South Jersey Transportation Planning Organization

WWW.SJTPO.ORG

SJTPO is the federally recognized Metropolitan Planning Organization (MPO) for the southern New Jersey region, serving Atlantic, Cape May, Cumberland, and Salem Counties. Under federal law, the formation of an MPO is required for any urbanized area (UZA) with a population greater than 50,000, permitting the MPO to carry out transportation planning and decision-making for the UZA(s). Formed in 1993, SJTPO replaced three smaller existing MPOs and incorporated areas not previously served. The formation provided a stronger regional approach to solving transportation problems and brought new opportunities to southern New Jersey. SJTPO is vital to the region, as the MPO serves as a technical resource, provides access to funding, and works to provide a regional approach to address transportation planning and engineering issues.



Four counties, one mission:
to create a transportation system, based on regional collaboration that moves people and goods in a safe and efficient manner, inclusive of all modes and users.

Title VI Compliance / SJTPO fully complies with Title VI of the Civil Rights Act of 1964, the Civil Rights Restoration Act of 1987, Executive Order 72898 on Environmental Justice, and related nondiscrimination mandates in all programs and activities. SJTPO's website, www.sjtpo.org, may be translated into multiple languages. Publications and other public documents can be made available in alternative languages and formats, if requested. SJTPO's public meetings are always held in ADA-accessible facilities and held in transit-accessible locations whenever possible. SJTPO will work to accommodate all reasonable requests for translation, interpretation, or auxiliary services, but encourages that requests be made at least seven days prior to public meetings to ensure that SJTPO is able to secure requested services. Other translation requests, such as those associated with larger documents will be provided as quickly as possible and could take up to three weeks. Requests may be made by calling (856) 794-1941, or by completing a request form available at www.sjtpo.org/Title-VI. Any person who believes they have been aggrieved by an unlawful discriminatory practice by SJTPO under Title VI has a right to file a formal complaint. Any such complaint must be in writing and filed with SJTPO's Title VI Compliance Manager and/or the appropriate state or federal agency within 180 days of the alleged discriminatory occurrence. For more information on SJTPO Title VI program or to obtain a Title VI Complaint Form, please visit: www.sjtpo.org/Title-VI, call (856) 794-1941, or email TitleVI@sjtpo.org.

The preparation of this report has been funded in part by the U.S. Department of Transportation, Federal Transit Administration and Federal Highway Administration. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or its use thereof.

Contents

Tables:

Figures:

Appendices:

1. INTRODUCTION

The South Jersey Transportation Planning Organization (SJTPO) is the federally recognized Metropolitan Planning Organization (MPO) for the southern New Jersey region, serving Atlantic, Cape May, Cumberland, and Salem Counties. Under federal law, the formation of an MPO is required for any urbanized area (UZA) with a population greater than 50,000, permitting the MPO to carry out transportation planning and decision-making for the UZA(s). In 1993, SJTPO replaced three smaller existing MPOs and incorporated areas not previously served. The formation provided a more robust regional approach to solving transportation problems and brought new opportunities to southern New Jersey. SJTPO is vital to the region, as the MPO serves as a technical resource, maintains the eligibility of member agencies for federal transportation funds, provides a forum for cooperative decision-making, and coordinates the planning activities of participating agencies to provide a regional approach to addressing transportation planning and engineering issues.

For an MPO, such as SJTPO, with a regional population greater than 200,000, the Transportation Management Area (TMA) designation is assigned. This designation stipulates additional planning requirements, creating a strong regional voice in setting priorities and implementing projects. The designation also requires the TMA to construct and implement a Congestion Management Process (CMP) as part of its regional transportation planning process. The United States Department of Transportation (USDOT) provides detailed guidelines for this requirement. The MPO must provide a process for effectively managing and operating new and existing transportation facilities using travel demand management (TDM) and operation management strategies. The CMP produces a prioritized list of locations, issues, or projects to be considered as input into the other parts of the SJTPO planning process.

This CMP: Methodology Report replaces the previously approved version adopted in November 2018, formally referred to as the Congestion Management Process: Methodology Report Fiscal Years (FFY) 2017-2020. The Methodology Report is evaluated annually and updated as needed based on new data. The bulk of this report constitutes the Methodology Report. SJTPO has combined it with the CMP Activity Report because the CMP Methodology has changed. The latest CMP Activity Report is part of **Appendix A** of this document.

This CMP: Methodology Report uses the availability of vehicle probe travel time data and analytical tools for congestion screening and performance management. Updates have incorporated the newly available INRIX Signal Analytics data for regionwide congestion screening and location prioritization. In addition, as SJTPO is emphasizing project-oriented congestion planning, the goal is to prepare cost-effective projects for federal funding. This report outlines that process. It has been vetted and will be considered by the Technical Advisory Committee (TAC) for Policy Board approval and adoption in November 2024.

The Congestion Management Process: Activity Report is a supporting document to the Methodology Report and is completed every two years. The CMP Activity Report details all the congestion planning activities from 2022 to 2023. It includes SJTPO's utilization of the archived travel time data. This report documents project-oriented planning efforts, such as assisting SJTPO subregions in developing congestion relief projects.

Due to the Methodology Report and Activity Report being updated simultaneously, they have been combined into a single report. Typically, the Activity Report is a stand-alone document updated every four years. The Activity Report contains an analysis from FFY 2022-2025 and will be incorporated into SJTPO's Regional Transportation Plan (RTP), named Forward 2050, which will be considered for adoption in January 2025.

Figure 1 summarizes the chronological order and the relationship for these CMP-related documents.

Figure 1: Timetable of SJTPO CMP-Related Documents

2024 Congestion Management Process Report
Methodology Report* and Activity Report combined for this RTP

2025 Regional Transportation Plan
Forward 2050

FFY 2025-2029 CMP Activity Report**

2029 Regional Transportation Plan

*CMP Methodology Report updated as needed.

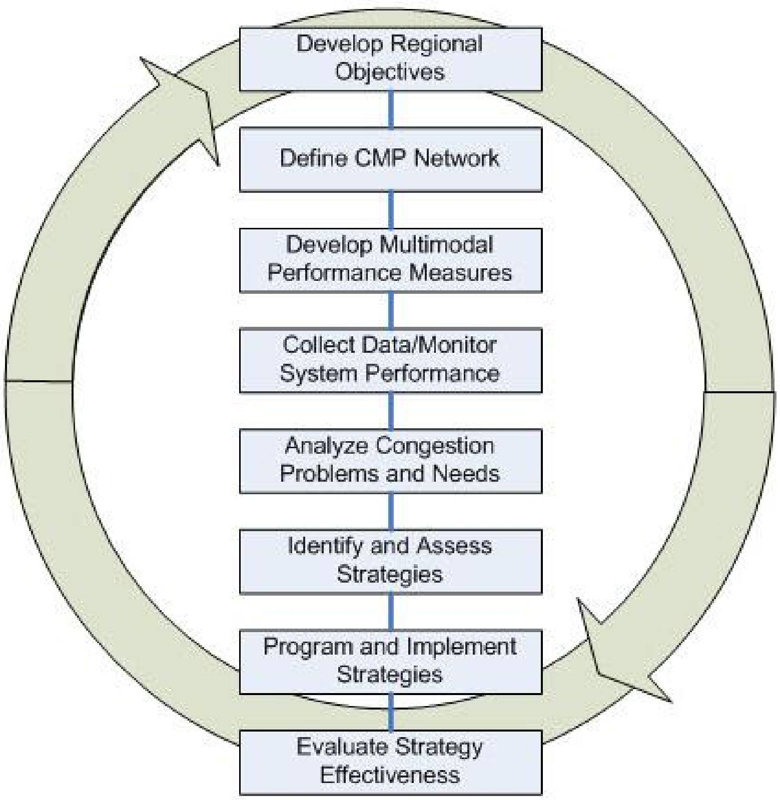
** CMP Activity Report updated every two years.

2. CMP Workflow

This CMP Report is documentation of the SJTPO congestion planning process. The SJTPO congestion planning process is based on the workflow detailed in the Federal Highway Administration (FHWA) Congestion Management Process Guidebook and SJTPO's vision statement established in the RTP.

This CMP Report is formatted to reflect the CMP Workflow outlined by the FHWA in the Congestion Management Process Guidebook. Figure 2 provides a visual representation of the eight distinct steps.

Figure 2: FHWA CMP Workflow



Source: FHWA. Congestion Management Process Guidebook[1]

Updated in 2017, the FHWA CMP Guidebook is a compilation of state-of-the-practice congestion planning methods used nationwide. FHWA, FTA, and metropolitan transportation planning professionals collaboratively developed the guidebook. The guidebook does not strictly prescribe the best methodology to use. Instead, it is a literature review of successful congestion planning

[1] http://www.fhwa.dot.gov/planning/congestion_management_process/cmp_guidebook/fig2.cfm

processes documented and endorsed by FHWA. A higher-level picture of the CMP Workflow is available in **Appendix B**.

As part of SJTPO's RTP, a vision statement is developed to guide all planning processes. The vision statement for the current RTP and the one that will be used for Forward 2050 is as follows:

"A transportation system based on regional collaboration that moves people and goods in a safe and efficient manner, inclusive of all modes and users."

The vision statement represents the outcome of what SJTPO and its residents would like the transportation system to look like and operate in the year 2050. While the vision statement reflects the desires and aspirations of the region's people, it should also be realistic and attainable, with goals and strategies established to support and achieve the RTP's vision.

The regional goals established in the RTP are based on planning factors provided by the Fixing America's Surface Transportation (FAST) Act, signed into law in 2015. The most recent FHWA reauthorization is through the Infrastructure Investment and Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law, signed into law on November 15, 2021. This act authorizes spending on federal highway and public transportation programs through September 30, 2026. These ten regional goals are used to define the SJTPO CMP's regional objectives, which are used to develop performance measures and strategies. The ten regional goals are:

1. Promote **Accessibility** and **Mobility** for the movement of People and Goods
2. Support the **Regional Economy**
3. Mitigate **Traffic Congestion**
4. Improve the **Resiliency** and **Reliability** of the transportation infrastructure
5. Protect and enhance **the Environment**
6. **Restore, Preserve, and Maintain** the existing transportation system
7. Improve **Security**
8. Improve **Transportation Safety**
9. Enhance the **Integration** and **Connectivity** of the transportation system
10. Increase and enhance opportunities for **Travel** and **Tourism**

These ten regional goals are considered when developing the goals, performance measures, and strategies of the CMP.

Detailed and Data-Driven

The Federal transportation reauthorization legislation Moving Ahead for Progress in the 21st Century (MAP-21), signed into law in 2012, called for a performance measure-driven planning process. This emphasis on performance-based planning was maintained in the FAST Act of 2015. In response, SJTPO developed performance measures for all systems, including Congestion

Management. The CMP and related documentation are detail-oriented, including those details in the appendices at the end of this report.

While the IIJA broadly emphasizes performance-based planning and the efficient use of resources, specific changes to CMP requirements under the IIJA focus on enhancing the integration of new technologies and data-driven approaches.

One notable emphasis is improving data collection and analysis capabilities to better understand and address congestion. This can involve using advanced data analytics tools and integrating real-time data to assess congestion levels and traffic patterns more accurately. MPOs are encouraged to adopt these innovative tools to enhance their congestion management strategies and improve overall traffic operations.

Moreover, the IIJA promotes a more collaborative approach among various stakeholders, including state departments of transportation, local governments, and other relevant entities. This collaborative effort is essential in developing more comprehensive and effective congestion management strategies that align with broader transportation planning and infrastructure goals set forth by the IIJA.

For MPOs like the SJTPO, the IIJA offers enhanced funding opportunities and emphasizes the importance of sustainable and technologically integrated transportation solutions. The act also supports the expansion and rehabilitation of critical infrastructure across the region, including road and bridge improvements and developments in public transportation systems.

Additionally, New Jersey is set to benefit from discretionary competitive funding that supports various infrastructure projects. This includes a strong focus on broadband expansion, electric vehicle charging infrastructure, and environmental sustainability initiatives designed to reduce carbon emissions and improve energy efficiency across the state.

Figure 2 demonstrates that the eight-step process from the FHWA CMP Guidebook is a continuous cycle, guiding the development of a regional CMP Methodology. The eight steps are as follows:

1. **Develop Regional Objectives for Congestion Management:** These objectives should draw from the regional vision and goals outlined in the RTP. As such, the vision statement and ten regional goals from SJTPO's latest RTP have been adopted for this document. Objectives should be specific, realistic, and bound by a specified time frame. These objectives will serve as the basis for the development of performance measures.
2. **Define CMP Network:** The key components of the transportation system focused on in the CMP will need to be determined. This requires defining two aspects of the system that will be examined as part of the planning process: the geographic scope and system elements (e.g., freeways, major arterials, transit routes).

3. **Develop Multi-modal Performance Measures:** Performance measures that will be used to measure congestion on a regional and local scale need to be established. The selected performance measures should relate to and support the CMP regional objectives developed in Step 1 of this eight-step process.

4. **Collect Data/Monitor System Performance:** With the performance measures developed, the next action is to collect and analyze data to determine how the transportation system performs. Data collection may be ongoing and involve a wide range of data sources and partners. Several common types of data that can be used in the CMP include traffic volume counts (automated or manual), speed and travel time data, transit data, bicycle/pedestrian data, and travel survey data.

5. **Analyze Congestion Problems and Needs:** As data is collected, the raw data must be translated into meaningful measures of performance. Specific locations with congestion problems present in the region or that are anticipated should be addressed using data and analysis techniques. Newly developed analysis tools, such as the Probe Data Analytics Suite, may be used for this purpose.

6. **Identify and Assess Strategies:** The data and analysis should be turned into a set of recommended solutions to manage congestion and achieve congestion management objectives effectively. Potential strategies for mitigating congestion should be identified and assessed with state and local planning partners.

7. **Program and Implement Strategies:** Project-oriented planning is crucial for implementing CMP strategies. SJTPO will work with its planning partners to prepare high-quality projects for federal funding and Problem Statement reports for initiating projects through NJDOT's Capital Program Delivery system. Implementation of CMP strategies occurs on three levels: system or regional, corridor, and project. SJTPO will prioritize effective strategies in a regional context and integrate congestion planning strategies into the Transportation Improvement Program (TIP) process.

8. **Evaluate Strategy Effectiveness:** There should be an ongoing process to evaluate the implemented strategies and monitor system performance. Future decision-making about the effectiveness of transportation strategies can be informed through this step.

These eight steps form a Process Model that provides a flexible framework for MPOs to develop an individualized approach. These steps are interrelated, and many steps are an ongoing process. The steps are not necessarily performed sequentially but form an ongoing and cyclical process. This process results in identifying and implementing strategies, evaluating their effectiveness, and repeating them cyclically.

Technical Advisory Committee (TAC)

Feedback is continually solicited from SJTPO's TAC, which consists of planners and engineers from SJTPO's subregional planning partners. The TAC is a thirteen-member committee comprised of each Policy Board member's staff and representatives of the New Jersey Turnpike Authority (NJTA) and the Delaware River and Bay Authority (DRBA). The FHWA, Federal Transit Administration (FTA), South Jersey Economic Development District (SJEDD), Cross County Connection Transportation Management Association (CCCTMA), and the New Jersey Office of Planning Advocacy (NJOPA) each have one non-voting representative on the TAC.

Feedback is also sought from SJTPO's NJ MPO planning partners, including the North Jersey Transportation Planning Authority (NJTPA) and the Delaware Valley Regional Planning Commission (DVRPC).

Intelligent Transportation Systems (ITS) and Technology

Staff turnover and difficulty finding suitable replacements have hindered the SJTPO from advancing CMP and ITS goals and developing actionable projects. A partnership with NJDOT through sharing new tools, particularly Streetlight and expansion of Probe Data Analytics (RITIS) Signal Analytics, has fostered new relationships between SJTPO, University of Maryland RITIS, Rutgers CAIT, The College of New Jersey, Rowan University and NJDOT.

Since the last CMP Methodology Report was completed, the landscape of transportation technology has seen transformative advancements. Broadband (5G and newer) wireless internet has vastly improved communication capabilities, essential for real-time traffic management and the integration of smart transportation systems. Enhanced computer processing power has allowed for more complex data analysis and modeling, improving traffic predictions and system responses. The rise of Advanced Program Interfaces (APIs) has also created a common language in cloud computing, facilitating seamless data integration from multiple sources, enriching traffic databases, and enhancing analytic capabilities.

However, the most significant change may be the introduction and integration of artificial intelligence (AI) into transportation. AI's ability to learn from data and make intelligent decisions is revolutionizing safety systems with features like predictive analytics for crash prevention, adaptive traffic signals, and autonomous vehicle navigation. These technological advancements are reshaping the transportation sector's tools, perspectives, and expectations, driving toward more efficient, safe, and responsive systems.

Automobile safety systems have enhanced driver assistance and crash prevention. Key developments include the refinement of automatic emergency braking systems that now feature pedestrian detection and the widespread adoption of lane-keeping assist technology to prevent unintended lane departures. Adaptive cruise control has evolved to handle complex traffic scenarios, offering speed adjustment and stop-and-go functionality. Additionally, the integration of AI has improved the responsiveness of these systems, leading to safer and more intuitive vehicle behavior in diverse driving conditions.

Implementing personal navigational software in motor vehicles and even for bicyclists and pedestrians has revolutionized the collection of travel demand data. Companies like INRIX, Streetlight Data, and Waze leverage API-based aggregation to revolutionize traffic data analysis. INRIX analyzes data from various sources, enhancing road safety and congestion management[2] Streetlight Data uses mobile GPS data to provide transportation analytics for urban planning (Source: Streetlight Data website). Waze aggregates real-time user data to update traffic conditions and suggest optimal routes, aiding in dynamic traffic management (Source: Waze website). These tools offer real-time insights, improving traffic flow and infrastructure planning.

The challenge of developing a CMP Methodology extends beyond merely adopting new tools and data. It requires a deep understanding of how these elements transform system behavior and performance. Understanding the dynamics of change is crucial for achieving our goals. Simply being aware of the current situation is not enough. True success involves anticipating future developments, taking control, and taking decisive action.

[2] www.inrix.com.

3. SJTPO's Congestion Management Process

While the above section describes FHWA's prescribed steps in a CMP, the following section describes the steps within SJTPO's CMP, which is modeled closely on the FHWA's recommended steps.

Step 1: Develop Regional Objectives for Congestion Management

These objectives were developed in coordination with the vision statement and regional goals found in the RTP. MAP-21 and the FAST Act emphasize performance-based planning, and these objectives should directly relate to those measures. The IIJA significantly increases funding across various transportation modalities compared to its predecessor, the FAST Act, with a total of about $1.2 trillion in investments. While the FAST Act focused primarily on highway and motor vehicle safety, public transportation, and federal-aid highways, the IIJA expanded the focus to include significant investments in rail, broadband, water infrastructure, and more. The IIJA emphasizes addressing climate change, resilience, and sustainability more than the FAST Act. The IIJA includes provisions for modernizing infrastructure with technology and innovation, such as electric vehicle charging infrastructure, which was less emphasized in the FAST Act.

The ten regional goals from the RTP have been combined into a smaller set of five CMP objectives for which performance measures can be developed. SJTPO's CMP objectives reflect a multi-modal approach and emphasize travel demand and system management, as the FHWA CMP Guidebook encourages. The CMP objectives are as follows:

Reduce congestion and improve travel time reliability

This objective summarizes one of the main functions of the congestion management process. It incorporates three regional goals from the RTP: Mitigate Traffic Congestion, Improve the Resiliency and Reliability of the transportation infrastructure, and Increase and Enhance opportunities for Travel and Tourism. Progress toward this objective should be measured by system-level performance measures of travel time reliability derived from archived operations data.

As the SJTPO region experiences significant seasonal congestion, measuring travel time reliability during summer is essential to ensure that the travel and tourism sectors are correctly accounted for. Congestion and delays within the region frequently occur at intersections, creating bottlenecks. As the University of Maryland's RITIS bottleneck report is relatively easy to generate, the bottleneck reports are being continued here as the primary data source for congested locations in SJTPO's CMP. The bottleneck reports initiated in the previous CMP Methodology report have been continued to help identify locations of chronic congestion, but several limitations have been identified. When traffic volumes or impediments change, the bottleneck reports are based on the first downstream location. This will move up or downstream as the volume changes. A series of less severe bottlenecks on the same corridor may suggest improvement when the total delay rises. The bottleneck data does not contain volume data that would help diagnose the nature of the problem or possible remedies. The University of Maryland Center for Advanced Transportation Technology (CATT) Lab is aware of these shortcomings and will be enhancing the process to upgrade the queue.

For the most part, the SJTPO roadway network consists of two-lane roadways with at-grade intersections. These intersections are the most significant cause of congestion and delay in the network as conflicting traffic movements must vie for green time, and major intersections are already at maximum cycle lengths.

The addition of INRIX Signal Analytics has added traffic signal performance reporting to the SJTPO toolbox. This data partially cures some of the shortcomings of the Bottleneck Reports by providing a great deal of data about signalized intersections. Unfortunately, SJTPO only has a limited number of signals being monitored. The members of the TAC selected the 88 signals for various reasons, which limits SJTPO's ability to make systematic analyses. The addition of more signals and the extension of the duration of the coverage are being actively explored to take advantage of this exciting technology.

Improve the safety and security of the transportation system

This objective combines two regional goals: Improve Security and Improve Transportation Safety. All strategies considered in the CMP must result in a safer transportation system for all users, including bicyclists and pedestrians. Progress toward this objective should be measured by using regionwide crash rates.

Several factors are pivotal to safety and security progress: Education, Engineering, and emerging technologies. SJTPO continues to provide and encourage driver education and safety training through the Traffic Safety Education Program, Local Safety Program (Infrastructure), Design Assistance Program for Safety Projects, Safe Routes to School (SRTS) Program, and Countywide Local Road Safety Plans. Progress will be measured by continually analyzing crashes and incidents along SJTPO's congested roadways and monitoring the correlation between crashes and the number of crashes at locations throughout the region.

Improve multi-modal mobility and the accessibility of the transportation system to all users

Federal guidance emphasizes multi-modal accessibility to ensure that all surface transportation system users are served. Personal vehicle travel should not be prioritized to the detriment of transit, bicycle, and pedestrian travel. Strategies that provide alternatives to new Single Occupancy Vehicle (SOV) capacity should be considered first, and all strategies should be evaluated in a multi-modal context. Progress toward this objective should be measured by the transit usage rates, transit reliability scores, and bicycle/pedestrian count data where available. This objective incorporates the RTP goals to Promote Accessibility and Mobility and Enhance the Integration and Connectivity of the transportation system.

Support the regional economy, protect the environment, promote goods movement, and ensure that the CMP supports the regional goals established in the latest RTP

This objective combines the regional plan goals relating to economic development and the preservation of transportation infrastructure. Progress toward this objective shall be measured by tracking regionwide vehicle emissions, vehicle miles traveled, pavement condition, and freight network reliability.

These four core objectives will be used to establish performance measures and develop strategies for CMP implementation.

Step 2: Define the Congestion Management System Network

The CMP network is defined by geographic boundaries and the surface transportation system's components. The multi-modal CMP network includes components essential to freight transport, transit facilities, and bicycle and pedestrian infrastructure. Including multi-modal components helps ensure that strategies to reduce single-occupancy vehicle travel are represented. The CMP network is also defined in the context of data availability. The continued use of vehicle probe data has expanded the scope of roadways for which high-quality travel time and congestion data are available. The CMP network also includes roads that serve South Jersey's important tourism and recreation economic sectors. SJTPO has also acquired access to Signal Analytics data, in which the performance of 88 traffic signals at various locations throughout the region is continuously monitored.

Geographic Area of Application

The CMP Network mimics the four-county SJTPO planning region, including Atlantic, Cape May, Cumberland, and Salem counties in southern New Jersey. Congestion Screening and analysis will be carried out on all CMP network components, as listed below, in this region for which data can be obtained. While the state system is included in some data analysis and experiences much congestion, the focus is on the county and local roadway network.

In addition, SJTPO acknowledges the importance of planning for a greater regional context. SJTPO staff participate in many statewide congestion management and freight activities in collaboration with NJDOT and other planning partners.

System Components

The CMP network is defined to be comprised of the following system components in the SJTPO planning region, which depicts the multi-modal nature of the CMP:

- All roadways on the National Highway System
- All NJ State Highways and US Routes
- County highways classified as Major Collector or higher
- Roadways that carry NJ Transit service
- Roadways that intersect or are part of Freight Priority locations, as identified in SJTPO's Regional Freight Plan
- Bicycle facilities, pedestrian facilities, and multi-use trails
- Other roadways specifically identified as corridors of interest by subregional planning partners

While the CMP network includes all these components, SJTPO's focus has always been on the county and local roadway network, as SJTPO has the most discretion to fund projects on these roads. For most components listed above, travel time data is available through the Probe Data Analytics (PDA) Suite, which can be used for network-wide screening. Performance Measures such as travel time reliability, delay, and bottleneck occurrences shall be developed network-wide to generate screening lists for further analysis. For bicycle and pedestrian facilities, data is limited to spot counts as broad screening tools are emerging. As such, conducting spot counts is not cost-effective systemwide, but there may be instances where a particular study or project might benefit from this data.

Step 3: Develop Multi-modal Performance Measures

The emphasis on performance-based planning introduced in MAP-21 and continued in the FAST Act leads to planning processes becoming grounded in quantifiable performance measures. The measures selected for the SJTPO CMP directly address the objectives established earlier in this report and cover various congestion-related issues.

According to the FHWA CMP Guidebook, objectives and related performance measures should be SMART: Specific, Measurable, Agreed-upon (supported by a consensus of CMP stakeholders), Realistic, and Time-bound. As such, each performance measure should have an identified data source by which it can be measured and a timeline to achieve it. The four core objectives of the SJTPO CMP and their associated performance measures are listed below.

Reduce congestion and improve travel time reliability

Performance measures for this objective should be derived from archived operations data. Congestion performance measures have four dimensions: Intensity, Duration, Extent, and Variability. Variability is of particular interest in the SJTPO region, as congestion on many major corridors is seasonal and heavily affected by special events, the weather, and holiday weekends. Each measure will be computed for the calendar year and the summer season (Memorial Day to Labor Day).

The following performance measures will be computed from archived operations data. Archived operations data is information collected and stored to support the monitoring and management of the transportation system. Examples include traffic, transit, bike, and pedestrian data generally collected by user devices such as GPS or smartphones or ITS infrastructure, such as pavement inductive loop detectors, radar detectors, Bluetooth, and EZ Pass tag readers. INRIX, the primary data vendor behind much of the University of Maryland RITIS Analytics software, acquires much of its data through these methods

Travel time reliability on National Highway System roadways - a regionwide measure that will be computed for each year and summer season. This measure is calculated using archived operations data provided through the Probe Data Analytics Suite, described in detail in the following section. This measure can also be computed at the corridor level as needed. The SJTPO region's National Highway System includes most major regional roadways, including the Garden State Parkway, New Jersey Turnpike, Atlantic City Expressway, many State and US Highways, and other Principal Arterials that serve the shore region.

Bottleneck Ranking - the intensity, duration, and extent of congestion are all factors in computing a roadway's bottleneck ranking. This measure will be used for initial screening and prioritizing congested locations, creating lists for each county and the entire region. This measure should be computed for each year and for each summer season. To the extent possible, bottleneck lists from multiple years will be compiled and reviewed, allowing analysts and other readers to easily detect performance in congestion management. These lists will be used for congestion screening, location prioritization, and tracking congestion at individual locations yearly. Additional corridor-level and intersection-level measures, such as planning time index or cost of delay will be computed for priority locations as needed.

Improve the safety and security of the transportation system

The number of crashes along a corridor and at an intersection and the severity of the crashes shall be used to assist in congested location prioritization. Corridors or intersections are traditionally prioritized for improvements based on their history of crashes. This methodology is called the hot-spot approach. The roadway network is screened based on the number of crashes and the severity of crashes, with each location receiving a crash severity score, known as Equivalent Property Damage Only (ePDO). ePDOs is a metric that indicates the equivalent severity of a crash in terms of property damage only (PDO) crashes. Those locations with a higher ePDO score are ranked higher on the list.

Five different sets of network screening lists were developed for the SJTPO region on behalf of the NJDOT. Corridors along the State Highway or intersections on the state's system are not included in the network screening lists. The list only includes county and municipal-owned locations.

These lists are utilized to establish performance measures to improve the safety and security of the transportation system. Safety issues must be accounted for in addition to congestion when evaluating CMP strategies.

Improve multi-modal mobility and the accessibility of the transportation system to all users

Multi-modal mobility within the transportation system refers to the integration and coordination of various modes of travel, including vehicles, buses, trains, walking, bicycling, etc.

SJTPO collaborates with NJ TRANSIT and county transit providers to develop performance measures relating to the number of transit users and the reliability of transit trips each year. Transit reliability should be measured by the percentage of on-time transit trips each year. The number of passenger trips in the SJTPO region should also be computed annually, pending data availability.

Measures relating to bicycle and pedestrian trips are more challenging to quantify, as spot counts from studies have been the only available data sources. As previously mentioned, emerging technologies may provide solutions to some of the data gaps in vehicle occupancy, freight, pedestrian, and bicyclist data. SJTPO will evaluate the cost and benefits of adopting these programs and services.

Support the regional economy, protect the environment, promote goods movement, and ensure that the CMP supports the regional goals established in the latest RTP

While many regional plan goals are qualitative, others may be tracked through performance measures. Regionwide ozone emissions, already tracked for air quality conformity purposes, should be used in the CMP. Oxides of nitrogen (Nox) and volatile organic compounds (VOC) are tracked by SJTPO using the South Jersey Travel Demand Model and air quality post-processing tools. These measures are generally computed for each TIP cycle or every two years. Emissions may also be computed as part of project-level analyses using tools available to SJTPO, such as Trafficware Synchro and Air Quality Off-network Estimator (NJ-AQONE). In addition, the regionwide truck travel time reliability index should be computed on an annual basis.

The increasing adoption of electric and low-emission vehicles offers significant environmental and public health benefits. These vehicles substantially reduce air pollution, as they emit far fewer pollutants than traditional gasoline and diesel-powered cars. This decrease in emissions is crucial for improving air quality. Electric vehicles (EVs) also play a pivotal role in mitigating climate change by reducing the dependence on fossil fuels and lowering carbon dioxide emissions. If the electricity grid becomes greener and renewable sources supply more energy, the environmental impact of electric vehicles will continue to improve.

The transition to electric and low-emission vehicles presents challenges, particularly the lack of available grid capacity and the need for charging infrastructure. Despite these challenges, the shift towards electric and low-emission vehicles is expected to have a profoundly positive impact on global environmental sustainability and public health.

SJTPO will continue to work with its state and local planning partners to access additional data sources and develop performance measures that can meaningfully track progress toward CMP goals. Table 1, on the following page, summarizes the CMP objectives and the corresponding performance measures.

Table 1: CMP Performance Measures

Objectives	Performance Measures
1. Reduce congestion and improve travel time reliability	• Travel time reliability on National Highway System roadways – annual and summer season • Bottleneck ranking – annual and summer season
2. Improve the safety and security of the transportation system	• Corridor and intersection-level vehicle crash rates – total crashes in a three-year period • Corridor and intersection-level bicycle/pedestrian crash rates – total crashes in a five-year period
3. Improve multi-modal mobility and accessibility	• Transit reliability – the percentage of on-time transit trips each year • Transit usage – number of trips made by transit each year • Corridor and intersection-level bicycle and pedestrian trips
4. Support the economy, environment, goods movement, and contribute toward regional goals	• Truck travel time reliability index – annual

Step 4: Collect Data/Monitor System Performance

Data is collected and monitored for SJTPO roadways primarily via the University of Maryland's RITIS data portal and NJDOT Management Systems. Some of the data is used in the CMP and other systems. The data sources are tied directly to the CMP Performance Measures, as illustrated in Table 3.

The following is a comprehensive list of CMP Data Sources, with the Probe Data Analytics Suite as the primary data source. Not all the data sources listed here are needed for the performance measures found in this report. Some of the sources are used in more detailed analyses.

Data Sources:

- Probe Data Analytics Suite
- NJDOT Highway Performance Monitoring System (HPMS)
- SJTPO Data Collection – Technical Studies and Subregional Program
- NJDOT Congested Places Screening Process
- Local Member Agencies – Stakeholder Collaboration

- NJ TRANSIT
- Air Quality Modeling

Probe Data Analytics (PDA) Suite

The Probe Data Analytics (PDA) Suite is a product of the University of Maryland's CATT Lab. This project was known in prior publications as the Vehicle Probe Project. Vehicle probe data refers to information collected from vehicles moving along roadways. This data is typically gathered using GPS devices, smartphones, or other vehicle sensors. The primary purpose of vehicle probe data is to provide real-time and historical insights into traffic conditions, travel times, and vehicle movements.

The PDA Suite is a set of analysis tools initially made available to member agencies of the Eastern Transportation Coalition, including the State of New Jersey, but is now available in many other parts of the nation. This suite of analysis tools takes vehicle probe data provided by vendors, such as INRIX, HERE, and TomTom, and outputs usable metrics like travel times on individual roadways, travel time reliability scores, congestion bottleneck screening, delay cost analysis, and more. The vendors mentioned above collect real-time data through smartphone navigation apps. This data is anonymously aggregated to determine travel speed on individual Traffic Message Channel (TMC) roadway segments. The real-time travel time data is helpful to operating agencies, such as NJDOT and the NJ Turnpike Authority (NJTA). SJTPO's primary interest is in analyzing the archived travel time data. The archived data can be analyzed as far back as 2012 for certain major roadways and 2014 for most collectors and arterials in the SJTPO region. The PDA Suite provides tools for computing performance measures for these roadways, which have proven invaluable in the congestion planning process.

SJTPO has used the PDA Suite for performance measurement and congestion screening. Performance measures, including vehicle hours of delay, Planning Time Index (PTI), Travel Time Index (TTI), and others, have been developed for all major regional roadways. Roadways have been ranked by each of these performance measures.

The PDA Suite coverage in the region is extensive, including all authority roadways, state highways, and many major county and municipal arterials and collectors, allowing for a comprehensive congestion screening tool. On a smaller scale, the PDA's Suite Bottleneck Ranking tool has been used to locate bottleneck conditions, allowing sources of recurring congestion to be identified. Bottleneck locations refer to specific points or segments within a transportation network where traffic flow is significantly impeded, leading to congestion and delays. These areas can cause a chain reaction that affects the overall efficiency and performance of the network. The Bottleneck Ranking tool measures the total delay experienced at locations in the system, with those locations with the highest amount of delay rising to the top of the list.

Appendix A includes a detailed description and explanation of the Bottleneck Tool, including lists of the Top 100 Congested State and Authority Roadways and lists for each county. It also includes technical reports on some of the features of this powerful tool, including congestion scans and the cost of delay.

NJDOT Highway Performance Monitoring System (HPMS)

NJDOT's Highway Performance Monitoring System (HPMS) collects traffic count data on many roadways throughout the state on a recurring basis. These counts may be used to determine average daily traffic on corridors and approach volumes at intersections. NJDOT also uses this data to estimate vehicle-miles traveled (VMT) by county and roadway functional classification.

SJTPO Data Collection – Technical Studies and Subregional Program

SJTPO staff manage technical studies and projects performed by consultants. Projects may involve data collection (traffic volume counts, turning moving counts, etc.), travel time studies, or intersection delays. Continuing data collection efforts include using Probe Data Analytics (PDA) and the addition of Signal Analytics, a product of a collaboration between INRIX and the CATT Lab. The precise speeds and pathways through signalized intersections can be isolated and analyzed. With these tools, users can access movement-specific metrics to identify, rank and prioritize intersection signal projects, or conduct many other forms of analysis. Signal Analytics allows users to conduct systemwide intersection comparisons and performance monitoring, and it also provides the ability to drill down to understand individual intersection movements.

SJTPO purchased INRIX Signal Analytics to analyze traffic signal metrics at select signalized intersections within the SJTPO region. An initial purchase with access to Signal Analytics for 88 signalized intersections was made in 2022, with a second-year purchase and access to the data through February 28, 2024. SJTPO recently executed an agreement with the University of Maryland, College Park, extending the performance period to December 31, 2024. SJTPO intends to purchase access to the data for the 88 signalized intersections for an additional two years, with access to the data through 2026. SJTPO will continue to collaborate with NJDOT to share and potentially change/expand the project's scope in the future.

NJDOT Congested Places Screening Process

SJTPO works collaboratively with NJDOT through the Congested Places Vetting Process to prioritize state highway locations for problem statement development. This process makes data available from the NJ Congestion Management System (NJCMS), NJDOT's Transportation Data and Safety Unit, NJDOT's Freight Planning unit, and other management systems. This data is used to quantitatively rank congested locations using several criteria relating to congestion, safety, freight, and stakeholder input. SJTPO participates in field visits to congested locations to record traffic data and observations. SJTPO also assists in authoring the problem statement reports.

Local Member Agency – Stakeholder Collaboration

SJTPO works closely with its subregional partners throughout the congestion planning process. Qualitative input from planning partners is crucial to supplement the data provided by quantitative data sources.

Upon completing the preliminary congestion screening lists, SJTPO met with the TAC members to discuss the rankings. SJTPO and its planning partners discussed each location at these in-person meetings and ensured that subregional feedback was incorporated into the finalized congested locations lists. Outlier locations were identified for further examination. Locations of high interest to subregions were noted. Other input collected for each location included seasonality of congestion, safety concerns, potential strategies to improve congestion, prior studies or projects, and other information. Input from local planning partners is invaluable to the planning process, and SJTPO will continue to work with local stakeholders throughout the ongoing congestion planning process.

NJ TRANSIT

NJ TRANSIT operates bus lines on many major regional corridors and operates the Atlantic City Rail Line, which carries passengers between Atlantic City and Philadelphia. Data related to transit ridership and reliability in the region is available to SJTPO through NJ TRANSIT to assist with CMP analysis. However, the data is not aggregated below the statewide level.

The lingering effects of COVID and trends towards working from home have negatively impacted bus and rail ridership and user fees.

Travel Demand Modeling

SJTPO maintains the South Jersey Travel Demand Model (SJTDM) for air quality conformity and traffic growth modeling purposes. The SJTDM models estimated travel volumes on major regional roadways from its base year of 2015 through 2050. Projections are based on growth in population and employment. Future-year highway projects are included in the model to determine their impacts. The SJTDM can be used to predict various congestion performance measures on the future transportation network, including V/C ratios, vehicle-hours of delay, signal delay, etc.

Table 2, on the following page, summarizes which data sources were used for each performance measure identified in the previous section.

Table 2: Performance Measure Data Sources

Objectives	Performance Measures	Data Source(s)
1. Reduce congestion and improve travel time reliability	• Travel time reliability on National Highway System roadways – annual and summer season • Bottleneck ranking – annual and summer season	• Probe Data Analytics Suite, Signal Analytics Module
2. Improve the safety and security of the transportation system	• Corridor and intersection-level vehicle crash rates – total crashes in a three-year period • Corridor and intersection-level bicycle/pedestrian crash rates – total crashes in a five-year period	• NJDOT Safety, Bicycle, and Pedestrian Programs; Network screening lists
3. Improve multi-modal mobility and the accessibility	• Transit reliability – percentage of on-time transit trips each year • Transit usage – number of trips made by transit each year • Corridor and intersection-level bicycle and pedestrian trips	• NJ TRANSIT • SJTPO Technical studies and subregional count data
4. Support the economy, environment, goods movement, and contribute toward regional goals	• Regionwide ozone precursor emissions – tons per day • Project-level emissions impact – kilograms of ozone precursors reduced per year • Truck travel time reliability index – annual	• SJTPO Travel Demand Modeling Process • Probe Data Analytics Suite

Step 5: Analyze Congestion Problems and Needs

Once data is collected, the raw data must be translated into useful measures of performance. Specific locations with congestion problems present in the region or that are anticipated should be addressed using data and analysis techniques. Identifying the congestion problems, where they are located, and what is causing them is vital before strategies are determined. Throughout this process, stakeholder collaboration is critical. SJTPO will continue to work closely with its subregional partners and state agencies to identify and prioritize congested locations.

According to the FHWA CMP Guidebook, when evaluating data to define or locate congestion problems, MPOs should consider:

- **Locations of major trip generators** – It is beneficial to know about major trip generators and the typical traffic patterns, users, and times of high demand at these locations to fully understand the congestion issues. Major trip generators include freight/intermodal facilities, major tourist attractions, stadiums/areas, universities, hospitals, employers, airports, and shopping centers. In the SJTPO region, travel demand is generated in shore communities, such as Atlantic City, Ocean City, and Cape May.
- **Seasonal traffic variations** – Traffic patterns can vary immensely due to seasonal changes. Seasonal changes may vary depending on the area, but the different types include school-related trips, tourist/resort activity, farming and farm equipment activity, weather conditions, and daylight conditions. The SJTPO region experiences considerable variations in seasonal travel demand due to the shore communities in Atlantic and Cape May Counties. Because of this, congestion performance measures should be computed for the summer season.
- **Time-of-day traffic variations** – The highest demand may not be experienced during typical commuter periods at all locations. For example, areas with heavy school traffic coincide with the morning peak (7:00-9:00 AM) but have an earlier afternoon peak, beginning at 2:00 PM. Areas with large employers with shift change times may have a higher demand outside the typical peak period (7:00-9:00 AM and 4:00-6:00 PM).
- **Work trips vs. non-work trips** – Knowing and understanding the balance between work-related and non-work trips within an area can be valuable. Strategies may differ for these different trip types.

Data should be translated to correlate the diverse levels of congestion in the region. The performance measures considered in Step 2 need to be inflicted on specific system sections. The FHWA CMP Guidebook recommends the following steps:

- A set of areas or corridors may be defined as "congested." Corridors characterized as congested may then be used to indicate what activities are necessary and appropriate to address congestion.
- A ranking of corridors throughout the region may be developed. The locations could be ranked separately in categories based on the function/scale of the facility. Using the ranked lists, corridors with the highest rank based on congestion relief needs can be determined.
- Analysis may be conducted to determine how well the region is meeting congestion management objectives denoted in Step 1.

SJTPO should use archived operations data to develop initial screening lists of congested locations in each county. These lists will use the bottleneck ranking score provided by the Probe Data Analytics Suite as a preliminary ranking system. Each list shall be screened for outliers and then brought to subregional planning partners for discussion.

Explicit benchmarks or targets need to be identified and used to determine how well or poorly the system is meeting the desired objectives. Targets may be used to analyze the data on corridor and regional levels. More advanced analytical methods (detailed traffic modeling) could be used to determine if the system meets the desired conditions.

It is imperative to understand which congestion mitigation strategies are appropriate for each selected corridor by identifying and interpreting the causes of congestion. SJTPO will continue conducting technical analyses and collaborating with local stakeholders and subject matter experts to further analyze the identified causes of congestion.

Step 6: Identify and Assess Strategies

Various strategies, including demand management, operational improvements, and multi-modal facilities/services, should be identified and evaluated to address congestion. This process requires research literature review and outreach to subject matter experts. Several strategies are identified in the FHWA CMP Guidebook and are included with the understanding that not all strategies are appropriate in all contexts.

Innovative strategies identified as part of FHWA Every Day Counts initiatives, such as Adaptive Signal Control, should also be considered. SJTPO will also solicit feedback from SJTPO's subregional planning partners.

Strategy Identification

The FHWA CMP Guidebook outlines these general strategy categories:

- **Reduce Demand** – for motorized vehicular capacity on the congested corridors;
- **Shift Mode of Trip** – from single-occupant vehicles to more capacity-efficient modes;
- **Improve Operations** – specifically the operational aspects of congested corridors;
- **Increase Capacity** – of the congested corridors to accommodate additional traffic.

The four objectives identified in Step 1 shall be used when evaluating strategies. Strategies should contribute to congestion relief, but contributions to other regional objectives, such as safety and multi-modal mobility, must also be considered. Increasing single-occupancy vehicle (SOV) capacity should not be considered a first choice. Alternatives to additional SOV capacity should be given priority per Federal guidance.

Strategies that will be evaluated will include, but are not limited to, the following:

- **Demand Management Strategies** – Travel Demand Management (TDM), promoting alternatives to SOV travel, and encouraging effective land use should be considered. Specific strategies may include promoting transit and ridesharing services, improving bicycle and pedestrian facilities, promoting flexible work hours or telecommuting programs, and promoting transit-oriented development.

SJTPO should work with planning partners at agencies, such as CCCTMA, to promote these and other demand management strategies. Strategies, such as congestion pricing or high-occupancy vehicle (HOV) lanes, may be appropriate for planning partners to consider. FHWA has compiled research into the cost-effectiveness of many TDM strategies, which should be reviewed.

- **Traffic Operations Strategies** – Operational improvements should always be considered an alternative to new SOV capacity. Research has shown that operations investments can be cost-effective for congestion reduction and safety improvements. Operations strategies should include traffic signal retiming, upgrades, corridor-level signal coordination, arterial access management, restricting turning movements, geometric improvements to intersections and corridors, traffic calming, road diets, and more. Many of these strategies are already being pursued through SJTPO's Congestion Mitigation and Air Quality Improvement Program (CMAQ) and Carbon Reduction Program (CRP) programs, which have funded traffic signal upgrades and retiming efforts throughout the region. SJTPO should also continue to work with State planning partners to bring operational improvements to state highways.
- **Intelligent Transportation Systems (ITS) Strategies** – An area of particular emphasis is ITS. SJTPO's participation in statewide ITS planning efforts is outlined in Chapter 2. ITS strategies identified through FHWA Every Day Counts initiatives and by organizations like ITS New Jersey should be considered. Specific strategies should include Active Traffic Management, incident management, transit signal priority, adaptive signal control, integrated corridor management, automated traffic signal performance measures, and more.
- **Public Transportation Strategies** – SJTPO should work with NJ TRANSIT and county transit providers to identify strategies that may improve transit accessibility and reliability in the region. Strategies may include real-time information systems for transit users, transit signal priority, bus rapid transit, improvements to bicycle and pedestrian facilities that serve as intermodal connectors, and more.
- **Road Capacity Strategies** – Adding new capacity to a roadway network is costly and should not be carried out until alternatives can be considered. Many operations strategies are more cost-effective than roadway widening. Other alternative road capacity strategies that shall be considered include removing bottlenecks, improving intersections, installing left turn lanes, reintegrating interchange reconfigurations, and more. Such strategies are generally non-exempt from air quality conformity analysis, and thus, the additional emissions must be modeled and included in conformity analyses. Though

costly, adding new capacity can effectively reduce congestion and improve regional mobility.

The strategies identified should be considered in collaboration with the appropriate implementing agencies and local stakeholders.

Strategy Assessment

Each strategy shall be assessed in comparison to the four CMP objectives. Strategy assessment should be conducted collaboratively with partner agencies. Methods available to evaluate strategies include:

- **Research literature review** – Compilations of research provided by FHWA and other agencies can compare strategies, including before-and-after studies, benefit-cost analyses, and more. Implementing agencies often publish white papers and similar research detailing their experiences with specific strategies.
- **Travel demand modeling** – As previously noted, SJTPO maintains the SJTDM to forecast future traffic volumes and air quality conformity. The travel demand model may be used to evaluate the impacts of capacity-enhancing projects.
- **Traffic simulation modeling** – In the past, SJTPO has used Trafficware Synchro and SimTraffic in-house to model various proposed projects, including traffic signal improvements and road diets. In more recent years, any simulation models used to determine the impact of traffic signal upgrades, retiming efforts, or other improvements are completed through consultant support as part of their larger project. These models can also be used to determine if intersection reconfigurations or road diets will impact congestion.
- **Past experience or evaluation of strategies – Working with subject matter experts can yield valuable insights into which solutions have worked** and which have fallen short of expectations. Strategies such as adaptive signal control may not be one-size-fits-all solutions to traffic congestion and must be applied selectively. It is essential to draw from past experiences, especially on projects that cannot easily be modeled.
- **Technical studies** – Through the SJTPO Unified Planning Work Program (UPWP), consultant-led technical studies may be conducted to evaluate strategies and provide recommendations for improvements. These studies can target singular intersections, corridors, or groups of intersections or corridors. Project development efforts undertaken in the past have initiated projects throughout the SJTPO region. Consultants bring outside expertise and new assessment methodologies, which is especially important when considering new or innovative strategies.

Each strategy should be evaluated in a local context. The project's contribution to other goals besides congestion relief should be considered. As a planning agency, SJTPO must work with subregional partners to implement the desired mitigation efforts. In some cases, specific improvements may not have support from the implementing agency. Therefore, proper coordination with other agencies is an evaluation factor.

The overall assessment of any project or effort will consider all the above.

A Balanced Approach

As stated earlier, all the elements of the CMP (strategies, techniques, etc.) are driven by SJTPO's regional goals. In some cases, these goals may have conflicting desired results. For example, increasing speed may negatively impact safety. Therefore, strategies and the mitigation techniques selected should be considered collectively instead of individually. A balanced approach ensures all the goals are addressed.

Regional and Financial Environment Considerations

Strategy and congestion mitigation techniques must also consider the region's unique nature and anticipated financial constraints. In many instances, the specific solutions recommended will depend on the types of trips using the corridor. For example, a corridor servicing primarily freight traffic will have different solutions than one primarily servicing tourism traffic. Financial considerations may limit the solutions that can be realistically employed.

Step 7: Program and Implement Strategies

CMP Strategies are implemented through the SJTPO RTP, TIP, UPWP, and the work programs of SJTPO's partner agencies. SJTPO participates in NJDOT and other partners' planning processes, striving to implement strategies shared with other organizations.

Although other venues are used, federal transportation funds are the most direct method of implementation of the CMP strategy. Therefore, the major planning documents, including the RTP and TIP, should be in sync with the CMP. CMP strategies can be at the regional, corridor, or project levels.

TMA activities and SJTPO's safety education outreach are examples of regional strategies. Corridor strategy examples may include traffic signal coordination and synchronization, the addition of bicycle lanes, and operational improvements.

Programming & Implementation

The SJTPO provides federal CMAQ funding for surface transportation projects that reduce harmful emissions by reducing congestion and improving air quality. Project selection is based on the air quality benefit, environmental screening, cost-effectiveness, and deliverability. The CRP funds projects that intend to reduce carbon emissions. Much like the CMAQ project selection process, the CRP project selection process is based on air quality benefits, environmental screening, cost-effectiveness, and deliverability. The CMAQ and CRP complete a combined application process for the joint solicitation. Both are well-suited for implementing projects developed under the CMP.

Projects are solicited over three federal fiscal years. Additional information on SJTPO's CMAQ, including the most up-to-date application process, is available on the SJTPO website at www.sjtpo.org/CMAQ. Similarly, information is available on SJTPO's CRP at www.sjtpo.org/CRP.

CMP projects may also be funded through the Surface Transportation Block Grant Program. This funding source has traditionally been used mainly for resurfacing projects. In addition, SJTPO subregions receive state funding that SJTPO does not administrate and may be used for CMP project implementation at the local level.

Technical studies and staff activities contributing to the CMP may be funded through SJTPO's UPWP. Many studies have been completed in recent years, including local safety program design assistance, county safety action plans, and freight planning studies. SJTPO can effectively bundle multiple locations together across multiple counties for administrative efficiency.

CMP Implementation Partners

SJTPO will work with the agencies listed below to implement many of its congestion mitigation strategies:

- Atlantic, Cape May, Cumberland, and Salem Counties
- City of Atlantic City
- City of Vineland
- Cross-County Connection Transportation Management Association (CCCTMA)
- Delaware Valley Regional Planning Commission (DVRPC)
- New Jersey Department of Transportation (NJDOT)
- New Jersey Turnpike Authority (NJTA)
- NJ TRANSIT
- North Jersey Transportation Planning Authority (NJTPA)
- Rutgers University
- South Jersey Transportation Authority (SJTA)

The following tables contain the projects that are part of the SJTPO CMP effort. Project funding is made available for various phases of work, including design (DES), right-of-way (ROW), or construction (CON).

Table 3 lists SJTPO's programmed projects into SJTPO's FFY 2024-2033 TIP and the RTP between FY 2020-2024 as part of SJTPO's CMP effort. SJTPO flexed over $1.8M in CMAQ funds to NJ

TRANSIT in FFY 2023. In FFY 2024, $1.5M in congestion mitigation projects within the SJTPO region has been authorized thus far. Between FFY 2024 and FFY 2027, SJTPO has programmed over $5.0M of congestion mitigation projects.

Table 3: SJTPO's Programmed Congestion Mitigation Projects, FFY 2020-2024

DBNUM	PROJECT NAME	SPONSOR	MUNCIPALITY	COUNTY	MPO	PHASE	FUND	STATUS OF AUTHORIZATION	SOLICTATION YEAR	2023	2024	2025	2026	2027	2023-2027
X065	Ventnor Avenue Signal Synchronization Project	City of Ventnor	Ventnor	Atlantic	SJTPO	CON	CMAQ	Authorized	FFY 2022-24		$1.336				$ 1.5000
S2319						CON	CR-AC	Authorized	FFY 2022-24		$0.164				
X065	Purchase of 7 Replacement Paratransit Passenger Buses	Atlantic CountyTransportation Unit	Various	Atlantic	SJTPO	n/a	CMAQ	Flexed to NJ TRANSIT	FFY 2018	$0.616					$ 0.7700
S2319						n/a	CR-AC		FFY 2018	$0.154					
X065	Procurement of 5 low emission, unleaded fuel, body on chassis mini-buses	Cape May County Fare Free Transportation	Various	Cape May	SJTPO	n/a	CMAQ	Flexed to NJ TRANSIT	FFY 2018	$0.480					$ 0.6160
S2319						n/a	CR-AC		FFY 2018	$0.136					
S2319	Cumberland County Department of Workforce Development "To-Work" Transportation Vehicle Replacement	Cumberland County Department of Workforce Development	Various	Cumberland	SJTPO	n/a	CR-VINELAND	Flexed to NJ TRANSIT	FFY 2022-24	$0.128					$ 0.4620
X065						n/a	CMAQ		FFY 2022-24	$0.334					
X065	Pacific Avenue Traffic Signal Optimization and ITS Improvements	Atlantic City	Atlantic City	Atlantic	SJTPO	PE	CMAQ	Authorized	FFY 2022-24						$ -
						FD	Other	--	--						
						CON	CMAQ	Programmed	FFY 2022-24			$1.200			$ 1.2000
S2319	Cape May Microtransit Feasibility Study	Cape May County	Various	Cape May	SJTPO	n/a	Other	--	--						$ -
X065	New Jersey Avenue Traffic Signal Synchronization	Cape May County	Borough of Wildwood Crest and City of Wildwood	Cape May	SJTPO	CON	CMAQ	Programmed	FFY 2025-27			$1.830			$ 2.4090
S2319						CON	CR-AC	Programmed	FFY 2025-27			$0.579			
X065	Landis & Valley Traffic Signal Upgrade	Cumberland County	City of Vineland	Cumberland	SJTPO	PE	CR-VINELAND	Programmed	FFY 2025-27		$0.112				$ 0.7190
						FD	CR-VINELAND	Programmed	FFY 2025-27			$0.057			
						CON	CMAQ	Programmed	FFY 2025-27				$0.550		
X065	Park and West Traffic Signal Upgrade	Cumberland County	City of Vineland	Cumberland	SJTPO	PE	CR-VINELAND	Programmed	FFY 2025-27			$0.112			$ 0.7190
						FD	CR-VINELAND	Programmed	FFY 2025-27				$0.057		
						CON	CMAQ	Programmed	FFY 2025-27					$0.550	

Updated January 2, 2024

DBNUM	Program Name
X065	Local CMAQ Initiatives
S2319	SJTPO Carbon Reduction Program

	2023	2024	2025	2026	2027
Total Programmed					
CMAQ	$ 1.430	$ 1.336	$ 3.030	$ 0.550	$ 0.550
CR >200k (AC)	$ 0.290	$ 0.164	$ 0.579	$ -	$ -
CR 50K-200K, inlcuding					
CR-VINELAND	$ 0.128	$ 0.112	$ 0.169	$ 0.057	$ -
CR-VILLAS	$ -	$ -	$ -	$ -	$ -
CMAQ					
Line Item	$ 1.670	$ 1.655	$ 1.833	$ 1.900	$ 1.900
Balance	$ 0.240	$ 0.319	$ (1.197)	$ 1.350	$ 1.350
Additional CMAQ Resources provided by NJDOT	$ 1.096	n/a	n/a	n/a	n/a
CR-AC					
Line Item	$ 0.556	$ 0.567	$ 0.579	$ 0.590	$ 0.602
Balance	$ 0.266	$ 0.403	$ -	$ 0.590	$ 0.602
CR 50K-200K					
Line Item	$ 0.115	$ 0.325	$ 0.325	$ 0.331	$ 0.337
Balance	$ (0.013)	$ 0.213	$ 0.156	$ 0.274	$ 0.337

green = within budget
red = overbudget

Step 8: Evaluating Strategy Effectiveness

The CMP evaluation/monitoring step is part of the continual planning improvement cycle. It is a multi-level evaluation. The projects, programs, and the entire process are monitored. The FHWA CMP Guidebook identifies two general approaches for strategy evaluation:

1. **System-level performance evaluation** – Using regionwide or system-level performance measurement.
2. **Strategy effectiveness evaluation** - Project-level or program-level analysis of conditions before and after the implementation of a congestion mitigation effort.

Monitoring Projects and Programs

The effectiveness of each project and program will allow for improvements to those projects and program types. It may also call for entirely different projects and programs when confronted with similar issues in the future. Before-and-after studies can be conducted on projects for which good baseline data has been collected. For example, baseline traffic simulation models using SYNCRHO traffic simulation software may be developed for traffic signal improvement projects to capture the "before" conditions. After the upgraded signals have been in operation for some time, the "after" conditions can be accessed, and the effectiveness of the signal upgrades can be determined. Projects promoting transit, bicycle, or pedestrian modes can also be evaluated using before-and-after studies.

Archived operations data may also be used to evaluate strategy effectiveness for various projects. As archived travel time data stretches back to 2014 for most of the SJTPO region, this data can serve as a "before" baseline for corridor-level projects. After improvements are made, the real-time data can be observed and compared against the baseline. For example, for the Garden State Parkway grade separation project in Cape May County, travel time and delay data can be compiled for the year before and following construction. The corridor travel time can also be evaluated for traffic signal improvement projects using archived operations data. INRIX is the primary vendor of the data, much of which is housed in a user-friendly format via the University of Maryland's CATT Lab. Specific data metrics to be utilized for these before/after studies could include Travel Time Index, Planning Time Index, Cost of Delay, and Total Delay Due to Bottlenecks, as described above.

Next Steps

This Congestion Management Process: Methodology Report constitutes SJTPO's latest version of its CMP. This report replaces the Congestion Management Process: Methodology Report Fiscal

Years (FFY) 2017-2020, adopted in November 2018. The Methodology Report is evaluated annually and updated as needed based on new data.

It should be noted that the CMP is continually evolving and will continue to evolve in conjunction with internally generated documents and studies, such as the RTP Goals and Objectives, as well as external factors, such as changing planning guidelines, regional demographics, and available fiscal resources.

The Congestion Management Process: Activity Report is a supporting document to the Methodology Report. An Activity Report is completed every four years, corresponding to the four-year cycle update of the RTP. The Activity Report serves as a report computing the metrics mentioned in the Methodology Report.

This cycle, the Activity Report and the Methodology Report, are being updated simultaneously. The Activity Report contains analysis from FFY 2022-2025 and shall be incorporated into SJTPO's RTP, entitled *RTP* Forward 2050, to be considered for adoption in January 2025. In summary, the CMP is a systematic process that lists the congested locations in the region and evaluates the effectiveness of the strategies SJTPO and its partner agencies have implemented or are implementing to mitigate the congestion issues within the region.

Appendix A: CMP Activity Report

The CMP Activity Report is typically a separate document from the CMP Methodology Report, but it is combined here because of a change in the new methodology. In addition to the data analytics, the subsequent appendices go into more detail about each of the data sources and metrics used to measure and analyze congestion. Travel time data can provide an excellent basis for congestion screening. Travel time is a direct measure of roadway user experience, with high travel times indicating high delays and poor driver experience. By comparing an observed travel time to the expected free-flow travel time, the performance of the roadway can be measured.

Travel time data is becoming increasingly available and widespread. The primary data source used in this analysis is travel time data collected from probe vehicles and compiled by the Probe Data Analytics (PDA) Suite. The PDA Suite is a project of the University of Maryland's CATT Lab. This project was formerly called the Vehicle Probe Project (VPP). The PDA Suite provides tools to retrieve archived travel time data and analyze the data in several ways.

This travel time data is archived and is retrievable for analysis. The PDA Suite covers all regional authority roadways, such as the NJ Turnpike, Atlantic City Expressway, and Garden State Parkway, almost all state and US routes, and some county and local arterials and collectors.

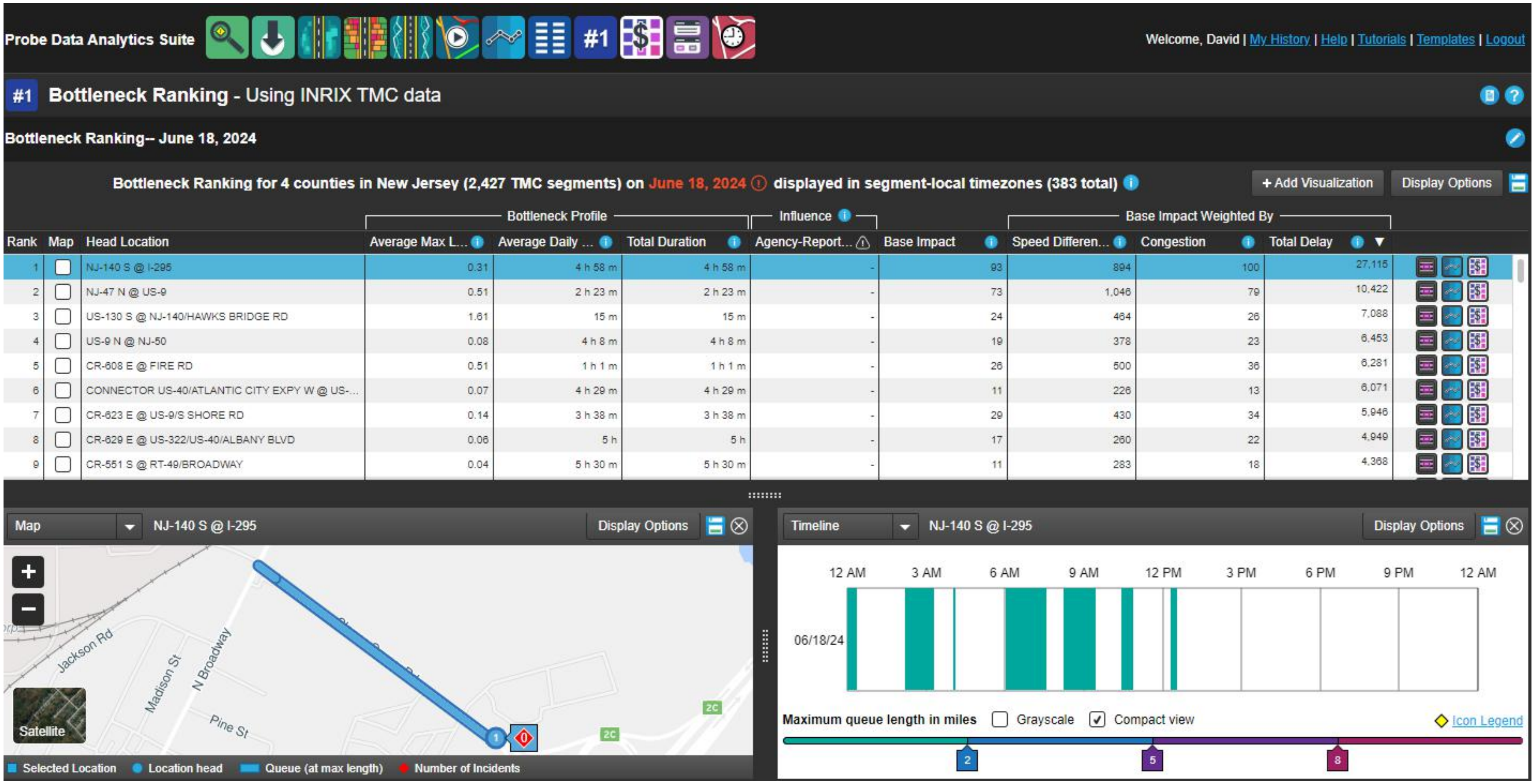
Data for the PDA Suite is collected from GPS-enabled connected devices, including smartphones and GPS units, and is compiled by three vendors: INRIX, HERE, and TomTom. Roadways are divided into segments referenced by the Traffic Message Channel (TMC) code. Urban segments are typically one-tenth to one-quarter of a mile long, and rural segments are longer. Segments usually begin and end at major intersections. Speed data reported by probe vehicles is aggregated by segment and into 1-minute time periods. This raw data may be downloaded directly as a database or analyzed using the tools provided in the PDA Suite.

Bottleneck Ranking Tool

One of the tools available in the PDA Suite is the Bottleneck Ranking tool. This tool scans the archived travel time data for all roadways in a user-defined region for which PDA coverage is available. For each bottleneck, the location, average duration, average maximum bottleneck length, and number of occurrences are reported by the bottleneck tool. Bottleneck roadway segments are then ranked according to their **total delay**. Total delay is defined as "Base Impact," defined as the sum of the queue lengths over the duration of a bottleneck, weighted by the difference between free-flow travel time and observed travel time multiplied by the average daily volume (AADT), adjusted by a day-of-the-week factor.

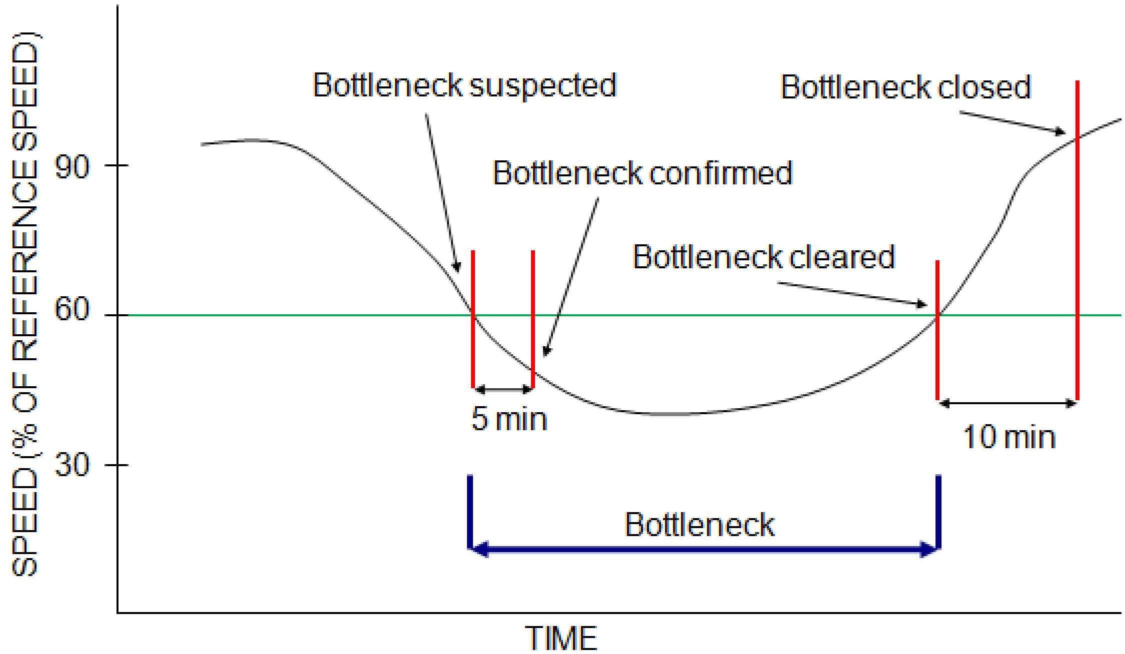
Figure 3, on the following page, is a screenshot of the bottleneck ranking tool. This list on the top shows the top-ranked bottleneck locations for the given period. In the bottom-left, the locations are mapped. In the bottom right, the times at which bottlenecks occur are plotted on a bar graph.

Figure 3: PDA Suite Bottleneck Ranking Tool



For each roadway segment, a reference speed is computed as the 85th percentile of the observed speeds for all periods, with a maximum value of 65 mph. A potential bottleneck is identified when the observed speed drops below 60 percent of the reference speed. The bottleneck is confirmed if speeds remain below 60 percent of the reference speed for more than five minutes. The bottleneck is cleared when the roadway speed is above 60 percent of the reference speed for at least 10 minutes. The duration of the bottleneck is computed as the length of time the observed speed falls below 60 percent of the reference speed. The figure below illustrates the methodology used to identify bottlenecks and their durations.

Figure 4: PDA Bottleneck Criteria



Multiple adjacent roadway segments experiencing bottleneck conditions simultaneously are joined together to determine the length of the bottleneck queue. In some cases, bottlenecks cause queues many miles in length. The PDA Suite Bottleneck Ranking tool ignores bottlenecks of less than 0.3 miles in length. The tool may display inconsistent bottleneck occurrences because bottleneck queues can merge or break into multiple pieces. According to PDA developers, the occurrence count includes only one entry for each bottlenecked location, even if the queues merge or break apart before the queue completely clears.

The PDA Suite Bottleneck Ranking tool lists all regional bottleneck occurrences in descending order of total delay.

Methodology

The PDA bottleneck ranking tool allows up to ten years of data to be analyzed. Two years of data (2022 and 2023) were selected and analyzed to evaluate congestion performance in the SJTPO region. The bottleneck ranking tool was utilized for the entire region (i.e., all four counties selected at once). As congestion in Atlantic County and Cape May County is mainly seasonal, three summer months were also selected: May 27, 2022, through September 5, 2022, and May 26, 2023, through September 4, 2023. This period includes three major holiday weekends: Memorial Day, Fourth of July, and Labor Day. All roadways for which PDA coverage was available were selected. This would include roadways under state, authority, and county and local jurisdiction. It should be noted the PDA coverage on county and local roads is not comprehensive, and the generated lists below (**Table 4** through **Table 7**) depict the top bottlenecks only on the limited set of county and local roads with coverage.

The bottleneck tool produced a list of roadway segments ranked by total delay. Total delay is first measured by computing the base impact, which is the sum of queue lengths over the duration of the bottleneck. The total delay is defined as the base impact weighted by the difference between free-flow travel time and observed travel time multiplied by the AADT, adjusted by a day-of-the-week factor. This metric ranks and compares the estimated total delay from all vehicles within the bottleneck. The tables below (**Table 4** through **Table 7**) are a data source for preliminary congestion screening and identifying roadway segments commonly overcapacity.

Table 4 through **Table 7** depict the top 100 bottlenecked locations for the SJTPO region for 2022 and 2023, as ranked by the PDA bottlenecking ranking tool. Four lists, including the Top 100 Bottleneck locations on local and county-owned roadways in the SJTPO region, are presented. Separate lists for 2022 and 2023 represent the entire calendar year. Additional lists which display the bottleneck locations in the 2022 and 2023 summer seasons are also provided. The lists are complemented by a map, visually displaying their location.

The lists were manually screened. They have also been vetted and shared with SJTPO's TAC.

Similar to the network screening lists used to identify locations with a high number of crashes, these bottleneck lists are intended to serve as an initial screening of congested locations in the SJTPO region where future congestion mitigation projects may be proposed and developed. The multiple periods also help identify the performance of congestion management overall and at specific locations over time, which can also help identify potential congestion mitigation projects. Further, as the SJTPO experiences a significant influx of traffic during the summer, it was essential to have a separate filter just for the seasonal traffic.

Table 4: 2022 Top 100 County and Local Bottleneck Locations

Rank	Road Name	Location	Total Delay	County	Municipality
2022.0009	CR-629 E	CR-629 E @ US-322/US-40/ALBANY BLVD	11,041,070	Atlantic	Atlantic City city
2022.0013	CR-613 E	CR-613 E @ US-9	8,773,562	Cape May	Lower Township
2022.0016	CR-551 S	CR-551 S @ RT-49/BROADWAY	7,450,257	Salem	Pennsville Township
2022.0018	CR-575 S	CR-575 S @ US-40/US-322	6,869,629	Atlantic	Hamilton Township, Atl
2022.0024	CR-551 S	CR-551 S @ RT-140/HAWKS BRIDGE RD	5,437,866	Salem	Carneys Point Township
2022.0025	CR-657 N	CR-657 N @ RT-47/N DELSEA DR	4,991,495	Cape May	Dennis Township
2022.0027	CR-540 E	CR-540 E @ CR-553/CENTERTON RD (ELMER) (EAST)	4,165,945	Salem	Pittsgrove Township
2022.0028	CR-575 N	CR-575 N @ US-40/US-322	4,126,983	Atlantic	Hamilton Township, Atl
2022.0033	CR-608 E	CR-608 E @ FIRE RD	3,755,747	Atlantic	Egg Harbor Township
2022.0034	CR-555 N	CR-555 N @ NJ-47/2ND ST	3,664,901	Cumberland	Millville city
2022.0050	CR-619 N	CR-619 N @ US-40/HARDING HWY	2,846,272	Atlantic	Buena Vista Township
2022.0051	CR-551 N	CR-551 N @ I-295/HAWKS BRIDGE RD	2,826,912	Salem	Carneys Point Township
2022.0053	CR-613 W	CR-613 W @ CR-626/SEASHORE RD	2,769,538	Cape May	Lower Township
2022.0055	CR-655 S	CR-655 S @ CR-555/S MAIN RD	2,725,824	Cumberland	Vineland city
2022.0057	CR-603 N	CR-603 N @ RT-47/S DELSEA DR	2,696,201	Cape May	Middle Township

Rank	Road Name	Location	Total Delay	County	Municipality
2022.0058	ATLANTIC AVE E	ATLANTIC AVE E @ CAPTAIN JOHN A O'DONNELL PKWY/N BOSTON AVE	2,508,270	Atlantic	Atlantic City city
2022.0061	CR-623 W	CR-623 W @ CR-619/CENTRAL AVE	2,421,063	Cape May	Ocean City city
2022.0062	CR-575 S	CR-575 S @ NJ-559 ALT/OCEAN HEIGHTS AVE	2,385,687	Atlantic	Egg Harbor Township
2022.0063	CR-618 S	CR-618 S @ CR-551/S PENNSVILLE AUBURN RD	2,361,455	Salem	Carneys Point Township
2022.0066	W PARK DR E	W PARK DR E @ CR-606/OLD DEERFIELD PIKE	2,218,072	Cumberland	Upper Deerfield Township
2022.0067	CR-613 W	CR-613 W @ CR-603/BAYSHORE RD	2,183,053	Cape May	Lower Township
2022.0069	CR-629 W	CR-629 W @ VENTNOR AVE	2,119,735	Atlantic	Ventnor City city
2022.0071	CR-626 N	CR-626 N @ US-9/SANDMAN BLVD	2,084,268	Cape May	Lower Township
2022.0076	CR-657 S	CR-657 S @ CR-619/3RD AVE	1,958,154	Cape May	Stone Harbor Borough
2022.0078	CR-651 S	CR-651 S @ ZION RD	1,931,626	Atlantic	Egg Harbor Township
2022.0079	CR-601 W	CR-601 W @ US-9	1,928,616	Cape May	Middle Township
2022.0082	PETERSBURG RD S	PETERSBURG RD S @ RT-47/DELSEA DR	1,863,302	Cape May	Dennis Township
2022.0087	CR-655 N	CR-655 N @ E SHERMAN AVE	1,779,883	Cumberland	Vineland city
2022.0088	CR-651 S	CR-651 S @ GARDEN STATE PKWY	1,771,266	Atlantic	Egg Harbor Township
2022.0089	CR-650 E	CR-650 E @ RT-49/W BROAD ST	1,766,848	Cumberland	Bridgeton city
2022.0090	CR-657 N	CR-657 N @ US-9/N MAIN ST	1,717,751	Cape May	Middle Township

Rank	Road Name	Location	Total Delay	County	Municipality
2022.0091	CR-654 W	CR-654 W @ CR-603/BAYSHORE RD	1,711,690	Cape May	Lower Township
2022.0092	CR-611 S	CR-611 S @ NJ-56	1,698,339	Cumberland	Upper Deerfield Township
2022.0093	CR-575 S	CR-575 S @ ATLANTIC CITY EXPY	1,669,147	Atlantic	Hamilton Township, Atl
2022.0097	CR-555 S	CR-555 S @ NJ-49/W MAIN ST	1,654,395	Cumberland	Millville city
2022.0098	CR-542 W	CR-542 W @ RT-54/BELLEVUE AVE	1,619,578	Atlantic	Hammonton Town
2022.0099	CR-626 S	CR-626 S @ W PERRY ST	1,570,650	Cape May	West Cape May Borough
2022.0100	ATLANTIC AVE W	ATLANTIC AVE W @ CAPTAIN JOHN A O'DONNELL PKWY/N BOSTON AVE	1,561,809	Atlantic	Atlantic City city
2022.0102	CR-625 S	CR-625 S @ CR-619/LANDIS AVE	1,552,651	Cape May	Sea Isle City city
2022.0107	CR-619 N	CR-619 N @ CR-625/JOHN F KENNEDY BLVD	1,499,357	Cape May	Sea Isle City city
2022.0108	CR-563 S	CR-563 S @ DELILAH RD/AMELIA EARHART BLVD	1,498,707	Atlantic	Egg Harbor Township
2022.0112	CR-654 E	CR-654 E @ RT-47	1,456,151	Cape May	Middle Township
2022.0113	CR-552 E	CR-552 E @ US-40/HARDING HWY	1,450,610	Atlantic	Hamilton Township, Atl
2022.0123	W PERRY ST W	W PERRY ST W @ CR-626/BROADWAY	1,352,014	Cape May	West Cape May Borough
2022.0124	CR-563 S	CR-563 S @ FIRE RD	1,343,493	Atlantic	Egg Harbor Township
2022.0126	CR-623 E	CR-623 E @ CR-619/CENTRAL AVE	1,335,399	Cape May	Ocean City city
2022.0127	CR-657 S	CR-657 S @ GARDEN STATE PKWY	1,328,624	Cape May	Middle Township

Rank	Road Name	Location	Total Delay	County	Municipality
2022.0128	CR-575 S	CR-575 S @ CR-559/MAYS LANDING-SOMERS POINT RD	1,314,459	Atlantic	Egg Harbor Township
2022.0132	CR-651 N	CR-651 N @ US-30/WHITE HORSE PIKE	1,255,366	Atlantic	Absecon city
2022.0136	CR-651 N	CR-651 N @ NJ-559 ALT/OCEAN HEIGHTS AVE	1,215,560	Atlantic	Egg Harbor Township
2022.0146	CR-606 S	CR-606 S @ RT-49/W BROAD ST	1,077,524	Cumberland	Bridgeton city
2022.0148	CR-603 S	CR-603 S @ US-9/SANDMAN BLVD	1,063,507	Cape May	Lower Township
2022.0149	CR-659 W	CR-659 W @ RT-77/N PEARL ST	1,050,700	Cumberland	Bridgeton city
2022.0150	CR-619 S	CR-619 S @ LINCOLN AVE	1,050,519	Atlantic	Buena Vista Township
2022.0152	CR-618 N	CR-618 N @ RT-47/S DELSEA DR	1,045,300	Cape May	Middle Township
2022.0153	CR-619 S	CR-619 S @ US-40/HARDING HWY	1,042,597	Atlantic	Buena Vista Township
2022.0157	CR-625 N	CR-625 N @ US-9/N ROUTE 9/SHORE RD	1,000,213	Cape May	Dennis Township
2022.0158	CR-552 W	CR-552 W @ US-40/HARDING HWY	1,000,190	Atlantic	Hamilton Township, Atl
2022.0168	CR-555 S	CR-555 S @ NJ-47/2ND ST	954,713	Cumberland	Millville city
2022.0170	CR-575 N	CR-575 N @ US-40/US-322/BLACK HORSE PIKE	939,399	Atlantic	Egg Harbor Township
2022.0172	CR-575 N	CR-575 N @ US-30/W WHITE HORSE PIKE	937,333	Atlantic	Galloway Township
2022.0176	CR-655 S	CR-655 S @ E SHERMAN AVE	861,574	Cumberland	Vineland city
2022.0177	CR-550 S	CR-550 S @ US-9/SHORE RD	854,506	Cape May	Dennis Township
2022.0185	CR-608 S	CR-608 S @ RT-49/W MAIN ST	817,896	Cumberland	Millville city

Rank	Road Name	Location	Total Delay	County	Municipality
2022.0186	CR-651 N	CR-651 N @ GARDEN STATE PKWY	813,437	Atlantic	Egg Harbor Township
2022.0195	CR-631 W	CR-631 W @ RT-50	773,453	Cape May	Upper Township
2022.0198	CR-651 N	CR-651 N @ DELILAH RD	770,772	Atlantic	Egg Harbor Township
2022.0199	CR-629 W	CR-629 W @ US-322/US-40/ALBANY BLVD	770,289	Atlantic	Atlantic City city
2022.0200	CR-623 E	CR-623 E @ GARDEN STATE PKWY	769,922	Cape May	Upper Township
2022.0201	CR-623 E	CR-623 E @ BAY AVE	765,082	Cape May	Ocean City city
2022.0204	CR-536 N	CR-536 N @ US-206/TRENTON RD	759,079	Atlantic	Hammonton Town
2022.0208	CR-670 E	CR-670 E @ RT-47/DELSEA DR	748,599	Cumberland	Maurice River Township
2022.0210	CR-626 S	CR-626 S @ US-9/SANDMAN BLVD	737,643	Cape May	Lower Township
2022.0211	CR-561-SPUR N	CR-561-SPUR N @ 8TH ST	729,728	Atlantic	Folsom Borough
2022.0214	CR-561 W	CR-561 W @ FRANCIS ST	701,085	Atlantic	Hammonton Town
2022.0218	CR-575 S	CR-575 S @ ZION RD	691,654	Atlantic	Egg Harbor Township
2022.0220	CR-563 N	CR-563 N @ US-40/US-322/BLACK HORSE PIKE (EGG HARBOR TOWNSHIP) (SOUTH)	682,183	Atlantic	Egg Harbor Township
2022.0222	CR-551 N	CR-551 N @ CR-646/POINTER'S AUBURN RD	663,930	Salem	Oldmans Township
2022.0224	CR-638 W	CR-638 W @ BAYSHORE AVE	646,066	Atlantic	Brigantine city
2022.0232	CR-651 S	CR-651 S @ TILTON RD	624,628	Atlantic	Egg Harbor Township
2022.0234	CR-608 N	CR-608 N @ RT-49/W MAIN ST	623,268	Cumberland	Millville city

Rank	Road Name	Location	Total Delay	County	Municipality
2022.0235	CR-585 N	CR-585 N @ NJ-52/MACARTHUR BLVD	616,268	Atlantic	Somers Point city
2022.0236	HARVARD RD N	HARVARD RD N @ RIVIERA DR	614,545	Salem	Pennsville Township
2022.0238	CR-623 W	CR-623 W @ GARDEN STATE PKWY	606,097	Cape May	Upper Township
2022.0240	CR-542 E	CR-542 E @ RT-54/BELLEVUE AVE	603,599	Atlantic	Hammonton Town
2022.0242	CR-659 E	CR-659 E @ RT-77/N PEARL ST	595,311	Cumberland	Bridgeton city
2022.0246	CR-638 N	CR-638 N @ RT-49/E COMMERCE ST	583,051	Cumberland	Bridgeton city
2022.0250	CR-665 N	CR-665 N @ RT-49/E BROADWAY	569,331	Salem	Salem city
2022.0251	PENNSVILLE AUBURN RD W	PENNSVILLE AUBURN RD W @ NJ-49/N BROADWAY	568,296	Salem	Pennsville Township
2022.0252	CR-575 N	CR-575 N @ GARDEN STATE PKWY	565,802	Atlantic	Galloway Township
2022.0253	CR-623 E	CR-623 E @ US-9/S SHORE RD	556,985	Cape May	Upper Township
2022.0254	CR-651 N	CR-651 N @ MILL RD	556,602	Atlantic	Egg Harbor Township
2022.0257	CR-552-SPUR E	CR-552-SPUR E @ CR-555/N 3RD ST	549,146	Cumberland	Millville city
2022.0259	CR-623 E	CR-623 E @ CENTRAL AVE	547,472	Cape May	Ocean City city
2022.0261	CR-585 S	CR-585 S @ NJ-52/MACARTHUR BLVD	544,565	Atlantic	Somers Point city
2022.0262	CR-651 N	CR-651 N @ US-40/US-322/BLACK HORSE PIKE	541,071	Atlantic	Egg Harbor Township
2022.0266	CR-651 S	CR-651 S @ US-40/US-322/BLACK HORSE PIKE	534,353	Atlantic	Egg Harbor Township

Rank	Road Name	Location	Total Delay	County	Municipality
2022.0267	CR-619 S	CR-619 S @ RT-147/N WILDWOOD BLVD	529,818	Cape May	Middle Township
2022.0268	CR-552 W	CR-552 W @ RT-77/N PEARL ST	528,858	Cumberland	Bridgeton city
2022.0269	CR-553 N	CR-553 N @ US-40/MALAGA RD/HARDING HWY	523,862	Salem	Upper Pittsgrove Township

Table 5: 2022 Top 100 County and Local Bottleneck Locations (Summer)

Rank	Road Name	Location	Total Delay	County	Municipality
2022.0012	CR-629 E	CR-629 E @ US-322/US-40/ALBANY BLVD	2,864,661	Atlantic	Atlantic City city
2022.0017	CR-613 E	CR-613 E @ US-9	2,380,638	Cape May	Lower Township
2022.0022	CR-551 S	CR-551 S @ RT-49/BROADWAY	1,915,082	Salem	Pennsville Township
2022.0024	CR-551 S	CR-551 S @ RT-140/HAWKS BRIDGE RD	1,693,777	Salem	Carneys Point Township
2022.0028	CR-657 N	CR-657 N @ RT-47/N DELSEA DR	1,470,328	Cape May	Dennis Township
2022.0030	CR-575 S	CR-575 S @ US-40/US-322	1,429,666	Atlantic	Hamilton Township, Atl
2022.0037	CR-629 W	CR-629 W @ VENTNOR AVE	1,182,619	Atlantic	Ventnor City city
2022.0044	CR-625 S	CR-625 S @ CR-619/LANDIS AVE	1,115,363	Cape May	Sea Isle City city
2022.0049	CR-540 E	CR-540 E @ CR-553/CENTERTON RD (ELMER) (EAST)	1,001,665	Salem	Pittsgrove Township
2022.0053	CR-619 N	CR-619 N @ CR-625/JOHN F KENNEDY BLVD	958,623	Cape May	Sea Isle City city
2022.0056	CR-626 N	CR-626 N @ US-9/SANDMAN BLVD	878,313	Cape May	Lower Township
2022.0057	CR-613 W	CR-613 W @ CR-626/SEASHORE RD	860,688	Cape May	Lower Township
2022.0062	CR-623 W	CR-623 W @ CR-619/CENTRAL AVE	816,166	Cape May	Ocean City city
2022.0064	CR-618 S	CR-618 S @ CR-551/S PENNSVILLE AUBURN RD	799,048	Salem	Carneys Point Township

Rank	Road Name	Location	Total Delay	County	Municipality
2022.0067	CR-657 S	CR-657 S @ CR-619/3RD AVE	749,380	Cape May	Stone Harbor Borough
2022.0068	W PERRY ST W	W PERRY ST W @ CR-626/BROADWAY	747,599	Cape May	West Cape May Borough
2022.0069	CR-603 N	CR-603 N @ RT-47/S DELSEA DR	746,526	Cape May	Middle Township
2022.0073	CR-551 N	CR-551 N @ I-295/HAWKS BRIDGE RD	727,594	Salem	Carneys Point Township
2022.0074	CR-613 W	CR-613 W @ CR-603/BAYSHORE RD	720,485	Cape May	Lower Township
2022.0075	CR-619 N	CR-619 N @ US-40/HARDING HWY	717,113	Atlantic	Buena Vista Township
2022.0077	CR-601 W	CR-601 W @ US-9	709,528	Cape May	Middle Township
2022.0081	CR-575 N	CR-575 N @ US-40/US-322	650,228	Atlantic	Hamilton Township, Atl
2022.0082	CR-623 E	CR-623 E @ GARDEN STATE PKWY	633,579	Cape May	Upper Township
2022.0087	CR-655 S	CR-655 S @ CR-555/S MAIN RD	618,765	Cumberland	Vineland city
2022.0088	ATLANTIC AVE E	ATLANTIC AVE E @ CAPTAIN JOHN A O'DONNELL PKWY/N BOSTON AVE	614,942	Atlantic	Atlantic City city
2022.0090	CR-626 S	CR-626 S @ W PERRY ST	610,804	Cape May	West Cape May Borough
2022.0095	CR-657 N	CR-657 N @ US-9/N MAIN ST	568,777	Cape May	Middle Township
2022.0099	PETERSBURG RD S	PETERSBURG RD S @ RT-47/DELSEA DR	548,239	Cape May	Dennis Township
2022.0101	CR-555 N	CR-555 N @ NJ-47/2ND ST	532,325	Cumberland	Millville city
2022.0102	W PARK DR E	W PARK DR E @ CR-606/OLD DEERFIELD PIKE	531,382	Cumberland	Upper Deerfield Township

Rank	Road Name	Location	Total Delay	County	Municipality
2022.0104	CR-608 E	CR-608 E @ FIRE RD	516,960	Atlantic	Egg Harbor Township
2022.0106	CR-623 E	CR-623 E @ CR-619/CENTRAL AVE	496,760	Cape May	Ocean City city
2022.0112	CR-650 E	CR-650 E @ RT-49/W BROAD ST	470,049	Cumberland	Bridgeton city
2022.0113	CR-623 E	CR-623 E @ CENTRAL AVE	458,146	Cape May	Ocean City city
2022.0118	CR-638 W	CR-638 W @ BAYSHORE AVE	442,208	Atlantic	Brigantine city
2022.0120	CR-651 S	CR-651 S @ GARDEN STATE PKWY	425,020	Atlantic	Egg Harbor Township
2022.0123	CR-550 S	CR-550 S @ US-9/SHORE RD	410,626	Cape May	Dennis Township
2022.0126	CR-651 N	CR-651 N @ NJ-559 ALT/OCEAN HEIGHTS AVE	396,036	Atlantic	Egg Harbor Township
2022.0128	ATLANTIC AVE W	ATLANTIC AVE W @ S ALBANY AVE	394,764	Atlantic	Atlantic City city
2022.0130	CR-542 W	CR-542 W @ RT-54/BELLEVUE AVE	384,118	Atlantic	Hammonton Town
2022.0134	CR-552 E	CR-552 E @ US-40/HARDING HWY	374,651	Atlantic	Hamilton Township, Atl
2022.0137	CR-623 E	CR-623 E @ BAY AVE	368,370	Cape May	Ocean City city
2022.0138	CR-611 S	CR-611 S @ NJ-56	357,979	Cumberland	Upper Deerfield Township
2022.0139	CR-563 S	CR-563 S @ FIRE RD	357,409	Atlantic	Egg Harbor Township
2022.0140	CR-654 W	CR-654 W @ CR-603/BAYSHORE RD	353,393	Cape May	Lower Township
2022.0142	CR-651 S	CR-651 S @ ZION RD	351,108	Atlantic	Egg Harbor Township
2022.0150	CR-618 N	CR-618 N @ RT-47/S DELSEA DR	305,884	Cape May	Middle Township

Rank	Road Name	Location	Total Delay	County	Municipality
2022.0151	CR-575 S	CR-575 S @ CR-559/MAYS LANDING-SOMERS POINT RD	301,442	Atlantic	Egg Harbor Township
2022.0152	CR-575 N	CR-575 N @ US-9/NEW YORK RD	296,812	Atlantic	Port Republic city
2022.0155	CR-606 S	CR-606 S @ RT-49/W BROAD ST	296,059	Cumberland	Bridgeton city
2022.0159	CR-659 W	CR-659 W @ RT-77/N PEARL ST	289,707	Cumberland	Bridgeton city
2022.0160	CR-540 E	CR-540 E @ US-40/HARDING HWY	288,295	Atlantic	Buena Vista Township
2022.0161	CR-619 S	CR-619 S @ US-40/HARDING HWY	281,212	Atlantic	Buena Vista Township
2022.0164	CR-638 E	CR-638 E @ W BRIGANTINE AVE	276,068	Atlantic	Brigantine city
2022.0167	CR-655 S	CR-655 S @ E SHERMAN AVE	270,816	Cumberland	Vineland city
2022.0170	CR-555 S	CR-555 S @ NJ-49/W MAIN ST	267,754	Cumberland	Millville city
2022.0172	CR-563 S	CR-563 S @ DELILAH RD/AMELIA EARHART BLVD	263,552	Atlantic	Egg Harbor Township
2022.0173	CR-654 E	CR-654 E @ RT-47	262,177	Cape May	Middle Township
2022.0174	CR-657 S	CR-657 S @ GARDEN STATE PKWY	260,493	Cape May	Middle Township
2022.0175	CR-619 S	CR-619 S @ LINCOLN AVE	260,204	Atlantic	Buena Vista Township
2022.0178	CR-552 W	CR-552 W @ US-40/HARDING HWY	249,911	Atlantic	Hamilton Township, Atl
2022.0180	CR-623 W	CR-623 W @ GARDEN STATE PKWY	245,975	Cape May	Upper Township
2022.0181	CR-619 S	CR-619 S @ CR-601/AVALON BLVD	243,358	Cape May	Avalon Borough

Rank	Road Name	Location	Total Delay	County	Municipality
2022.0188	CR-585 N	CR-585 N @ NJ-52/MACARTHUR BLVD	232,520	Atlantic	Somers Point city
2022.0190	HARVARD RD N	HARVARD RD N @ RIVIERA DR	231,604	Salem	Pennsville Township
2022.0191	CR-629 W	CR-629 W @ US-322/US-40/ALBANY BLVD	229,462	Atlantic	Atlantic City city
2022.0193	CR-623 E	CR-623 E @ US-9/S SHORE RD	226,873	Cape May	Upper Township
2022.0194	CR-555 S	CR-555 S @ NJ-47/2ND ST	226,260	Cumberland	Millville city
2022.0200	CR-552 E	CR-552 E @ NJ-47/S DELSEA DR	211,143	Cumberland	Vineland city
2022.0203	CR-536 N	CR-536 N @ US-206/TRENTON RD	206,190	Atlantic	Hammonton Town
2022.0208	CR-625 N	CR-625 N @ US-9/N ROUTE 9/SHORE RD	192,450	Cape May	Dennis Township
2022.0210	CR-670 E	CR-670 E @ RT-47/DELSEA DR	190,228	Cumberland	Maurice River Township
2022.0213	CR-630 N	CR-630 N @ NJ-49/S BROADWAY	186,599	Salem	Pennsville Township
2022.0217	CR-608 S	CR-608 S @ RT-49/W MAIN ST	176,732	Cumberland	Millville city
2022.0218	CR-670 N	CR-670 N @ RT-49/E BROAD ST	175,824	Cumberland	Bridgeton city
2022.0219	W PERRY ST E	W PERRY ST E @ MYRTLE AVE	175,330	Cape May	Cape May city
2022.0220	CR-619 S	CR-619 S @ RT-147/N WILDWOOD BLVD	170,788	Cape May	Middle Township
2022.0221	CR-626 S	CR-626 S @ US-9/SANDMAN BLVD	170,173	Cape May	Lower Township
2022.0222	CR-561 W	CR-561 W @ FRANCIS ST	169,535	Atlantic	Hammonton Town
2022.0224	CR-552-SPUR E	CR-552-SPUR E @ CR-555/N 3RD ST	167,806	Cumberland	Millville city

Rank	Road Name	Location	Total Delay	County	Municipality
2022.0225	CR-651 N	CR-651 N @ DELILAH RD	165,365	Atlantic	Egg Harbor Township
2022.0227	CR-575 N	CR-575 N @ US-40/US-322/BLACK HORSE PIKE	165,159	Atlantic	Egg Harbor Township
2022.0235	CR-659 E	CR-659 E @ RT-77/N PEARL ST	154,914	Cumberland	Bridgeton city
2022.0237	CR-638 E	CR-638 E @ BAYSHORE AVE	153,532	Atlantic	Brigantine city
2022.0239	CR-551 N	CR-551 N @ RT-49/BROADWAY	153,373	Salem	Pennsville Township
2022.0240	ATLANTIC AVE W	ATLANTIC AVE W @ CAPTAIN JOHN A O'DONNELL PKWY/N BOSTON AVE	152,897	Atlantic	Atlantic City city
2022.0241	CR-542 E	CR-542 E @ RT-54/BELLEVUE AVE	151,741	Atlantic	Hammonton Town
2022.0242	CR-626 N	CR-626 N @ W PERRY ST	151,073	Cape May	West Cape May Borough
2022.0243	CR-625 S	CR-625 S @ US-9/N ROUTE 9/SHORE RD	149,847	Cape May	Dennis Township
2022.0245	CR-655 N	CR-655 N @ E SHERMAN AVE	145,976	Cumberland	Vineland city
2022.0246	CR-550 W	CR-550 W @ RT-47/DELSEA DR	145,349	Cumberland	Maurice River Township
2022.0247	CR-626 N	CR-626 N @ BRIDGE RD/SEASHORE BRIDGE RD	143,725	Cape May	Lower Township
2022.0248	CHRISTOPHER COLUMBUS BLVD S	CHRISTOPHER COLUMBUS BLVD S @ ATLANTIC AVE	142,562	Atlantic	Atlantic City city
2022.0251	CR-651 S	CR-651 S @ TILTON RD	140,186	Atlantic	Egg Harbor Township
2022.0252	CR-552 W	CR-552 W @ RT-77/N PEARL ST	138,777	Cumberland	Bridgeton city
2022.0253	CR-631 W	CR-631 W @ RT-50	138,503	Cape May	Upper Township

Rank	Road Name	Location	Total Delay	County	Municipality
2022.0259	CR-651 N	CR-651 N @ US-40/US-322/BLACK HORSE PIKE	133,124	Atlantic	Egg Harbor Township
2022.0260	CR-552-SPUR W	CR-552-SPUR W @ CR-555/N 3RD ST	131,009	Cumberland	Millville city
2022.0262	CR-563 N	CR-563 N @ US-40/US-322/UIBEL AVE	129,996	Atlantic	Egg Harbor Township
2022.0263	PENNSVILLE AUBURN RD W	PENNSVILLE AUBURN RD W @ NJ-49/N BROADWAY	129,946	Salem	Pennsville Township

Table 6: 2023 Top 100 County and Local Bottleneck Locations

Rank	Road Name	Location	Total Delay	County	Municipality
2023.0011	CR-629 E	CR-629 E @ US-322/US-40/ALBANY BLVD	7,401,271	Atlantic	Atlantic City city
2023.0013	CR-613 E	CR-613 E @ US-9	6,587,376	Cape May	Lower Township
2023.0016	CR-575 N	CR-575 N @ US-40/US-322	6,065,696	Atlantic	Hamilton Township, Atl
2023.0017	CR-551 S	CR-551 S @ RT-49/BROADWAY	5,728,486	Salem	Pennsville Township
2023.0027	CR-575 S	CR-575 S @ US-40/US-322	3,972,335	Atlantic	Hamilton Township, Atl
2023.0029	CR-608 E	CR-608 E @ FIRE RD	3,839,839	Atlantic	Egg Harbor Township
2023.0037	CR-657 N	CR-657 N @ RT-47/N DELSEA DR	2,749,697	Cape May	Dennis Township
2023.0038	CR-540 E	CR-540 E @ CR-553/CENTERTON RD (ELMER) (EAST)	2,659,151	Salem	Pittsgrove Township
2023.0040	CR-651 S	CR-651 S @ GARDEN STATE PKWY	2,649,771	Atlantic	Egg Harbor Township
2023.0041	CR-551 S	CR-551 S @ RT-140/HAWKS BRIDGE RD	2,607,773	Salem	Carneys Point Township
2023.0045	CR-551 N	CR-551 N @ I-295/HAWKS BRIDGE RD	2,353,339	Salem	Carneys Point Township
2023.0046	W PARK DR E	W PARK DR E @ CR-606/OLD DEERFIELD PIKE	2,257,008	Cumberland	Upper Deerfield Township
2023.0054	CR-613 W	CR-613 W @ CR-626/SEASHORE RD	2,149,220	Cape May	Lower Township
2023.0056	ATLANTIC AVE E	ATLANTIC AVE E @ CAPTAIN JOHN A O'DONNELL PKWY/N BOSTON AVE	2,111,185	Atlantic	Atlantic City city

Rank	Road Name	Location	Total Delay	County	Municipality
2023.0058	CR-555 N	CR-555 N @ NJ-47/2ND ST	2,060,416	Cumberland	Millville city
2023.0059	CR-619 N	CR-619 N @ US-40/HARDING HWY	2,044,102	Atlantic	Buena Vista Township
2023.0065	CR-603 N	CR-603 N @ RT-47/S DELSEA DR	1,828,961	Cape May	Middle Township
2023.0066	CR-659 W	CR-659 W @ RT-77/N PEARL ST	1,821,986	Cumberland	Bridgeton city
2023.0073	CR-655 S	CR-655 S @ CR-555/S MAIN RD	1,748,326	Cumberland	Vineland city
2023.0075	CR-623 W	CR-623 W @ CR-619/CENTRAL AVE	1,666,555	Cape May	Ocean City city
2023.0077	CR-651 N	CR-651 N @ DELILAH RD	1,654,684	Atlantic	Egg Harbor Township
2023.0084	CR-626 N	CR-626 N @ US-9/SANDMAN BLVD	1,592,975	Cape May	Lower Township
2023.0085	CR-650 E	CR-650 E @ RT-49/W BROAD ST	1,567,915	Cumberland	Bridgeton city
2023.0086	CR-601 W	CR-601 W @ US-9	1,537,833	Cape May	Middle Township
2023.0087	CR-623 E	CR-623 E @ CR-619/CENTRAL AVE	1,499,627	Cape May	Ocean City city
2023.0090	CR-651 N	CR-651 N @ US-30/WHITE HORSE PIKE	1,452,624	Atlantic	Absecon city
2023.0092	CR-623 E	CR-623 E @ GARDEN STATE PKWY	1,420,098	Cape May	Upper Township
2023.0093	CR-651 S	CR-651 S @ TILTON RD	1,357,410	Atlantic	Egg Harbor Township
2023.0097	CR-563 S	CR-563 S @ FIRE RD	1,313,431	Atlantic	Egg Harbor Township
2023.0098	CR-613 W	CR-613 W @ CR-603/BAYSHORE RD	1,272,572	Cape May	Lower Township
2023.0099	CR-563 S	CR-563 S @ MILL RD	1,265,256	Atlantic	Northfield city

Rank	Road Name	Location	Total Delay	County	Municipality
2023.0103	ATLANTIC AVE W	ATLANTIC AVE W @ CAPTAIN JOHN A O'DONNELL PKWY/N BOSTON AVE	1,232,057	Atlantic	Atlantic City city
2023.0105	CR-611 S	CR-611 S @ NJ-56	1,204,451	Cumberland	Upper Deerfield Township
2023.0106	CR-657 S	CR-657 S @ CR-619/3RD AVE	1,198,693	Cape May	Stone Harbor Borough
2023.0109	CR-654 W	CR-654 W @ CR-603/BAYSHORE RD	1,171,480	Cape May	Lower Township
2023.0110	CR-626 S	CR-626 S @ W PERRY ST	1,167,246	Cape May	West Cape May Borough
2023.0114	CR-555 S	CR-555 S @ NJ-49/W MAIN ST	1,118,231	Cumberland	Millville city
2023.0119	CR-626 S	CR-626 S @ US-9/SANDMAN BLVD	1,075,357	Cape May	Lower Township
2023.0123	CR-625 N	CR-625 N @ US-9/N ROUTE 9/SHORE RD	1,046,248	Cape May	Dennis Township
2023.0125	CR-657 N	CR-657 N @ US-9/N MAIN ST	1,036,638	Cape May	Middle Township
2023.0126	CR-625 S	CR-625 S @ CR-619/LANDIS AVE	1,028,448	Cape May	Sea Isle City city
2023.0127	PETERSBURG RD S	PETERSBURG RD S @ RT-47/DELSEA DR	1,025,957	Cape May	Dennis Township
2023.0128	CR-563 S	CR-563 S @ DELILAH RD/AMELIA EARHART BLVD	1,019,373	Atlantic	Egg Harbor Township
2023.0130	CR-622 W	CR-622 W @ NJ-47/DELSEA DR	1,006,933	Cumberland	Vineland city
2023.0134	CR-618 N	CR-618 N @ RT-47/S DELSEA DR	980,977	Cape May	Middle Township
2023.0137	CR-619 S	CR-619 S @ LINCOLN AVE	965,360	Atlantic	Buena Vista Township
2023.0139	CR-654 E	CR-654 E @ RT-47	949,976	Cape May	Middle Township
2023.0146	CR-553 N	CR-553 N @ CR-629/NEWPORT CENTRE GROVE RD	876,874	Cumberland	Lawrence Township, Cum
2023.0147	CR-606 S	CR-606 S @ RT-49/W BROAD ST	876,742	Cumberland	Bridgeton city

Rank	Road Name	Location	Total Delay	County	Municipality
2023.0148	CR-617 N	CR-617 N @ RT-49	868,964	Cape May	Upper Township
2023.0150	CR-542 W	CR-542 W @ RT-54/BELLEVUE AVE	849,462	Atlantic	Hammonton Town
2023.0151	CR-623 E	CR-623 E @ US-9/S SHORE RD	840,519	Cape May	Upper Township
2023.0155	CR-619 S	CR-619 S @ US-40/HARDING HWY	829,820	Atlantic	Buena Vista Township
2023.0156	CR-575 S	CR-575 S @ NJ-559 ALT/OCEAN HEIGHTS AVE	823,664	Atlantic	Egg Harbor Township
2023.0157	CR-550 S	CR-550 S @ US-9/SHORE RD	813,921	Cape May	Dennis Township
2023.0158	CR-651 S	CR-651 S @ US-40/US-322/BLACK HORSE PIKE	813,360	Atlantic	Egg Harbor Township
2023.0163	CR-555 S	CR-555 S @ NJ-47/2ND ST	793,883	Cumberland	Millville city
2023.0165	CR-563 S	CR-563 S @ US-40/US-322/BLACK HORSE PIKE (EGG HARBOR TOWNSHIP) (SOUTH)	790,908	Atlantic	Egg Harbor Township
2023.0167	CR-651 S	CR-651 S @ ZION RD	785,950	Atlantic	Egg Harbor Township
2023.0168	CR-619 N	CR-619 N @ CR-625/JOHN F KENNEDY BLVD	781,630	Cape May	Sea Isle City city
2023.0173	CR-651 N	CR-651 N @ MILL RD	737,531	Atlantic	Egg Harbor Township
2023.0178	CR-540 E	CR-540 E @ US-40/HARDING HWY	716,577	Atlantic	Buena Vista Township
2023.0181	CR-575 S	CR-575 S @ US-40/US-322/BLACK HORSE PIKE	705,676	Atlantic	Egg Harbor Township
2023.0182	CR-651 N	CR-651 N @ US-40/US-322/BLACK HORSE PIKE	684,820	Atlantic	Egg Harbor Township
2023.0183	CR-618 S	CR-618 S @ CR-551/S PENNSVILLE AUBURN RD	684,528	Salem	Carneys Point Township

Rank	Road Name	Location	Total Delay	County	Municipality
2023.0184	CR-623 W	CR-623 W @ US-9	679,081	Cape May	Upper Township
2023.0185	CR-623 E	CR-623 E @ CENTRAL AVE	675,503	Cape May	Ocean City city
2023.0189	CR-575 S	CR-575 S @ CR-559/MAYS LANDING-SOMERS POINT RD	664,661	Atlantic	Egg Harbor Township
2023.0190	CR-621 S	CR-621 S @ RT-47/W RIO GRANDE AVE	664,161	Cape May	Wildwood city
2023.0193	CR-536 N	CR-536 N @ US-206/TRENTON RD	657,005	Atlantic	Hammonton Town
2023.0195	CR-608 S	CR-608 S @ RT-49/W MAIN ST	645,077	Cumberland	Millville city
2023.0196	CR-670 E	CR-670 E @ RT-47/DELSEA DR	640,011	Cumberland	Maurice River Township
2023.0202	CR-630 N	CR-630 N @ NJ-49/S BROADWAY	617,085	Salem	Pennsville Township
2023.0203	CR-670 N	CR-670 N @ RT-49/E BROAD ST	613,793	Cumberland	Bridgeton city
2023.0206	CR-623 E	CR-623 E @ BAY AVE	602,048	Cape May	Ocean City city
2023.0207	CR-551 N	CR-551 N @ CR-646/POINTER'S AUBURN RD	598,087	Salem	Oldmans Township
2023.0209	CR-561-SPUR N	CR-561-SPUR N @ 8TH ST	568,926	Atlantic	Folsom Borough
2023.0210	CR-563 N	CR-563 N @ US-40/US-322/BLACK HORSE PIKE (EGG HARBOR TOWNSHIP) (SOUTH)	555,305	Atlantic	Egg Harbor Township
2023.0211	CR-575 N	CR-575 N @ US-40/US-322/BLACK HORSE PIKE	555,123	Atlantic	Egg Harbor Township
2023.0214	CR-638 N	CR-638 N @ RT-49/E COMMERCE ST	549,838	Cumberland	Bridgeton city
2023.0220	CR-555 S	CR-555 S @ CR-553/MAIN ST	528,709	Cumberland	Downe Township
2023.0226	CR-625 S	CR-625 S @ US-9/N ROUTE 9/SHORE RD	496,445	Cape May	Dennis Township

Rank	Road Name	Location	Total Delay	County	Municipality
2023.0227	PENNSVILLE AUBURN RD W	PENNSVILLE AUBURN RD W @ NJ-49/N BROADWAY	488,896	Salem	Pennsville Township
2023.0228	CR-623 W	CR-623 W @ GARDEN STATE PKWY	488,446	Cape May	Upper Township
2023.0231	CR-626 S	CR-626 S @ RT-47	468,359	Cape May	Middle Township
2023.0232	HARVARD RD N	HARVARD RD N @ RIVIERA DR	466,941	Salem	Pennsville Township
2023.0238	CR-631 W	CR-631 W @ RT-50	445,456	Cape May	Upper Township
2023.0240	CR-563 S	CR-563 S @ US-40/US-322/BLACK HORSE PIKE (EGG HARBOR TOWNSHIP) (NORTH)	432,676	Atlantic	Egg Harbor Township
2023.0242	CR-629 W	CR-629 W @ VENTNOR AVE	430,087	Atlantic	Ventnor City city
2023.0243	CR-563 N	CR-563 N @ DELILAH RD/AMELIA EARHART BLVD	429,962	Atlantic	Egg Harbor Township
2023.0244	CR-618 S	CR-618 S @ US-9	428,272	Cape May	Middle Township
2023.0249	CR-619 S	CR-619 S @ RT-147/N WILDWOOD BLVD	421,772	Cape May	Middle Township
2023.0250	CR-540 W	CR-540 W @ CR-553/CENTERTON RD (ELMER) (WEST)	421,651	Salem	Pittsgrove Township
2023.0252	N DR MARTIN LUTHER KING BLVD N	N DR MARTIN LUTHER KING BLVD N @ US-30/ABSECON BLVD	417,796	Atlantic	Atlantic City city
2023.0253	CR-622 E	CR-622 E @ CR-615/WEST BLVD/EAST BLVD	416,348	Cumberland	Vineland city
2023.0254	CR-552-SPUR E	CR-552-SPUR E @ CR-555/N 3RD ST	414,962	Cumberland	Millville city
2023.0258	EGG HARBOR RD E	EGG HARBOR RD E @ US-30/S WHITE HORSE PIKE	396,310	Atlantic	Hammonton Town

Rank	Road Name	Location	Total Delay	County	Municipality
2023.0266	CR-561 W	CR-561 W @ FRANCIS ST	388,418	Atlantic	Hammonton Town
2023.0268	CR-650 W	CR-650 W @ RT-49/W BROAD ST	387,351	Cumberland	Bridgeton city
2023.0273	CR-552 W	CR-552 W @ RT-77/N PEARL ST	374,151	Cumberland	Bridgeton city

Table 7: 2023 Local and County Bottleneck Locations (Summer)

Rank	Road Name	Location	Total Delay	County	Municipality
2023.0016	CR-575 N	CR-575 N @ US-40/US-322	2,139,171	Atlantic	Hamilton Township, Atl
2023.0018	CR-629 E	CR-629 E @ US-322/US-40/ALBANY BLVD	1,991,994	Atlantic	Atlantic City city
2023.0027	CR-613 E	CR-613 E @ US-9	1,544,234	Cape May	Lower Township
2023.0036	CR-657 N	CR-657 N @ RT-47/N DELSEA DR	1,115,522	Cape May	Dennis Township
2023.0038	CR-623 E	CR-623 E @ GARDEN STATE PKWY	1,067,842	Cape May	Upper Township
2023.0039	CR-551 S	CR-551 S @ RT-49/BROADWAY	1,026,031	Salem	Pennsville Township
2023.0043	CR-651 S	CR-651 S @ GARDEN STATE PKWY	989,615	Atlantic	Egg Harbor Township
2023.0052	CR-625 S	CR-625 S @ CR-619/LANDIS AVE	805,003	Cape May	Sea Isle City city
2023.0057	CR-563 S	CR-563 S @ MILL RD	777,187	Atlantic	Northfield city
2023.0063	CR-608 E	CR-608 E @ FIRE RD	733,162	Atlantic	Egg Harbor Township
2023.0064	CR-651 N	CR-651 N @ DELILAH RD	725,965	Atlantic	Egg Harbor Township
2023.0068	CR-551 N	CR-551 N @ I-295/HAWKS BRIDGE RD	646,896	Salem	Carneys Point Township
2023.0071	CR-623 E	CR-623 E @ CENTRAL AVE	638,094	Cape May	Ocean City city
2023.0072	CR-626 N	CR-626 N @ US-9/SANDMAN BLVD	633,465	Cape May	Lower Township
2023.0073	CR-623 W	CR-623 W @ CR-619/CENTRAL AVE	629,279	Cape May	Ocean City city
2023.0076	CR-619 N	CR-619 N @ US-40/HARDING HWY	606,932	Atlantic	Buena Vista Township

Rank	Road Name	Location	Total Delay	County	Municipality
2023.0077	CR-623 E	CR-623 E @ CR-619/CENTRAL AVE	599,642	Cape May	Ocean City city
2023.0079	CR-603 N	CR-603 N @ RT-47/S DELSEA DR	584,728	Cape May	Middle Township
2023.0080	CR-659 W	CR-659 W @ RT-77/N PEARL ST	582,045	Cumberland	Bridgeton city
2023.0081	CR-613 W	CR-613 W @ CR-626/SEASHORE RD	579,815	Cape May	Lower Township
2023.0088	CR-626 S	CR-626 S @ W PERRY ST	559,608	Cape May	West Cape May Borough
2023.0089	CR-540 E	CR-540 E @ CR-553/CENTERTON RD (ELMER) (EAST)	557,155	Salem	Pittsgrove Township
2023.0090	ATLANTIC AVE E	ATLANTIC AVE E @ CAPTAIN JOHN A O'DONNELL PKWY/N BOSTON AVE	555,079	Atlantic	Atlantic City city
2023.0091	CR-651 S	CR-651 S @ TILTON RD	544,296	Atlantic	Egg Harbor Township
2023.0095	W PARK DR E	W PARK DR E @ CR-606/OLD DEERFIELD PIKE	522,378	Cumberland	Upper Deerfield Township
2023.0097	CR-623 W	CR-623 W @ US-9	493,295	Cape May	Upper Township
2023.0101	CR-657 N	CR-657 N @ US-9/N MAIN ST	477,066	Cape May	Middle Township
2023.0103	CR-563 S	CR-563 S @ FIRE RD	458,680	Atlantic	Egg Harbor Township
2023.0104	CR-651 N	CR-651 N @ US-30/WHITE HORSE PIKE	449,162	Atlantic	Absecon city
2023.0107	CR-623 E	CR-623 E @ BAY AVE	443,729	Cape May	Ocean City city
2023.0108	CR-553 N	CR-553 N @ CR-629/NEWPORT CENTRE GROVE RD	439,597	Cumberland	Lawrence Township, Cum
2023.0110	CR-623 W	CR-623 W @ GARDEN STATE PKWY	430,590	Cape May	Upper Township

Rank	Road Name	Location	Total Delay	County	Municipality
2023.0112	CR-657 S	CR-657 S @ CR-619/3RD AVE	415,713	Cape May	Stone Harbor Borough
2023.0113	CR-551 S	CR-551 S @ RT-140/HAWKS BRIDGE RD	413,126	Salem	Carneys Point Township
2023.0115	CR-550 S	CR-550 S @ US-9/SHORE RD	392,712	Cape May	Dennis Township
2023.0116	CR-622 W	CR-622 W @ NJ-47/DELSEA DR	386,463	Cumberland	Vineland city
2023.0120	CR-613 W	CR-613 W @ CR-603/BAYSHORE RD	365,000	Cape May	Lower Township
2023.0123	CR-619 N	CR-619 N @ CR-625/JOHN F KENNEDY BLVD	360,696	Cape May	Sea Isle City city
2023.0137	CR-619 S	CR-619 S @ LINCOLN AVE	318,341	Atlantic	Buena Vista Township
2023.0138	CR-651 N	CR-651 N @ US-40/US-322/BLACK HORSE PIKE	317,194	Atlantic	Egg Harbor Township
2023.0141	CR-617 N	CR-617 N @ RT-49	306,560	Cape May	Upper Township
2023.0146	CR-655 S	CR-655 S @ CR-555/S MAIN RD	298,382	Cumberland	Vineland city
2023.0152	CR-575 S	CR-575 S @ US-40/US-322/BLACK HORSE PIKE	281,841	Atlantic	Egg Harbor Township
2023.0153	CR-626 S	CR-626 S @ US-9/SANDMAN BLVD	281,362	Cape May	Lower Township
2023.0155	CR-555 S	CR-555 S @ NJ-49/W MAIN ST	278,684	Cumberland	Millville city
2023.0156	CR-629 W	CR-629 W @ VENTNOR AVE	278,194	Atlantic	Ventnor City city
2023.0158	CR-651 S	CR-651 S @ ZION RD	271,815	Atlantic	Egg Harbor Township
2023.0161	CR-555 N	CR-555 N @ NJ-47/2ND ST	263,415	Cumberland	Millville city
2023.0163	CR-654 W	CR-654 W @ CR-603/BAYSHORE RD	257,317	Cape May	Lower Township
2023.0167	CR-651 N	CR-651 N @ GARDEN STATE PKWY	248,996	Atlantic	Egg Harbor Township

Rank	Road Name	Location	Total Delay	County	Municipality
2023.0171	CR-651 S	CR-651 S @ US-40/US-322/BLACK HORSE PIKE	244,354	Atlantic	Egg Harbor Township
2023.0174	CR-618 N	CR-618 N @ RT-47/S DELSEA DR	234,940	Cape May	Middle Township
2023.0175	CR-606 S	CR-606 S @ RT-49/W BROAD ST	234,893	Cumberland	Bridgeton city
2023.0177	CR-552 E	CR-552 E @ US-40/HARDING HWY	233,559	Atlantic	Hamilton Township, Atl
2023.0183	CR-654 E	CR-654 E @ RT-47	222,511	Cape May	Middle Township
2023.0186	CR-575 S	CR-575 S @ US-40/US-322	217,385	Atlantic	Hamilton Township, Atl
2023.0190	CR-563 S	CR-563 S @ US-40/US-322/BLACK HORSE PIKE (EGG HARBOR TOWNSHIP) (SOUTH)	210,926	Atlantic	Egg Harbor Township
2023.0195	CR-650 E	CR-650 E @ RT-49/W BROAD ST	206,418	Cumberland	Bridgeton city
2023.0196	CR-563 N	CR-563 N @ US-40/US-322/BLACK HORSE PIKE (EGG HARBOR TOWNSHIP) (SOUTH)	205,503	Atlantic	Egg Harbor Township
2023.0197	CR-621 S	CR-621 S @ RT-47/W RIO GRANDE AVE	205,248	Cape May	Wildwood city
2023.0201	CR-657 S	CR-657 S @ GARDEN STATE PKWY	202,262	Cape May	Middle Township
2023.0203	CR-611 S	CR-611 S @ NJ-56	191,094	Cumberland	Upper Deerfield Township
2023.0206	CR-608 E	CR-608 E @ GARDEN STATE PKWY	185,101	Atlantic	Egg Harbor Township
2023.0214	CR-619 S	CR-619 S @ US-40/HARDING HWY	170,693	Atlantic	Buena Vista Township
2023.0217	CR-555 S	CR-555 S @ NJ-47/2ND ST	167,231	Cumberland	Millville city
2023.0219	CR-625 S	CR-625 S @ US-9/N ROUTE 9/SHORE RD	163,984	Cape May	Dennis Township

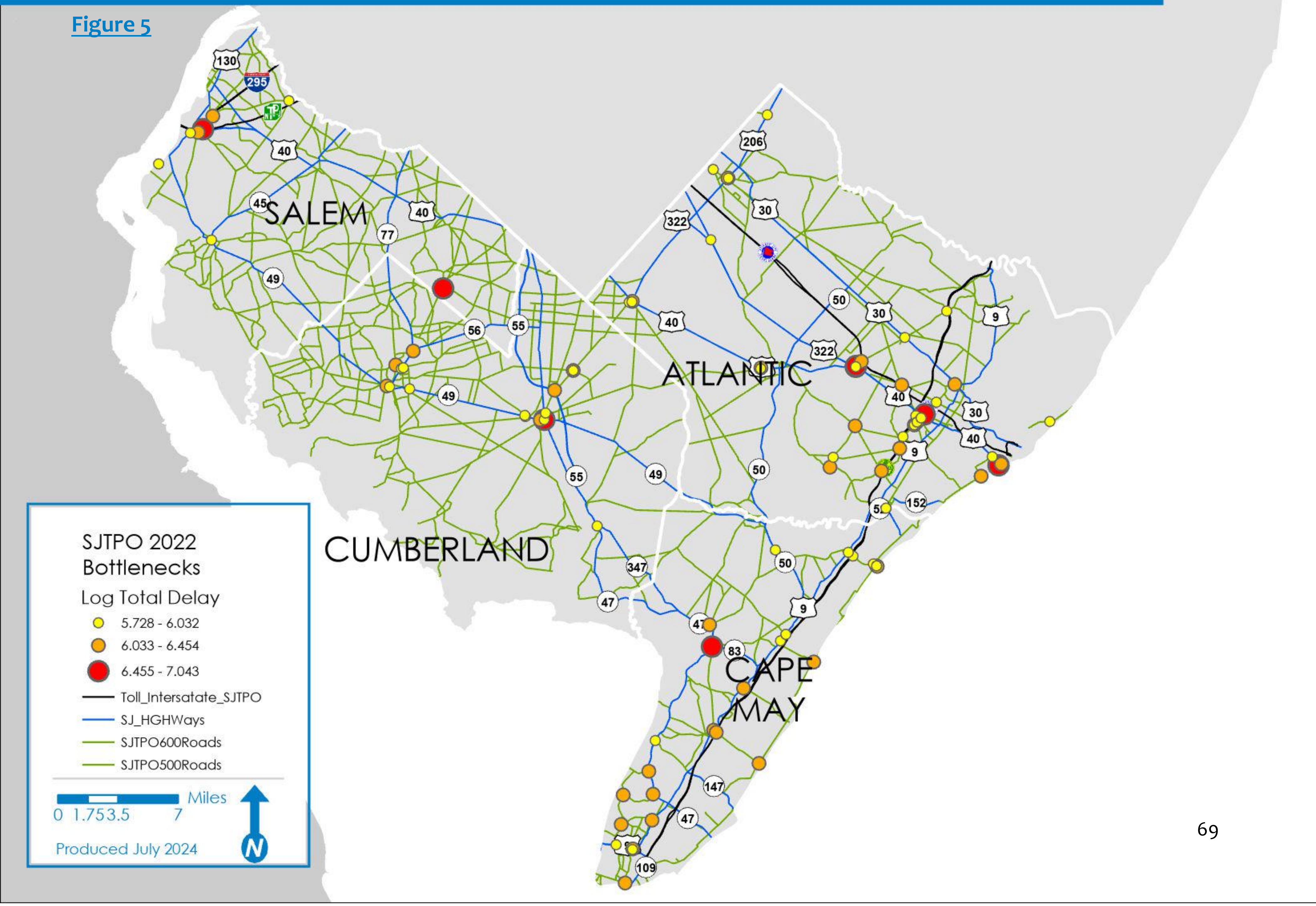
Rank	Road Name	Location	Total Delay	County	Municipality
2023.0220	N DR MARTIN LUTHER KING BLVD S	N DR MARTIN LUTHER KING BLVD S @ ATLANTIC AVE	163,893	Atlantic	Atlantic City city
2023.0221	PETERSBURG RD S	PETERSBURG RD S @ RT-47/DELSEA DR	163,692	Cape May	Dennis Township
2023.0226	CR-561-SPUR N	CR-561-SPUR N @ 8TH ST	152,850	Atlantic	Folsom Borough
2023.0228	CR-670 E	CR-670 E @ RT-47/DELSEA DR	152,026	Cumberland	Maurice River Township
2023.0229	CR-563 S	CR-563 S @ US-40/US-322/BLACK HORSE PIKE (EGG HARBOR TOWNSHIP) (NORTH)	148,953	Atlantic	Egg Harbor Township
2023.0230	CR-626 S	CR-626 S @ RT-47	148,294	Cape May	Middle Township
2023.0231	CR-651 N	CR-651 N @ US-9/CR-634/S PITNEY RD/N NEW RD	147,724	Atlantic	Absecon city
2023.0234	CR-601 W	CR-601 W @ US-9	144,554	Cape May	Middle Township
2023.0235	CR-540 W	CR-540 W @ CR-553/CENTERTON RD (ELMER) (WEST)	144,430	Salem	Pittsgrove Township
2023.0239	CR-619 N	CR-619 N @ CR-623/34TH ST	139,104	Cape May	Ocean City city
2023.0240	CR-619 S	CR-619 S @ RT-147/N WILDWOOD BLVD	136,118	Cape May	Middle Township
2023.0244	CR-618 S	CR-618 S @ US-9	130,972	Cape May	Middle Township
2023.0246	CR-626 N	CR-626 N @ RT-47	130,828	Cape May	Middle Township
2023.0247	PENNSVILLE AUBURN RD W	PENNSVILLE AUBURN RD W @ NJ-49/N BROADWAY	130,722	Salem	Pennsville Township
2023.0248	CR-575 N	CR-575 N @ GARDEN STATE PKWY	129,441	Atlantic	Galloway Township
2023.0251	CR-542 W	CR-542 W @ RT-54/BELLEVUE AVE	127,490	Atlantic	Hammonton Town

Rank	Road Name	Location	Total Delay	County	Municipality
2023.0252	CR-638 W	CR-638 W @ HARBOUR BEACH BLVD	127,425	Atlantic	Brigantine city
2023.0264	CR-626 N	CR-626 N @ W PERRY ST	121,304	Cape May	West Cape May Borough
2023.0266	CR-575 S	CR-575 S @ CR-559/MAYS LANDING-SOMERS POINT RD	120,387	Atlantic	Egg Harbor Township
2023.0267	CR-638 N	CR-638 N @ RT-49/E COMMERCE ST	119,371	Cumberland	Bridgeton city
2023.0268	CR-608 S	CR-608 S @ RT-49/W MAIN ST	119,367	Cumberland	Millville city
2023.0269	CR-621 S	CR-621 S @ RT-109	119,210	Cape May	Lower Township
2023.0271	CR-621 N	CR-621 N @ RT-47/E RIO GRANDE AVE	117,512	Cape May	Wildwood city
2023.0273	CR-619 S	CR-619 S @ CR-601/AVALON BLVD	116,299	Cape May	Avalon Borough
2023.0274	CR-563 N	CR-563 N @ US-40/US-322/UIBEL AVE	116,241	Atlantic	Egg Harbor Township
2023.0276	CR-651 N	CR-651 N @ TILTON RD	113,759	Atlantic	Egg Harbor Township
2023.0277	CR-626 N	CR-626 N @ BRIDGE RD/SEASHORE BRIDGE RD	111,992	Cape May	Lower Township
2023.0278	CR-551 N	CR-551 N @ CR-646/POINTER'S AUBURN RD	111,981	Salem	Oldmans Township
2023.0279	CR-563 N	CR-563 N @ DELILAH RD/AMELIA EARHART BLVD	111,909	Atlantic	Egg Harbor Township
2023.0280	CR-622 E	CR-622 E @ CR-615/WEST BLVD/EAST BLVD	111,143	Cumberland	Vineland city
2023.0281	CR-621 S	CR-621 S @ RT-47/E RIO GRANDE AVE	111,031	Cape May	Wildwood city
2023.0282	W PERRY ST E	W PERRY ST E @ MYRTLE AVE	109,636	Cape May	West Cape May Borough

Rank	Road Name	Location	Total Delay	County	Municipality
2023.0283	CR-552-SPUR E	CR-552-SPUR E @ CR-555/N 3RD ST	109,586	Cumberland	Millville city
2023.0289	N DR MARTIN LUTHER KING BLVD N	N DR MARTIN LUTHER KING BLVD N @ US-30/ABSECON BLVD	105,429	Atlantic	Atlantic City city

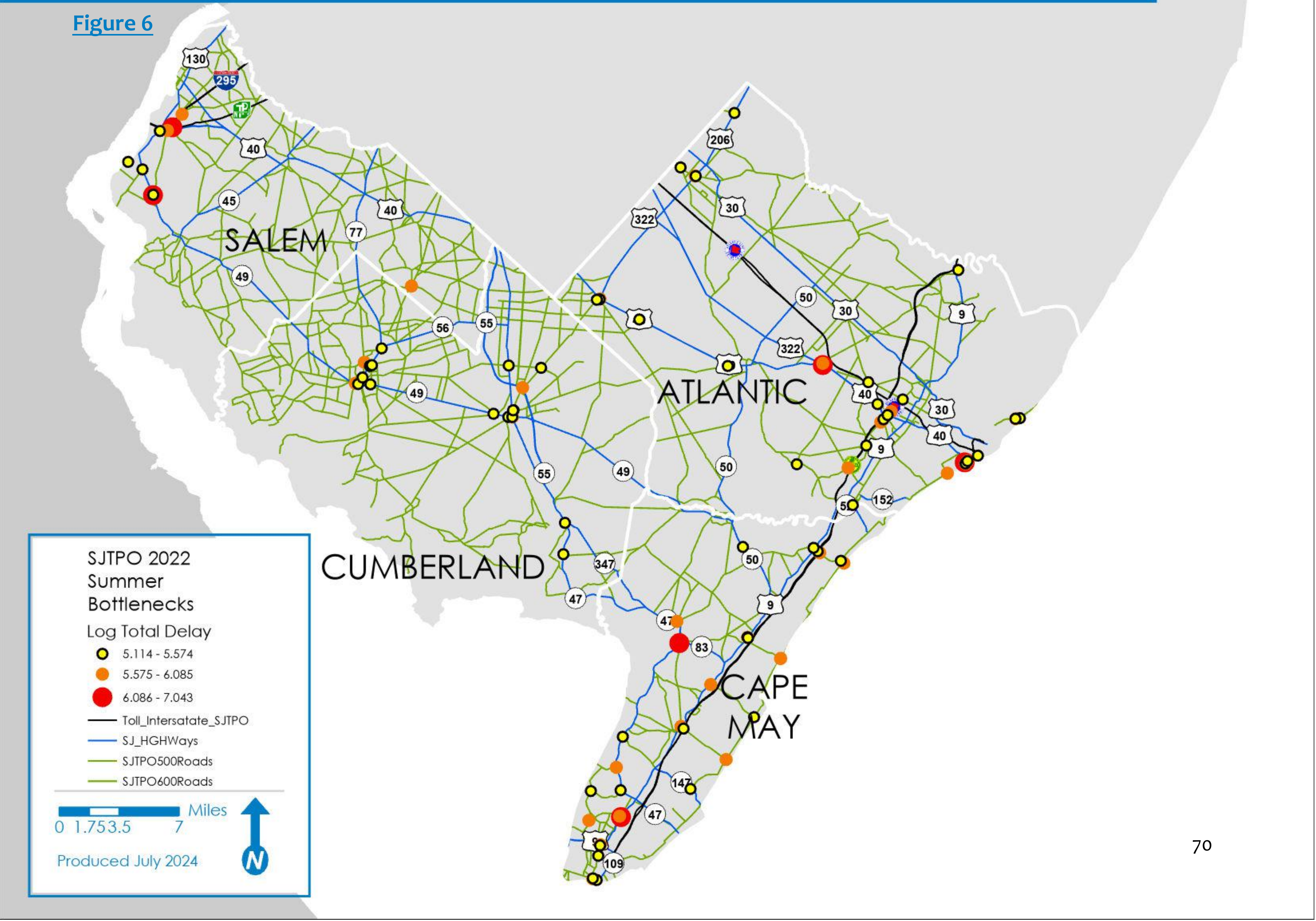
SJTPO 2022 Top 100 County and Local Road Bottlenecks

Figure 5



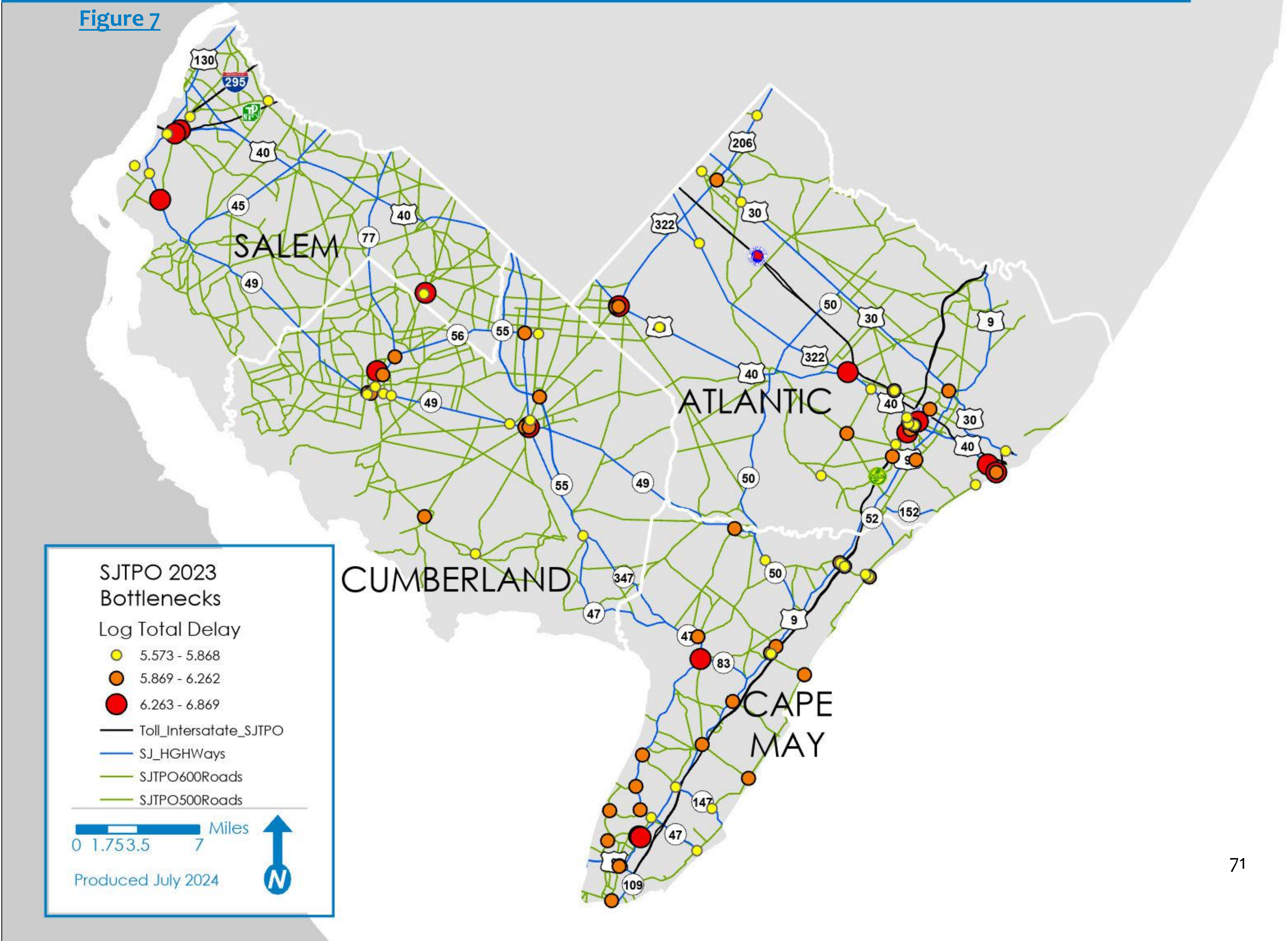
SJTPO 2022 Summer Top 100 County and Local Road Bottlenecks

Figure 6



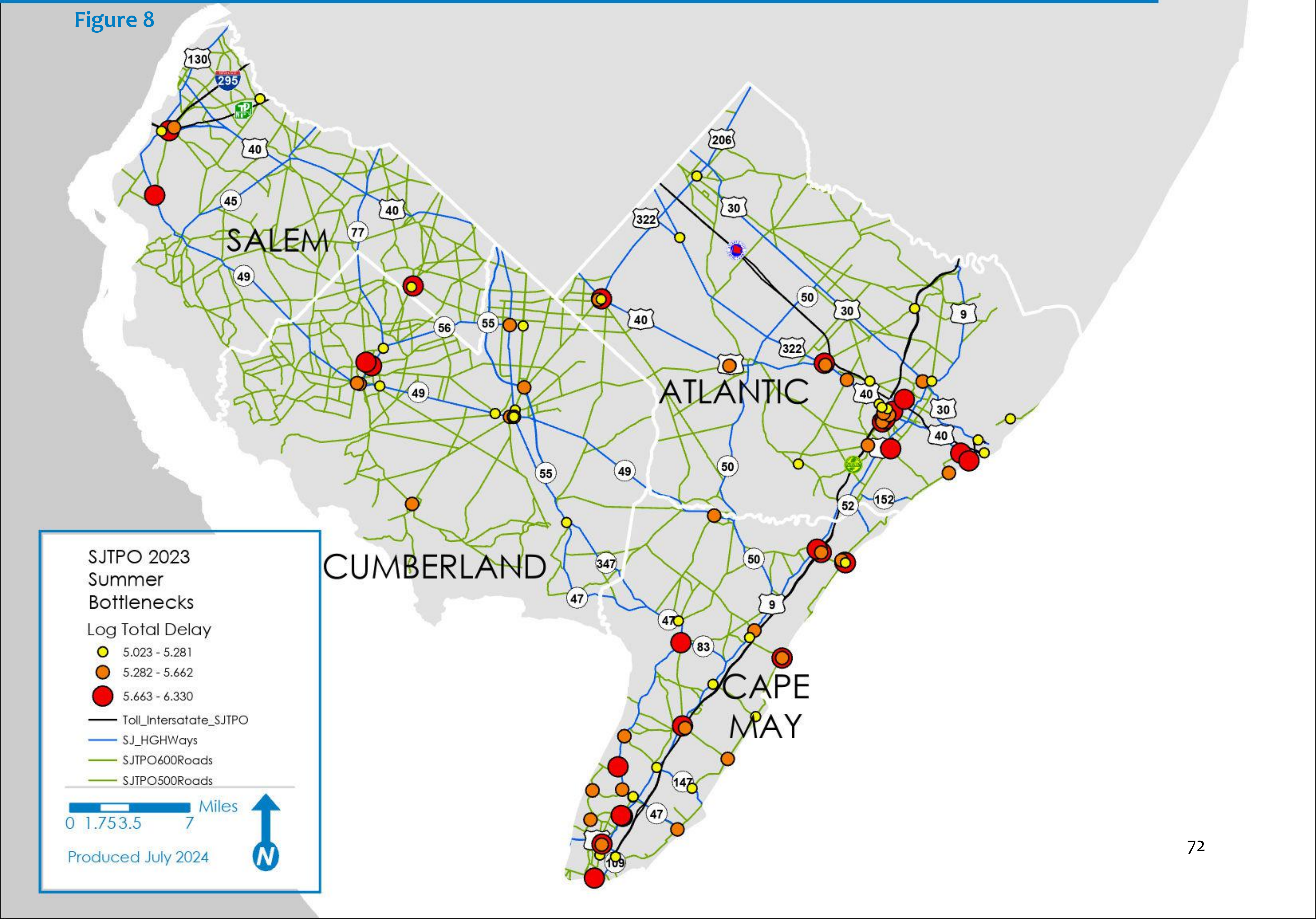
SJTPO 2023 Top 100 County and Local Road Bottlenecks

Figure 7



SJTPO 2023 Summer Top 100 County and Local Road Bottlenecks

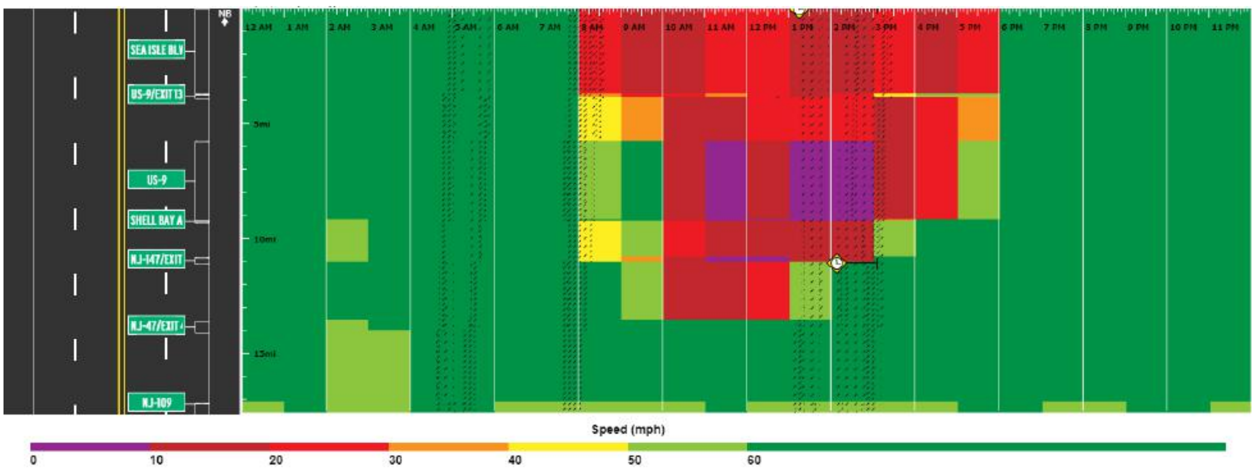
Figure 8



PDA suite Congestion Scan

Another tool provided by the PDA Suite is the Congestion Scan. This tool produces a graph depicting congestion by time of day and segment along a roadway. Users can select a roadway or portion of a roadway along with a period, and congestion is graphed from red (heavy congestion) to green (no congestion) as a function of the percentage of the free-flow speed. The raw speed data may also be plotted, as in the graph below.

Figure 9: Speed for Garden State Parkway from NJ-109 to Sea Isle Boulevard



This congestion scan above shows congestion that occurred on the Garden State Parkway northbound on Sunday, May 27, 2024, the Sunday of the Memorial Day weekend. The horizontal axis is the time of day, the vertical axis is the location on the roadway, and the color indicates the average speed at that location and time. In this scan, the congestion occurred throughout most of the day on several interchanges between NJ-109 and Sea Isle Boulevard. On a nearly 40-mile stretch in Atlantic and Cape May Counties, speeds fell from above 60 mph to less than 40 mph, with patches of dark red indicating speeds below 20 mph on occasions. As this congestion was in the northbound direction on a Sunday afternoon, it was likely caused by visitors to the shore heading home at the end of the weekend.

Congestion scans provide a clear picture of the extent and severity of congestion and can help locate the causes of bottlenecks. The congestion scan tool works well in conjunction with the bottleneck ranking tool. As the bottleneck ranking tool screens congested segments on a regional level, the congestion scan tool examines these segments at a closer level.

PDA Suite Cost-of-Delay Analysis

Another tool provided by the PDA Suite is the User Delay Cost Analysis. This tool allows users to estimate the total congestion cost by assigning an average cost to each vehicle hours of delay. The user may select any roadway, collection of roadways, or region to analyze. The user may also select a period. A speed threshold may be defined as a function of the historic average speed, the free-flow speed, or an absolute speed, such as the speed limit. Delay is calculated as the difference between travel time at the free-flow speed and travel time at the delay threshold speed. For each vehicle hour of delay, a dollar value is assigned. By default, these values are:

- **Passenger vehicles:** $39.30/vehicle-hour
- **Commercial vehicles:** $64.68/vehicle-hour

The delay cost report is run, and a table is provided that lists the cost of delay for each hour of each day in the designated period, along with the total delay cost.

The tables below show an example cost-of-delay analysis for the SJTPO region from Friday, August 18, 2023, through Sunday, August 20, 2023. This represents a typical summer weekend. In the first table, the columns show the total vehicle hours of delay for each hour and day. The second table shows the cost of delay in dollars for this delay.

Table 8: PDA Suite Vehicle-hours of Delay for all Four SJTPO Counties

	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	Daily Totals
8/18/23	32.7	21.7	19.4	18.9	129.0	267.4	449.4	668.9	644.2	605.0	848.8	1239.2	1,540.8	1,511.0	1,163.7	1128.3	1045.9	1077.9	927.0	741.7	599.0	420.2	244.0	96.7	15,440.9
8/19/23	69.4	31.9	36.1	20.8	39.4	65.7	113.0	204.3	316.1	768.8	1504.0	1868.0	1,999.6	1,660.1	1,138.4	1087.9	789.7	645.7	928.4	510.2	331.2	256.9	187.3	73.5	14,646.3
8/20/23	31.2	27.9	9.6	10.9	17.7	22.1	48.0	115.6	229.6	392.0	680.4	1153.0	1080.8	1301.7	1128.1	745.9	641.1	1182.6	686.6	554.8	368.3	200.6	98.3	55.5	10,782.4
Hourly totals	133.3	81.5	65.2	50.6	186.1	355.3	610.4	988.8	1189.9	1765.8	3033.2	4260.3	4621.2	4472.8	3430.3	2962.0	2476.7	2906.1	2542.1	1806.6	1298.5	877.7	529.5	225.6	40,869.5

As seen in **Table 8**, this Friday-Saturday-Sunday period from August 18 through August 20, 2023, experienced almost 41,000 vehicle hours of delay on roadways within the SJTPO region. Using these delay estimates, the cost-of-delay values can be applied to obtain delay cost estimates in dollars, as seen in the following table.

Table 9: PDA Suite Cost of Delay in the Thousands of Dollars for all Four SJTPO Counties

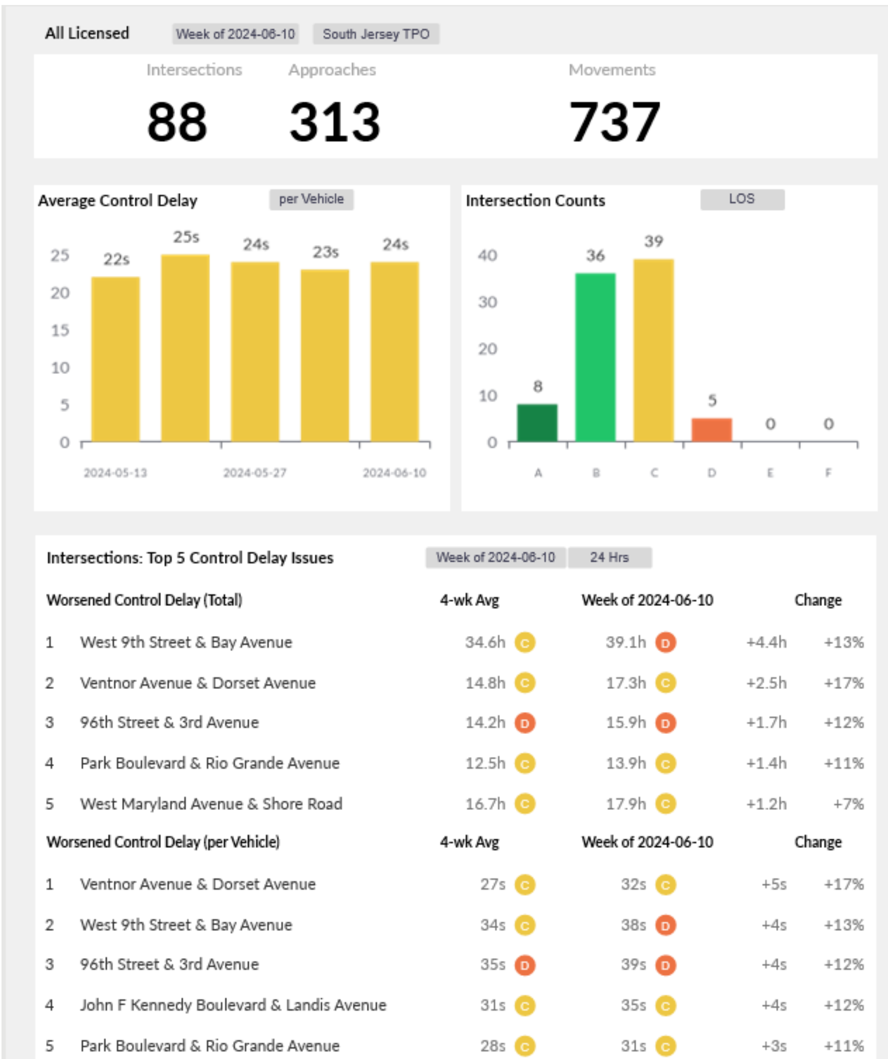
	12 AM	1 AM	2 AM	3 AM	4 AM	5 AM	6 AM	7 AM	8 AM	9 AM	10 AM	11 AM	12 PM	1 PM	2 PM	3 PM	4 PM	5 PM	6 PM	7 PM	8 PM	9 PM	10 PM	11 PM	Daily Totals
8/18/23	$1.4	$0.9	$0.8	$0.8	$0.5	$11.2	$18.8	$28.0	$27.0	$25.3	$35.5	$51.8	$64.5	$63.2	$48.7	$47.2	$43.8	$45.0	$38.8	$31.0	$25.0	$17.6	$10.2	$4.0	$646.0
8/19/23	$2.9	$1.3	$1.5	$0.9	$1.6	$2.8	$4.7	$8.5	$13.2	$32.2	$62.9	$78.1	$83.6	$69.4	$47.6	$45.5	$33.0	$27.0	$38.8	$21.3	$13.9	$10.7	$7.8	$3.1	$612.8
8/20/23	$2.9	$1.3	$1.5	$0.9	$1.6	$2.8	$4.7	$8.5	$13.2	$32.2	$62.9	$78.1	$45.1	$54.5	$47.2	$31.2	$26.8	$49.5	$28.7	$23.2	$15.4	$8.4	$4.1	$2.3	$451.1
Hourly totals	$5.6	$3.4	$2.7	$2.1	$7.8	$14.9	$25.5	988.8	$49.8	$73.8	$126.9	$178.2	$193.3	$187.1	$143.5	$123.9	$103.6	$121.6	$106.4	$75.6	$54.3	$36.7	$22.2	$9.4	$1,709.9

As seen in **Table 9**, the almost 41,000 vehicle-hours of delay are estimated by the PDA to cost approximately $1.7 M, according to the delay-cost figures generated by the University of Maryland RITIS PDA module.

RITIS Signal Analytics

SJTPO has access to RITIS Signal Analytics software, which includes several performance metrics on signals and intersections throughout the SJTPO region. The Signal Analytics software utilizes data provided by INRIX. SJTPO intends to make much more extensive use of these metrics and analytics as part of its CMP.

Figure 10: Example of INRIX Intersection Performance Report



Worsened Control Delay (Total)		4-wk Avg	Week of 2024-06-10	Change	
1	West 9th Street & Bay Avenue	34.6h C	39.1h D	+4.4h	+13%
2	Ventnor Avenue & Dorset Avenue	14.8h C	17.3h C	+2.5h	+17%
3	96th Street & 3rd Avenue	14.2h D	15.9h D	+1.7h	+12%
4	Park Boulevard & Rio Grande Avenue	12.5h C	13.9h C	+1.4h	+11%
5	West Maryland Avenue & Shore Road	16.7h C	17.9h C	+1.2h	+7%
Worsened Control Delay (per Vehicle)		**4-wk Avg**	**Week of 2024-06-10**	**Change**	
1	Ventnor Avenue & Dorset Avenue	27s C	32s C	+5s	+17%
2	West 9th Street & Bay Avenue	34s C	38s D	+4s	+13%
3	96th Street & 3rd Avenue	35s D	39s D	+4s	+12%
4	John F Kennedy Boulevard & Landis Avenue	31s C	35s C	+4s	+12%
5	Park Boulevard & Rio Grande Avenue	28s C	31s C	+3s	+11%

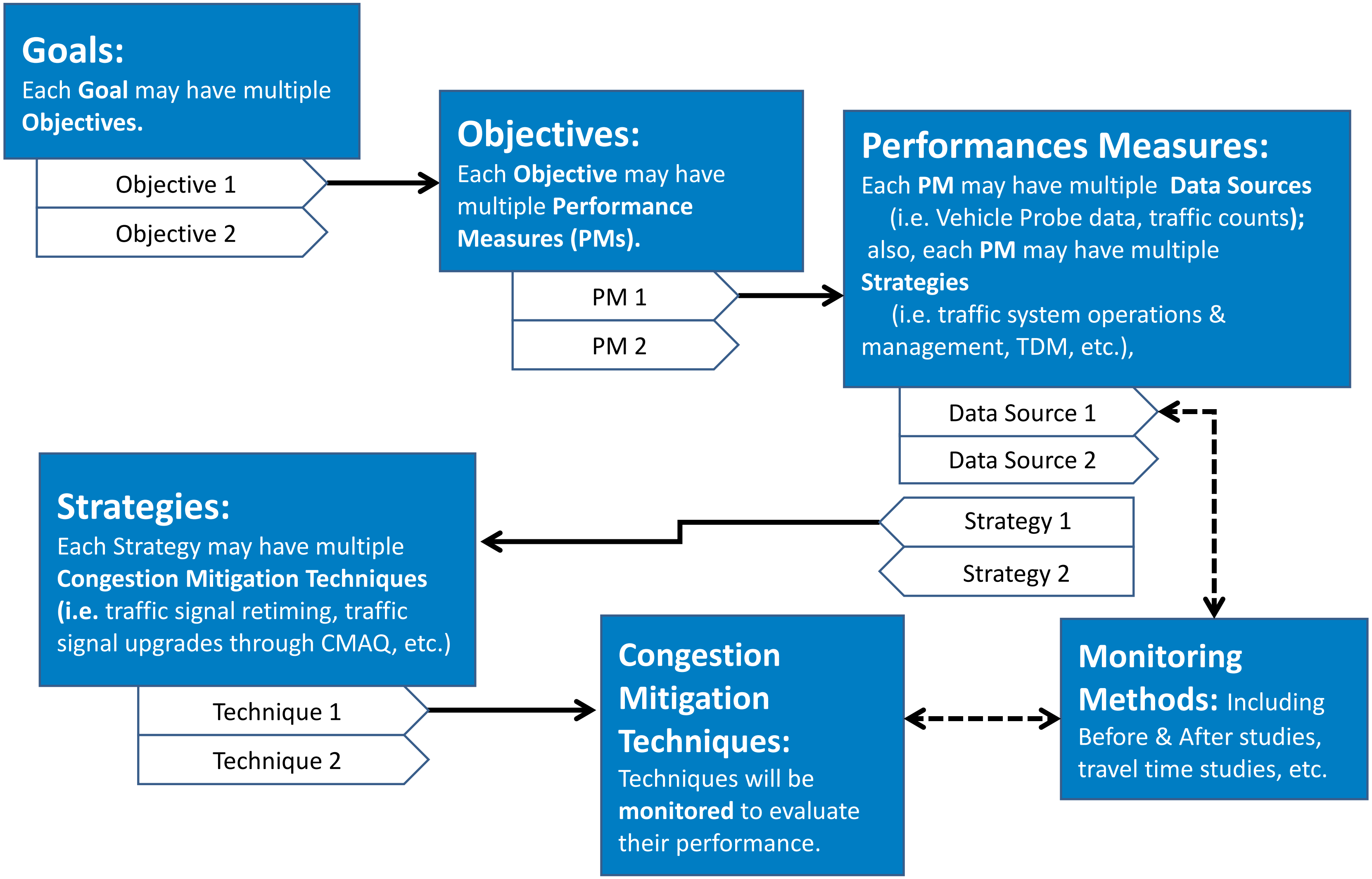
Figure 11: Example of Corridor Performance Report

23 Licensed Corridors: Top 3 Corridor Issues — Week of 2024-06-10 | weekdays | South Jersey TPO

	Worsened Travel Times	4-wk Avg		Current Week		Change	
1	Mississippi to MLK	1.9m	F	2.0m	F	+11.5s	+10.31%
2	Main North	4.8m	B	4.9m	B	+10.3s	+3.60%
3	Zion to BHP	5.9m	D	6.1m	D	+10.0s	+2.84%

	Worsened Travel Time Index	4-wk Avg		Current Week		Change	
1	Winchester to Atlantic	2.51x	F	3.81x	F	+1.30x	+51.83%
2	Ventnor Ave	2.04x	E	2.47x	E	+0.43x	+21.17%
3	Baton Rouge to Dorset	1.72x	D	2.09x	E	+0.36x	+21.09%

Appendix B: SJTPO CMP Workflow



Appendix C: Looking Forward – New Tools and Emerging Technology

Since the last CMP: Methodology Report, approved on November 26, 2018, several new and exciting tools and technologies have become available.

Signal Analytics

The Signal Analytics tool includes the Intersection Analysis and the Intersection Matrix tools. As mentioned, SJTPO currently has a license to monitor 88 signals within its region. Performance measures, such as average control delay per vehicle, travel time, approach speed, specification, and level of service, are depicted. The tool can also report the Travel Time Index across select corridors that the user can specify and give the performance of signals and/or corridors over a select period.

StreetLight Data

StreetLight Data, Inc. ("StreetLight") pioneered using Big Data analytics to shed light on how people, goods, and services move, empowering smarter, data-driven transportation decisions. StreetLight's proprietary data processing engine, Route Science® algorithmically transforms its vast data resources to measure travel patterns of vehicles, bicycles and pedestrians, accessible as analytics on the StreetLight InSight® SaaS platform. StreetLight provides innovative digital solutions to help communities reduce congestion, improve safe and equitable transportation, and maximize the positive impact of infrastructure investment. StreetLight provides valuable data such as AADT, Origin-Destination, and other valuable performance measures. As long as SJTPO has access to this data (through April 30, 2025), it will use it for its CMP and numerous other applications in its work.

Driver Assistance

Driver assistive technologies, such as adaptive cruise control, lane-keeping assistance, and automatic emergency braking, are changing the road transportation system. These innovations enhance vehicle safety by reducing human error, a major cause of traffic incidents. They also contribute to smoother traffic flow and potentially lower congestion by maintaining optimal speed and safe distances between vehicles. As adoption rates increase, these technologies could lead to fewer crashes and improved overall traffic efficiency. However, the transition involves challenges, including ensuring compatibility between different levels of vehicle automation and addressing concerns about cybersecurity and privacy.

While driver-assistive technologies offer substantial benefits to road safety and efficiency, they also present potential drawbacks, particularly concerning driver distraction. One significant concern is the potential for over-reliance on these technologies. Drivers may become less attentive or overly confident in the capabilities of systems like autopilot or lane-keeping assist, which can lead to complacency and reduced situational awareness.

Moreover, the complexity and variability of these technologies across different vehicle models can also contribute to distraction. Drivers may need to interact with complex interfaces to activate or monitor these systems, which can divert attention from the driving task. This is particularly problematic when drivers are transitioning between vehicles with different levels or types of automation.

Additionally, there is the issue of "mode confusion," where drivers may be unclear whether the automated system or the human is in control, leading to potentially dangerous situations. For example, a driver might assume the vehicle will automatically brake for a stopped car ahead when the function is not active or not designed for such scenarios.

While driver-assistive technologies aim to enhance safety and efficiency, their effectiveness can be compromised if they lead to increased driver distraction or misuse. Ensuring these technologies are user-friendly and that drivers are properly educated on their use is crucial for maximizing their potential benefits while minimizing risks.

Low Emission /Electric Vehicles (EVs)

The increasing adoption of electric and low-emission vehicles marks a transformative shift in the automotive industry, offering significant environmental and public health benefits. These vehicles substantially reduce air pollution, as they emit far fewer pollutants than traditional gasoline and diesel-powered cars. This decrease in emissions is crucial for improving air quality, particularly in urban areas where traffic congestion typically leads to higher pollution levels.

EVs also play a pivotal role in mitigating climate change by reducing the dependence on fossil fuels and lowering carbon dioxide emissions. As the electricity grid becomes greener, with more energy supplied by renewable sources, the environmental impact of electric vehicles will continue to improve.

However, the transition to electric and low-emission vehicles also presents challenges, including the need for widespread charging infrastructure, the environmental impact of battery production and disposal, and the economic implications for oil-dependent economies. Despite these challenges, the shift towards electric and low-emission vehicles is expected to have a profoundly positive impact on global environmental sustainability and public health.

Artificial Intelligence (AI)

AI increasingly plays a critical role in managing and alleviating road congestion, offering innovative solutions that enhance traffic flow and reduce travel times. AI plays a significant role in managing road congestion, contributing in various ways that improve traffic flow and reduce delays.

- **Traffic Prediction and Management** – AI algorithms can analyze vast amounts of data from various sources, including traffic cameras, sensors, and GPS devices, to predict traffic patterns and congestion in real-time. This capability allows traffic management centers to anticipate and mitigate bottlenecks before they occur by adjusting traffic light timings, suggesting alternative routes to drivers, and optimizing public transit schedules.
- **Autonomous Vehicles and Smart Infrastructure** – The integration of AI in autonomous vehicles and smart road infrastructure can significantly enhance traffic efficiency. Autonomous vehicles communicate with each other and road infrastructure to maintain optimal speed, minimize lane changes, and avoid collisions. This coordination can lead to smoother traffic flow and reduced congestion.
- **Dynamic Pricing and Demand Management** – AI can help implement dynamic pricing strategies for toll roads and congestion charges based on real-time traffic conditions. Increasing prices during peak times can dissuade some drivers from entering congested areas, thus reducing traffic volumes. Similarly, AI can optimize the scheduling and routing of public transportation, making it a more attractive option for commuters.
- **Incident Detection and Response** – AI-powered systems can quickly detect accidents or road obstructions and immediately alert relevant authorities, enabling faster response times. By swiftly managing and clearing incidents, these systems help restore normal traffic flow, minimizing congestion caused by such disruptions.
- **Personalized Commuting Suggestions** – By analyzing commuter patterns and preferences, AI can provide customized recommendations through mobile apps or in-car systems, suggesting the best times to travel or alternative modes of transportation to avoid congested routes.

The application of AI in road congestion management promises to enhance daily commuting experiences and contributes to broader goals like reducing carbon emissions and improving urban mobility. As AI technology advances, its integration into traffic management systems is expected to become more sophisticated, offering even greater benefits.