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Atlanta Regional Commission Reduces Regional Greenhouse Gas Emissions through Performance-Based Transportation Project Selection

OVERVIEW

The Atlanta Regional Commission (ARC) incorporates greenhouse gas (GHG) emissions as a scoring criterion for its regional transportation project selection process to promote investments in sustainability and performance-based planning decisions.

BACKGROUND

ARC is the metropolitan planning organization (MPO) for the 20-county Atlanta, Georgia region and has been an active advocate for reducing GHG emissions in the area. ARC has developed a multi-faceted scoring system for quantifying the emissions associated with transportation projects. This approach allows ARC to demonstrate its progress toward State performance measures, while also working towards its own regional goals for improving access, mobility, connectivity, and air quality. ARC has shown

leadership in climate action in the absence of state-level goals and guidance on GHG emissions reductions. With a grant from the Environmental Protection Agency, Georgia is developing their first ever Climate Action Plan, which will influence ARC's future approach and investments towards emissions reductions. The document will serve as roadmap for how the state will manage the effect of climate change and reduce statewide GHG emissions. Initial drafts are expected to be available by early 2024.

Score Criteria	Components
Mobility & Access	Evaluates whether the project relieves congestion, how many people it serves, can efficiently improve travel times and reliability, and connects people to destinations.
Equity	Evaluates if the project serves underserved populations based on where the project physically is located, who the project services, and the kinds of outreach the sponsor has conducted.
Safety	Evaluates if the addition of this project addresses the transportation safety issues present in the project area.
Resiliency	Evaluates how much the project will reduce emissions, greenhouse gases, and if it addresses stormwater management issues present in the project area.

Table 1: TIP Key Scoring Criteria



INTEGRATION WITH TRANSPORTATION PLANNING

ARC's latest metropolitan transportation plan (MTP), [Atlanta Region's Plan](#), emphasizes sustainability and includes strategies to reduce GHG emissions. The MTP guides transportation investments and policies in the Atlanta region through 2050. ARC also includes GHG reduction as a scoring criterion for project selection and programming.

To guide project selection and prioritization for its Transportation Improvement Program (TIP), ARC created the ARC TIP Project Evaluation Framework, also known as the "[The Project Evaluation Cookbook](#)" or "TIP Cookbook." The framework outlines scoring criteria, measures, and metrics and demonstrates how they apply to different project types. Each criterion includes a combination of quantitative and qualitative analysis elements.

First, ARC planners filter projects that do not align with regional policy and goals through normalized scoring across projects of similar types. ARC uses nine general project types, each of which is subject to four primary scoring criteria: Mobility and Access, Equity, Safety, and Resiliency (Table 1). These four categories parallel Federal transportation priorities.

The Resiliency category includes air quality and emissions considerations, in addition to how projects will impact natural disasters resiliency and hazard mitigation. The specific formula varies by project type, but GHG reduction typically comprises 25 percent of the air quality score, which is typically 70 percent of the full Resiliency score. Resiliency comprises between 15 and 20 percent of the total project score, depending on project type, therefore GHG reduction typically comprises between three and five percent of the final project score.

After the score is tallied for a project within its project category, ARC staff then weigh projects across the entire potential portfolio and the transportation goals for the region. The project evaluation framework also assesses project proposals for their project deliverability, benefit-cost ratio, and cost-effectiveness.

Measure	Metric	Nature of Metric	Sponsor Provided	Percent of Criterion Score
Project Emissions	Changes in NO _x emissions	Numerical; in kg/year	Yes	25%
	Changes in VOC emissions	Numerical; in kg/year	Yes	25%
	Changes in PM _{2.5} emissions	Numerical; in kg/year	Yes	25%
	Change in greenhouse gas emissions CO ₂ (e)	Numerical; in kg/year	Yes	25%

Table 2: Metrics for Evaluating the Bicycle & Pedestrian Air Quality & Climate Change Criterion

Source: [ARC TIP Cookbook 2021](#)



	Mobility & Access	Equity	Safety	Resiliency	% of Total Weight GHG comprises
Bike & Pedestrian	30%	20%	30%	20%	3.5%
Multiuse Trails	30%	20%	35%	15%	2.625%
Roadway Asset Management	25%	15%	40%	20%	N/A
Roadway Expansion	30%	20%	30%	20%	3.5%
TSM&O- Built Environment	30%	15%	40%	15%	2.625%
TSM&O- Technology	25%	15%	40%	20%	5.0%
Transit Expansion	35%	25%	20%	20%	3.5%
Transit Asset Management	30%	20%	30%	20%	2.5%

Table 3: Full Criteria Weights by Project Type and GHG-specific Weight

Source: [ARC TIP Cookbook 2021](#)

ARC scores the GHG impacts of a project on a range from 0-100. Table 2 demonstrates how the scoring distributes percentages for a bicycle and pedestrian project's proposed change in different emissions and particulates. The project demonstrating the most emissions reduced receives the highest score. For bicycle and pedestrian projects, ARC leverages the [CMAQ calculator](#) to quantify the emissions impacts of a project. ARC uses other tools, including an in-house Visum model to quantify GHG emissions from roadway capacity, signalization, and transit projects. The Visum model affords ARC more flexibility to change intersections, lanes, extension to networks, signalization, changes to transit routes and other output modifications.

Once the emissions estimates are calculated, project scores are compared to inform the final portfolio of projects selected for inclusion in the TIP. The final scores for a project determined using the TIP Cookbook do not always dictate funding. Some roadway capacity projects that are a priority are funded even if they conflict with ARC's GHG emissions reduction goals, and transit projects can be funded even if they demonstrate lower emissions benefits. Ultimately, the projects are selected based on their ability to help ARC meet long-term goals for the region. Transit may not have immediate measurable GHG impacts but is generally considered a strategy for reducing single-occupancy vehicle dependence in the region. Roadway capacity projects may be funded based on ARC member priorities and public input.

NEXT STEPS

Looking forward, ARC anticipates continuing to incorporate data-driven decision-making processes into its transportation project selection, including improvements to how it estimates GHG emissions reduction benefits. One tool ARC is exploring is the [POLARIS model](#), developed by Argonne National Laboratory, that is built to have better emissions calculating and predictions effects for an entire transportation network. The POLARIS model has the potential to be a successor to ARC's current activity-based travel demand model with more GHG emissions outputs. Updates to the CMAQ Calculator



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or use of similar Excel-based calculators will be considered for project evaluation based on their ability to reliably predict emissions impacts of individual or packages of projects.

The TIP Cookbook is continually undergoing evaluation and improvement to better guide the region toward reducing GHG emissions, and ultimately, an improved transportation network. ARC is also considering opportunities to incorporate more emphasis on housing and land use considerations into its transportation planning processes.