THE ARC TIP PROJECT EVALUATION FRAMEWORK

"The Project Evaluation Cookbook"

Atlanta Regional Commission

Winter 2017

The ARC Title VI Program & Plan was adopted on 10/26/16 –

The Atlanta Regional Commission, as a federal grant recipient, conforms to Title VI of the Civil Rights Act of 1964 and its amendments. Title VI of the Civil Rights Act of 1964 requires that no person in the United States shall, on the ground of race, color or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance. Presidential Executive Order 12898 addresses environmental justice in minority and low-income populations. Presidential Executive Order 13166 addresses services to those individuals with limited English proficiency. ARC is committed to enforcing the provisions of Title VI and to taking positive and realistic affirmative steps to ensure the protection of rights and opportunities for all persons affected by its programs.

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Glossary of Acronyms

AADT	Average Annual Daily Traffic
ABM	Activity-Based Travel Demand Model
ARC	Atlanta Regional Commission
AREES	Atlanta Roadside Emission Exposure Study; tool developed by ARC to determine local hotspots of transportation-induced poor air quality
ARFMP	Atlanta Regional Freight Mobility Plan
ASTRoMaP	Atlanta Strategic Truck Route Master Plan
ATMS	Advanced Traffic Management Systems
B/C	Benefit-Cost Ratio; sum of project's expected benefits divided by the sum of its expected costs
CE	Categorical Exclusion
CFI	Continuous Flow Intersection
CMAQ	Congestion Mitigation & Air Quality Improvement Program; funding category
CMF	Crash Modification Factor
CST	Construction; phase of project funding
CID	Community Improvement District
DCA	Department of Community Affairs
DDI	Diverging Diamond Interchange
DOC	Diesel Oxidation Catalyst; a technology used in diesel retrofits
DPF	Diesel Particulate Filter; a technology used in diesel retrofits
ETA	Equitable Target Area; index developed by ARC to identify low income and minority communities
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
GDOT	Georgia Department of Transportation
GEARS	Georgia Electronic Accident Reporting System
GHG	Greenhouse gas
GRTA	Georgia Regional Transportation Authority
KDP	Key decision point; framework for technical evaluation used by ARC
LCI	Livable Centers Initiative
MPO	Metropolitan Planning Organization; part of ARC's duties is to serve as the Atlanta region's MPO
NBI	National Bridge Inventory
NHFN	National Highway Freight Network
PDP	Plan Development Process; GDOT's procedure to move projects from planning to construction
QLG	Qualified Local Government; status given to local governments by the DCA
ROW	Right-of-way; phase of project funding
RTP	Regional Transportation Plan

SSTP	Statewide Strategic Transportation Plan
STBG	Surface Transportation Block Grant Program; funding category
TIP	Transportation Improvement Program
TAP	Transportation Alternatives Program; funding category
TAQC	Transportation and Air Quality Committee; the policy board for the MPO work at ARC made up of local elected officials, citizen representatives and planning partners required by USDOT
TCC	Transportation Coordinating Committee
TERM	Transit Economic Requirements Model; FTA tool to assess a transit project's merit
TOD	Transit-Oriented Development
TSM&O	Transportation System Management & Operations
TSP	Transit Signal Priority; technology that gives transit vehicles priority at red lights
TTI	Travel Time Index; a metric to determine how long it takes to travel a congested corridor
USDOT	United States Department of Transportation
UTL	Utility; phase of project funding
VHD	Vehicle Hours of Delay; a metric to determine how many vehicles are impacted by congestion on a corridor. This metric can be turned into person hours of delay by multiplying by the occupancy rate of the vehicles.

Glossary of Planning Terms

Asset Management	KDP2 project type & criterion; the process of operating, maintaining and upgrading infrastructure to ensure a state of good repair.
Atlanta Region's Plan	Regional plan that focuses on the vision of world class infrastructure, healthy livable communities and a competitive economy. The Atlanta Region's Plan guides regional policy and is the cornerstone of ARC's programs.
Benefit-Cost Ratio	Monetized sum of project's expected benefits divided by the sum of its costs.
CMAQ Calculator	Tool developed by ARC to determine emissions and congestion benefits of CMAQ funding eligible projects.
Complete Street	Allows for safe travel by those walking, bicycling, driving and riding transit along the same corridor.
Cost-Effectiveness	Measure of how well a project achieves certain goals for the cost. For example, the number of transit trips a project generates per dollar spent to build and maintain the project.
Employment Accessibility	KDP2 prioritization criterion; extent to which a transportation system provides access to important destination and opportunities, such as employment, that support economic development and quality of life. Measures/metrics related to this criterion focus on improving access to key centers in the region.
FAST Act	Current federal transportation authorization bill; codified additional need for performance-driven planning into decision-making.
MAP-21	Previous federal transportation authorization bill; initiated efforts to incorporate a higher level of performance-driven planning into decision-making.
Mobility	KDP2 prioritization criterion; the ability to move people or goods from place to place. Measures/metrics related to this criterion ask the questions 'how do you get somewhere' and 'how fast can you travel there.'
Multimodalism	KDP2 prioritization criterion; The extent to which multiple modes of transportation are accommodated along a single corridor. For example, a 2-lane road with bicycle lanes, sidewalks and regular transit service is a good multimodal corridor in that it accommodates trips for people driving, walking, bicycling and riding transit.
Network Connectivity	KDP2 prioritization criterion; The extent to which a transportation system can work as a contiguous network, including an adequate number of connections and an appropriate level of redundancy. Ensuring transportation projects connect to existing infrastructure, fill in network gaps, or build redundancy ensures travel alternatives and improves access to key centers.
Reliability	KDP2 prioritization criterion; the ability to reach destinations in a predictable amount of time, even if that trip is on congested roadways.
Resiliency	The capacity to recover quickly from stressors; a factor incorporated into the FAST Act and linked to climate adaptation planning
Social Equity	KDP2 prioritization criterion; The extent to which all people are granted fair and equitable access to the benefits of the transportation system and transportation improvements.
Walk. Bike. Thrive!	ARC's bicycle and pedestrian plan developed in 2016.

Glossary of Links

ARC TIP Solicitation Website	http://www.atlantaregional.com/projectsolicitation
Atlanta Regional Freight Mobility Plan	http://www.atlantaregional.com/transportation/freight#plan-update
Atlanta Region's Plan Website	http://www.atlantaregionsplan.com
Atlanta Roadside Emissions Exposure Study	http://www.atlantaregional.com/arees
CMAQ Calculator	http://www.atlantaregional.com/cmaqcalculator
Crash Modification Factors Clearinghouse	http://www.cmfclearinghouse.org/index.cfm
FTA Transit Densities Guidelines	https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/Land_Use_and_EconDev_Guidelines_August_2013.pdf
GDOT Traffic Counts	http://geocounts.com/gdot/
Walk. Bike. Thrive!	http://www.atlantaregional.com/transportation/bicycle--pedestrian

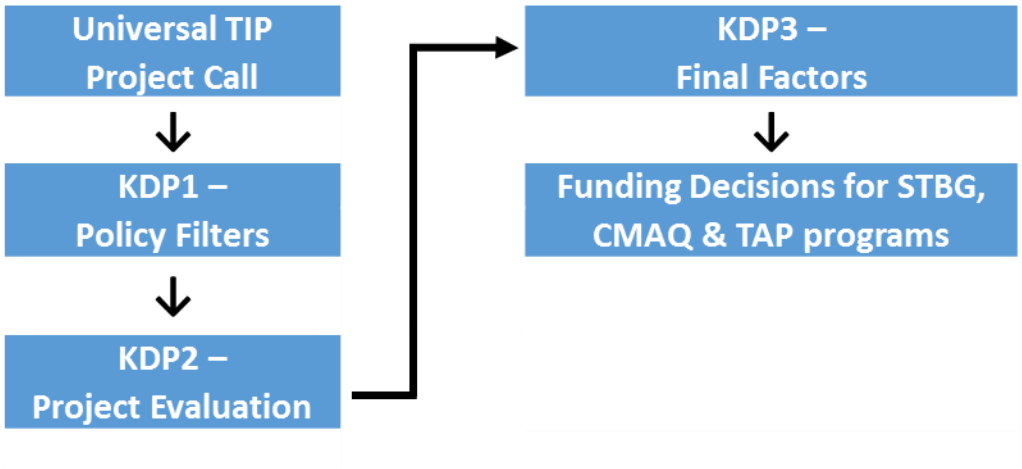
Overview

ARC has a rich history of performance-driven planning and decision-making. With the passage of the past two federal transportation authorization bills, MAP-21 and the FAST Act, states and metropolitan planning organizations (MPOs) across the nation are putting additional emphasis on developing performance-driven project and program evaluation methods. To further ARC's state-of-practice and help demonstrate progress towards meeting eventual state and federal performance measures, ARC is migrating the Transportation Improvement Program (TIP) solicitation process towards a key decision point (KDP) framework. This framework is similar to the one used in previous Regional Transportation Plan (RTP) development cycles in that it incorporates rigorous data-driven decision-making into the planning process.

Key Decision Point Framework

Similar to what was used to prioritization transportation projects in the Atlanta Region's Plan RTP, ARC staff have put forth a three tiered KDP flowchart for evaluating all transportation projects seeking funding in the TIP. Figure O1 outlines the steps of the process.

Figure O1 – KDP Flowchart



First, ARC will initiate a call for projects. Unlike recent solicitations, this call will not focus on a single funding category, but instead it will be universal. In KDP1, ARC staff will use a set of filters to remove projects that do not match regional policy on the front-end. After applying these policy filters, ARC staff will technically evaluate the remaining projects in KDP2. After projects are evaluated and scored, ARC staff, project sponsors and policymakers will consider any final factors that cannot be accounted for in a technical exercise. This process, KDP3, is meant to recognize that solely performance-driven decision-making can sometimes overlook important factors that could lead to vital projects being left out of the TIP. Finally, ARC staff will allocate funding to the selected projects. The bulk of this document is dedicated to the KDP2 process. Information on the filters in KDP1 and the decision-making in KDP3 are also included.

An exception to the flow proposed in the KDP process are GDOT's projects that are funded fully using a mix of state and GDOT's share of federal funds. These projects are not evaluated through the full KDP framework. It is the goal of ARC to gradually incorporate and provide a KDP2 score for all GDOT funded projects in the Atlanta TIP. Federal planning regulations in the FAST Act require MPOs to demonstrate how the TIP is helping move the needle on performance measures and metrics. In order to determine how GDOT funded projects are impacting regional performance, ARC must evaluate these projects for technical merit. All GDOT funded projects that are seeking funding from ARC's share of federal obligation authority will pass through the full KDP process, from KDP1 to KDP3.

KDP1 – Policy Filters

The first step in the evaluation process focuses on removing project submittals that are not supported by regional policy. Project submittals that do not meet the policy filter criteria outlined in KDP1 will not advance to the KDP2 process for technical evaluation and will not be considered for funding. Policy filters are broken out into three categories: general, roadway capacity specific and transit capacity specific. Transit capacity filters only apply to right-of-way (ROW), utility (UTL) and construction (CST) funding requests and do not apply to planning, design or environmental activity. Table O1 outlines the policy filters ARC staff will utilize in the TIP project solicitation.

Table O1 – KDP1 Policy Filters

	Policy Filter Language
General Filters	Project must originate from a locally adopted plan
	Sponsors must have Qualified Local Government (QLG) status current or pending
Roadway Capacity Filters	Project must be federal aid eligible
	Project must be located on a regional or national priority transportation network
	Project must include a complete streets component that is context sensitive to the existing community
	Rural projects should support economic competitiveness by improving multi-modal connectivity between regional centers
	Projects that are estimated to cost $20 million or more must demonstrate a firm financial package
Transit Capacity Filters	Project must demonstrate a firm financial package
	Project must connect to an existing public transit service or regional center

KDP2 Project Evaluation & the TIP Prioritization Task Force

In order to further develop the KDP2 process, ARC convened a working group of staff from local governments, state agencies, transit providers, non-profit organizations and private consultants. This group, called the TIP Prioritization Task Force, met in the spring and summer of 2016 to develop a master performance matrix that guided the development of individual metrics used for project evaluation. This group also weighed in on the development of KDP1 policy filters and KDP3 final factors. The bulk of the committee's time was spent considering elements relevant to KDP2.

The matrix developed by the group organizes the solicitation by project type/mode and by a series of key performance criteria. These criteria were determined to be the most important indicators in determining the composition of a successful project. The criteria are all nested within the vision statements of the Atlanta Region's Plan, which strives for the region to have world class infrastructure, healthy livable communities and a competitive economy. Certain criteria do not apply to all project types. The nesting of project types and criteria developed by the TIP Prioritization Task Force is outlined in Table O2. Values with a ✓ indicate performance measures and metrics were identified for that particular project type and criterion.

Project types were determined by the TIP Prioritization Task Force to allow for an apples-to-apples comparison among projects with consistent performance measures and metrics. The nine categories represent the wide variety of projects sponsors in the Atlanta region implement.

Table O2 – TIP Prioritization Task Force Project Type/Mode and Key Criteria

Atlanta Region's Plan Goals	Performance Criteria	Project Types								
		Bicycle	Pedestrian	Trail	Roadway Asset Management & Resiliency	Roadway Expansion	Roadway Transportation Systems Management & Operations	Transit Expansion	Transit Asset Management and System Upgrades	Misc. Emissions Related Projects
World Class Infrastructure	Mobility & Congestion	✓	✓	✓	✓	✓	✓	✓	✓	
	Reliability					✓	✓	✓		
	Network Connectivity	✓	✓	✓	✓	✓	✓	✓		
	Multimodalism	✓	✓	✓	✓	✓	✓	✓		
	Asset Management & Resiliency				✓				✓	
Healthy Livable Communities	Safety	✓	✓	✓	✓	✓	✓	✓	✓	
	Air Quality & Climate Change	✓	✓	✓		✓	✓	✓	✓[1]	✓
	Cultural & Environmental Resources	✓	✓	✓	✓	✓	✓	✓	✓	
	Social Equity	✓	✓	✓	✓	✓	✓	✓	✓	
	Land Use Compatibility	✓	✓	✓				✓		
Competitive Economy	Goods Movement				✓	✓	✓			
	Employment Accessibility	✓	✓	✓	✓	✓	✓	✓	✓	

For the purpose of TIP project evaluation, all submittals are assumed to have one primary project type represented by the columns in Table O2, above. The component of the project that is the most important to the sponsor is considered the primary type. Many projects are multimodal in nature. This nuance is handled through the multimodalism criterion. For example, if a sponsor is planning on widening a road and adding bicycle lanes the project is considered multimodal. The sponsor would be required to choose the primary and supporting project types. Assuming the sponsor chooses the roadway widening as the primary component, extra information will be collected to assess the benefits of the bicycle lanes in addition to the roadway widening.

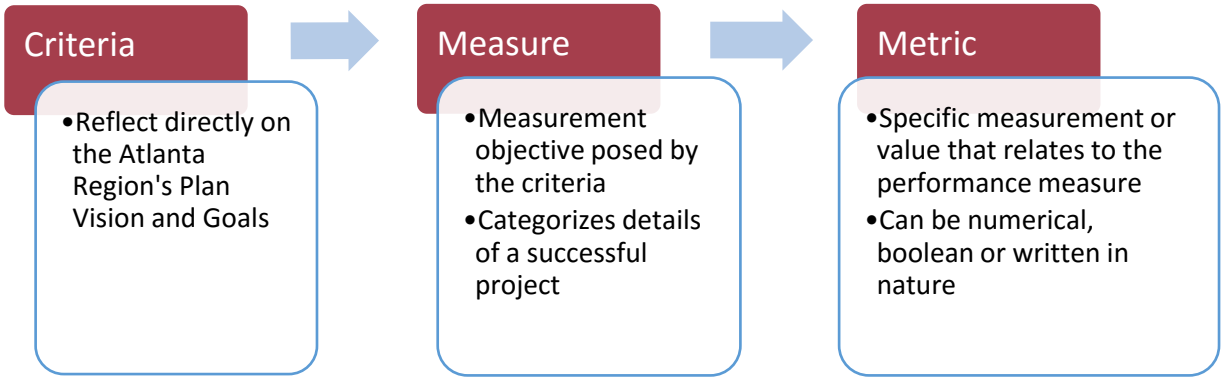
[1] This measure only applies to transit bus replacement asset management projects

ARC staff recognize that some projects submitted will not clearly fit into any of the nine project type categories identified in the matrix above. Staff will work with sponsors to identify how best to evaluate these projects and will ensure that all applications receive a fair chance to state their merit.

Criteria, Performance Measures and Metrics

After the TIP Prioritization Task force identified project types and criteria they worked on developing performance measures and metrics. Figure O2 outlines how criteria, measures and metrics all nest.

Figure O2 – Nesting of Criteria, Measures and Metrics



For example, a roadway expansion project would be assessed for ten of the twelve criteria developed by the TIP Prioritization Task Force (as indicated in Table O2 above). For the *Reliability* criterion ARC staff would evaluate the performance measure indicated: *Worst Hour Travel Time Reliability*. In order to determine this measure, staff would assess the metric *Aggregated 80% travel time / 50% travel time for all weekdays*. All roadway expansion projects reviewed would be compared and the best reliability-addressing projects could be identified. Full details about all measure and metrics by project type are identified in subsequent sections of this document, following the Project Scoring section.

KDP3 – Final Factors

The performance measures and metrics evaluated in KDP2 are not meant to be the only deciding factors in project selection. Other pieces of information help inform the selection of projects and align decisions with policy. These extra pieces of information are a critical part of the KDP3 process.

KDP3 is designed to account for factors in project selection that cannot be easily quantified or that account for local politics and regional equity. The key non-performance-driven factors ARC staff and stakeholders will look at before making final decisions on project selection are:

- Sponsor Priority
- Regional Equity
- Benefit-Cost or Cost-Effectiveness
- Deliverability

These four items reflect on long-standing practice at ARC and were used in previous RTP and TIP project evaluations. Taken together along with KDP2 scores, these KDP3 final factors help inform decisions that lead to project selection and funding awards. The four factors are outlined in more detail below.

Sponsor priority reflects on local politics and the choices communities have reached through outreach and collective decision-making. ARC staff will seek information from project sponsors on local priorities and share results from the KDP2 process to help determine sponsor priority.

In the Atlanta Region's Plan Policy Framework the ARC Board determined that regional equity is an important consideration. Ensuring a fair distribution of transportation projects throughout the region ensures opportunities for growth, access to jobs, and robust investment in regional transportation systems. ARC staff work with partner agencies and project sponsors to ensure that all places in the region receive equitable investment.

ARC has employed benefit-cost and cost-effectiveness measures in the past to tier project results. Looking at a component of a project's benefit compared to its cost helps compare big and small projects on equal footing. ARC and our planning partners strive to select projects that are cost-effective to ensure the best use of limited transportation funds. If a transportation project scores very well in KDP2, but is not cost-effective compared to similar projects, it may not be in the region's best interest to advance into the TIP at this time. More details on the cost-effectiveness and benefit-cost methods are provided in the Project Scoring section of this document.

Deliverability is key to the development of a successful TIP. Implementing promised projects on time improves public trust in government and ensures good stewardship of available resources. ARC staff have developed a comprehensive deliverability assessment as part of the TIP project solicitation application process. This assessment is discussed in greater detail in the following section.

Project Deliverability

Project deliverability has been identified by policymakers as a key concern for all projects incorporated into the TIP and RTP. Deliverability is considered as one of the KDP3 final factors in project selection and is based on information provided by sponsors in the TIP solicitation. Following is the list of questions and information the TIP solicitation application will ask sponsors in order for ARC staff to determine deliverability of TIP projects.

1. Environmental Screening & Impact Analysis
    a. Alternatives considered: Describe alternatives considered and why this alternative is preferred.
    b. Coordination with other Projects: List any transportation project (local, state, federal funds) scheduled within the constrained RTP which overlaps, intersects or extends the limits of this project.
    c. Railroad Involvement: Does the project involve construction on railroad property or crossing railroad tracks? If yes, please describe coordination to date.
    d. Inter-jurisdictional: Does project involve multiple jurisdictions? Describe any coordination to date.
    e. Environmental Impacts/Level of Analysis:
        i. What is the level of analysis anticipated: Programmatic Categorical Exclusion (PCE), Categorical Exclusion (CE), Environmental Assessments (EA) or Environmental Impact Statements (EIS)?
        ii. Historic resources: Does the project require Right-of-Way (ROW) acquisition, including construction easements, from a potential historic property or National Register listed property? Is the project located in a National Register Historic District?
        iii. Archaeology: Do you anticipate disturbance of any archaeological resources, including historic streetcar tracks that may be only 4 inches beneath the existing pavement surface?
        iv. Section 4(f): Does the project require ROW acquisition, including construction easements, from a cemetery, park or recreation area?
        v. Hazardous waste sites: Does the project require ROW acquisition or construction easement from a property containing underground storage tanks or other hazardous waste site?
        vi. Anticipated impacts to wetlands, streams or endangered species: Do you anticipate needing a Nationwide, Section 404 and/or other permits from USACE? Will a Section 401 Water Quality Certification be needed from the state? Have you determined if a stream buffer variance will be needed? Does this project require wetlands and/or stream mitigation? Is this project located adjacent or is hydrologically connected to an impaired waterbody? Have you conducted any desktop analysis for the potential Endangered Species Act considerations?
        vii. Air and Noise Impact: Will project reduce or increase number of traffic lanes, requiring more advanced air quality and noise impact modeling?
        viii. Social Equity: Where is the project located on the ARC's Equitable Target Area map? Explain how this project addresses social equity.
    f. Utility Involvement or Impacts (Communications, Power, Gas, Water, etc.):
        i. List known utilities in the project area.
        ii. Do you plan to move the utility poles?

iii. Do you plan to bury above-ground utilities?
iv. Do you plan to use federal funds for utility relocation?
v. Do you understand that federal funds do not permit sole sourcing for purchase and installation of lighting (in other words, you cannot just hire GA Power, you must bid the work).

g. Public Engagement:
i. List any public outreach held to date (may include planning study or project level).
ii. Identify major stakeholders
iii. Describe any organized opposition to the project (if any)
iv. List additional public outreach anticipated for the project

2. Design Information
a. Existing design features:
i. Typical Section: (Describe number & width of lanes, turn lanes, bike lanes, curb, gutter, sidewalks, medians, etc.)
ii. Width of ROW (in feet):
b. Proposed Design Features:
i. Proposed typical section(s): Describe number & width of lanes, turn lanes, curb & gutter, sidewalks, median, etc.
ii. Proposed ROW
1. Width
2. Easements: Temporary, Permanent, Utility, Other
3. Number of parcels
4. Number of displacements (estimated): Business, Residences, Other
5. Number of driveways to be removed
6. Number of private off-street parking spaces to be removed
7. Do you understand that the federal Uniform Relocation Act requires that fair market value must be offered for all property acquisition, even for temporary easements?
8. Does the jurisdiction have a policy or practice against using condemnation as a last resort ROW acquisition tool?
iii. Logical Termini: Does project meet the following criteria: sufficient length to address broad environmental concerns, independent utility, and allowing consideration of alternatives for other improvements, which are reasonably foreseeable?
iv. Describe any changes to existing, or new bridges, culverts, retaining walls or other major structures.
c. Capacity Projects, i.e. adding or removing through travel lanes, and one-way to two-way conversions:
i. Does the project do any of the following: Add through travel lane, remove through travel lane, convert one-way to two-way operations, and/or convert two-way to one-way operations?
ii. Has a traffic study been completed? If yes, please summarize the findings related to the project's impact on traffic volumes and LOS.
iii. Is the project on a U.S. or State Route? If yes, describe coordination with GDOT to date. Has GDOT approved the proposed lane configuration (attach documentation)?
d. Design Policy
i. Explain how project complies with GDOT and ARC's Complete Streets policy.

ii. Do you anticipated any design exceptions to FHWA/AASHTO controlling criteria or variances from GDOT standards criteria (insert tables)?

3. Budget and Schedule
   a. Do you plan to "flex" the funds to Federal Transit Administration (FTA)? If yes, what agency will serve as the grantee? Please provide a letter of support from the FTA grantee, if not the applicant.
   b. Project Delays: Does the Sponsor have a delayed project(s) in the TIP? What actions will the Sponsor take to ensure the new project is not significantly delayed, and what will the Sponsor do to advance its existing delayed project(s)?
   c. Complete schedule and budget Table PD1 below:

Table PD1 – Solicitation Deliverability Assessment Schedule and Budget Table

Phase	Fiscal Year Proposed	Federal Funds (Max. 80%)	Matching Funds (Min. 20%)			Total Cost
			State	Local	CID/Other	
PE						
ROW						
CST						
Utilities						
Environmental Mitigation						
CST Oversight						

4. Attachments and Required Documents
   a. Proposed GDOT/PDP milestone project schedule
   b. Project location map and shapefiles
   c. Typical cross section
   d. Concept layout
   e. Resolutions/Signatures: Local governing body AND CID or other agency involved (if applicable) committing to the local matching funds and implementation of the project
   f. Support letters of impacted agencies (if applicable), e.g. CSX, GDOT, FTA, etc.

Deliverability Assessment Evaluation Criteria

Eligible for PE/ROW/CST funding now:

1. Approved Concept Report or Scoping Report, or
2. Project to be flexed to FTA and CE is anticipated, or
3. Deliverability section is fully completed, including all attachments for project milestone schedule and detailed budget, concept layout and typical section, commitment letter or resolution. Clear understanding of potential right-of-way, social and environmental impacts is evident, and some public outreach has occurred (which may have been through a planning study resulting in this project application).

ARC will seek input from GDOT to assess project readiness based on the information provided by the sponsor. For projects requesting to be flexed, ARC will consult FTA regarding the project's "transit nexus" and anticipated level of environmental analysis.

Eligible for Scoping Funds:

Projects that score well under funding criteria, but do not pass the deliverability test above

Not Eligible for funding at this time:

Project scores poorly on KDP2 and LCI/KDP3 (if applicable) funding criteria, regardless of deliverability assessment outcome.

LCI Projects

The ARC Board created the Livable Centers Initiative (LCI) in 1999 to provide funding for studies and transportation projects located in activity and town centers that promote increased density, a mix of land uses, housing for people of all income levels, and multi-modal transportation options. Through the adoption of every RTP since then, ARC has committed $500 Million through 2040 for the projects identified in LCI plans. The program is unique in that priority for LCI transportation project funding is given to those communities that have shown continued support for creating multi-modal, livable centers through their on-going efforts to implement their adopted LCI plan, including making land use and zoning changes.

Only certain projects are eligible to be considered for LCI funding. These projects are a subset of those that pass through the entire KDP process. Eligibility for LCI funding is determined by the following criteria:

1) At least 50% of the project limits is within an LCI study area
2) The LCI plan has been adopted by a local governing body by resolution or other "official" manner
3) The project sponsor is current with minor (5-year) or major plan updates (at least 10 years old) (if applicable)
4) The project is listed in the LCI 5-year Implementation or Action Plan
5) The sponsor is a Qualified Local Government (QLG), or pending, by Department of Community Affairs (DCA) standards

If a project meets the LCI eligibility criteria, an additional set of evaluations will occur to determine projects that are the best fit for the program. This evaluation reflects established practice and ARC Board-adopted policy that are unique to the goals of the LCI program. LCI project selection will therefore be based on a combination of the KDP2 technical performance score, the KDP3 LCI assessment score, and a deliverability assessment.

LCI Evaluation Score

1. **LCI Plan Implementation (25 possible points total):**
   The primary goal of the LCI program is to create and enhance well-connected, dense, mixed-use centers that promote walking, bicycling and transit, which serve people of all ages and incomes. This section is intended to assess the commitment and progress made towards these goals.

   Do the codes/regulations covering the LCI area permit the following (check all that apply):
   - 5pts - Mixed-use zoning districts or provision allowing mix of uses
   - 3pts - Multi-family residential
   - 3pts - Incentives for workforce or affordable housing
   - 3pts - Required connectivity in development codes (i.e. no cul-de-sacs)
   - 3pts - Parking maximums or reduced parking requirements
   - 3pts - Historic district
   - 3pts - Buildings and entrance front the street/sidewalk (no parking between building and sidewalk)
   - 2pts - Design overlay district

2. **Creates a complete street & promotes walkability (30 possible pts):**
   a. Bike Facility (pick one – 10 possible points):
      i. Protected bike facility: 10 pts
      ii. Shared use path: 5 pts
      iii. Striped bike lane with painted buffer: 5 pts
      iv. Striped bike lane: 2pts
   b. Sidewalks (pick one – 5 possible points):

i. Replaces existing sidewalk: 1pt
ii. Installs new sidewalk (none previously existed): 5 pts
iii. Combination of #1 & #2: 3pts

c. Safety Features (pick all that apply – 15 possible points):
Includes raised median or islands, enhanced crossing (e.g. HAWK or Rectangular Rapid Flash Beacon (RRFB)), lane reductions, roundabout or traffic calming/speed reduction countermeasures.

3. **Innovation and Quality of Scope (15 possible pts):**

Project includes green infrastructure, creative placemaking elements, innovative or "smart" design elements (e.g. back-in parking, shared streets, use of technology – real time transit information signs, parking apps, electric car charging stations, etc).

4. **Provides access to transit[2] or supports Transit-Oriented Development (TOD) (max. 15 pts – select <u>ONE</u> below):**
   a. 15 pts: TOD project
   b. 15 pts: Bike/ped/transit infrastructure within 1/4 mile of transit station or bus stop
   c. 12 pts: Bike/ped/transit infrastructure within 1/2 mile of transit station or bus stop
   d. 8 pts: Bike/ped/transit infrastructure within 1 mile of transit station or bus stop
   e. 5 pts: Bike/ped/transit infrastructure within 1/4 mile of funded or programmed transit station or bus stop (such as those on Atlanta's TSPLOST list or projects with phases in current TIP)
   f. 0 pts: No existing or future transit

5. **Ladders of Opportunity/Social Equity (15 possible points):**
   a. Project provides direct access to an affordable housing complex (use FTA database if info not provided): 5 pts
   b. At least 50% of the project lies within the following Equitable Target Area thresholds (select one):
      i. Very High – 10 pts
      ii. High – 8 pts
      iii. Medium – 3 pts
      iv. None – 0 pts

[2] Transit includes MARTA rail, streetcar, any local bus route/stop, and GRTA Xpress park and ride

Project Scoring

All projects will be scored and ranked based on the primary project type indicated by the sponsor when submitting an application.[3] Each project type has a maximum of twelve criteria and up to 17 metrics. The TIP Prioritization Task Force determined that although evaluation criteria are held constant across project types, performance measures and metrics vary too much to allow for normalized scoring across different project types. As a result, projects are scored only against similar projects. Scoring by project type allows policymakers, sponsors and ARC staff the ability to compare projects on an apples-to-apples basis.

After scores are distributed, comparisons of specific criteria across project types are possible to help identify projects of any mode that contribute the most towards the goals of a specific criterion. For example, bicycle projects are scored only against other bicycle projects for the safety criterion. After scores are tallied for all projects, across all types, staff could compare bicycle safety projects to roadway expansion safety projects with a goal of selecting a handful of projects that move the needle the most for safety in the region.

Each criterion can receive a maximum of 100 points. After weights are applied to the criteria, projects are scaled based on the applied weights for a final KDP2 project score between 0-100.

The following subsections outline how points will be allocated across the three principal types of metrics identified by the TIP Prioritization Task Force: numerical, boolean (yes/no) and written responses.

Numerical Response Scoring

Data for numerical scores comes from a variety of sources such as: ARC's travel model, the CMAQ Calculator, real-world observations, GIS calculations, etc. Projects are generally scored on a normalized basis, with the highest scoring project receiving maximum points. All other projects are scored based on a distribution curve towards the lowest scoring project. ARC staff will account for outliers in determining the distribution of scores.

Several numerical metrics will use cut-off values to group scores into ranges. These metrics will award points after a certain numerical threshold is met. The points awarded and the thresholds used are clearly described in the associated sections of this document.

Boolean (Yes/No) Response Scoring

Some metrics are answered using a boolean-type response. These are typically yes/no questions for project sponsors or ARC staff to determine. Depending on the criteria, these metrics are scored with either full credit or no credit.

Written Response Scoring

Sponsors will be required to provide a written response for some criteria. These criteria often will give sponsors an opportunity to provide a list of project elements that address the performance measure associated with the criterion. Where possible, ARC staff will identify check lists and information to help project sponsors identify noteworthy characteristics of their project.

Credit for these written projects will be determined based on the responses received. ARC staff will determine similar project characteristics and reward points based on the pool of submitted responses.

[3] See clarifying details in the KDP2 section of this document

Criteria & Metric Weights

Weights are a necessity in dealing with frameworks that host a wide selection of criteria and often more than one metric per performance measure. Not all metrics are created equal and, depending on the project type, not all criteria are as important to selecting a successful project.

To start the conversation on weights, ARC staff prepared a survey that was broadly distributed to TIP Prioritization Taskforce members and ARC's Transportation Coordinating Committee (TCC). A total of 57 responses were received. The plurality of responses came from staff at local governments (20 responses). For this survey, several project types were aggregated due to having similar performance measures and expected outcomes. Respondents were asked to rank each criterion from most to least important in determining a successful project. Table S1 illustrates the survey results in one graphic that shows how respondents' preference for certain criteria varied by project type. The lower the number given by the respondent, the higher the priority of that criterion, with rank number 1 representing the top priority. Criteria towards the top of the table were more often considered important than measures towards the bottom.

Table S1 – Survey Respondents' Preference for Criteria by Project Type

Criteria	Bike/Ped/Trail	Roadway Asset Management	Roadway Expansion & TSM&O	Transit Expansion
Asset Management & Resiliency	-	1.0	-	-
Mobility & Congestion	3.0	3.0	2.0	1.0
Safety	1.0	2.0	1.0	6.0
Network Connectivity	2.0	4.0	3.0	2.0
Reliability	-	-	4.0	3.0
Multimodalism	4.0	5.0	5.0	5.0
Employment Accessibility	6.0	6.0	6.0	4.0
Land Use Compatibility	5.0	-	-	8.0
Social Equity	7.0	7.0	9.0	7.0
Air Quality & Climate Change	9.0	-	8.0	9.0
Goods Movement	10.0	8.0	7.0	11.0
Cultural & Environmental Sensitivity	8.0	9.0	10.0	10.0

Mobility, safety and network connectivity were among the three highest ranked criteria across multiple project types. Air quality & climate change, goods movement, and cultural & environmental sensitivity were the three lowest ranked criteria overall.

Next, the data from the survey was converted into a weighting scheme. This scheme applies a higher weight to criteria that were more preferred by respondents by project type. ARC staff tested a few

additional weighting schemes, including equal weights and weights based on the long-range portion of the Atlanta Region's Plan. Ultimately, the values from these tests were brought to a subcommittee of the Transportation & Air Quality Committee (TAQC) for their review. Policymakers and ARC staff came to an agreement to utilize the survey-derived weights for project evaluation in KDP2. These weights are outlined in Table S2, below. ARC understands that future work on these weights may be necessary to reflect changing values and opinions.

Table S2 – Criteria Weights by Project Type[4]

Criteria	Bike/Ped/Trail	Roadway Asset Management	Roadway Expansion & TSM&O	Transit Expansion	Transit Asset Management & System Upgrades[5]
Asset Management & Resiliency	-	14.9 %	-	-	24.4 % / 22.1 %
Mobility & Congestion	13.7 %	13.8 %	13.0 %	13.5 %	21.6 % / 19.6 %
Safety	14.5 %	14.4 %	13.4 %	8.5 %	13.6 % / 12.3 %
Network Connectivity	14.4 %	12.9 %	12.4 %	13.5 %	-
Reliability	-	-	12.1 %	12.0 %	-
Multimodalism	12.6 %	11.8 %	11.3 %	10.2 %	-
Employment Accessibility	10.4 %	10.2 %	10.3 %	11.6 %	18.6 % / 16.8 %
Land Use Compatibility	11.5 %	-	-	10.5 %	-
Social Equity	9.7 %	8.3 %	7.0 %	9.5 %	15.2 % / 13.8 %
Air Quality & Climate Change	6.3 %	-	7.3 %	6.5 %	0.0 % / 9.4 %
Goods Movement	-	8.1 %	7.8 %	-	-
Cultural & Environmental Sensitivity	6.8 %	5.5 %	5.3 %	4.1 %	6.6 % / 6.0 %

In addition, nested within some project types are multiple performance measures and metrics for each criterion. The metric level weighting was determined by ARC staff with help from partner state agencies. Information on these weights are provided in the corresponding sections of this document and do not affect criteria level weights.

Benefit-Cost Ratio and Cost-Effectiveness Scores

Historically, ARC has applied a very rigorous Benefit-Cost (B/C) ratio for roadway widening projects evaluated as part of the RTP. The B/C ratio is a sum of a project's expected benefits and disbenefits

[4] Values may not add to 100% due to rounding, some values that were surveyed were subsequently dropped from consideration as relevant criteria and are zeroed out in the weights

[5] The 2nd number is the weights for projects that replace transit buses and have an associated air quality benefit

divided by the sum of its expected costs.[6] ARC's B/C ratio includes monetized values for people's time, fuel usage, greenhouse gas (GHG) emissions and criteria air pollutant emissions. The B/C ratio is an imperfect, but useful, way of assessing whether a project's benefits to society outweigh the cost incurred by construction and maintenance of the facility.

Unfortunately, ARC does not have the tools available to develop a traditional B/C ratio using the same variables for all project types. The preexisting methodology for B/C ratios will continue to be used for roadway expansion projects, but a new cost-effectiveness measure is introduced for the other project types evaluated during the TIP project solicitation. This information will help tier projects to inform the KDP3 final decision-making process.

There are multiple ways to look at cost-effectiveness. Any numerical value generated by the KDP2 process can generate a cost-effectiveness associated with that criterion. Table S3 outlines the key cost-effectiveness measure that ARC staff plan to use to tier projects for KDP3 review. The chosen cost-effectiveness measure reflects the projects impact on mobility and congestion. Mobility and congestion was selected because it was the top criterion identified across most categories in the preference survey and has a universally numerical value to compare to cost.

Table S3 – Cost-Effectiveness & B/C Methods by Project Type

Project Type	Cost-Effectiveness & B/C Methods	Units
Bicycle/Pedestrian/Trail	Lifecycle cost per user per year	$/User/yr
Roadway Asset Management & Resiliency	Lifecycle cost per annual average daily traffic AADT	$/AADT/yr
Roadway Expansion	Traditional B/C Ratio	-
Roadway TSM&O	Lifecycle cost per change in vehicle hours of delay per day	$/ΔVHD/day
Transit Expansion	Lifecycle cost per boardings per day	$/Boarding/day
Transit Asset Management & System Upgrades	Lifecycle cost per passenger trip affected per year	$/Passenger trip/yr

Despite choosing one key cost-effectiveness measure, ARC staff will evaluate numerous ways to assess the cost-effectiveness of proposed projects. This information will help inform the KDP3 process.

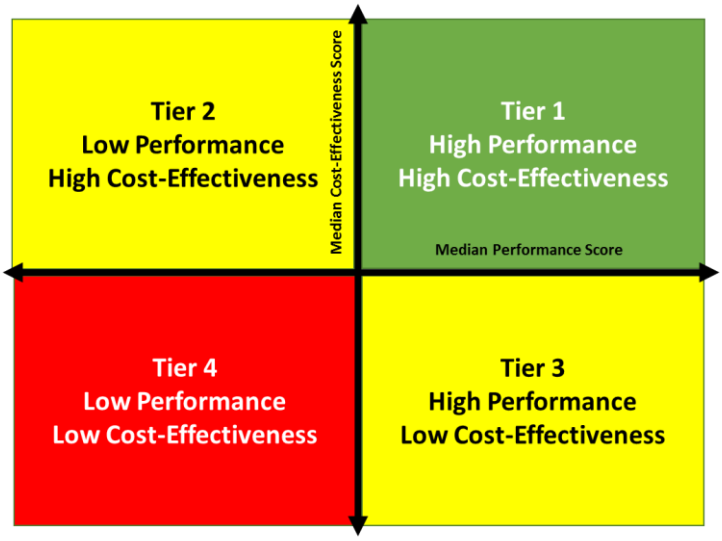
In addition, the cost-effectiveness data can help compare projects across project types in ways the selected performance measures and metrics do not allow. For example, if decision makers want to know the most cost-effective projects to improve air quality regardless of project mode, data can be queried to provide that information. Looking at the data from this perspective could be helpful in allocated Congestion Mitigation and Air Quality (CMAQ) money.

Project Tiers

In the past few regional plans ARC staff used a tiering system to succinctly summarize project performance and benefit-cost/cost-effectiveness. This method simplifies a series of numbers into a relativistic score of four tiers. Figure S1 illustrates the tiers planned to evaluate TIP project solicitations.

[6] Due to the addition of disbenefits in the numerator, it is possible to receive a negative B/C ratio

Figure S1 – Project Tiers for Final Evaluations



The x and y-axes in Figure S1 are based on the median performance and cost-effectiveness/benefit-cost scores. Roadways expansion projects will continue to be tiered based on their B/C ratio. All other projects will be tiered based on the cost-effectiveness scores outlined in Table S3, above.

After median scores are determined based, projects are then plotted on the chart and assigned a tier. The key benefit of using a tiering system is that it gives policymakers the ability to quickly reference how all scored projects relatively compare to each other. More specifics about the tiers is outlined in Table S4.

Table S4 – Project Tiers and Final KDP2 Recommendations

Tier	Performance	Cost-Effectiveness or B/C	KDP2 Recommendation
1	High	High	High
2	Low	High	Medium
3	High	Low	Medium
4	Low	Low	Low

Project Bundling

MAP-21 and the FAST Act encourage performance-driven decision-making of all transportation projects. In order to accurately and thoroughly assess the impacts of all submitted projects, it will be necessary for project sponsors to submit discreet project applications with logical termini. ARC staff will work with project sponsors on a case-by-case basis in situations where bundling multiple project segments or project locations into one application makes sense. However, in general, project bundling is discouraged.

After project evaluation in KDP2 is complete, ARC staff will work with project sponsors to determine if bundling some discreet projects into a program makes sense. These decisions will be reserved for the KDP3 process.

The balance of this document's sections outline the methodologies and scoring rubric ARC staff will use to evaluate TIP submittals. For each primary project type there are descriptions of the process to evaluate projects and an outline of the data ARC staff will require from project sponsors. These data requirements match what project sponsors will submit through the project solicitation application form.

Bicycle

Table B1 outlines the scheme for evaluating bicycle projects. No measures were identified for the criteria related to goods movement, reliability, and asset management and resiliency. Projects received in the solicitation that focus on adding bicycle infrastructure will be evaluated using the performance measures indicated in the table. Further information on the exact metrics and scoring follows in the subsections.

Table B1 – Bicycle Project Evaluation Scheme

Vision	Criteria	Measures
World Class Infrastructure	Mobility/Congestion	Bicycle Trips
	Reliability	-
	Network Connectivity	1) Transit Accessibility 2) Bike Network Connectivity
	Multimodalism	Multimodal Accommodation
	Asset Management & Resiliency	-
Healthy Livable Communities	Safety	Improved Safety
	Air Quality & Climate Change	Project Emissions
	Cultural & Environmental Resources	Benefits to Cultural and Environmental Resources
	Social Equity	Addressing Social Equity
	Land Use Compatibility	Connections to High Density Propensity Areas
Competitive Economy	Goods Movement	-
	Employment Accessibility	Supporting Regionally Significant Locations

Mobility & Congestion

The number of new bicycle trips associated with a project was identified as the key measure and metric to quantify the mobility and congestion criterion. The greater the number of bicycle trips the more cars are taken off the road, reducing congestion and improving regional mobility. See Table B2 for details.

Table B2 – Metric for Evaluating the Bicycle Mobility & Congestion Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Bicycle Trips	Number of bicycle trips generated by the infrastructure project.	Numerical	Yes; sponsor will provide data to analyze the number of trips

In order to quantify this metric, ARC will rely on the CMAQ Calculator. The CMAQ Calculator takes inputs related to a bicycle project such as the number of adjacent amenities, the amount of traffic on a parallel route and project details to calculate an estimated annual bicycle ridership of the new project. Projects with higher ridership receive a higher score for the mobility and congestion criterion. Table B3 outlines the required sponsor inputs for bicycle projects.

Table B3 – Sponsor Required Inputs for the Bicycle Mobility & Congestion Criterion

	Sponsor Required Input	Nature of Metric
1)	Annual average daily traffic on the parallel street	Numerical
2)	Length of the bicycle project	Numerical
3)	Posted speed on parallel street	Numerical
4)	Number of destinations within ½ mile of the project	Numerical; Destination examples: banks, churches, hospitals, park and ride, office parks, library, shopping, schools. Provide a number between 0 and 7.
5)	Is the project within 2 miles of a university or college?	Yes/No

After the CMAQ Calculator estimates the number of bicycle trips, all project scores are compared. A distribution of these data are used to assign scores from 0-100. The projects with the most trips will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Network Connectivity

Two performance measures were identified to evaluate bicycle projects for the network connectivity criterion. These measures, transit accessibility and bike network connectivity, evaluate how well the submitted project links to existing priority networks and assets in the region. An interconnected bicycle system encourages its usage and ensures that assets are used to implement a comprehensive regional system. Table B4 outlines the metric and scoring associated with the two performance measures for network connectivity. Project sponsors will not need to provide any additional information to determine these metrics.

Table B4 – Metrics for Evaluating the Bicycle Network Connectivity Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
1) Transit Accessibility	Is the project within 3 miles of a transit station or stop?	Yes/No	No	35%
2) Bike Network Connectivity	Does the project connect to another bike or trail system?	Yes/No	No	65%

Multimodalism

A good multimodal project includes elements of more than one project type to ensure transportation by multiple modes are accommodated, as appropriate for the corridor, in the design of a single project. The TIP Prioritization Task Force identified two metrics associated with the multimodalism criterion for bicycle projects. Even if a project does not accommodate multiple modes of transportation, credit can be awarded for ensuring that the design of a proposed project accounts for its interaction with other modes. See Table B5 for the metrics used to evaluate the bicycle multimodalism criterion.

Table B5 – Metrics for Evaluating the Bicycle Multimodalism Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Multimodal Accommodations	1) Additional active mode person throughput (pedestrian)	Numerical; evaluated through CMAQ Calculator	No	40%
	2) Design elements	Written; sponsor provides a list of elements of other modes being implemented as part of their bicycle project. This could include: ADA upgrades, crosswalks, bus shelters, etc.	Yes	60%

Similar to the number of bike trips, the number of pedestrian trips will be scored on a distribution to assign a range of scores from 0-100. The projects with the most pedestrian trips will receive the highest score, the project with the least (or no pedestrian trips) will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Safety

All projects should strive to correct existing safety issues while maximizing safe design for all modes along a corridor. The metrics associated with the safety criterion and performance measure were selected to encourage good design and prioritize safety-enhancing projects in areas where history shows an existing crash problem. See Table B6 for the metrics used to evaluate the bicycle safety criterion.

Table B6 – Metrics for Evaluating the Bicycle Safety Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Improved Safety	1) Serious injury + fatality crashes	Numerical; GEARS database	No	33%
	2) Bicycling Crash Risk	Numerical; from *Walk. Bike. Thrive!*	No	33%
	3) Safety countermeasures proposed	Numerical; Crash Modification Factors derived from sponsor selected from proven USDOT supported safety countermeasures. Sponsors will also be able to provide information on other countermeasures	Yes	33%

Existing crash information comes from the Georgia Electronic Accident Reporting System (GEARS). For the serious injury + fatality crashes numerical metric, a distribution of the results of the crash analyses will be used to assign scores from 0-100. The projects with the most crashes will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

For the bicycling crash risk metric, census tract level data from the *Walk. Bike. Thrive!* study will be used to determine the average area-level risk for bicyclists along the length of the project. This metric uses past bicycle crashes from the GEARS database and travel data from ARC's activity-based transportation model (ABM) to determine area-specific crash risk. The scoring for the metric is outlined in Table B7.

Table B7 - Scoring Scheme for Bicycling Crash Risk Metric

High Density Propensity Classification	Points Awarded
Low	25
Medium-Low	50
Medium-High	75
High	100

USDOT has compiled research on the effectiveness of certain safety countermeasures at reducing crashes. ARC is promoting the use of the nine USDOT highlighted measures for reducing crashes in the region:

- Roundabouts
- Corridor access management
- Pedestrian hybrid beacons
- Enhanced delineation and friction for horizontal curves
- Longitudinal rumble strips and stripes on two-lane roads
- Road diets
- Safety edges
- Medians and pedestrian crossing islands
- Backplates with retroreflective borders

Project sponsors will also be able to provide safety countermeasure details from the lists available on USDOT's website (see the Glossary of Links). This website provides a searchable database; searches by mode or other element can identify possible countermeasures for bicycle projects. Projects will be scored based on the effectiveness of the countermeasures proposed by their Crash Modification Factor (CMF).

Air Quality & Climate Change

Encouraging people to switch from car to active transportation modes reduces vehicle emissions that cause bad air quality and contribute to climate change. All bicycle projects help improve air quality. ARC's CMAQ Calculator is able to produce an estimate of the amount of emissions offset by the development of new bicycle projects. Project sponsors will not need to provide any additional information for this calculation. Table B8 outlines the metrics associated with the air quality and climate change criterion. Values include emission offsets from all modes of multimodal projects.

Table B8 – Metrics for Evaluating the Bicycle Air Quality & Climate Change Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Project Emissions	1) Change in NO_x, VOC, & $PM_{2.5}$ emissions	Numerical; sum of three pollutants in kg/year	No	50%
	2) Change in greenhouse gas emissions $CO_2(e)$	Numerical; in kg/year	No	50%

The amount of emissions offset will be scored on a distribution to assign a range of scores from 0-100. The project with the most emissions reduced will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Cultural & Environmental Resources

Like the air quality criterion, bicycle access to cultural and environmental resources in the region is generally considered to be beneficial to communities. Connecting people to these resources in a location-specific conscientious way enhances access and mobility while preserving the intrinsic value of local and regional assets. Table B9 outlines the metrics associated with the cultural and environmental resource criterion for bicycle projects.

Table B9 – Metrics for Evaluating the Bicycle Cultural & Environmental Resources Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Benefits to Cultural and Environmental Resources	1) Does the project provide a connection to cultural or environmental resources?	Yes/No; sponsor provides a list of connected environmental and cultural resources like state or national parks, historic sites, museums, etc.	Yes	50%
	2) Does the project have an environmental improvement component?	Written; sponsor provides a list of green infrastructure assets implemented in the project scope such as: storm water management, permeable pavement, LED lighting, etc.	Yes	50%

Social Equity

Ensuring a fair and equitable transportation system is a key goal associated with the Atlanta Region's Plan. Transportation assets should be sensitive to the needs of low-income and minority communities to support the USDOT's Ladders of Opportunity program as well as ARC's goals associated with Equitable Target Area (ETA) communities. ARC is still undergoing research on how best to measure a transportation project's impact on ETA communities. To meet the social equity criterion, project sponsors will be required to provide information on how projects serve ETA communities. This process is outlined in Table B10.

Table B10 – Metric for Evaluating the Bicycle Social Equity Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Addressing Social Equity	Does project serve an ETA community?	Written; sponsor provides an assessment of how developing the project will support ETA areas.	Yes; with supplemental ARC assessment of ETA areas

Land Use Compatibility

Ensuring the successful implementation of projects is a key concern for both ARC and project sponsors. Implementing bicycle projects where existing land use best supports project success is a key outcome of the land use compatibility criterion. The sole measure and metric associated with this criterion is correlation to the "high density propensity areas" identified in ARC's bike/ped plan *Walk. Bike. Thrive!* See Table B11 for details. Project sponsors do not need to provide any additional information for this criterion.

Table B11 – Metric for Evaluating the Bicycle Land Use Compatibility Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Connections to High Density Propensity Areas	Does the project connect to high-density propensity areas from ARC's *Walk. Bike. Thrive!* study?	Numerical; projects located in higher scoring areas receive more points	No

Walk. Bike. Thrive! evaluated the region's propensity for active transportation in five classifications, from low to high. The points awarded for the bicycle land use compatibility criterion will depend on the average classification of the area the project travels through. Table B12 below breaks the scoring down:

Table B12 - Scoring Scheme for Bicycle Land Use Compatibility Criterion

High Density Propensity Classification	Average Raster Value Score	Points Awarded
Low	≤ 8	0
Medium-Low	9 – 10	25
Medium	11 – 13	50
Medium-High	14 – 17	75
High	18 – 27	100

Employment Accessibility

Access to jobs is a vital function of the transportation system across all modes. Good access to employment opportunities by active modes ensures the Atlanta region's competitive advantage, is important for upward economic mobility and encourages people to shift to more environmentally friendly transportation modes. Ensuring bicyclists have last mile connectivity within, and connecting to, regional employment centers is an important component of regional transportation policy. Table B13, below, outlines the metric for bicycle projects and employment accessibility.

Table B13 – Metric for Evaluating the Bicycle Employment Accessibility Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Supporting Regionally Significant Locations	Does the project connect to (or is it within) a Regional Employment Center, a Freight Cluster Area or a Regional Place?	Yes/No	No

Pedestrian

Table P1 outlines the scheme for evaluating pedestrian projects. No measures were identified for the criteria related to goods movement, reliability, and asset management and resiliency. Projects received in the solicitation that focus on adding pedestrian infrastructure will be evaluated using the performance measures indicated in the table. Further information on the exact metrics and scoring follows in the subsections.

Table P1 – Pedestrian Project Evaluation Scheme

Vision	Criteria	Measures
World Class Infrastructure	Mobility/Congestion	Pedestrian Trips
	Reliability	-
	Network Connectivity	1) Transit Accessibility 2) Pedestrian Network Connectivity
	Multimodalism	Multimodal Accommodation
	Asset Management & Resiliency	-
Healthy Livable Communities	Safety	Improved Safety
	Air Quality & Climate Change	Project Emissions
	Cultural & Environmental Resources	Benefits to Cultural and Environmental Resources
	Social Equity	Addressing Social Equity
	Land Use Compatibility	Connections to High Density Propensity Areas
Competitive Economy	Goods Movement	-
	Employment Accessibility	Supporting Regionally Significant Locations

Mobility & Congestion

The number of new pedestrian trips associated with a project was identified as the key measure and metric to quantify the mobility and congestion criterion. The greater the number of pedestrian trips the more cars are taken off the road, reducing congestion and improving regional mobility. See Table P2 for details.

Table P2 – Metric for Evaluating the Pedestrian Mobility & Congestion Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Pedestrian Trips	Number of pedestrian trips generated by the infrastructure project.	Numerical	Yes; sponsor will provide data to analyze the number of trips

In order to quantify this metric, ARC will rely on the CMAQ Calculator. The CMAQ Calculator takes inputs related to a pedestrian project such as the number of adjacent amenities, the amount of traffic on a parallel route and project details to calculate an estimated number of annual pedestrian trips generated by the new project. Projects that generate more trips receive a higher score for the mobility and congestion criterion. Table P3 outlines the required sponsor inputs for pedestrian projects.

Table P3 – Sponsor Required Inputs for the Pedestrian Mobility & Congestion Criterion

	Sponsor Required Input	Nature of Metric
1)	Annual average daily traffic on the parallel street	Numerical
2)	Length of the pedestrian project	Numerical
3)	Posted speed on parallel street	Numerical
4)	Number of destinations within ½ mile of the project	Numerical; Destination examples: banks, churches, hospitals, park and ride, office parks, library, shopping, schools. Provide a number between 0 and 7.
5)	Is the project within 2 miles of a university or college?	Yes/No

After the CMAQ Calculator estimates the number of pedestrian trips, all project scores are compared. A distribution of these data are used to assign scores from 0-100. The projects with the most trips will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Network Connectivity

Two performance measures were identified to evaluate pedestrian projects for the network connectivity criterion. These measures, transit accessibility and pedestrian network connectivity, evaluate how well the submitted project links to existing priority networks and assets in the region. An interconnected pedestrian system encourages its usage and ensures that assets are used to implement a comprehensive regional system. Table P4 outlines the metric and scoring associated with the two performance measures for network connectivity. Project sponsors will not need to provide any additional information to determine these metrics.

Table P4 – Metrics for Evaluating the Pedestrian Network Connectivity Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
1) Transit Accessibility	Does the project connect to transit services?	Yes/No	No	60%
2) Pedestrian Network Connectivity	Does the project connect to another pedestrian or trail system?	Yes/No	No	40%

Multimodalism

A good multimodal project includes elements of more than one project type to ensure transportation by multiple modes are accommodated, as appropriate for the corridor, in the design of a single project. The TIP Prioritization Task Force identified two metrics associated with the multimodalism criterion for pedestrian projects. Even if a project does not accommodate multiple modes of transportation, credit can be awarded for ensuring that the design of a proposed project accounts for its interaction with other modes. See Table P5 for the metrics used to evaluate the pedestrian multimodalism criterion.

Table P5 – Metrics for Evaluating the Pedestrian Multimodalism Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Multimodal Accommodations	1) Additional active mode person throughput (bicycle)	Numerical; evaluated through CMAQ Calculator	No	40%
	2) Design elements	Written; sponsor provides a list of elements of other modes being implemented as part of their pedestrian project. This could include: ADA upgrades, crosswalks, bus shelters, etc.	Yes	60%

Similar to the number of pedestrian trips, the number of bicycle trips will be scored on a distribution to assign a range of scores from 0-100. The projects with the most bicycle trips will receive the highest score, the project with the least (or no bicycle trips) will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Safety

All projects should strive to correct existing safety issues while maximizing safe design for all modes along a corridor. The metrics associated with the safety criterion and performance measure were selected to encourage good design and prioritize safety-enhancing projects in areas where history shows an existing crash problem. See Table P6 for the metrics used to evaluate the pedestrian safety criterion.

Table P6 – Metrics for Evaluating the Pedestrian Safety Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Improved Safety	1) Serious injury + fatality crashes	Numerical; GEARS database	No	33%
	2) Walking Crash Risk	Numerical; from *Walk. Bike. Thrive!*	No	33%
	3) Safety countermeasures proposed	Numerical; Crash Modification Factors derived from sponsor selected from proven USDOT supported safety countermeasures. Sponsors will also be able to provide information on other countermeasures	Yes	33%

Existing crash information comes from the Georgia Electronic Accident Reporting System (GEARS). For the serious injury + fatality crashes numerical metric, a distribution of the results of the crash analyses will be used to assign scores from 0-100. The projects with the most crashes will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

For the walking crash risk metric, census tract level data from the *Walk. Bike. Thrive!* study will be used to determine the average area-level risk for pedestrians along the length of the project. This metric uses past pedestrian crashes from the GEARS database and travel data from ARC's activity-based transportation model (ABM) to determine area-specific crash risk. The scoring for the metric is outlined in Table P7.

Table P7 - Scoring Scheme for Walking Crash Risk Metric

High Density Propensity Classification	Points Awarded
Low	25
Medium-Low	50
Medium-High	75
High	100

USDOT has compiled research on the effectiveness of certain safety countermeasures at reducing crashes. ARC is promoting the use of the nine USDOT highlighted measures for reducing crashes in the region:

- Roundabouts
- Corridor access management
- Pedestrian hybrid beacons
- Enhanced delineation and friction for horizontal curves
- Longitudinal rumble strips and stripes on two-lane roads
- Road diets
- Safety edges
- Medians and pedestrian crossing islands
- Backplates with retroreflective borders

Project sponsors will also be able to provide safety countermeasure details from the lists available on USDOT's website (see the Glossary of Links). This website provides a searchable database; searches by mode or other element can identify possible countermeasures for pedestrian projects. Projects will be scored based on the effectiveness of the countermeasures proposed by their Crash Modification Factor (CMF).

Air Quality & Climate Change

Encouraging people to switch from car to active transportation modes reduces vehicle emissions that cause bad air quality and contribute to climate change. All pedestrian projects help improve air quality. ARC's CMAQ Calculator is able to produce an estimate of the amount of emissions offset by the development of new pedestrian projects. Project sponsors will not need to provide any additional information for this calculation. Table P8 outlines the metrics associated with the air quality and climate change criterion. Values include emission offsets from all modes of multimodal projects.

Table P8 – Metrics for Evaluating the Pedestrian Air Quality & Climate Change Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Project Emissions	1) Change in NO_x, VOC, & $PM_{2.5}$ emissions	Numerical; sum of three pollutants in kg/year	No	50%
	2) Change in greenhouse gas emissions $CO_2(e)$	Numerical; in kg/year	No	50%

The amount of emissions offset will be scored on a distribution to assign a range of scores from 0-100. The project with the most emissions reduced will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Cultural & Environmental Resources

Like the air quality criterion, pedestrian access to cultural and environmental resources in the region is generally considered to be beneficial to communities. Connecting people to these resources in a location-specific conscientious way enhances access and mobility while preserving the intrinsic value of local and regional assets. Table P9 outlines the metrics associated with the cultural and environmental resource criterion for bicycle projects.

Table P9 – Metrics for Evaluating the Pedestrian Cultural & Environmental Resources Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Benefits to Cultural and Environmental Resources	1) Does the project provide a connection to cultural or environmental resources?	Yes/No; sponsor provides a list of connected environmental and cultural resources like state or national parks, historic sites, museums, etc.	Yes	50%
	2) Does the project have an environmental improvement component?	Written; sponsor provides a list of green infrastructure assets implemented in the project scope such as: storm water management, permeable pavement, LED lighting, etc.	Yes	50%

Social Equity

Ensuring a fair and equitable transportation system is a key goal associated with the Atlanta Region's Plan. Transportation assets should be sensitive to the needs of low-income and minority communities to support the USDOT's Ladders of Opportunity program as well as ARC's goals associated with Equitable Target Area (ETA) communities. ARC is still undergoing research on how best to measure a transportation project's impact on ETA communities. To meet the social equity criterion, project sponsors will be required to provide information on how projects serve ETA communities. This process is outlined in Table P10.

Table P10 – Metric for Evaluating the Pedestrian Social Equity Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Addressing Social Equity	Does project serve an ETA community?	Written; sponsor provides an assessment of how developing the project will support ETA areas.	Yes; with supplemental ARC assessment of ETA areas

Land Use Compatibility

Ensuring the successful implementation of projects is a key concern for both ARC and project sponsors. Implementing pedestrian projects where existing land use best supports project success is a key outcome of the land use compatibility criterion. The sole measure and metric associated with this criterion is correlation to the "high density propensity areas" identified in ARC's bike/ped plan *Walk. Bike. Thrive!* See Table P11 for details. Project sponsors do not need to provide any additional information for this criterion.

Table P11 – Metric for Evaluating the Pedestrian Land Use Compatibility Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Connections to High Density Propensity Areas	Does the project connect to high-density propensity areas from ARC's *Walk. Bike. Thrive!* study?	Numerical; projects located in higher scoring areas receive more points	No

Walk. Bike. Thrive! evaluated the region's propensity for active transportation in five classifications, from low to high. The points awarded for the pedestrian land use compatibility criterion will depend on the average classification of the area the project travels through. Table P12 below breaks the scoring down:

Table P12 - Scoring Scheme for Pedestrian Land Use Compatibility Criterion

High Density Propensity Classification	Average Raster Value Score	Points Awarded
Low	≤ 8	0
Medium-Low	9 – 10	25
Medium	11 – 13	50
Medium-High	14 – 17	75
High	18 – 27	100

Employment Accessibility

Access to jobs is a vital function of the transportation system across all modes. Good access to employment opportunities by active modes ensures the Atlanta region's competitive advantage, is important for upward economic mobility and encourages people to shift to more environmentally friendly transportation modes. Ensuring pedestrians have last mile connectivity within, and connecting to, regional employment centers is an important component of regional transportation policy. Table P13, below, outlines the metric for pedestrian projects and employment accessibility.

Table P13 – Metric for Evaluating the Pedestrian Employment Accessibility Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Supporting Regionally Significant Locations	Does the project connect to (or is it within) a Regional Employment Center, a Freight Cluster Area or a Regional Place?	Yes/No	No

Trail

Table T1 outlines the scheme for evaluating trail projects. No measures were identified for the criteria related to goods movement, reliability, and asset management and resiliency. Projects received in the solicitation that focus on adding trail infrastructure will be evaluated using the performance measures indicated in the table. Further information on the exact metrics and scoring follows in the subsections.

Table T1 – Trail Project Evaluation Scheme

Vision	Criteria	Measures
World Class Infrastructure	Mobility/Congestion	Bicycle & Pedestrian Trips
	Reliability	-
	Network Connectivity	1) Transit Accessibility 2) Trail Network Connectivity
	Multimodalism	Multimodal Accommodation
	Asset Management & Resiliency	-
Healthy Livable Communities	Safety	Improved Safety
	Air Quality & Climate Change	Project Emissions
	Cultural & Environmental Resources	Impact on Culturally & Environmentally Sensitive Land Uses
	Social Equity	Addressing Social Equity
	Land Use Compatibility	1) Expanding Regional Trails 2) Connections to Parks
Competitive Economy	Goods Movement	-
	Employment Accessibility	Supporting Regionally Significant Locations

Mobility & Congestion

The number of new bicycle and pedestrian trips associated with a trail project was identified as the key measure and metric to quantify the mobility and congestion criterion. The greater the number of trips the more cars are taken off the road, reducing congestion and improving regional mobility. See Table T2 for details

Table T2 – Metric for Evaluating the Trail Mobility & Congestion Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Bicycle & Pedestrian Trips	Number of bicycle and pedestrian trips generated by the infrastructure project.	Numerical	Yes; sponsor will provide data to analyze the number of trips

In order to quantify this metric, ARC will rely on the CMAQ Calculator. The CMAQ Calculator takes inputs related to a trail project such as the number of adjacent amenities, the amount of traffic on a parallel route and project details to calculate an estimated pedestrian and bicyclist usership of the new project. Sponsors are also able to directly provide bicycle and pedestrian demand if they've already performed in-depth studies. Projects with higher ridership receive a higher score for the mobility and congestion criterion. Table T3 outlines the required sponsor inputs for trail projects.

Table T3 – Sponsor Required Inputs for Trail Mobility & Congestion Criterion

	Sponsor Required Input	Nature of Metric
1)	Annual average daily traffic on a parallel street	Numerical
2)	Posted speed on parallel street	Numerical
3)	Number of destinations within ½ mile of the project	Numerical; Destination examples: banks, churches, hospitals, park and ride, office parks, library, shopping, schools. Provide a number between 0 and 7.
4)	Is the project within 2 miles of a university or college?	Yes/No
~ OR ~		
1)	Predicted total daily bicycle demand for facility	Numerical; from a valid study
2)	Predicted total daily pedestrian demand for facility	Numerical; from a valid study

After the CMAQ Calculator estimates the number of trips, all project scores are compared. A distribution of these data are used to assign scores from 0-100. The projects with the most trips will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Network Connectivity

Two performance measures were identified to evaluate trail projects for the network connectivity criterion. These measures, transit accessibility and pedestrian/trail network connectivity, evaluate how well the submitted projects link to existing priority networks and assets in the region. An interconnected trail system encourages its usage and ensures that financial assets are used to implement a comprehensive regional system. Table T4 outlines the metric and scoring associated with the two performance measures for network

connectivity. Project sponsors will not need to provide any additional information to determine these metrics.

Table T4 – Metrics for Evaluating the Trail Network Connectivity Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
1) Transit Accessibility	Does the project connect to transit services?	Yes/No	No	20%
2) Trail Network Connectivity	Does the project connect to another pedestrian or trail system?	Yes/No	No	80%

Multimodalism

A good multimodal project includes elements of more than one project type to ensure transportation by multiple modes are accommodated in the design of a single project. Trail projects are multimodal in nature. Project sponsors can earn extra points by ensuring the connection points between trails and other modes ensure safe and seamless interaction. See Table T5 for the metric used to evaluate the trail multimodalism criterion.

Table T5 – Metrics for Evaluating the Trail Multimodalism Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Multimodal Accommodations	Design elements	Written; sponsor provides a list of elements of other modes being implemented as part of their trail project. This could include: ADA upgrades, crosswalks, bus shelters, etc.	Yes

Safety

All projects should strive to correct existing safety issues while maximizing safe design. Since trail projects are designed to minimize conflicts with cars, the metric selected for the safety criterion awards design for safety enhancing elements and ensuring minimum conflict of modes wherever trails intersect with other transportation modes. See Table T6 for the metric used to evaluate the trail safety criterion.

Table T6 – Metric for Evaluating the Trail Safety Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Improved Safety	Safety countermeasures proposed	Numerical; Crash Modification Factors derived from sponsor selected from proven USDOT supported safety countermeasures. Sponsors will also be able to provide information on other countermeasures	Yes

USDOT has compiled research on the effectiveness of certain safety countermeasures at reducing crashes. ARC is promoting the use of the nine USDOT highlighted measures for reducing crashes in the region:

- Roundabouts
- Corridor access management
- Pedestrian hybrid beacons
- Enhanced delineation and friction for horizontal curves
- Longitudinal rumble strips and stripes on two-lane roads
- Road diets
- Safety edges
- Medians and pedestrian crossing islands
- Backplates with retroreflective borders

Project sponsors will also be able to provide safety countermeasure details from the lists available on USDOT's website (see the Glossary of Links). This website provides a searchable database; searches by mode or other element can identify possible countermeasures for trail projects. Projects will be scored based on the effectiveness of the countermeasures proposed by their Crash Modification Factor (CMF).

Air Quality & Climate Change

Encouraging people to switch from car to active transportation modes reduces vehicle emissions that cause bad air quality and contribute to climate change. All trail projects help improve air quality. ARC's CMAQ Calculator is able to produce an estimate of the amount of emissions offset by the development of new trail projects. Project sponsors will not need to provide any additional information for this calculation. Table T7 outlines the metrics associated with the air quality and climate change criterion.

Table T7 – Metrics for Evaluating the Trail Air Quality & Climate Change Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Project Emissions	1) Change in NO_x, VOC, & $PM_{2.5}$ emissions	Numerical; sum of three pollutants in kg/year	No	50%
	2) Change in greenhouse gas emissions $CO_2(e)$	Numerical; in kg/year	No	50%

The amount of emissions offset will be scored on a distribution to assign a range of scores from 0-100. The project with the most emissions reduced will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Cultural & Environmental Resources

Transportation projects should not overly impact the region's cultural and environmental heritage. Projects that require extensive new right-of-way acquisition or new pavement have the potential to impact cultural and environmental assets. In past Regional Transportation Plans, ARC staff utilized a composite overlay index to assess how transportation projects might impact sensitive land uses as well as how those land uses might impact the schedule or deliverability of transportation projects. This analysis tool has been carried forward into the TIP project evaluation work. Table T8 outlines the metrics associated with the cultural and environmental resources criterion for trail projects.

Table T8 – Metrics for Evaluating the Trail Cultural & Environmental Resources Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Impact on Culturally & Environmentally Sensitive Land Uses	1) Cultural & Environmental GIS Overlay Score	Numerical	No	50%
	2) Does the project have an environmental improvement component?	Written; sponsor provides a list of green infrastructure assets implemented in the project scope such as: storm water management, permeable pavement, LED lighting, etc.	Yes	50%

Below is a list of the layers that are compiled to produce the cultural and environmental GIS overlay score. The scores produced by the GIS overlay will be converted to a 0-100 range. Projects that impact a large number of resources over a long distance of their limits will receive a low score. Projects that impact few or no resources will receive a high score.

Cultural and Environmental GIS Overlay Layers

- Brownfields
- FEMA Floodplains
- Historical Resources
- Hazardous Sites
- Metro River Protection Act Corridor
- Impaired Streams
- Trout Streams
- Existing Greenspace
- Groundwater Recharge Areas
- Small Water Supply Watersheds
- Wetlands
- Rural Areas
- Undeveloped Land
- Darter Habitat
- Endangered Species Habitat

In addition, project sponsors will be able to earn credit for implementing best practices in environmental design. These designs should improve the state of the natural environment or improve the adjacent community's resilience and environmental sustainability.

Social Equity

Ensuring a fair and equitable transportation system is a key goal associated with the Atlanta Region's Plan. Transportation assets should be sensitive to the needs of low-income and minority communities to support the USDOT's Ladders of Opportunity program as well as ARC's goals associated with Equitable Target Area (ETA) communities. ARC is still undergoing research on how best to measure a transportation project's impact on ETA communities. To meet the social equity criterion, project sponsors will be required to provide information on how projects serve ETA communities. This process is outlined in Table T9.

Table T9 – Metric for Evaluating the Trail Social Equity Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Addressing Social Equity	Does project serve an ETA community?	Written; sponsor provides an assessment of how developing the project will support ETA areas.	Yes; with supplemental ARC assessment of ETA areas

Land Use Compatibility

Ensuring the successful implementation of projects is a key concern for both ARC and project sponsors. Implementing trail projects where existing land use connections best support project success is a key outcome of the land use compatibility criterion. ARC's bike/ped plan W*alk. Bike. Thrive!* has clear goals to support the expansion of the regional trail system and ensure trails connect to parks and greenspace.

An interconnected trail and greenspace system supports active transportation and connects people to opportunities for physical activity improving public health. Table T10 outlines the measures and metrics for the land use compatibility criterion for trail projects. Project sponsors do not need to provide any additional information for this criterion.

Table T10 – Metrics for Evaluating the Trail Land Use Compatibility Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
1) Expanding Regional Trails	Does the project add new counties to the regional trail system?	Yes/No	No	75%
2) Connections to Parks	Does the project connect to a park?	Yes/No	No	25%

Employment Accessibility

Access to jobs is a vital function of the transportation system across all modes. Good access to employment opportunities by active modes ensures the Atlanta region's competitive advantage, is important for upward economic mobility and encourages people to shift to more environmentally friendly transportation modes. Ensuring pedestrians have last mile connectivity within, and connecting to, regional employment centers is an important component of regional transportation policy. Table T11, below, outlines the metric for trail projects and employment accessibility.

Table T11 – Metric for Evaluating the Trail Employment Accessibility Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Supporting Regionally Significant Locations	Does the project connect to (or is it within) a Regional Employment Center, a Freight Cluster Area or a Regional Place?	Yes/No	No

Roadway Asset Management & Resiliency

Table RA1 outlines the scheme for evaluating roadway asset management and resiliency projects. No measures were identified for the criteria related to reliability, air quality and climate change, and land use accessibility. Projects received in the solicitation that focus on maintaining a state of good repair or increasing system resiliency will be evaluated using the performance measures indicated in the table. Further information on the exact metrics and scoring follows in the subsections.

Table RA1 – Roadway Asset Management & Resiliency Project Evaluation Scheme

Vision	Criteria	Measures
World Class Infrastructure	Mobility/Congestion	Facility Throughput
	Reliability	-
	Network Connectivity	Regional Significance
	Multimodalism	Multimodal Accommodations
	Asset Management & Resiliency	Demonstrated Need
Healthy Livable Communities	Safety	Improved Safety
	Air Quality & Climate Change	-
	Cultural & Environmental Resources	Impact on Culturally & Environmentally Sensitive Land Uses
	Social Equity	Addressing Social Equity
	Land Use Compatibility	-
Competitive Economy	Goods Movement	1) Heavy Truck Accessibility 2) Regional Freight Significance
	Employment Accessibility	Supporting Regionally Significant Locations

Mobility & Congestion

Ensuring resources are provided to facilities that experience a large amount of traffic was identified as a key outcome for the mobility and congestion criterion. Therefore, the annual average daily traffic (AADT) on a facility will serve as the metric for the facility throughput performance measure.

GDOT traffic counts will be the primary source of traffic data. In areas where no GDOT traffic counts are available, ARC staff may request sponsors provide count data, or staff may use travel demand model data. Table RA2 outlines the metric and scoring for the mobility and congestion criterion. Projects with higher AADT receive a higher score.

Table RA2 – Metric for Evaluating the Roadway Asset Management & Resiliency Mobility & Congestion Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Facility Throughput	Average Annual Daily Traffic (AADT)	Numerical; provided by GDOT traffic counts	No; If no GDOT counts are available, ARC may request counts from project sponsors

After AADT values for all roadway asset management and resiliency projects are determined, project scores are compared. A distribution of these data are used to assign scores from 0-100. The project with the most AADT will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Network Connectivity

One performance measure was identified to evaluate roadway asset management and resiliency projects for the network connectivity criterion. This measure, regional significance, evaluates how critical the submitted project's location is to the regional network of roadways. The associated metric evaluates regional significance by looking at the functional classification of the roadway.

Tables RA3 and RA4 outline the metric and scoring associated with the performance measure for network connectivity. As with all measures, the maximum score possible is 100, which is awarded to the highest level of functional classification. Project sponsors will not need to provide any additional information to determine this metric.

Table RA3 – Metric for Evaluating the Roadway Asset Management & Resiliency Network Connectivity Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Regional Significance	Roadway Functional Classification	Written; FHWA roadway classification scheme	No

Table RA4 – Scoring for Roadway Functional Classification Metric

Functional Classification	Score
Collector	33 pts
Arterial	66 pts
Interstate/Freeway	100 pts

Multimodalism

A good multimodal project includes elements of more than one project type to ensure transportation by multiple modes are accommodated in the design of a single project. Roadway asset management and resiliency projects should be designed to add accommodation for other modes, where possible, and to enhance the condition or resiliency of all assets on the ground. See Table RA5 for the metric used to evaluate the asset management and resiliency multimodalism criterion.

Table RA5 – Metric for Evaluating the Roadway Asset Management and Resiliency Multimodalism Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Multimodal Accommodations	Design elements	Written; sponsor provides a list of elements of other modes being implemented as part of their asset management and resiliency project. This could include: ADA upgrades, crosswalks, bus shelters, etc. as well as direct repairs to adjacent sidewalks, bike lanes or transit infrastructure.	Yes

Asset Management and Resiliency

In order to maintain a regional state of good repair, asset management resources must be allocated towards roadways and infrastructure with the most needs. Therefore, demonstrated need is a key performance measure for asset management and resiliency projects. The TIP Prioritization Task Force identified two key metrics associated with the demonstrated need measure, outlined in Table RA6. Project sponsors will not need to provide any additional information for these metrics.

Table RA6 – Metrics for Evaluating the Roadway Asset Management & Resiliency Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Demonstrated Need	1) Pavement/Bridge rating compared to regional average	Numerical; pavement rating for roadway projects from GDOT RC database and Sufficiency rating for bridge projects from the National Bridge Inventory (NBI) database	No	75%
	2) Age of asset	Numerical; whichever is most recent of: year of initial build, year of last major rehabilitation or year of last rebuild	No	25%

Roadways or bridges with low pavement/sufficiency scores will receive a higher score for the asset management and resiliency criterion. Similarly, the oldest assets will receive a higher score. Scores will be normalized between 0-100.

Safety

All projects should strive to correct existing safety issues while maximizing safe design. Similar to the multimodalism criterion, project sponsors can earn extra points by addressing safety concerns during the implementation of asset management and resiliency projects. Implementing proven safety countermeasures can reduce crash rates and improve public safety. See Table RA7 for the metric used to evaluate the roadway asset management and resiliency safety criterion.

Table RA7 – Metric for Evaluating the Roadway Asset Management & Resiliency Safety Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Improved Safety	Safety countermeasures proposed	Numerical; Crash Modification Factors derived from sponsor selected from proven USDOT supported safety countermeasures. Sponsors will also be able to provide information on other countermeasures	Yes

USDOT has compiled research on the effectiveness of certain safety countermeasures at reducing crashes. ARC is promoting the use of the nine USDOT highlighted measures for reducing crashes in the region:

- Roundabouts
- Corridor access management
- Pedestrian hybrid beacons
- Enhanced delineation and friction for horizontal curves
- Longitudinal rumble strips and stripes on two-lane roads
- Road diets
- Safety edges
- Medians and pedestrian crossing islands
- Backplates with retroreflective borders

Project sponsors will also be able to provide safety countermeasure details from the lists available on USDOT's website (see the Glossary of Links). This website provides a searchable database; searches by mode or other element can identify possible countermeasures for roadway projects. Projects will be scored based on the effectiveness of the countermeasures proposed by their Crash Modification Factor (CMF).

Cultural & Environmental Resources

Transportation projects should not overly impact the region's cultural and environmental heritage. Projects that require extensive new right-of-way acquisition or new pavement have the potential to impact cultural and environmental assets. In past Regional Transportation Plans, ARC staff utilized a composite overlay index to assess how transportation projects might impact sensitive land uses as well as how those land uses might impact the schedule or deliverability of transportation projects. This analysis tool has been carried forward into the TIP project evaluation work. Table RA8 outlines the metrics associated with the cultural and environmental sensitivity criterion for roadway asset management and resiliency projects.

Table RA8 – Metrics for Evaluating the Roadway Asset Management & Resiliency Cultural & Environmental Resources Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Impact on Culturally & Environmentally Sensitive Land Uses	1) Cultural & Environmental GIS Overlay Score	Numerical	No	50%
	2) Does the project have an environmental improvement component?	Written; sponsor provides a list of green infrastructure assets implemented in the project scope such as: storm water management, permeable pavement, LED lighting, etc.	Yes	50%

Below is a list of the layers that are compiled to produce the cultural and environmental GIS overlay score. The scores produced by the GIS overlay will be converted to a 0-100 range. Projects that impact a large number of resources over a long distance of their limits will receive a low score. Projects that impact few or no resources will receive a high score.

Cultural and Environmental GIS Overlay Layers

- Brownfields
- FEMA Floodplains
- Historical Resources
- Hazardous Sites
- Metro River Protection Act Corridor
- Impaired Streams
- Trout Streams
- Existing Greenspace
- Groundwater Recharge Areas
- Small Water Supply Watersheds
- Wetlands
- Rural Areas
- Undeveloped Land
- Darter Habitat
- Endangered Species Habitat

In addition, project sponsors will be able to earn credit for implementing best practices in environmental design. These designs should improve the state of the natural environment or improve the adjacent community's resilience and environmental sustainability.

Social Equity

Ensuring a fair and equitable transportation system is a key goal associated with the Atlanta Region's Plan. Transportation assets should be sensitive to the needs of low-income and minority communities to support the USDOT's Ladders of Opportunity program as well as ARC's goals associated with Equitable Target Area (ETA) communities. ARC is still undergoing research on how best to measure a transportation project's impact on ETA communities. To meet the social equity criterion, project sponsors will be required to provide information on how projects serve ETA communities. This process is outlined in Table RA9.

Table RA9 – Metric for Evaluating the Roadway Asset Management & Resiliency Social Equity Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Addressing Social Equity	Does project serve an ETA community?	Written; sponsor provides an assessment of how developing the project will support ETA areas.	Yes; with supplemental ARC assessment of ETA areas

Goods Movement

In 2016, ARC updated the Atlanta Regional Freight Mobility Plan. This plan identified key areas of freight employment and activity as "freight cluster areas." Freight cluster areas serve as centers of employment in the Atlanta region and are interconnected by a series of priority transportation networks. Ensuring an adequate state of good repair and resilient access to these job centers by all modes is essential to safeguarding the movement of goods and services in the region. Table RA10 illustrates how ARC staff will assess asset management and resiliency projects for the goods movement criterion.

Table RA10 – Metrics for Evaluating the Asset Management and Resiliency Goods Movement Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
1) Heavy Truck Accessibility	Does the project reconstruct load-limited bridges to improve freight movement?	Yes/No	Yes	50%
2) Regional Freight Significance	Does the project improve the movement of freight and is it located on ARC's regional freight system (ASTRoMaP), GDOT's Statewide Designated Freight Corridors or the FHWA National Highway Freight Network (NHFN)?	Yes/No	No	50%

Employment Accessibility

Access to jobs is a vital function of the transportation system across all modes. Good access to employment opportunities ensures the Atlanta region's competitive advantage and is important for upward economic mobility. Ensuring a state of good repair for regional roadways, along with incorporating resilience to natural and man-made disasters is an important component of regional transportation policy. Table RA11, below, outlines the metric for roadway asset management and resiliency projects and employment accessibility.

Table RA11 – Metric for Evaluating the Roadway Asset Management and Resiliency Employment Accessibility Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Supporting Regionally Significant Locations	Does the project connect to (or is it within) a Regional Employment Center, a Freight Cluster Area or a Regional Place?	Yes/No	No

Roadway Expansion

Table RC1 outlines the scheme for evaluating roadway expansion projects. No measures were identified for the criteria related to asset management and resiliency and land use compatibility. Projects received in the solicitation that focus on increasing roadway expansion, either through widening existing facilities or adding new facilities or connections, will be evaluated using the performance measures indicated in the table. Further information on the exact metrics and scoring follows in the subsections.

Table RC1 – Roadway Expansion Project Evaluation Scheme

Vision	Criteria	Measures
World Class Infrastructure	Mobility/Congestion	1) Change in Congestion Intensity 2) Change in Congestion Extent
	Reliability	Worst Travel Time Reliability
	Network Connectivity	Connections to Other Facilities
	Multimodalism	Multimodal Accommodations
	Asset Management & Resiliency	-
Healthy Livable Communities	Safety	Improved Safety
	Air Quality & Climate Change	1) Project's Regional Emissions 2) Near Road Emissions Exposure
	Cultural & Environmental Resources	Impact on Culturally and Environmentally Sensitive Land Uses
	Social Equity	Addressing Social Equity
	Land Use Compatibility	-
Competitive Economy	Goods Movement	Supporting the Freight Economy
	Employment Accessibility	1) Supporting Regionally Significant Locations 2) Employment Accessibility

Mobility & Congestion

The mobility and congestion criterion is broken down into two key measures and metrics focused on congestion. These measures aim to assess the reduction in congestion and improvement in travel time along a project corridor and align with those proposed by USDOT.

The two metrics are: travel time index (TTI) and vehicle hours of delay (VHD). These measures quantify the intensity and extent of congestion, two of the three main dimensions ARC staff has evaluated in the past, by determining how severely congested a facility is and how many people are impacted. Small roadways that are severely congested but have very little traffic will receive a high intensity score but low extent score. The scheme seeks to balance the severity of congestion with the impact it has on a total population. Table RC2 outlines the metrics and scoring for the mobility and congestion criterion.

Table RC2 – Metrics for Evaluating the Roadway Expansion Mobility & Congestion Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
1) Change in Congestion Intensity	Absolute change in the link-level travel time index (TTI) in the build vs no build scenario for the worst traffic time period	Numerical; derived from ARC's modeling	No	50%
2) Change in Congestion Extent	Absolute change in regional vehicle hours of delay (VHD) in the build vs no build scenario for the worst traffic time period	Numerical; derived from ARC's modeling	No	50%

After TTI and VHD values for all roadway expansion projects are determined, project scores are compared. A distribution of these data are used to assign scores from 0-100. The project that reduces the most VHD and TTI will receive the highest score, the project with the least reduction will receive the lowest score. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Reliability

Reliability is another key criterion for project evaluation advanced by the Atlanta Region's Plan as well as by state and federal partners. Whereas congestion relates to how quickly travelers can move down a roadway, reliability relates to how consistently certain travel time conditions are observed. A roadway that is always congested at peak periods is considered very reliable. Travelers on that corridor know to anticipate the congestion and can adjust travel time accordingly. Research indicates that travelers are most impacted by unpredictable congestion conditions which are often caused by crashes, bad weather or other infrequent events.

Table RC3 illustrates the measure and metric for the reliability criterion for roadway expansion projects. The metric mirrors the proposed USDOT performance planning regulations.

Table RC3 – Metric for Evaluating the Roadway Expansion Reliability Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Worst Travel Time Reliability	Aggregated 80% travel time / 50% travel time for all weekdays	Numerical; derived from real-world data	No

The resulting ratio will be evaluated on a distribution to assign a range of scores from 0-100. Projects that are planned along very unreliable routes are awarded more points under the assumption that a key component of project design and engineering will be to improve reliability. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Network Connectivity

Ensuring our transportation system is well-connected is a key goal of the Atlanta Region's Plan. An interconnected network of roadways ensures route options and system-wide resiliency in the event that parallel facilities may be impassable. The TIP Prioritization Task Force identified one performance measure and metric to evaluate roadway expansion projects for the network connectivity criterion. This metric aims to assess which projects create new connections between key roadways in the region and is outlined in Table RC4.

Table RC4 – Metric for Evaluating the Roadway Expansion Network Connectivity Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Connections to Other Facilities	Does the project make two or more new connections to roadways rated as collectors or higher?	Yes/No	No

Multimodalism

A good multimodal project includes elements of more than one project type to ensure transportation by multiple modes are accommodated in the design of a single project. Roadway expansion projects should be designed to add accommodation for other modes, where possible, in a context sensitive manner. See Table RC5 for the metric used to evaluate the roadway expansion criterion. Roadway projects that include complete street (bike/ped/trail) or transit components will have their total active mode trips assessed through the CMAQ Calculator.

Table RC5 – Metric for Evaluating the Roadway Expansion Multimodalism Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Multimodal Accommodations	Additional person throughput by active modes or transit	Numerical	Yes; sponsor must provide the data necessary to run the project through the mobility portion of the bike/ped/trail/transit component of the CMAQ Calculator

After the CMAQ Calculator estimates the number of bicycle/pedestrian/transit trips, all project scores are compared. A distribution of these data are used to assign scores from 0-100. The projects with the most trips will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Safety

All projects should strive to correct existing safety issues while maximizing safe design. Two key metrics were identified by the TIP Prioritization Task Force for the safety criterion, outlined in Table RC6. The first metric relates to the current conditions on a roadway by looking at current injury and fatality crash rates. This metric helps prioritize safety improvements in areas that are experiencing a current problem. The

second metric directs project sponsors towards USDOT supported safety countermeasures to reduce crashes and improve public safety.

Table RC6 – Metrics for Evaluating the Roadway Expansion Safety Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Improved Safety	1) Serious injury + fatality crash rate per 100 million VMT	Numerical; GEARS database	No	50%
	2) Safety countermeasures proposed	Numerical; Crash Modification Factors derived from sponsor selected from proven USDOT supported safety countermeasures. Sponsors will also be able to provide information on other countermeasures	Yes	50%

Existing crash information comes from the Georgia Electronic Accident Reporting System (GEARS). For the serious injury + fatality crashes numerical metric, a distribution of the results of the crash analyses will be used to assign scores from 0-100. The projects with the most crashes will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

USDOT has compiled research on the effectiveness of certain safety countermeasures at reducing crashes. ARC is promoting the use of the nine USDOT highlighted measures for reducing crashes in the region:

- Roundabouts
- Corridor access management
- Pedestrian hybrid beacons
- Enhanced delineation and friction for horizontal curves
- Longitudinal rumble strips and stripes on two-lane roads
- Road diets
- Safety edges
- Medians and pedestrian crossing islands
- Backplates with retroreflective borders

Project sponsors will also be able to provide safety countermeasure details from the lists available on USDOT's website (see the Glossary of Links). This website provides a searchable database; searches by mode or other element can identify possible countermeasures for roadway projects. Projects will be scored based on the effectiveness of the countermeasures proposed by their Crash Modification Factor (CMF).

Air Quality & Climate Change

Automobile travel is a primary source of pollutants that cause bad air quality and climate change. Congested roadways with very slow speeds and start-and-stop traffic flow lead to increased emissions and worsened air quality. Well-designed transportation projects can help decrease emissions by reducing congestion and improving traffic flow. That said, many projects can also induce traffic demand and can lead to worsened air quality. Therefore, it's not uncommon for roadway expansion projects to either improve or worsen air quality depending on the project specific details.

Table RC7 outlines the metrics associated with the roadway expansion air quality and climate change criterion. Project emissions are calculated from the mobility metric modeling. Regional emissions from a build and no build scenario are compared. Near road emissions are determined using ARC's recently developed Atlanta Roadside Emissions Exposure Study (AREES) model. This model calculates the existing transportation system's $PM_{2.5}$ emissions to determine local air quality hotspots. Any project that adds regional emissions within a 100m buffer to locations in the top decile ($\geq$1.6 $\mu g/m^3$) of AREES-identified locations will be considered to be in a hotspot.

Where roadway expansion projects include elements of other modes, values reported include emission changes from all modes of those multimodal projects. Project sponsors will not need to provide any additional information for this calculation.

Table RC7 – Metrics for Evaluating the Roadway Expansion Air Quality & Climate Change Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
1) Project's Regional Emissions	1) Change in NO_x, VOC, & $PM_{2.5}$ emissions	Numerical; sum of three pollutants in kg/year	No	25%
	2) Change in greenhouse gas emissions $CO_2(e)$	Numerical; in kg/year	No	50%
2) Near Road Emissions Exposure	Is the project located in a $PM_{2.5}$ hotspot?	Yes/No	No	25%

The amount of emissions offset will be scored on a distribution to assign a range of scores from 0-100. The project with the most emissions reduced will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Cultural & Environmental Resources

Transportation projects should not overly impact the region's cultural and environmental heritage. Projects that require extensive new right-of-way acquisition or new pavement have the potential to impact cultural and environmental assets. In past Regional Transportation Plans, ARC staff utilized a composite overlay index to assess how transportation projects might impact sensitive land uses as well as how those land uses might impact the schedule or deliverability of transportation projects. This analysis tool has been carried forward into the TIP project evaluation work. Table RC8 outlines the metrics associated with the cultural and environmental resources criterion for roadway expansion projects.

Table RC8 – Metrics for Evaluating the Roadway Expansion Cultural & Environmental Resources Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Impact on Culturally & Environmentally Sensitive Land Uses	1) Cultural & Environmental GIS Overlay Score	Numerical	No	50%
	2) Does the project have an environmental improvement component?	Written; sponsor provides a list of green infrastructure assets implemented in the project scope such as: storm water management, permeable pavement, LED lighting, etc.	Yes	50%

Below is a list of the layers that are compiled to produce the cultural and environmental GIS overlay score. The scores produced by the GIS overlay will be converted to a 0-100 range. Projects that impact a large number of resources over a long distance of their limits will receive a low score. Projects that impact few or no resources will receive a high score.

Cultural and Environmental GIS Overlay Layers

- Brownfields
- FEMA Floodplains
- Historical Resources
- Hazardous Sites
- Metro River Protection Act Corridor
- Impaired Streams
- Trout Streams
- Existing Greenspace
- Groundwater Recharge Areas
- Small Water Supply Watersheds
- Wetlands
- Rural Areas
- Undeveloped Land
- Darter Habitat
- Endangered Species Habitat

In addition, project sponsors will be able to earn credit for implementing best practices in environmental design. These designs should improve the state of the natural environment or improve the adjacent community's resilience and environmental sustainability.

Social Equity

Ensuring a fair and equitable transportation system is a key goal associated with the Atlanta Region's Plan. Transportation assets should be sensitive to the needs of low-income and minority communities to support the USDOT's Ladders of Opportunity program as well as ARC's goals associated with Equitable Target Area (ETA) communities. ARC is still undergoing research on how best to measure a transportation project's impact on ETA communities. To meet the social equity criterion, project sponsors will be required to provide information on how projects serve ETA communities. This process is outlined in Table RC9.

Table RC9 – Metric for Evaluating the Roadway Expansion Social Equity Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Addressing Social Equity	Does project serve an ETA community?	Written; sponsor provides an assessment of how developing the project will support ETA areas.	Yes; with supplemental ARC assessment of ETA areas

Goods Movement

In 2016, ARC updated the Atlanta Regional Freight Mobility Plan. This plan identified key areas of freight employment and activity as "freight cluster areas." Freight cluster areas serve as centers of employment in the Atlanta region and are interconnected by a series of priority transportation networks. Ensuring adequate capacity for truck and vehicular access to these job centers by all modes is essential to safeguarding the movement of goods and services in the region. Table RC10 outlines how ARC staff will assess roadway expansion projects for the goods movement criterion.

Table RC10 – Metric for Evaluating the Roadway Expansion Goods Movement Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Supporting the Freight Economy	Does the project improve the movement of freight and is it located on ARC's regional freight system (ASTRoMaP), GDOT's Statewide Designated Freight Corridors or the FHWA National Highway Freight Network (NHFN)?	Yes/No	No

Employment Accessibility

Access to jobs is a vital function of the transportation system across all modes. Good access to employment opportunities ensures the Atlanta region's competitive advantage and is important for upward economic mobility. Improving the number of workers that can reach employment centers is a key goal of ARC and GDOT. Employment accessibility metrics have been used in previous RTPs and continue on at the recommendation of the TIP Prioritization Task Force. This measure will be broken out by ETA and non-ETA communities' access to help inform decision-making with the social equity criterion, see Table RC11.

Table RC11 – Metrics for Evaluating the Roadway Expansion Employment Accessibility Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
1) Supporting Regionally Significant Locations	Does the project connect to (or is it within) a Regional Employment Center, a Freight Cluster Area or a Regional Place?	Yes/No	No	50%
2) Employment Accessibility	Accessibility Index: The index is a measure of the change in workers and jobs accessible due to the new road or roadway expansion	Numerical	No	50%

The number of new workers with access to Regional Employment Centers will be scored on a distribution to assign a range of scores from 0-100. The project with the most new workers gaining access will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Roadway Transportation System Management & Operations

Table RT1 outlines the scheme for evaluating roadway transportation system management and operations (TSM&O) projects. No measures were identified for the criteria related to asset management and resiliency and land use compatibility. Projects received in the solicitation that focus on roadway operations and management, such as intersection reconfigurations, signal timing, or roadway operational modifications, will be evaluated using the performance measures indicated in the table. Further information on the exact metrics and scoring follows in the subsections.

Table RT1 – Roadway TSM&O Project Evaluation Scheme

Vision	Criteria	Measures
World Class Infrastructure	Mobility/Congestion	1) Corridor Congestion Intensity 2) Change in Congestion Extent
	Reliability	Worst Hour Travel Time Reliability
	Network Connectivity	Supports the Regional Policy Networks
	Multimodalism	Multimodal Accommodations
	Asset Management & Resiliency	-
Healthy Livable Communities	Safety	Improved Safety
	Air Quality & Climate Change	1) Project Emissions 2) Near Road Emissions Exposure
	Cultural & Environmental Resources	Impact on Culturally and Environmentally Sensitive Land Uses
	Social Equity	Addressing Social Equity
	Land Use Compatibility	-
Competitive Economy	Goods Movement	Supporting the Freight Economy
	Employment Accessibility	Supporting Regionally Significant Locations

Mobility & Congestion

The mobility and congestion criterion is broken down into two key measures and metrics focused on congestion. These measures aim to assess the reduction in congestion and improvement in travel time along a project corridor and align with those proposed by USDOT.

The two metrics are: travel time index (TTI) and vehicle hours of delay (VHD). These measures quantify the intensity and extent of congestion, two of the three main dimensions ARC staff has evaluated in the past, by determining how severely congested a facility is and how many people are impacted. Small roadways that are severely congested but have very little traffic will receive a high intensity score but low extent score. The scheme seeks to balance the severity of congestion with the impact it has on a total population. Table RT2 outlines the metrics and scoring for the mobility and congestion criterion.

Table RT2 – Metrics for Evaluating the Roadway TSM&O Mobility & Congestion Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
1) Corridor Congestion Intensity	Current project limit peak period travel time index (TTI)	Numerical; derived from real-world data	No	50%
2) Change in Congestion Extent	Absolute change in vehicle hours of delay (VHD) in the build vs no build scenario for the worst traffic time period	Numerical; derived from ARC's modeling[7]	No	50%

After TTI and VHD values for all roadway TSM&O projects are determined, project scores are compared. A distribution of these data are used to assign scores from 0-100. The project that reduce the most VHD will receive the highest score, the project with the least reduction will receive the lowest score. For TTI, projects on corridors with the highest TTI will receive the most points, under the assumption that implementing the project will improve the intensity of congestion on the facility. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Reliability

Reliability is another key criterion for project evaluation advanced by the Atlanta Region's Plan as well as by state and federal partners. Whereas congestion relates to how quickly travelers can move down a roadway, reliability relates to how consistently the conditions are observed. A roadway that is always congested at peak periods is considered very reliable. Travelers on that corridor know to anticipate the congestion and can adjust travel time accordingly. Research indicates that travelers are most impacted by unpredictable congestion conditions which are often caused by crashes, bad weather or other infrequent events.

Table RT3 illustrates the measure and metric for the reliability criterion for roadway TSM&O projects. The metric mirrors the proposed metric associated with FAST Act performance planning regulations.

[7] ARC staff may use either the travel model or the CMAQ Calculator to evaluate this metric depending on the project

Table RT3 – Metric for Evaluating the Roadway TSM&O Reliability Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Worst Hour Travel Time Reliability	Aggregated 80% travel time / 50% travel time for all weekdays	Numerical; derived from real-world data	No

The resulting ratio will be evaluated on a distribution to assign a range of scores from 0-100. Projects that are planned along very unreliable routes are awarded more points under the assumption that a key component of project design and engineering will be to improve reliability. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Network Connectivity

Ensuring our transportation system is well-connected is a key goal of the Atlanta Region's Plan. An interconnected network of roadways ensures route options and system-wide resiliency in the event that parallel facilities may be impassable. Ensuring the deployment of traffic technology and improved intersection geometry advances those goals.

The TIP Prioritization Task Force identified one performance measure and metric to evaluate roadway TSM&O projects for the network connectivity criterion. This metric focuses on ensuring priority networks are emphasized in project decision-making and is outlined in Table RT4. The following roadway networks are considered part of the regional policy network:

- National Highway System
- National Freight Network
- Regional Thoroughfare Network
- Atlanta Strategic Truck Route Master Plan (ASTRoMaP)

Table RT4 – Metric for Evaluating the Roadway TSM&O Network Connectivity Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Supports the Regional Policy Networks	Is the project located on, or does it connect to, a regional policy network?	Yes/No	No

Multimodalism

A good multimodal project includes elements of more than one project type to ensure transportation by multiple modes are accommodated in the design of a single project. Roadway TSM&O projects should be designed to add accommodation for other modes, where possible. See Table RT5 for the metric used to evaluate the roadway TSM&O criterion. Roadway projects that include complete street (bike/ped/trail) components will have their total active mode trips assessed through the CMAQ Calculator.

Table RT5 – Metric for Evaluating the Roadway TSM&O Multimodalism Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Multimodal Accommodations	Additional person throughput by active modes	Numerical	Yes; sponsor must provide the data necessary to run the project through the mobility portion of the bike/ped/trail component of the CMAQ Calculator

After the CMAQ Calculator estimates the number of bicycle/pedestrian/transit trips, all project scores are compared. A distribution of these data are used to assign scores from 0-100. The projects with the most trips will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Safety

All projects should strive to correct existing safety issues while maximizing safe design. Two key metrics were identified by the TIP Prioritization Task Force for the safety criterion, outlined in Table RT6. The first metric relates to the current conditions on a roadway by looking at current injury and fatality crash rates. This metric helps prioritize safety improvements in areas that are experiencing a current problem. The second metric directs project sponsors towards USDOT supported safety countermeasures to reduce crashes and improve public safety.

Table RT6 – Metrics for Evaluating the Roadway TSM&O Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Improved Safety	1) Serious injury + fatality crash rate per 100 million VMT	Numerical; GEARS database	No	50%
	2) Safety countermeasures proposed	Numerical; Crash Modification Factors derived from sponsor selected from proven USDOT supported safety countermeasures. Sponsors will also be able to provide information on other countermeasures	Yes	50%

Existing crash information comes from the Georgia Electronic Accident Reporting System (GEARS). For the serious injury + fatality crashes numerical metric, a distribution of the results of the crash analyses will be used to assign scores from 0-100. The projects with the most crashes will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

USDOT has compiled research on the effectiveness of certain safety countermeasures at reducing crashes. ARC is promoting the use of the nine USDOT highlighted measures for reducing crashes in the region:

- Roundabouts
- Corridor access management
- Pedestrian hybrid beacons
- Enhanced delineation and friction for horizontal curves
- Longitudinal rumble strips and stripes on two-lane roads
- Road diets
- Safety edges
- Medians and pedestrian crossing islands
- Backplates with retroreflective borders

Project sponsors will also be able to provide safety countermeasure details from the lists available on USDOT's website (see the Glossary of Links). This website provides a searchable database; searches by mode or other element can identify possible countermeasures for roadway projects. Projects will be scored based on the effectiveness of the countermeasures proposed by their Crash Modification Factor (CMF).

Air Quality & Climate Change

Automobile travel is a primary source of pollutants that cause bad air quality and climate change. Congested roadways with very slow speeds and start-and-stop traffic flow lead to increased emissions and worsened air quality. Well-designed TSM&O projects can help decrease emissions by reducing congestion and improving traffic flow. That said, many projects can also induce traffic demand and can lead to worsened air quality. Therefore, it's not uncommon for some roadway TSM&O projects to either improve or worsen air quality depending on the project specific details.

Table RT7 outlines the metrics associated with the roadway TSM&O air quality and climate change criterion. Project emissions are calculated from the mobility metric modeling. Near road emissions are determined using ARC's recently developed Atlanta Roadside Emissions Exposure Study (AREES) model. This model calculates the existing transportation system's $PM_{2.5}$ emissions to determine local air quality hotspots. Any project that adds emissions within a 100m buffer to locations in the top decile ($\geq$1.6 $\mu g/m^3$) of AREES-identified locations will be considered to be in a hotspot.

Where roadway TSM&O projects include elements of other modes, values reported include emission changes from all modes of those multimodal projects.

Table RT7 – Metrics for Evaluating the Roadway TSM&O Air Quality & Climate Change Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
1) Project Emissions	1) Change in NO_x, VOC, & $PM_{2.5}$ emissions	Numerical; sum of three pollutants in kg/year	No; however, sponsors will provide data for ARC staff to run emission tools	25%
	2) Change in greenhouse gas emissions $CO_2(e)$	Numerical; in kg/year	No; however, sponsors will provide data for ARC staff to run emission tools	50%
2) Near Road Emissions Exposure	Is the project located in a $PM_{2.5}$ hotspot?	Yes/No	No	25%

The amount of emissions offset will be scored on a distribution to assign a range of scores from 0-100. The project with the most emissions reduced will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Many roadway TSM&O projects will require additional information to determine air quality benefits, which in addition to being a performance criteria makes the project potentially eligible for CMAQ funds. The following project types will require additional information provided by the project sponsor:

- Diverging Diamond Interchange (DDI)
- Signal Synchronization
- Roundabouts
- Intersection Upgrade – New Signals
- Intersection Upgrade – New Signal Phases
- Intersection Upgrade – Capacity & Phases
- Incident Management
- Advanced Traffic Management Systems (ATMS)

The following series of tables outline the sponsor required inputs by project type in order to calculate the emission benefits of certain types of roadway TSM&O projects. If sponsors do not have the required data, ARC staff can help supplement the information using travel model or regional values.

Table RT8 – Sponsor Required Inputs for Advanced Traffic Management Systems (ATMS) Projects

	Sponsor Required Input	Nature of Metric
1)	Average peak hour volume along corridor	Numerical
2)	Heavy truck percentage of traffic	Numerical
3)	Does the project include an adaptive signal system?	Yes/No
4)	Number of intersections along the corridor	Numerical

Table RT9 – Sponsor Required Inputs for Signal Synchronization Projects

	Sponsor Required Input	Nature of Metric
1)	Length of signalized corridor	Numerical; miles
2)	Existing number of signalized intersections	Numerical
3)	Existing number of lanes	Numerical
4)	Average peak hour volume for both AM (inbound) and PM (outbound)	Numerical
5)	Heavy truck percentage of traffic	Numerical
6)	Average corridor travel time (one direction) during both AM (inbound) and PM (outbound)	Numerical; minutes
7)	Existing average cycle length	Numerical; seconds

Table RT10 – Sponsor Required Inputs for Roundabout Projects

	Sponsor Required Input	Nature of Metric
1)	Average peak hour volume for each approach	Numerical; at least 4 approaches
2)	Percentage of left turns for each approach	Numerical; at least 4 approaches
3)	Percentage of right turns for each approach	Numerical; at least 4 approaches
4)	Heavy truck percentage of traffic	Numerical; weighted average of all approaches
5)	Proposed number of lanes for roundabout	Numerical

Table RT11 – Sponsor Required Inputs for Intersection Upgrade – New Signal Projects

	Sponsor Required Input	Nature of Metric
1)	Facility type of streets	Written; minor/major collector, minor/major/principal arterial, HOV lane, managed lane
2)	Peak hour volume for each street	Numerical
3)	Heavy truck percentage of each street	Numerical

Table RT12 – Sponsor Required Inputs for Intersection Upgrade – New Signal Phase Projects

	Sponsor Required Input	Nature of Metric
1)	Type of turn with new phase	Written; left or right
2)	Number of lanes for which the movement is being enabled	Numerical
3)	Heavy truck percentage of traffic	Numerical

Table RT13 – Sponsor Required Inputs for Intersection Upgrade – Capacity & Phase Projects

	Sponsor Required Input	Nature of Metric
1)	Facility type of streets	Written; minor/major collector, minor/major/principal arterial, HOV lane, managed lane
2)	Number of turn lanes being added by direction	Written; sponsor will need to provide new turning capacity by street
3)	Peak hour volume for each street	Numerical
4)	Heavy truck percentage for each street	Numerical
5)	Existing intersection signal cycle length	Numerical; seconds

Table RT14 – Sponsor Required Inputs for Incident Management Projects

	Sponsor Required Input	Nature of Metric
1)	Facility type being served	Written; Interstate/Freeway, parkway, expressway, principal arterial
2)	Number of lanes on facility in each direction	Numerical
3)	Peak hour volume in each direction	Numerical
4)	Annual number of incidents in each direction	Numerical
5)	Average IMS response and clear-up time	Numerical; proposed or expected time in minutes
6)	Average highway patrol response and clear-up time	Numerical; current/pre-project time in minutes
7)	Percent of incidents resulting in total closures	Numerical
8)	Heavy truck percentage for corridor	Numerical

Table RT15 – Sponsor Required Inputs for Diverging Diamond (DDI) or Continuous Flow Intersection (CFI) Projects

	Sponsor Required Input	Nature of Metric
1)	Heavy truck percentage for intersection	Numerical
2)	Existing interchange peak hour volume turning movements	Numerical; sponsor will need to provide modeled turning movements or schematics for all possible motions through an interchange
3)	DDI/CFI peak hour volume turning movements	Numerical; sponsor will need to provide modeled turning movements or schematics for all possible motions through the proposed DDI/CFI

Cultural & Environmental Resources

Transportation projects should not overly impact the region's cultural and environmental heritage. Projects that require extensive new right-of-way acquisition or new pavement have the potential to impact cultural and environmental assets. In past Regional Transportation Plans, ARC staff utilized a composite overlay index to assess how transportation projects might impact sensitive land uses as well as how those land uses might impact the schedule or deliverability of transportation projects. This analysis tool has been carried forward into the TIP project evaluation work. Table RT16 outlines the metrics associated with the cultural and environmental resources criterion for roadway TSM&O projects.

Table RT16 – Metrics for Evaluating the Roadway TSM&O Cultural & Environmental Resources Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Impact on Culturally & Environmentally Sensitive Land Uses	1) Cultural & Environmental GIS Overlay Score	Numerical	No	50%
	2) Does the project have an environmental improvement component?	Written; sponsor provides a list of green infrastructure assets implemented in the project scope such as: storm water management, permeable pavement, LED lighting, etc.	Yes	50%

Below is a list of the layers that are compiled to produce the cultural and environmental GIS overlay score. The scores produced by the GIS overlay will be converted to a 0-100 range. Projects that impact a large number of resources over a long distance of their limits will receive a low score. Projects that impact few or no resources will receive a high score.

Cultural and Environmental GIS Overlay Layers

- Brownfields
- FEMA Floodplains
- Historical Resources
- Hazardous Sites
- Metro River Protection Act Corridor
- Impaired Streams
- Trout Streams
- Existing Greenspace
- Groundwater Recharge Areas
- Small Water Supply Watersheds
- Wetlands
- Rural Areas
- Undeveloped Land
- Darter Habitat
- Endangered Species Habitat

In addition, project sponsors will be able to earn credit for implementing best practices in environmental design. These designs should improve the state of the natural environment or improve the adjacent community's resilience and environmental sustainability.

Social Equity

Ensuring a fair and equitable transportation system is a key goal associated with the Atlanta Region's Plan. Transportation assets should be sensitive to the needs of low-income and minority communities to support the USDOT's Ladders of Opportunity program as well as ARC's goals associated with Equitable Target Area (ETA) communities. ARC is still undergoing research on how best to measure a transportation project's impact on ETA communities. To meet the social equity criterion, project sponsors will be required to provide information on how projects serve ETA communities. This process is outlined in Table RT17.

Table RT17 – Metric for Evaluating the Roadway TSM&O Social Equity Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Addressing Social Equity	Does project serve an ETA community?	Written; sponsor provides an assessment of how developing the project will support ETA areas.	Yes; with supplemental ARC assessment of ETA areas

Goods Movement

In 2016, ARC updated the Atlanta Regional Freight Mobility Plan. This plan identified key areas of freight employment and activity as "freight cluster areas." Freight cluster areas serve as centers of employment in the Atlanta region and are interconnected by a series of priority transportation networks. Ensuring adequate operational conditions for truck and vehicular access to these job centers by all modes is essential to safeguarding the movement of goods and services in the region. Table RT18 outlines how ARC staff will assess roadway TSM&O projects for the goods movement criterion.

Table RT18 – Metrics for Evaluating the Roadway TSM&O Freight Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Supporting the Freight Economy	Does the project improve the movement of freight and is it located on ARC's regional freight system (ASTRoMaP), GDOT's Statewide Designated Freight Corridors or the FHWA National Highway Freight Network (NHFN)?	Yes/No	No

Employment Accessibility

Access to jobs is a vital function of the transportation system across all modes. Good access to employment opportunities by all modes ensures the Atlanta region's competitive advantage and is important for upward economic mobility. Roadway TSM&O projects are especially important in improving access to the region's largest job centers, where active modes and transit service already exists and there may be no means to increase roadway capacity. In these often congested centers, applying TSM&O solutions can improve travel times and help job centers maintain their competitive advantage. Table RT19, below, outlines the metric for roadway TSM&O projects and employment accessibility.

Table RT19 – Metric for Evaluating the Roadway TSM&O Employment Accessibility Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Supporting Regionally Significant Locations	Does the project connect to (or is it within) a Regional Employment Center, a Freight Cluster Area or a Regional Place?	Yes/No	No

Transit Expansion

Table TE1 outlines the scheme for evaluating transit expansion projects. No measures were identified for the criteria related to goods movement and asset management and resiliency. Projects received in the solicitation that focus on expanding transit service, such as new rail or bus service, will be evaluated using the performance measures indicated in the table. Further information on the exact metrics and scoring follows in the subsections.

Table TE1 – Transit Expansion Project Evaluation Scheme

Vision	Criteria	Measures
World Class Infrastructure	Mobility/Congestion	1) Project Trips 2) Regional Trips
	Reliability	1) Dedicated Right-of-Way 2) Transit Service Frequency
	Network Connectivity	Connections to Fixed Guideway Transit[8]
	Multimodalism	Multimodal Accommodations
	Asset Management & Resiliency	-
Healthy Livable Communities	Safety	Improved Safety
	Air Quality & Climate Change	Project Emissions
	Cultural & Environmental Resources	Impact on Culturally and Environmentally Sensitive Land Uses
	Social Equity	Addressing Social Equity
	Land Use Compatibility	Supporting Land Use
Competitive Economy	Goods Movement	-
	Employment Accessibility	1) Supporting Regionally Significant Locations 2) Employment Center Accessibility

[8] Fixed guideway services are considered to be any service that uses exclusive or controlled rights-of-way or rails, entirely or in part. In the Atlanta region this includes the MARTA heavy rail system, the Atlanta streetcar, GRTA Xpress buses, and other bus routes that run in bus-only lanes or in the regional managed lanes system.

Mobility & Congestion

Transit projects can help reduce congestion and improve regional mobility by improving access for more people to more locations in the region and by reducing the demand on public roadways. Two key measures and metrics were identified for the transit expansion mobility and congestion criterion in Table TE2. These metrics quantify both the local and regional impact of a transit expansion project through the number of trips taken. By looking at boardings and linked trips, analysts can develop a three-dimensional image of how implementing transit expansion projects impacts both the local and regional movement of transit riders.

Table TE2 – Metrics for Evaluating the Transit Expansion Mobility & Congestion Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
1) Project Trips	Change in project level transit boardings (unlinked trips)	Numerical; derived from ARC's modeling (boardings)	No	50%
2) Regional Trips	Change in regional transit trips (linked trips)	Numerical; derived from ARC's modeling	No	50%

After project-level and regional trips are calculated for all transit expansion projects, project scores are compared. A distribution of these data are used to assign scores from 0-100. The projects with the most trips will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Reliability

Reliability is another key criterion for project evaluation advanced by the Atlanta Region's Plan as well as by state and federal partners. Whereas reliability for roadway projects focuses on predictable travel times, reliability in regards to the expansion of transit service is focused on ensuring proposed projects offer frequent service on dedicated or exclusive right-of-way. These two measures ensure predictability in travel times and competitive advantage over automobile travel. Table TE3 illustrates the measure and metrics for the reliability criterion for transit expansion projects.

Table TE 3– Metrics for Evaluating the Transit Expansion Reliability Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
1) Dedicated Right-of-Way	Percent of proposed route with dedicated right-of-way	Numerical; amount of the route with dedicated right-of-way as a percent of total project centerline miles	Yes	50%
2) Transit Service Frequency	Service headway in minutes	Numerical; sponsor should provide service frequency for peak and off-peak periods	Yes	50%

Dedicated right-of-way is considered to be right-of-way that is either totally exclusive to the transit service or right-of-way that is managed. For this analysis, heavy rail, light rail, bus rapid transit in exclusive right-of-way or on managed lanes, and express bus operating on managed lanes is considered dedicated.

Streetcar operating on-road is not considered to be on dedicated right-of-way. The resulting values for the two metrics will be evaluated on a distribution to assign a range of scores from 0-100. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Network Connectivity

Ensuring our transit system is well-connected is a key goal of the Atlanta Region's Plan. An interconnected high-frequency network of transit services ensures route options and improves regional access to employment and services.

The TIP Prioritization Task Force identified one performance measure and metric to evaluate transit expansion projects for the network connectivity criterion. This metric focuses on awarding credit to transit projects that maximize connections to fixed guideway transit services, see Table TE4. Fixed guideway services are considered to be any service that uses exclusive or controlled rights-of-way or rails, entirely or in part. In the Atlanta region this includes the MARTA heavy rail system, the Atlanta streetcar, GRTA Xpress buses, and other bus routes that run in bus-only lanes or in the regional managed lanes system.

Table TE4 – Metric for Evaluating the Transit Expansion Network Connectivity Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Connections to Fixed Guideway Transit	The number of fixed guideway connections served by the project	Numerical	No

Projects that qualify as fixed guideway service on their own, for example a new rail line or bus route traveling in exclusive right-of-way, will automatically receive credit for one fixed-guideway connection. Additional credit will be given for connections with additional fixed guideway networks; for example, an express bus or streetcar route will get additional credit for serving a MARTA heavy rail station. Local bus routes will receive credit for this measure if they connect with stations (including park and ride lots) on the fixed guideway network. The resulting values for the metric for all submitted projects will be evaluated on a distribution to assign a range of scores from 0-100. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Multimodalism

A good multimodal project includes elements of more than one project type to ensure transportation by multiple modes are accommodated in the design of a single project. Transit expansion projects should be designed to add accommodation for other modes, where possible, especially as it relates to last mile connectivity.

The TIP Prioritization Task Force identified two metrics associated with the transit expansion multimodalism criterion. Even if a project does not accommodate multiple modes of transportation, credit can be awarded for ensuring that the design of a proposed project accounts for its interaction with other modes. See Table TE5 for the metrics used to evaluate the transit expansion multimodalism criterion.

Transit expansion projects that include complete street (bike/ped/trail) components will have their total active mode trips assessed through the CMAQ Calculator.

Table TE5 – Metrics for Evaluating the Transit Expansion Multimodalism Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Multimodal Accommodations	1) Additional active mode person throughput (pedestrian)	Numerical; evaluated through the CMAQ Calculator	Yes; sponsor must provide the data necessary to run the project through the mobility portion of the bike/ped/trail component of the CMAQ Calculator	50%
	2) Design elements	Written; sponsor provides a list of elements of other modes being implemented as part of their bicycle project. This could include: ADA upgrades, crosswalks, bus shelters, etc.	Yes	50%

After the CMAQ Calculator estimates the number of bicycle/pedestrian trips, all project scores are compared. A distribution of these data are used to assign scores from 0-100. The projects with the most trips will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Safety

All projects should strive to correct existing last-mile connectivity safety issues while maximizing safe design. Similar to the multimodalism criterion, project sponsors can earn extra points by addressing safety concerns during the implementation of transit expansion projects. Implementing proven safety countermeasures can reduce crash rates for transit vehicles and improve last mile connectivity safety. See Table TE6 for the metric used to evaluate the transit expansion safety criterion.

Table TE6 – Metric for Evaluating the Transit Expansion Safety Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Improved Safety	Safety countermeasures proposed	Numerical; Crash Modification Factors derived from sponsor selected from proven USDOT supported safety countermeasures. Sponsors will also be able to provide information on other countermeasures	Yes

USDOT has compiled research on the effectiveness of certain safety countermeasures at reducing crashes. ARC is promoting the use of the nine USDOT highlighted measures for reducing crashes in the region:

- Roundabouts
- Corridor access management
- Pedestrian hybrid beacons
- Enhanced delineation and friction for horizontal curves
- Longitudinal rumble strips and stripes on two-lane roads
- Road diets
- Safety edges
- Medians and pedestrian crossing islands
- Backplates with retroreflective borders

Project sponsors will also be able to provide safety countermeasure details from the lists available on USDOT's website (see the Glossary of Links). This website provides a searchable database; searches by mode or other element can identify possible countermeasures for transit projects. Projects will be scored based on the effectiveness of the countermeasures proposed by their Crash Modification Factor (CMF).

Air Quality & Climate Change

Encouraging people to switch from automobile to transit travel reduces vehicle emissions that cause bad air quality and contribute to climate change. Despite requiring fuel and electricity, transit trips are generally considered to be beneficial to air quality, especially on well utilized transit routes. ARC's CMAQ Calculator is able to produce an estimate of the amount of emissions offset by the development of new transit projects. Table TE7 outlines the metrics associated with the air quality and climate change criterion. Values include emission offsets from all modes of multimodal projects.

Table TE7 – Metrics for Evaluating the Transit Expansion Air Quality & Climate Change Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Project Emissions	1) Change in NO_x, VOC, & $PM_{2.5}$ emissions	Numerical; sum of three pollutants in kg/year	Yes; see Table TE8 below	50%
	2) Change in greenhouse gas emissions $CO_2(e)$	Numerical; in kg/year	No	50%

The amount of emissions offset will be scored on a distribution to assign a range of scores from 0-100. The project with the most emissions reduced will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

In order to calculate emissions for transit expansion projects, sponsors will need to provide the following additional information in Table TE8 to run projects through the CMAQ Calculator.

Table TE8 – Sponsor Required Inputs for Transit Expansion Projects

	Sponsor Required Input	Nature of Metric
1)	New type of transit service	Written; diesel bus, CNG bus, LNG bus, hybrid electric bus, light rail, heavy rail
2)	Transit corridor weekday hours of service per day	Numerical; hours
3)	Is real-time information available?	Yes/No

Cultural & Environmental Resources

Transportation projects should not overly impact the region's cultural and environmental heritage. Projects that require extensive new right-of-way acquisition or new pavement/rail have the potential to impact cultural and environmental assets. In past Regional Transportation Plans, ARC staff utilized a composite overlay index to assess how transportation projects might impact sensitive land uses as well as how those land uses might impact the schedule or deliverability of transportation projects. This analysis tool has been carried forward into the TIP project evaluation work. Table TE9 outlines the metrics associated with the cultural and environmental resources criterion for transit expansion projects.

Table TE9 – Metrics for Evaluating the Transit Expansion Cultural & Environmental Resources Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Impact on Culturally & Environmentally Sensitive Land Uses	1) Cultural & Environmental GIS Overlay Score	Numerical	No	50%
	2) Does the project have an environmental improvement component?	Written; sponsor provides a list of green infrastructure assets implemented in the project scope such as: storm water management, permeable pavement, LED lighting, etc.	Yes	50%

Below is a list of the layers that are compiled to produce the cultural and environmental GIS overlay score. The scores produced by the GIS overlay will be converted to a 0-100 range. Projects that impact a large number of resources over a long distance of their limits will receive a low score. Projects that impact few or no resources will receive a high score.

Cultural and Environmental GIS Overlay Layers

- Brownfields
- FEMA Floodplains
- Historical Resources
- Hazardous Sites
- Metro River Protection Act Corridor
- Impaired Streams
- Trout Streams
- Existing Greenspace
- Groundwater Recharge Areas
- Small Water Supply Watersheds
- Wetlands
- Rural Areas
- Undeveloped Land
- Darter Habitat
- Endangered Species Habitat

In addition, project sponsors will be able to earn credit for implementing best practices in environmental design. These designs should improve the state of the natural environment or improve the adjacent community's resilience and environmental sustainability.

Social Equity

Ensuring a fair and equitable transportation system is a key goal associated with the Atlanta Region's Plan. Transportation assets should be sensitive to the needs of low-income and minority communities to support the USDOT's Ladders of Opportunity program as well as ARC's goals associated with Equitable Target Area (ETA) communities. ARC is still undergoing research on how best to measure a transportation project's impact on ETA communities. To meet the social equity criterion, project sponsors will be required to provide information on how projects serve ETA communities. This process is outlined in Table TE10.

Table TE10 – Metric for Evaluating the Transit Expansion Social Equity Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Addressing Social Equity	Does project serve an ETA community?	Written; sponsor provides an assessment of how developing the project will support ETA areas.	Yes; with supplemental ARC assessment of ETA areas

Land Use Compatibility

Ensuring the successful implementation of projects is a key concern for both ARC and project sponsors. Implementing transit expansion projects where existing land use best supports project success is a key outcome of the land use compatibility criterion. The sole metric identified by the TIP Prioritization Task Force relates to ensuring supportive residential densities at planned transit stations and stops, see Tables TE11 and TE12 for details on the metric and the scoring scheme.

Table TE11 – Metric for Evaluating the Transit Expansion Land Use Compatibility Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Supporting Land Use	Do the communities the transit line passes through have transit supportive land use zoning in place?	Numerical; sponsor should provide information on the average number of dwelling units/acre zoning provisions within ½ mile of new transit stations and/or stops	Yes

Table TE12 – Scoring Scheme for Transit Expansion Land Use Compatibility Criterion

FTA Guideline Density Classification	Residential Density Threshold (Dwelling Units/Acre)	Points Awarded
Low	< 5	0
Low-Medium	5 – 10	25
Medium	10 – 15	50
Medium-High	15 – 25	75
High	> 25	100

The values in the table above are supported by FTA research and documented in the publication *Guidelines for Land Use and Economic Development Effects for New Starts and Small Starts Projects*.[9]

Employment Accessibility

Access to jobs is a vital function of the transportation system across all modes. Good access to employment opportunities ensures the Atlanta region's competitive advantage and is important for upward economic mobility. Improving the number of workers that can reach employment centers within 45 minutes is a key goal of the ARC and GDOT regardless of travel mode. This metric has been used in previous RTPs and continues on at the recommendation of the TIP Prioritization Task Force. This metric will be broken out by ETA and non-ETA communities' access to help inform decision-making with the social equity criterion, see Table TE13.

Table TE13 – Metrics for Evaluating the Transit Expansion Employment Accessibility Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
1) Supporting Regionally Significant Locations	Does the project connect to (or is it within) a Regional Employment Center, a Freight Cluster Area or a Regional Place?	Yes/No	No	50%
2) Employment Center Accessibility	Change in the number of workers that can access Regional Employment Centers within 45 minutes during peak periods, broken out between ETA and non-ETA communities.	Numerical	No	50%

The number of new workers with access to Regional Employment Centers will be scored on a distribution to assign a range of scores from 0-100. The project with the most new workers gaining access will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

[9] https://www.transit.dot.gov/sites/fta.dot.gov/files/docs/Land_Use_and_EconDev_Guidelines_August_2013.pdf

Transit Asset Management & System Upgrades

Table TA1 outlines the scheme for evaluating transit asset management and system upgrade projects. Overall, much fewer quantitative performance measures were identified by the TIP Prioritization Task Force for these projects. Due to the variable nature of transit asset management and system upgrade projects, many applications will have to be taken on a case-by-case basis with as much emphasis on performance metrics as possible and within reason. Sponsors will be asked a few qualitative questions to help inform the KDP3 process related to reliability and multimodalism, but will not be directly scored on those in KDP2.

Projects received in the solicitation that focus on transit asset management and system upgrades could include: bus replacements, transit station upgrades, preventative maintenance, new bus signage, and transit maintenance facilities. Further information on the exact metrics and scoring follows in the subsections.

Table TA1 – Transit Asset Management & System Upgrades Project Evaluation Scheme

Vision	Criteria	Measures
World Class Infrastructure	Mobility/Congestion	Affected Passenger Trips
	Reliability	-[10]
	Network Connectivity	-
	Multimodalism	-[11]
	Asset Management & Resiliency	Asset Condition
Healthy Livable Communities	Safety	Improved Safety
	Air Quality & Climate Change	Project Emissions[12]
	Cultural & Environmental Resources	Benefits to the Natural Environment
	Social Equity	Addressing Social Equity
	Land Use Compatibility	-
Competitive Economy	Goods Movement	-
	Employment Accessibility	Supporting Regionally Significant Locations

[10] Project sponsors will be asked to indicate how their project impacts the reliability of transit service for KDP3 consideration
[11] Project sponsors will be asked to indicate how their project will impact other travel modes for KDP3 consideration
[12] This measure only applies to transit bus replacements

Mobility & Congestion

Maintenance and upgrades of transit projects can help attract and maintain ridership on public transportation, reducing congestion and improving regional mobility. Projects affecting a larger number of passenger trips will have a greater impact than projects affecting fewer passenger trips.

Table TA2 – Metrics for Evaluating the Transit Asset Management & System Upgrades Mobility & Congestion Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Affected Passenger Trips	1) Number of passenger trips per year affected by the asset upgrade	Numerical; based on existing ridership	Yes	50%
	2) Share of annual system trips impacted	Numerical; percent based on data in metric 1	Yes	50%

After affected trips are calculated for all transit asset management and system upgrade projects, project scores are compared. A distribution of these data are used to assign scores from 0-100. The projects with the most affected trips will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Asset Management and Resiliency

In order to maintain transit infrastructure in a state of good repair, asset management resources must be allocated towards projects that demonstrate the most need. The TIP Prioritization Task Force identified two key metrics associated with the asset condition measure, outlined in Table TA3.

Table TA3 – Metrics for Evaluating the Transit Asset Management & Resiliency Criterion

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Asset Condition	1) Current age of asset(s) being replaced or improved	Numerical	Yes	50%
	2) a) If the replaced asset is a vehicle or technology, has it met or exceeded its useful life benchmark? b) If the asset is a facility, does it have a condition rating below 3.0 on the FTA TERM scale?	Yes/No	Yes	50%

For the age metric, the oldest assets will receive the highest score. Scores will be normalized between 0-100. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

Safety

All projects should strive to correct existing safety issues while maximizing safe design. Project sponsors can earn extra points by addressing safety concerns during the implementation of transit asset management projects. Implementing proven safety countermeasures can reduce crash rates for transit vehicles and improve last mile connectivity safety. See Table TA4 for the metric used to evaluate the transit asset management safety criterion.

Table TA4 – Metric for Evaluating the Transit Asset Management & System Upgrades Safety Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Improved Safety	Safety countermeasures proposed	Numerical; Crash Modification Factors derived from sponsor selected from proven USDOT supported safety countermeasures. Sponsors will also be able to provide information on other countermeasures	Yes

USDOT has compiled research on the effectiveness of certain safety countermeasures at reducing crashes. ARC is promoting the use of the nine USDOT highlighted measures for reducing crashes in the region:

- Roundabouts
- Corridor access management
- Pedestrian hybrid beacons
- Enhanced delineation and friction for horizontal curves
- Longitudinal rumble strips and stripes on two-lane roads
- Road diets
- Safety edges
- Medians and pedestrian crossing islands
- Backplates with retroreflective borders

Project sponsors will also be able to provide safety countermeasure details from the lists available on USDOT's website (see the Glossary of Links). This website provides a searchable database; searches by mode or other element can identify possible countermeasures for transit projects. Projects will be scored based on the effectiveness of the countermeasures proposed by their Crash Modification Factor (CMF).

Air Quality & Climate Change

Transit bus replacement projects are a subset of transit asset management projects. These projects are focused only on replacing existing buses with newer vehicles. Often, replacing older diesel buses with new vehicles can have positive air quality benefits, especially when switching to cleaner burning fuels or electric vehicles.

ARC's CMAQ Calculator is able to produce an estimate of the amount of emissions offset by replacing older vehicles. Table TA5 outlines the metrics associated with the air quality and climate change criterion. The air quality and climate change criterion only applies to transit bus replacements.

Table TA5 – Metrics for Evaluating the Transit Asset Management Air Quality & Climate Change Criterion for Transit Bus Replacement Projects

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Project Emissions	1) Change in NO_x, VOC, & $PM_{2.5}$ emissions	Numerical; sum of three pollutants in kg/year	Yes; see Table TA5 below	50%
	2) Change in greenhouse gas emissions $CO_2(e)$	Numerical; in kg/year	No	50%

The amount of emissions offset will be scored on a distribution to assign a range of scores from 0-100. The project with the most emissions reduced will receive the highest score, the project with the least will receive the lowest. ARC staff will account for outlier projects when assigning the distribution curve to assign points.

In order to calculate emissions for transit expansion projects, sponsors will need to provide the following additional information in Table TA6 to run projects through the CMAQ Calculator.

Table TA6 – Sponsor Required Inputs for Transit Bus Replacements

	Sponsor Required Input	Nature of Metric
1)	Existing fuel type of vehicle being replaced	Written; CNG, LNG, gas, diesel, electric, hybrid electric, propane
2)	Alternative fuel type of vehicle being purchased	Written; CNG, LNG, gas, diesel, electric, hybrid electric, propane
3)	Number of vehicles being replaced	Numerical
4)	Annual miles traveled per vehicle	Numerical

Cultural & Environmental Resources

ARC staff does not expect transit asset management projects to negatively impact cultural or environmental resources in the region. Project sponsors will be able to earn credit for implementing best practices in environmental design. These designs should improve the state of the natural environment or improve the adjacent community's resilience and environmental sustainability.

Table TA7 – Metric for Evaluating the Transit Asset Management & System Upgrades Cultural & Environmental Resources Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Benefits to the Natural Environment	Does the project have an environmental improvement component?	Written; sponsor provides a list of green infrastructure assets implemented in the project scope such as: storm water management, permeable pavement, LED lighting, etc.	Yes

Social Equity

Ensuring a fair and equitable transportation system is a key goal associated with the Atlanta Region's Plan. Transportation assets should be sensitive to the needs of low-income and minority communities to support the USDOT's Ladders of Opportunity program as well as ARC's goals associated with Equitable Target Area (ETA) communities. ARC is still undergoing research on how best to measure a transportation project's impact on ETA communities. To meet the social equity criterion, project sponsors will be required to provide information on how projects serve ETA communities. This process is outlined in Table TA8.

Table TA8 – Metric for Evaluating the Transit Asset Management & System Upgrades Social Equity Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Addressing Social Equity	Does project serve an ETA community?	Written; sponsor provides an assessment of how developing the project will support ETA areas.	Yes; with supplemental ARC assessment of ETA areas

Employment Accessibility

Access to jobs is a vital function of the transportation system across all modes. Good access to employment opportunities by transit ensures the Atlanta region's competitive advantage, is important for upward economic mobility and encourages people to shift to more environmentally friendly transportation modes. Table TA9, below, outlines the metric for the employment accessibility by transit.

Table TA9 – Metrics for Evaluating the Transit Asset Management & System Upgrades Employment Accessibility Criterion

Measure	Metric	Nature of Metric	Sponsor Provided
Supporting Regionally Significant Locations	Does the project connect to (or is it within) a Regional Employment Center or Regional Place?	Yes/No	No

Miscellaneous Emissions Related Projects

Most types of CMAQ-eligible projects will fit into the categories listed in previous sections of this document. Some project types are not as easy to categorize but are still eligible for CMAQ funds. These projects will be evaluated on a case-by-case basis through ARC's CMAQ Calculator or off-model techniques as necessary. All CMAQ projects must demonstrate, at a minimum, an emissions reduction. ARC staff will work with project sponsors to acquire the necessary information to evaluate these projects.

Below is a list of some additional eligible project types that aren't included in the project categories above:

- Diesel engine retrofits
- Alternative fuel vehicles & technology
- Transit Signal Priority

Diesel Engine Retrofits

Adding emission control technology to old diesel engines can lead to better air quality and improved public health outcomes for regional communities. Table E1 outlines the sponsor required data to evaluate emission benefits of diesel retrofit projects.

Table E1 – Sponsor Required Inputs for Diesel Engine Retrofits

	Sponsor Required Input	Nature of Metric
1)	Retrofit technology	Written; either diesel particulate filters (DPF) or diesel oxidation catalyst (DOC)
2)	Number of trucks/buses proposed to be retrofitted (built after 1995 if using DPF)	Numerical
3)	Average annual miles traveled per vehicle	Numerical

Alternative Fuel Vehicles & Technology

Local governments can use CMAQ funds to pay for the difference in cost of purchasing alternative fuel vehicles compared to conventional gas or diesel vehicles. Electric vehicle charging stations as well as alternative fueling stations are also applicable, providing that the public can still access the facilities. Table E2 outlines the sponsor required data to evaluate emission benefits of alternative fuel vehicle & technology projects.

Table E2 – Sponsor Required Inputs for Alternative Fuel Vehicles & Technology

	Sponsor Required Input	Nature of Metric
1)	Existing fuel type of vehicle being replaced	Written; CNG, LNG, gas, diesel, electric, hybrid electric, propane
2)	Type of vehicle being replaced	Written; bus, car, passenger truck, medium duty truck, heavy duty truck, refuse truck
3)	Alternative fuel type of vehicle being purchased	Written; CNG, LNG, gas, diesel, electric, hybrid electric, propane
4)	Type of vehicle being purchased	Written; bus, car, passenger truck, medium duty truck, heavy duty truck, refuse truck
5)	Number of vehicles being replaced	Numerical
6)	Annual miles traveled per vehicle	Numerical

Transit Signal Priority

Technologies that give transit vehicles (bus, streetcar or light rail) priority at intersections improve the attractiveness of transit and can help reduce emissions. ARC's CMAQ Calculator can determine if transit signal priority (TSP) projects are suitable for CMAQ funds provided sponsors can provide the information in Table E3.

Table E3 – Sponsor Required Inputs for Transit Signal Priority Projects

	Sponsor Required Input	Nature of Metric
1)	Facility type of approaching roadway with proposed transit signal priority (TSP)	Written; minor/major collector, minor/major/principal arterial
2)	Facility type of approaching roadway without proposed transit signal priority	Written; minor/major collector, minor/major/principal arterial
3)	Average peak hour volume along both facilities	Numerical
4)	Heavy truck percentage of traffic along both facilities	Numerical
5)	Average existing intersection signal cycle length	Numerical; seconds
6)	Average daily headways for transit with proposed TSP	Numerical; minutes
7)	TSP hours of service per day	Numerical; hours
8)	Daily transit ridership for transit alignment with proposed TSP	Numerical
9)	Average corridor travel time for buses (in one direction)	Numerical; minutes
Sponsor must provide information for EITHER item 10 or 11		
10)	Change in green cycle length ratio with addition of TSP	Numerical; percent
11)	Maximum green time extension and maximum red time truncation	Numerical; seconds