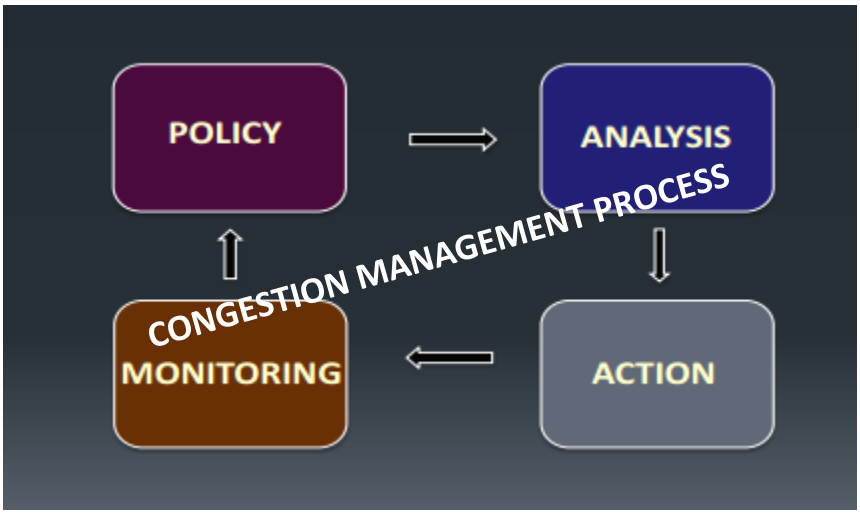
Introduction: What is the NJTPA Congestion Management Process (CMP)?

The NJTPA operates a Congestion Management Process (CMP), systematically investigating the region's complex travel patterns and advancing suitable approaches for improving transportation system performance. This performance-based process is federally required as an integral part of the planning process[1]. The CMP provides information and strategies to decision-makers regarding accessibility, mobility, reliability and congestion as they relate to the movements of persons and goods in northern New Jersey.

Aspects of the CMP span the NJTPA planning process, as highlighted in the figure below. Guided by established NJTPA policy in the Regional Transportation Plan (RTP), *Plan 2045*, and the Regional Capital Investment Strategy, the CMP is structured around broad regional analysis of transportation needs and strategies. It offers potential recommendations for further planning and analysis by NJTPA, its subregions and partner agencies, and checks potential concepts and projects for consistency. Periodic monitoring examines whether desired policy objectives are achieved.

Figure 1: Congestion Management Process (CMP) in the context of the NJTPA Planning Process



The CMP is dynamic, informed by and contributing to other activities by the NJTPA and its partners. Recent CMP enhancements have supported Plan 2045 development, the Together North Jersey Plan, and updating of the NJTPA Project Prioritization process. An Assessment of System Connectivity, based on a set of 60 representative origin-destination (O-D) pairs, identified issues in the travel between the region's urban, suburban and rural places. Building on prior planning work while evolving to meet emerging priorities, the CMP attends to each of the four themes highlighted in Plan 2045, contributing to a Competitive, Efficient, Livable and Resilient northern New Jersey. The CMP also complements the newly federally established transportation system performance measures and will assist the NJTPA in identifying and addressing the performance targets associated with those measures.

[1] As per 23 CFR § 450.322, a congestion management process is required for transportation management areas with population over 200,000, with specific provisions applicable to non-attainment areas for high concentrations of ozone and carbon monoxide.

Further, the NJTPA has developed a new Planning Recommendations Integration Management Engine (PRIME) to strengthen the integration of the CMP and other planning work for the region. PRIME will help regional, subregional, state and other partner planners query, draw from, and connect planning findings. This should help to advance recommendations that emerge from systematic planning work like the CMP and subregional planning studies toward implementation. It should also help to find synergies among needs so that complementary strategies can be packaged appropriately and advanced concurrently.

Elements of the NJTPA Congestion Management Process

1. POLICY

The CMP is guided by adopted NJTPA policy – especially the Regional Capital Investment Strategy (RCIS) and other elements of the RTP – and through coordination with NJTPA member and partner agencies. National, state and local priorities are fully incorporated as conveyed through federal CMP requirements, directions set by the NJDOT Long Range Transportation Plan and the State Development and Redevelopment Plan, preservation needs identified by the Highlands, Pinelands, and Meadowlands agencies, and continual subregional input into the metropolitan process.

As a crucial foundation, the RCIS explicitly emphasizes safe travel, preserving existing transportation infrastructure, expanding the region's transit system, operationally improving the roadway system, efficient goods transport, managing incidents and applying technology, supporting walking and bicycling and increasing regional resiliency. All of these priorities are in some way connected to how well the transportation system performs its essential functions, and how congestion and related issues reflect on that performance.

In this policy context, it is recognized that traffic congestion is complex to address. While widening roadways at a bottleneck may help manage or reduce congestion, widening long stretches of roadways may add a level of additional capacity that can lead to overall increased vehicle volumes, more traffic congestion and air pollution over time. Also, many vibrant commercial districts, urbanized areas and important major roadway arteries experience daily recurring "routine" traffic congestion that cannot realistically be eliminated due to potential costs, limited land availability and/or potential quality of life impacts to communities. Recognizing these limitations, the NJTPA's multi-modal CMP is used to explore a full range of transportation solutions, including finding alternatives to avoid all but the most essential additions of roadway capacity.

Importantly, the NJTPA recognizes that congestion is most problematic when it hinders accessibility, a key contributor to the region's economic and community well-being. Transportation works well when it puts travelers' desired destinations (jobs, shopping, schools, parks, and so on), within reach, making them accessible. It works well when the transportation system is reliable and trips are therefore predictable, with reasonable expected travel times and actual travel times matching those expectations. Effective transportation provides accurate information to travelers and offers flexibility and convenience, in terms of available routes and a good choice of possible means of transportation.

2. ANALYSIS

Congestion, crowding, incidents and crashes can reduce the region's accessibility, as can inefficient roads or transit connections, missing sidewalks, or unavailable information on travel options. But accessibility is also fundamentally tied to where people live, work, shop and play in the region – specifically, how far destinations are from one another and whether households and businesses are located where the transportation system can serve them best. Overall, the northern New Jersey transportation system provides enormous accessibility to the region, but addressing the challenges of a growing and changing region require understanding congestion in these broader contexts. Analysis within the CMP contributes to this understanding.

Findings from longstanding CMP regional analysis are included within Plan 2045 and earlier RTPs, with ongoing updates drawn from regional studies such as the Assessment of System Connectivity. Other NJTPA study findings are part of CMP analysis, such as freight studies, safety analysis, asset management analysis, pedestrian studies, The Connected Corridor and other intelligent transportation systems efforts, Complete Streets studies, and the Transportation Vulnerability and Adaptation Assessment. Focused corridor and subregional studies, transit studies, Transportation Management Association work, placemaking efforts and local transportation circulation elements are all resources for the CMP. Foundational analysis in the NJTPA's earlier Strategy Evaluation study remains an important reference in the CMP, even as elements are continually updated.

The CMP is concerned with questions such as:

- How reliable is the transportation system?
- Can people readily access jobs and other destinations?
- Do they have access to public transit?
- Does the roadway system support transit service?
- How bad are highway delays?
- Is freight movement efficient?
- How safe and convenient is pedestrian and bicycle travel?
- Is the transportation network resilient to severe weather or other events?

Further, what improvement strategies are most appropriate and where should they be implemented?

CMP analysis is data-driven, identifies needs using performance measures, and looks to connect them to travel between origins and destinations. In this way, needs have a context, and solutions selected for them should be appropriate for prevailing land uses and activities in particular places. This explicitly draws attention to the diversity of land use and environmental conditions ("place types") present in northern New Jersey municipalities. Special considerations regarding environmentally sensitive areas and low-income and minority communities are also taken into account.

To support consistency among these complementary efforts with regard to the CMP, findings are used by the NJTPA as a regional reference. This is particularly critical for initiatives that may result in significant expansion of roadways as CMP assessment is mandated for capacity-increasing projects before Federal funds may be applied. For such projects, the CMP looks at road expansions as a last

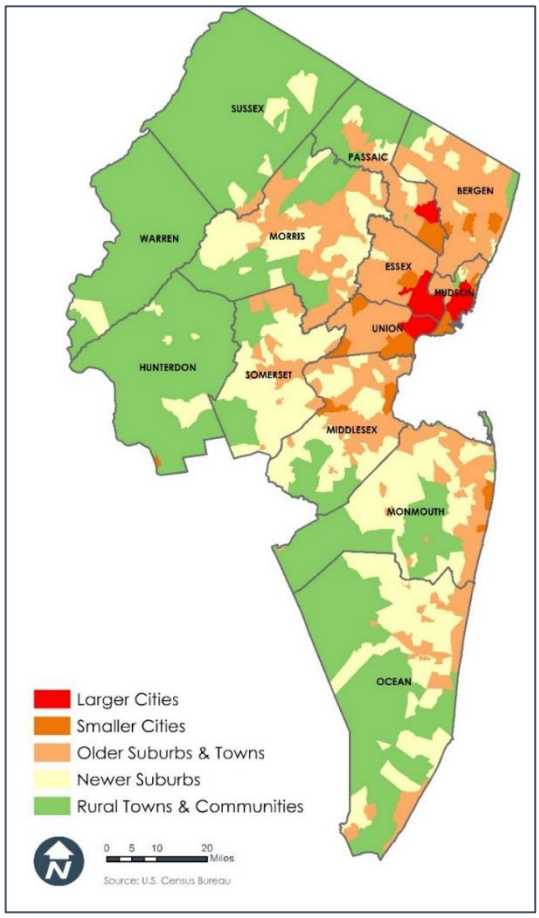
resort and as appropriate, requires that they be coupled with complimentary operational and travel demand management strategies.

1) **Context**

CMP regional analysis is conducted against the background of various types of places present in northern New Jersey from rural/vacation areas to urban areas. The analysis also considers different transportation markets and geographic levels referred to as perspectives.

Place Types: Transportation performance and needs vary greatly depending on the landscape – ranging from the urban core to exurban and rural areas. The region contains large environmentally sensitive areas close to developed areas, adding to its complexity. The variety of place types – considering land use, population density, employment, the nature of economic activities, street patterns, and so on – help point the way to how future land use and transportation features should be supported or discouraged. CMP regional analysis particularly focuses on Together North Jersey (TNJ) Place Types such as Large Cities, Smaller Cities, Older Suburbs, Newer Suburbs and Rural/Vacation areas, but has also drawn from more detailed distinctions in the earlier Strategy Evaluation study. Environmentally sensitive areas and places with high concentrations of low-income and minority populations warrant special consideration in the CMP.

Figure 2: NJTPA Place Types



Perspectives: The CMP also references different geographic scales and travel movements when assessing transportation performance and considering potential strategies.

- Local/Place: Local mobility that includes local movements and shorter trips with an emphasis on targeted actions that fit in with land use goals and community character. This scale also involves local access to the regional transit and highway network.
- Origin-Destination/Corridor: This view targets the purpose of transportation—to provide accessibility to opportunities for persons and goods. Improvements serve regional travel movements, multimodally. This is a traveler/customer market perspective, sensitive to how places are interconnected by transportation.
- Network: This view highlights the operation and effectiveness of the transportation network overall and its elements. It considers: how facilities function; how they interconnect to one another; what travel movements and markets they serve; and their place type setting. Improvements are identified throughout the system to support its function.

2) **Performance Measures**

Performance measures are an important part of data-driven CMP regional analysis. Performance measures help planners and decision makers to assess whether goals and objectives are being met. Performance measures used in the NJTPA CMP therefore draw directly from established regional planning goals, desired outcomes in the NJTPA Regional Capital Investment Strategy, national performance measures, and measures applied in other activities in the planning process.

The categories of performance (by perspective) in the following table reflect priorities for CMP analysis. Specific measures and associated metrics in these categories have been applied in various studies and continue to be enhanced for the CMP. While all are relevant to the CMP, several apply to topics that are more fully analyzed in other NJTPA and partner efforts (e.g., safety, resiliency, freight mobility, and infrastructure condition). The Assessment of System Connectivity conducted within the NJTPA CMP directly looked at accessibility and origin-destination performance, travel time reliability, roadway support of transit movement, freight mobility, roadway route redundancy and directness.

Table 1: NJTPA CMP Performance Measures

Perspective	*Performance Category*
Local	1. **Pedestrian/Bicycle Connectivity** (support for non-motorized shorter trips)
	2. **Accessibility** (Connect people to local attractions such as markets, jobs, educational centers, health care centers and civic centers; access to public transit system; goods movement along local routes)
	3. **Safety** on local roads
Origin-Destination	4. **Accessibility** (Connect people multimodally to regional opportunities such as employment, shopping, universities, and recreation. Goods movement to and from ports and regional distribution centers)
	5. **Mobility of People and Freight** in terms of travel time
	6. **Resiliency of Regional Routes** to extreme travel conditions (availability of alternative travel routes, transit supportive highways and different modes of transportation)
Network	7. **Travel Time Reliability** on roadway and transit
	8. **Safety** on highways and arterials
	9. **Resiliency of Regional Infrastructure** to extreme weather (flooding, hurricane) and other conditions
	10. **Asset Condition** (pavement, bridges, transit, signs and signals)

3) **Regional Needs**

As performance measures are applied in CMP analysis and other related studies, indication of specifically *where* performance falls short is taken to reflect regional CMP "needs". Determination of whether a particular level of deficient performance meets the bar of being termed a need is based both on technical assessment of metrics, measures, standards and targets and on collaboration to ensure that NJTPA and partner policies are reflected by such identification.

The NJTPA CMP always considers needs to be those of people, goods, and places being served by transportation, rather than of facilities or vehicles. The long-standing Strategy Evaluation analysis employed a place-based perspective, tying performance measures to origins and destinations and setting place-type specific performance thresholds. Adding to this, current updates to the CMP (including the Assessment of System Connectivity) are streamlining analysis with the three perspectives noted above.

With these perspectives, a wide range of types of needs are relevant to and considered in the CMP. Roadway Accessibility, Public Transit and Shared Ride Use, Walking and Biking, and Goods Movement needs originally analyzed in Strategy Evaluation continue to serve as a reference. Updated performance measures and new data continue to be investigated and applied according to the table below.

Table 2: NJTPA CMP Identified Regional Needs			
Needs			*Perspectives* and Performance Categories
Unpredictable roadway travel and bottleneck congestion		Travel time on roadways is often unpredictable, due to incidents, volume of traffic, and other factors. Bottlenecks or congestion hotspots can be highly challenging to travelers. Unreliable conditions necessitate that travelers budget extra time over that which is routinely required.	*Origin-Destination* and *Network* 1) Regional accessibility 2) Travel time reliability
Public Transit availability and reliability		The region's extensive public transit system supports nearly a million trips each weekday, among the highest public transit use in the nation. Service varies widely in the region though, as it depends on supporting markets. On-time performance, service headways and connectivity to desired destinations are critical.	*Origin-Destination* 1) Regional accessibility 2) Ridership, person trips 3) Travel time reliability
Access to public transit		First and last mile access between rail and bus transit stations/stops and local attractions, residences and services via walking, biking and local roads is a significant issue in the region. Land use and development patterns along with local street networks contribute to local accessibility.	*Local* 1) Local accessibility 2) Pedestrian / bicycle connectivity
Freight mobility		Unpredictable roadway travel and bottleneck congestion affect freight movement. Network availability (considering roadway usage restrictions and limited parking availability) are factors. Freight multimodal service depends on market and logistical factors.	*Origin-Destination* and *Network* 1) Regional accessibility 2) Amount of freight transported, by mode 3) Travel time reliability
Safety		Safety is a necessary condition of effective transportation performance and thus critical to the CMP. NJTPA analysis of safety is a major emphasis outside of the CMP, but the CMP recognizes this analysis as an important foundation.	*Network* 1) Safety on roads and streets 2) Safety on public transit 3) Pedestrian / bicycle safety
Infrastructure condition and resiliency		The transportation network in northern New Jersey is at risk of extreme weather and homeland security. Resiliency is fostered by parallel routes, mode options and network redundancy. Good infrastructure condition is a necessary condition of effective transportation performance, analyzed in asset management alongside the CMP.	*Network* 1) Resilience of regional routes 2) Resilience of infrastructure 3) Redundancy, mode options 4) State of good repair
Walking and Biking		Network availability and interconnectivity, Infrastructure design, traffic levels, safety, and surrounding land use features contribute to effective walking and bicycling conditions.	*Local* 1) Walking and biking trips 2) Street/intersection density 3) Land use mix 4) Activity concentration

4) **Strategies**

The broad Regional Capital Investment Strategy sets the stage for identifying specific strategies to address needs. The needs listed above closely correlate with how the RCIS itself is organized. Correspondingly, RCIS guidelines assist in the next CMP step of finding potentially suitable strategies for improvement.

RCIS Investment Principles
Help Northern New Jersey Grow Wisely
Make Travel Safer
Fix it First
Expand Public Transit
Improve Roads but Add Few
Move Freight More Efficiently
Manage Incidents and Apply Transportation Technology
Support Walking and Bicycling
Increase Regional Resiliency

To address CMP needs, regional analysis considers characteristics of potential strategies and factors that would support their success. The type of need being addressed is of course a major factor, but others come into play as well, e.g., performance, place types, travel markets, infrastructure features, surrounding context, etc. Multiple strategies are grouped together for each needs category.

Planners and government officials can consider implementing strategies within groups together or individually. It should however be noted that the strategies, associated with each need, are not always suitable for implementation consideration due to the characteristics of the location/place. Hence the NJTPA CMP also identifies place-specific criteria/characteristics that may support effective implementation of each group of strategies (together or individually). It also recognizes travel markets that might most benefit from implementation of particular strategies.

Further information about NJTPA CMP recommended strategies and criteria that suggest which strategies may be suitable in particular locations is available at *http://www.njtpa.org/planning/performance-analysis/congestion-management* .[2]

Important note on roadway-related needs and strategies: the CMP first considers to what extent strategies associated with other needs can address roadway-related needs. This provides for travel demand management, trip reduction, and support for alternate modes to address needs to the extent practicable, particularly avoiding the addition of single-occupant-vehicle (SOV) capacity or the

[2] Planners should consider this information comprehensively in order to select appropriate strategies for implementation. This analysis presents a first screen of possible suitable strategies, requiring more detailed study to gauge real-world strategy applicability and viability. The criteria themselves are rough guidelines, subject to refinement and adjustment based on available information and appropriate context.

inducement of increased vehicular traffic. If new SOV capacity is warranted other complementary strategies are identified to manage demand into the future.

3. ACTION

As needs and strategies are identified in various paths in the NJTPA planning process, public action can follow in many ways. Generating potential project concepts directly from CMP analysis has been accomplished through a process called Strategy Refinement. Dozens of such concepts were included in earlier NJTPA plans, and consistency with both CMP Regional Analysis and Refinement findings is considered by NJTPA as studies, work programs and projects have been advanced by NJDOT, NJ TRANSIT, TMAs, subregions and others. The PRIME tool, noted earlier, will support future iterations of this process.

There are other actions in the planning process that either draw from or are consistent with the NJTPA CMP. These include Subregional Studies, Planning for Emerging Centers, the Street Smart Campaign, Freight Concept Development, Local Concept Development, NJDOT's mobility problem statement development, and The Connected Corridor. Together North Jersey has been another important generator of actions for improving the region's accessibility and transportation reliability. The TNJ Plan drew in part from NJTPA CMP analysis in its development and itself now serves as an important resource for the CMP. The TNJ 2.0 phase, engaging regional Task Forces, is also advancing CMP-related actions.

More generally, as project concepts and specific projects are developed, the NJTPA examines them for consistency via a CMP Compliance approach described below. This focuses on ensuring that required features of planning work are conducted as projects move forward.

In project prioritization stages of the NJTPA process, well-defined project candidates are considered for inclusion in the TIP according to a broad range of goal-oriented criteria. CMP-related criteria are among these, providing consistent input as projects compete for implementation funding. The NJTPA is currently updating the project prioritization process, incorporating CMP measures and findings.

CMP Compliance

Beyond strategies and concepts that directly emerge from the CMP's regional analysis and Strategy Refinement, the NJTPA examines congestion-related projects proposed for the Regional Transportation Plan, Unified Planning Work Program, and Transportation Improvement Program for CMP consistency. This CMP Compliance process provides support for efforts of all participants in the planning process, while maintaining the essential integrity of the CMP approach. To that end, NJTPA has developed a set of screening guidelines in a template structure to help conduct such examination.

The guidelines ask study and project sponsors (such as those producing a Local Concept Development study) to assist in making connections to RTP and CMP identified priorities, specific objectives, and established performance measures. Where initiatives are not drawn from or cannot reference such elements, additional work may be required or reexamination of established priorities may need to be considered by the NJTPA. Connections are also made to the ranges and types of considered strategies. Here again, consistency with NJTPA established priorities and findings is required or differences must be justified.

For projects proposing additional carrying capacity for single occupancy vehicles, NJTPA CMP compliance requires that studies carefully demonstrate that the road expansion is fully warranted and that all appropriate complementary operational improvement and travel demand management strategies are packaged with the project. The current version of the template structure (as used to review products of the Local Concept Development Program) is available here: *http://www.njtpa.org/planning/performance-analysis/congestion-management.*

Participation

The CMP overall, and its RCIS underpinning, regional analysis, Assessment of System Connectivity and Strategy Refinement elements, incorporated interagency participation and perspectives from public input in NJTPA regional transportation plan and TNJ development.

Overall, the NJTPA Board of Trustees and its Planning and Economic Development Committee has guided the CMP via direction in the Unified Planning Work Program Tasks. Earlier Strategy Evaluation and Strategy Refinement efforts included workshops and one-on-one meetings with NJTPA member and partner agencies and regional stakeholders, particularly as represented through the standing NJTPA Regional Transportation Advisory Committee (RTAC). These workshops covered all phases of the studies: defining place types, setting planning and transportation objectives, choosing performance measures, setting targets, identifying needs, categorizing appropriate strategies, identifying strategy locations, and selecting strategy areas for refinement. The Assessment of System Connectivity effort engaged a Technical Advisory Committee of partner agencies and the RTAC in reviewing and improving its products.

Application of results from the CMP is continually subject to input in follow-up planning and project development and in further regional analysis as part of the normal NJTPA planning cycle.

4. MONITORING

Examining the region's progress toward meeting its goals provides important feedback to decision-makers focusing on performance, and is a defined element within the CMP. The NJTPA monitors such progress in a variety of ways. This includes regular monitoring of key regional indicators, the periodic updates of performance measures and needs in the regional analysis, and encouraging the use of techniques developed for tracking project-level performance results[3]. The Assessment of System Connectivity Study supported such tracking by identifying performance measures of interest for planners to investigate actual project accomplishments, fine tune improvements, and correct for unintended consequences in the future.

Plans 2045 (and prior NJTPA plans) incorporate information from these types of monitoring, which helps to frame considerations on the region's goals, investment strategy and selection of strategies and projects to implement. In addition, specific monitoring requirements are taking effect stemming from MAP-21 legislation regarding national performance goals, state and MPO targets, and reporting on congestion, reliability, air quality, freight movement, safety, and other performance measures. These

[3] NJTPA Performance Results Study, Assessing the Impacts of Implemented Projects, Final Report and Guidebook, December 2011.

requirements will involve specific reporting in future RTPs and TIPs, and complementing (and contributing to the CMP), should help point the way toward beneficial, effective transportation investments for the region.