



2050 MTP

Appendix I: Prioritization Process





MACORTS 2050 Metropolitan Transportation Plan – Project Assessment and Prioritization Tool Technical Memo

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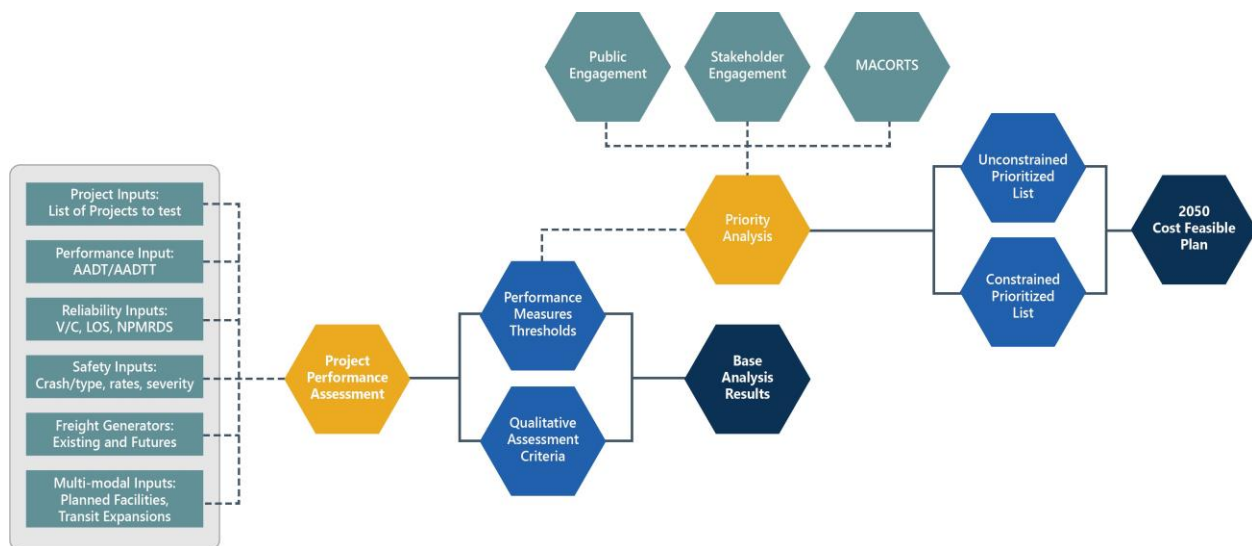


Project Prioritization Scoring Methodology

The MACORTS 2050 Metropolitan Transportation Plan (MTP) Project Assessment and Prioritization Tool is a user friendly, Microsoft Excel based platform designed to fulfill the Performance-Based Planning and Programming requirements of the Bipartisan Infrastructure Law (BIL) legislation. According to FHWA, Performance-Based Planning and Programming is a strategic approach that uses performance data to inform decision-making and outcomes. When implemented effectively, performance management can improve project and program delivery, inform investment decisions, focus staff on leadership priorities, and provide greater transparency and accountability.

MACORTS worked collaboratively with FHWA, GDOT Planning, and the MACORTS Technical Subcommittee to establish the framework, functionality, inputs, and outputs for the Tool. The following graphic shows a functional summary of how the Tool utilizes a data driven approach to assess a project's effectiveness at responding to existing and future transportation deficiencies and applying Federal, State, and Local goals to prioritize investments.

Figure 1: Performance Based Screening Tool Functional Diagram



In order to effectively prepare and utilize the MACORTS Tool, the following steps must be performed.

- Project List Development
- Data Collection and Processing
- Geospatial Analysis
- Database Entry
- Tool Output Review

PREPARING A PROJECT LIST FOR THE ANALYSIS TOOL

MACORTS began with the 2040 project list and incorporated additional projects identified through the existing and future conditions analysis, operational and safety analysis, and public and stakeholder input resulting in a comprehensive unconstrained project list.



The Tool utilizes a detailed project list as the foundation for analysis. This project list should be developed in Microsoft Excel and must contain, at a minimum, the following factors:

- MPO Project ID
- GDOT PI#
- Primary County
- Primary Functional Classification
- Project Description
- Project Type
- Project Limits (From, To)
- Project Length in Miles
- Existing number of travel lanes
- Planned number of travel lanes
- Project Cost by Phase
- Preliminary Engineering (PE)
- Right-of-Way (ROW)
- Utilities (UTL)
- Construction (CST)
- Total Base Year Cost
- Project funded in Cost Constrained List (Yes, No)

These data should also be captured for projects funded by alternative sources, such as HB170 and locally funded projects. It is also recommended that the project sheet include a sorting function to ensure that the project list can be returned to the original layout during the analysis process.

DATA COLLECTION

The initial task is the collection of data used as the inputs to the prioritization tool. It is critical that the data is collected in the editable file formats specified. The following provides a detailed listing of all data utilized in the MACORTS 2050 MTP Project Assessment and Prioritization Tool.

- Study Area Base Map Data (ArcGIS Shapefiles)
 - Jurisdictional boundaries: State, County, City, MPO, etc.
 - Functionally Classified Roadways
- Numeric Crash Data for 5 years (ArcGIS Shapefiles)
 - Total Vehicle Crashes
 - Total Bike / Pedestrian Crashes
 - Crashes with Bike / Pedestrian Injuries
 - Crashes with Bike / Pedestrian Fatalities
 - Vehicle Crashes with Injury
 - Vehicular Crashes with Fatality
- Traffic Counts (ArcGIS Shapefiles)
 - TADA AADT and AADTT
 - GDOT Travel Demand Model AADT and AADTT



- Local/Study Counts
- Level of Service and Volume/Capacity (ArcGIS Shapefiles)
 - GDOT Travel Demand Model Base Year LOS and V/C
 - GDOT Travel Demand Model Future Horizon LOS and V/C for existing plus committed (3rd network)
 - Local / Special Studies with LOS and V/C defined for roadway segments or intersections.
- Freight Generators (ArcGIS shapefiles, Microsoft Excel Spreadsheet with Latitude and Longitude of features)
 - Rail Roads and Crossings
 - Select Georgia Industrial Sites and Buildings (SF/Acreage)
 - Local Comprehensive Plan Existing and Future Land Use Maps
 - Local Economic/Industrial Development Agency Master Plan Data
 - Existing Generators and Attractors (SF/Acreage)
 - Planned Generators and Attractors (SF/Acreage)
- Historic and Environmental (ArcGIS Shapefiles)
 - National Register of Historic Places (Sites and Structures)
 - Local Historic Resources Data
 - EPD
 - DNR Managed Lands
 - US Fish and Wildlife Services Wetland Inventory
 - National Oceanic and Atmospheric Administration NOAA Sea Level Rise Model
- Multimodal (ArcGIS Shapefiles)
 - State Bicycle Routes and Trails (Existing and Planned)
 - Local sidewalks, bicycle facilities, and trails (Existing and Planned)
 - Airport Master Plans
 - Local, Regional and Intercity Transit Routes, Stops, and Stations (Existing and Planned)
 - Other (golf cart, public marina/beach, etc.)
- Other
 - Chamber of Commerce Tourism Attractors
 - Project List as Detailed in Section 1
 - GIS Shapefiles of Project Alignments and Features
 - Title VI and Environmental Justice Populations

Data Preparation Process

GIS Processing Overview

ArcGIS Pro by ESRI is a software program and tool utilized to process data to obtain location-based information. GIS can symbolize data geographically as shapefiles. After collecting the data, GIS processing is used to prepare the data for spreadsheet analysis.



Representation of each MTP roadway corridor as a linear shapefile can facilitate segmentation and detailed analysis of all underlying attributes.

Each roadway corridor includes a variety of data sets represented by a series of points along or in the vicinity of a proposed roadway project alignment. This underlying data is the key component used to summarize the performance of the roadway where a project is proposed and utilized to prioritize the MTP projects. The figure shows an example of a corridor divided into segments with crash data coded to the associated segment.

To enable spreadsheet analysis and summary reports, the input data are first processed in GIS. For example, the GDOT Traffic Analysis Database Application (TADA) count station shapefile and Travel Demand Model Loaded Network shapefiles with AADT and Truck AADT data should be spatially joined with roadway segments. Similarly, the segments should also be spatially joined to the crash data shapefiles obtained from the GDOT maintained Numetric.

Unlike traffic count and crash data, which are specific to highway segments, land uses, and environmental impacts have a broader context. Therefore, spatial join of various data sets at the County, City, and Parcel level is necessary to attribute impacts of associated transportation enhancements. This process is repeated for all data sets identified for the performance-based analysis.

Project Assessment and Analysis Tool

Spreadsheet Analysis Overview

The Project Assessment and Analysis Tool includes a series of tabs located at the bottom of the Microsoft Excel workbook. The GIS-processed data are the inputs included in these tabs, which are then used to create summaries of proposed MTP projects. The following table provides an overview of the tabs and the associated data found in each.

All tabs beginning with lowercase “i” are source data inputs for the Tool. Within each of the data input tabs, a description of the source, data collection, and processing methodology is included in an information call-out box. This information box also includes a disclaimer reminding the user that the accuracy of the results generated by the Tool is dependent on the accuracy of data and input procedures applied by the user.

Table 1: Performance Based Screening Tool Inputs

Tab Title	General Description
Overview	Graphic description of how the Tool functions
Dashboard	Summarizes the results of the MTP
2050 Project List Approved	Detailed comprehensive project list approved by MACORTS
Text	Text
Priority Weighting	Averages prioritization values for weighting criteria



Performance Summary	Summary of project performance linking project list to source data
Prioritized Ranking Summary	Summary of project performance ranking with priority weighting factors applied
iHistoric	Source data: Qualitative assessment of impacts to historic structures and/or sites
iCrash	Source data: Quantitative assessment of crash data by type and severity, and associated ranking
iVC_LOS	Source data: Quantitative assessment of Level of Service and Volume/Capacity for corridors with projects identified
iNatural_R	Source data: Qualitative assessment of impacts to natural and cultural resources such as waterbodies or public parks
iTourism	Source data: Qualitative assessment of improvements that support access to local travel and tourism destinations
iAADT	Source data: Quantitative assessment of vehicles traveling in the region. This input is used in calculations of crash rates.
iPer_Trk	Source data: Quantitative assessment of percentage trucks derived from base year AADT
iEx_FM	Source data: Qualitative assessment of transportation improvements that directly impact or benefit existing freight and manufacturing attractors and generators
iMultiM	Source data: Qualitative assessment of multimodal transportation features present or planned within proposed project limits
iEquity	Source data: Quantitative assessment of impacts to underserved populations through the Justice40 Climate & Economic Justice Screening Tool

For the projects being scored, both quantitative and qualitative data are included to create an aggregate score by which to rank the projects. Quantitative factors are given scores based on numerical data, and qualitative factors are evaluated based on established subjective criteria and assigned 'yes = 2,' 'no = 0,' 'somewhat = 1' scores. This technical memorandum describes the data sources, approach, and methodology utilized for each of the MACORTS MTP quantitative and qualitative measures of effectiveness.

Quantitative Factors

1. AADT (Average Annual Daily Traffic)/Average Annual Daily Truck Traffic (AADTT)
 - a. For existing corridors with traffic counts, data was pulled from three primary sources: local traffic counts, GDOT traffic counts, and GDOT Travel Demand Model (TDM) counts.
 - b. For new construction project corridors, traffic counts were sourced from TDM counts for both base year and 2050 future year projections.
 - c. For corridors where no existing traffic counts or 2020 base year TDM source data was available, the 5th TDM network (unconstrained build scenario) was utilized and future AADT volumes were deflated at 2% annually to arrive at the base year AADT volume estimates. This adjustment factor is consistent with the Technical



Subcommittee approved methodology for the 2045 MTP data collection and assessment efforts.

2. Level of Service (LOS) 2020 and 2050 “Do Nothing”
 - a. LOS sourced from GDOT TDM 4th Network (Existing Plus Committed) and 5th Network (Unconstrained Build Scenario).

$$LOS = \frac{\text{Modeled Daily Traffic}}{\text{Daily Roadway Capacity}}$$

- b. Where LOS was not available in the GDOT TDM, the FHWA 2018 Traffic Data Computation Method Pocket Guide approach was used to generate estimates.
3. Volume to Capacity Ratio (V/C) 2020 and 2050 “Do Nothing”
 - a. Volume to Capacity Ratio (V/C) was sourced from the GDOT TDM 4th Network (Existing Plus Committed) and 5th Network (Unconstrained Build Scenario).
 - b. For corridors where no TDM source data was available, an average was generated following FHWA’s 2017 Simplified Highway Capacity Calculation Method for the Highway Performance Monitoring System guidelines.

Figure 2: Performance Based Screening Tool - Level of Service and V/C Thresholds

Level Of Service	V/C Ratio
A	≤ 0.26
B	>0.26 – 0.4
C	>0.4 - 0.6
D*	>0.6 - 0.8
E	>0.8 - 1.0
F	>1.0

* LOS D is the threshold for acceptable road performance

4. Total Vehicle Crashes, Bike/Ped Crashes, Injury Crashes and Fatal Crashes
 - a. Comprehensive crash data was gathered from Numetric.
 - b. Proposed new construction projects were not assigned crash data estimates and will be represented as null values.
 - c. The following calculations were utilized to establish Crash Rates for each 2050 MTP project.
5. 3.2.1. Road Segment Rate Calculation



$$R = \frac{100,000,000 \times C}{365 \times N \times V \times L}$$

R = Crash rate for the road segment expressed as crashes per 100 million vehicle-miles of travel (VMT).

C = Total number of crashes in the study period.

N = Number of years of data.

V = Number of vehicles per day (both directions)

L = Length of the roadway segment in miles.

Intersection Rate Calculation

$$R = \frac{1,000,000 \times C}{365 \times N \times V}$$

R = Crash rate for the intersection expressed as accidents per million entering vehicles (MEV).

C = Total number of intersection crashes in the study period.

N = Number of years of data.

V = Traffic volumes entering the intersection daily.

Qualitative Factors

- Supports Access to Freight Generators and Attractors
 - Data sources:
 - 2023 GDOT Freight Plan
 - GDOT designated Freight Corridors alignments
 - Qualitative criteria:
 - Does this project support access to freight generators and attractors?
 - Is the proposed improvement located on an existing freight corridor?
- Supports Access to Tourism Attractions
 - Data sources:
 - Athens Convention and Visitors Bureau
 - 2023 Athens Comprehensive Plan
 - Qualitative criteria:
 - Does the proposed project support access to existing and planned regional tourism attractions?
- Multimodal Elements: Access to Planned Bicycle and Pedestrian Facilities
 - Data sources:



- Athens In Motion Bicycle / Pedestrian Master Plan
 - Athens Transit TDP
- Qualitative criteria:
 - Does planned improvement provide access and/or safety enhancements for cyclists and pedestrians?
 - Does planned improvement provide ease of transfer between bike/ped and public transit?
 - Is the planned improvement located within $\frac{3}{4}$ mile of school or known Safe Route to School?
- Multimodal Elements: Access to Existing / Planned Transit Services
 - Data sources:
 - Athens Transit fixed route and ADA Paratransit routes and service area
 - Athens Transit Transit Development Plan – Planned service expansions
 - Qualitative criteria:
 - Does the project support existing transit service on an existing service corridor?
 - Will the project support a planned transit expansion?
 - Does the project connect to an existing or planned transit route, thereby providing last mile connectivity?
- Multimodal Elements: Access to Airport
 - Data sources:
 - Airport Master Plan
 - Qualitative criteria:
 - Is this project on a corridor that will improve airport access?
- Local Support
 - Data sources:
 - Athens-Clarke County SPLOST Project Lists
 - TSPLOST Proposed Projects 2018, 2020, 2023
 - Locally sponsored projects – Feedback from Stakeholders
 - Qualitative criteria:
 - Does the project have existing local funding contributions/commitments?
 - Does the project have funding commitments through existing Special Purpose Local Option Sales Tax (SPLOST) or Transportation Special Purpose Local Option Sales Tax (TSPLOST)?
 - Does the project have non-traditional Local/State/Federal funding authorized that would expedite delivery (Example: TE/TAP funding for Preliminary Engineering).
- Proximity to Historic Locations and Buildings in MACORTS planning region
 - Data sources:



- Georgia Natural Archaeologic Historic Resource Geographic Information System (GNAHRGIS)
 - Georgia Historic Preservation Division
 - Athens Historical Society
- Qualitative criteria:
 - Will this project interfere with existing historic and/or cultural resource?
 - Is this project in proximity to a cultural or historic resource that would likely trigger NEPA EIS?
- Proximity to Wetlands and Natural Resources
 - Data sources:
 - Georgia Department of Natural Resources
 - US Fish and Wildlife Service
 - Qualitative criteria:
 - Does this project interfere with wetlands or other natural resources?
 - Does this project interfere with Wetlands, National/State Parks, Rivers, Creeks?

The quantitative and qualitative data is aggregated and displayed on the Tool “Performance Summary” tab. This summary spreadsheet is shown on the following page and provides a comprehensive snapshot for each proposed transportation project, where data was available.



These projects are TIP/TSPLOST projects and were not evaluated for prioritization.

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PRIORITY RANKING PROCEDURES

The quantitative data is sorted within each source data tab to place the projects and their associated data in ascending/descending order based on performance. (Ex. the higher the V/C value, the worse this roadway segment is performing; therefore, this metric will be sorted highest to lowest). Once the sorting is completed, a ranking score is assigned in numerical order. If there are 100 projects, the project at the top of the list receives a ranking score of 100 and the project at the bottom of the list receives a ranking score of 1.

TIP projects are not ranked and should not receive a score for each ranking criterion. These projects are included for information purposes and to ensure that data is available if the project status changes and the MTP prioritization must be revisited.

The performance-based ranking scores are aggregated into a Prioritized Ranking Summary spreadsheet where the various scores are displayed for each project. These scores are then coded to reflect the associated priority weighting factor established through public and stakeholder outreach. The following figure shows the MACORTS 2050 Priority Weighting Factors used in this prioritization process.

Table 2: MACORTS 2050 Priority Weighting Factors

MACORTS 2050 Goals	Average
Enhance Land Use	0
Safety and Security	10
Transit	8
Mobility	7
Environment and Quality of Life	6
Multimodal Connectivity	9
System Preservation and Maintenance	3
System Management and Operation	2
Reliability and Resiliency	5
Travel and Tourism	1
Economic Vitality	4

With the prioritization ranking scores now reflecting local goals and objectives, the projects are sorted based on the aggregate ranking scores to demonstrate a preliminary prioritized project list for the MPO.

Example:

If there are 100 MACORTS projects and project X has the highest crash ranking, it will be assigned a score of 100, since Safety and Security is ranked highest in priority factors it will then be multiplied by a factor of 8. The adjusted safety score for project X is now 800.

If the same project supports access to freight generators/attractors, it will also receive a score of 2 ("Yes" = 2) and a weighting criteria multiplier of 7. The adjusted freight score of 14 is then added to the safety score of 800 for an aggregate ranking score of 814.



This process is repeated for each prioritization criteria, resulting in a comprehensive prioritization ranking score. The following figure shows the Prioritized Ranking Summary spreadsheet for the MACORTS MTP.



These projects are TIP/TSPLOST projects and were not evaluated for prioritization.

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