



EVALUATION METHODOLOGY MEMORANDUM I-85 PEL Study



July 22, 2020



EVALUATION METHODOLOGY MEMO

I-85 Planning and Environmental
Linkages (PEL) Study

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VERSION CONTROL

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ACRONYMS AND ABBREVIATIONS

ARC	Atlanta Regional Commission
ATL	Atlanta Transit Link Authority
CID	Community Improvement District
CTP	Comprehensive Transportation Plan
DNR	Department of Natural Resources
DRI	Development of Regional Impact
EPA	United States Environmental Protection Agency
EPD	Georgia Environmental Product Division
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
GCDOT	Gwinnett County Department of Transportation
GCT	Gwinnett County Transit
GDOT	Georgia Department of Transportation
GEARS	Georgia Electronic Accident Reporting System
GIS	Geographic Information System
GRTA	Georgia Regional Transit Authority
HERO	Highway Emergency Response Operator
HIFLD	Homeland Infrastructure Foundation-Level Data
HOT	High Occupancy Toll
HOV	High Occupancy Vehicle
HPMS	Highway Performance Monitoring System
IPaC	Information for Planning and Consultation
LEP	Limited English Proficiency
MARTA	Metropolitan Atlanta Rapid Transit Authority
MMIP	Major Mobility Improvement Program
NAHRGIS	Natural, Archaeological, and Historic Resources Geographic Information System
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory

I-85 Planning and Environmental Linkages (PEL) Study
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OES	Office of Environmental Services
PEL	Planning and Environmental Linkages
RITIS	Regional Integrated Transportation Information System
RTP	Regional Transportation Plan
SPLOST	Special-Purpose Local-Option Sales Tax
SR	State Route
SRTA	State Road & Tollway Authority
TADA	Transportation Analysis & Data Application
TIP	Transportation Improvement Program
TO	Task Order
USFWS	US Fish & Wildlife Service

1 INTRODUCTION

The purpose of this memorandum is to provide the Georgia Department of Transportation (GDOT), the Gwinnett County Department of Transportation (GCDOT), and stakeholders with an overview of the alternatives evaluation process and proposed screening methods for the I-85 Planning and Environmental Linkages (PEL) Study, hereafter referred to as the I-85 PEL Study. This memo describes the study methodology, which includes a three-tier evaluation process, and the proposed analysis framework, which is tied to the vision and goals developed during the stakeholder visioning meeting held on May 7, 2019. This document is a “living document” and will be revised at strategic points in the planning process as the study progresses.

The Study Team will use Federal Highway Administration’s (FHWA’s) Planning and Environmental Linkages (PEL) process, authorized under 23 United States Code (U.S.C.) 168, in the I-85 Corridor Study. PEL represents a collaborative and integrated approach to transportation decision-making. FHWA’s PEL framework is being applied to this study to encourage transportation decision-makers to incorporate environmental, community, and economic goals early in the transportation planning process. Decision-makers can then rely on more robust planning analyses, studies, and decisions throughout project development and during the environmental review processes. In accordance with this statute, FHWA, GDOT, and GCDOT intend to incorporate by reference the alternatives evaluation and screening process described in this document in future environmental review processes under the National Environmental Policy Act (NEPA).

1.1 Purpose and Intent of PEL

The purposes of the PEL process are to improve planning-level and project-level decision-making; minimize duplication of effort during project-level environmental compliance efforts; enhance relationships with resource and regulatory agencies, stakeholders, and the public; and streamline project delivery timeframes. The PEL process will achieve these purposes by incorporating consideration of the natural and human environment, coordination with agencies and the public, and clear documentation of decisions and rationales into the planning process. The planning process will be linked through incorporation of planning information, analysis, and products into future project-level environmental reviews. In addition, findings from this study can be used to make preliminary determinations regarding the appropriate level of NEPA documentation (i.e., categorical exclusion, environmental assessment, or environmental impact statement) required for future projects.

The outcomes of this PEL study will be to:

- Identify existing and future transportation needs and problem areas along the I-85 study corridor that will inform future project Need and Purpose and project limits
- Develop and prioritize a range of improvement alternatives to address the identified transportation needs along the corridor
- Conduct a preliminary assessment of environmental concerns and important issues from the proposed improvements that will need to be studied further in future NEPA processes
- Involve the public/stakeholders and local, state, and federal resource agencies throughout the planning process, including early identification of their concerns and interests
- Integrate solutions with input from stakeholder and public engagement

- Develop an implementation plan for the proposed improvements, including potential funding options that provide the context for how projects will advance in the future
- Document the planning process and decisions providing the foundation for future NEPA scoping to support future project-level environmental reviews, reduce duplication of efforts, and streamline delivery
- Encourage environmental stewardship by incorporating environmental screening analysis in the planning process

1.2 Study Description

Throughout the past several years, GDOT and GCDOT have recognized the need for improvements along the I-85 corridor to reduce congestion and to improve safety. Realizing both organizations had similar interests, GDOT and GCDOT partnered to conduct the I-85 PEL Study.

The study area incorporates approximately 20 miles of the I-85 corridor from its interchange with I-285 at the “Spaghetti Junction” to its interchange with I-985. Figure 1 presents a map of the study area. This portion of I-85 passes through the northeast corridor of the Atlanta suburbs, serving as the route from Atlanta toward Suwanee and beyond. The study area is primarily located in Gwinnett County.

The objectives of the I-85 PEL Study are to develop recommendations to improve congestion and safety along the corridor and determine strategies for implementing recommendations. As part of the I-85 PEL Study, the Study Team will identify issues associated with the study corridor, develop potential solutions through FHWA’s PEL process to address the issues, involve stakeholders, evaluate the potential solutions to select the best and most feasible solutions for recommendation, and identify resources to assist GDOT and GCDOT in implementing projects quickly and efficiently.

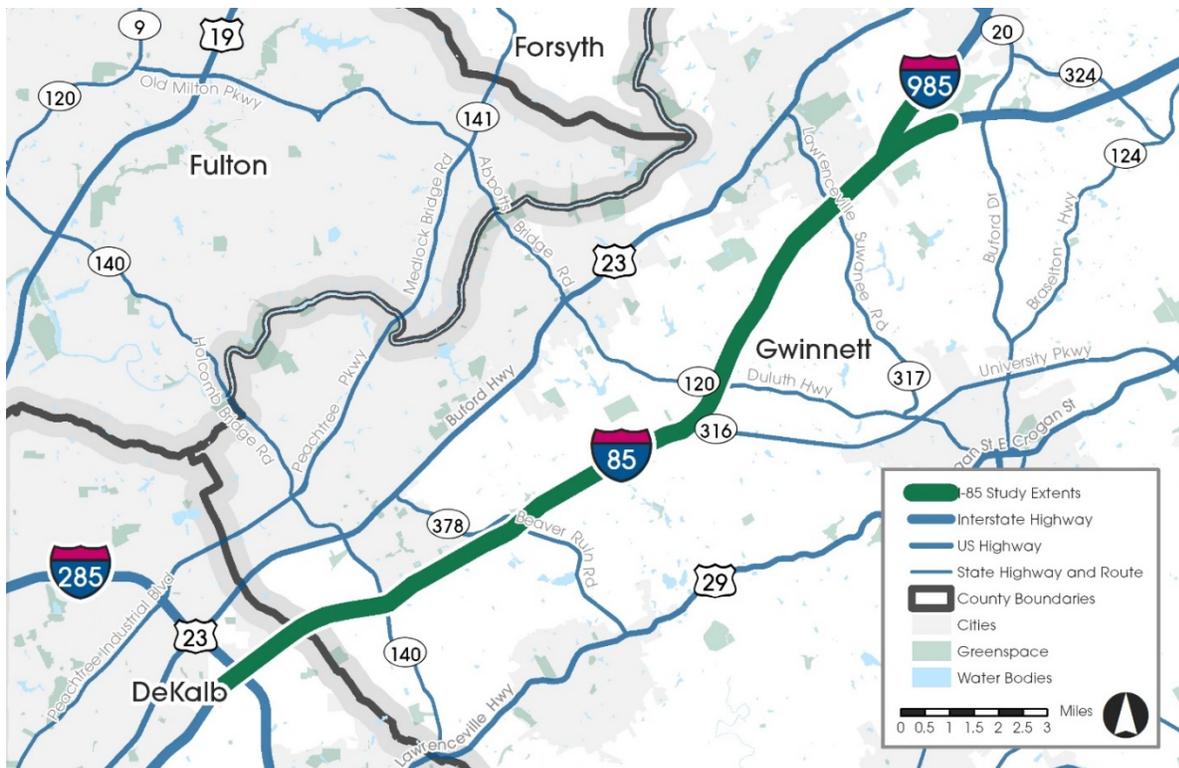


Figure 1. I-85 Corridor Study Area Map

1.3 Stakeholder Involvement

Stakeholders are regularly involved in the I-85 PEL Study. Stakeholder involvement is crucial to:

- 1) Facilitate consideration of potential recommendation ideas and allow the Study Team to thoroughly document why certain ideas did not advance to final recommendations;
- 2) Incorporate the needs of stakeholders who will be most impacted by the improvements; and
- 3) Create advocates among local leaders and decision-makers for the implementation of the final study recommendations.

Stakeholders play a critical role in identifying the study's vision and goals, which are instrumental to screening and analysis throughout the life of the study. Stakeholder Committees for the I-85 PEL Study include representatives from relevant agencies, organizations, and community groups within and along the study corridor and the surrounding area. Each Committee provides diverse institutional knowledge, experience, and insight into the study process. The I-85 PEL Study Stakeholder Committees are listed below:

- Project Management Team (PMT)
- Executive Committee
- GDOT Internal Review Committee
- PEL Committee
- Technical Advisory Committee (TAC)
- Key Organization Committee

Detailed organization lists of each Committee is available in the *Stakeholder and Communications Plan*.

1.4 PEL Purpose and Need

A PEL Purpose and Need is being identified for the I-85 PEL Study and will be used throughout the screening process as described within this document. This process is consistent with FHWA's PEL Questionnaire, FHWA's PEL Process, and their planning regulations (23 CFR 450). Within the PEL Questionnaire, the PEL Purpose and Need is specifically referenced within question 5b:

Provide the purpose and need statement, or the corridor vision and transportation goals and objectives to realize that vision.

The PEL Purpose and Need is comprised of three components, which are detailed in the figure below:

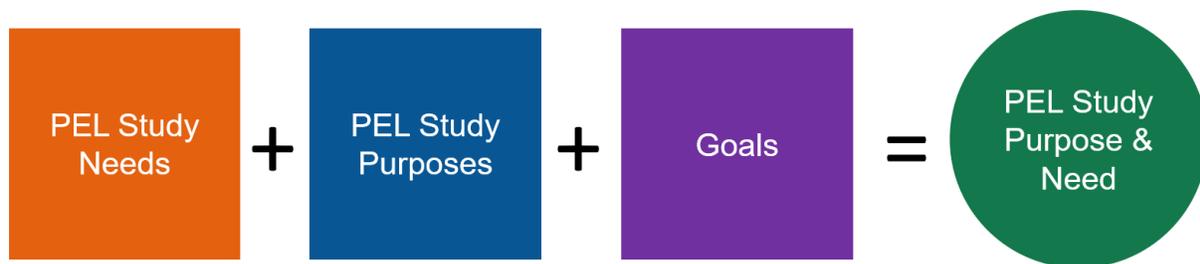


Figure 2. PEL Study Purpose and Need Equation

PEL Study Needs - These needs were identified through detailed analysis of existing and future conditions along the study corridor, including data-driven input from traffic operations, safety analysis, environmental screening, roadway audits, demographics and land use, and a multimodal inventory.

PEL Goals and Objectives - The goals and objectives were developed through coordination with the stakeholders and presented to the public. Additional information is available in subsequent sections of this document.

PEL Purposes - These purposes were defined using input from both the needs and objectives. During their development, overlapping needs and objectives were noted where applicable.

The PEL Study Purpose and Need therefore contains both needs-based input, as well as input received from the public and stakeholders. Additional documentation regarding the PEL Purpose and Need can be found in the forthcoming PEL Study Purpose and Need Memo, and additional documentation regarding the PEL Study Needs can be found in the I-85 Study Existing and Future Conditions and Needs Assessment Memo.

1.5 Vision, Goals, and Objectives

A **vision** is a clear, inspirational, and concise definition of a future position. It is intended to serve as a guide for choosing current and future courses of action. **Goals** identify the purpose toward which an endeavor is directed and typically are not directly quantifiable. Goals are a further refinement, clarification, and definition of the vision. An **objective** can be considered an intermediate step to reaching a goal and is more focused and better measured in quantitative terms. These terms and how they are defined for the I-85 PEL Study are described in detail below.

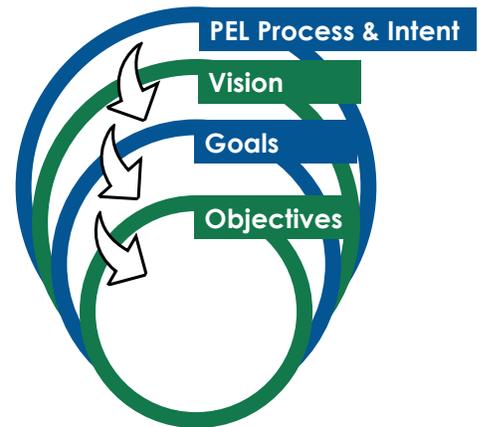


Figure 3. I-85 PEL Study Approach

1.5.1 Vision

Based on stakeholder feedback at the May 7, 2019 visioning meeting, the project team developed the draft vision of the I-85 corridor, which states as follows:

I-85 will provide safe, reliable interstate travel for people and goods as part of a connected, efficient transportation network while creating value for surrounding communities.

1.5.2 Goals

The following goals and objectives are drafted based on stakeholder feedback:

Improve Safety

- Reduce crashes along the corridor for both personal and commercial vehicles
- Improve incident response and support safe driving enforcement
- Leverage innovative technology to promote safety
- Consider driver expectations
- Improve reliability through safety enhancements

Improve Vehicular Mobility

- Reduce peak hour congestion to improve peak hour travel speeds and times
- Maximize vehicular throughput
- Update geometric design
- Separate regional and local travel where possible
- Review and modify interchange operations to decrease travel times and to improve the interface between systems
- Leverage innovative technology to improve vehicular mobility
- Improve reliability of vehicular travel

Facilitate Commercial Travel

- Provide better access to local freight activity centers
- Increase efficiency of long-haul freight movement
- Leverage innovative technology to facilitate commercial travel
- Improve reliability of commercial trips

Evaluate Multimodal Options

- Consider local transit plans/recommendations and facilitate logical connections
- Evaluate multimodal connections that intersect or cross the corridor
- Leverage innovative technology to accommodate multimodal options
- Improve reliability across all modes

Support Georgia's Economy

- Develop solutions with positive economic benefits that outweigh costs
- Benefit state and local economy
- Minimize impacts to traveling public during construction
- Leverage public-private partnerships for successful infrastructure development and maintenance

Support the Corridor's Communities

- Enhance local access
- Promote community connectivity
- Provide consistency with local and regional land use and transportation plans
- Minimize environmental (natural, social, and cultural) impacts
- Minimize adverse air quality impacts

Goals and objectives will be finalized after the stakeholders have verified the vision and goals during the one-on-one meetings. Performance measures will be developed after the goals and objectives are approved.

2 STUDY METHODOLOGY

The overall study process, illustrated on Figure 4, involves three major phases:

- 1) Alternative Generation
- 2) Screening Methods
- 3) Implementation Plan

During the **Alternative Generation** phase, the Study Team will collect data; analyze existing conditions; develop the vision, goals, and objectives based on stakeholder and public input, identify PEL study Purposes and Needs, and generate improvement ideas for the corridor. Details on the process for analyzing existing conditions to identify key problem areas on the corridor, referred to as Hot Spots, and improvement alternatives are presented in the Evaluation Process section of this memo. Improvement ideas will undergo a high-level feasibility and constructability screening, and those with fatal flaws in implementation will be eliminated from further consideration. Comparable improvement ideas will be combined, as appropriate, during this phase. The result will be a manageable number of improvement alternatives to advance to more detailed evaluation.

Following the Alternative Generation phase, the Study Team will employ a three-tiered **Screening Methods** process to evaluate the benefits and effectiveness of the alternatives, as well as to further evaluate their feasibility and constructability. The evaluation and screening process will be data-driven through the use of collected data, traffic analysis models, economic evaluation models, geographic information system (GIS) based spatial analysis, and other quantifiable metrics. Environmental, community, and economic goals will be considered throughout this process.

The Screening Methods process consists of the following three tiers of evaluation, which will be discussed in more detail in the next section:

- *Tier 1 Screening – Evaluate if the Alternatives Seem to Address an Identified Need or Problem*
- *Tier 2 Screening – Measure How Well Individual Projects Work*
- *Tier 3 Screening – Finalization of Alternatives*

After improvement recommendations are finalized, the Study Team will develop an **Implementation Plan** outlining the recommended phasing for implementation of projects, potential funding methods, and construction strategies. The Implementation Plan will include other recommended steps for GDOT, GCDOT, and their partners to follow for a successful implementation of projects.

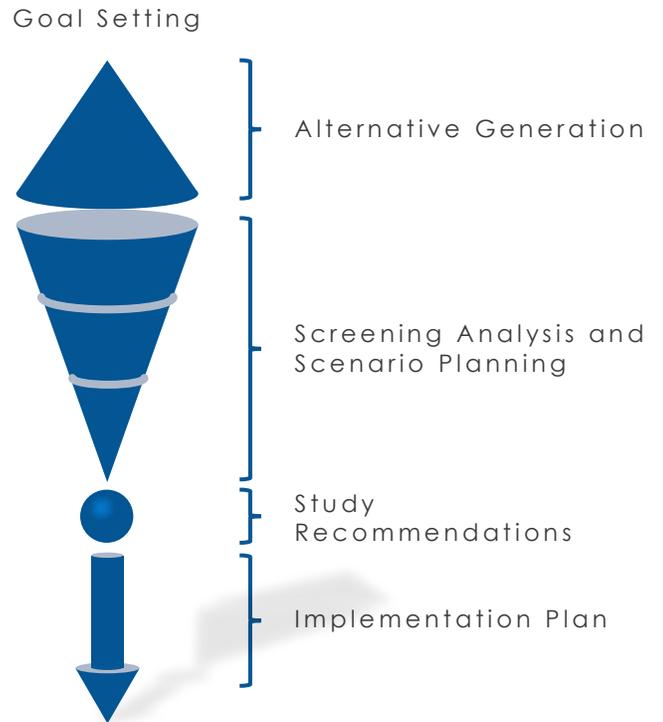


Figure 4. Overview of the Organization of Project Phases

3 ANALYSIS FRAMEWORK

3.1 Alternative Generation

There are two steps in the Alternative Generation Phase: Hot Spot Identification and the Development of the Universe of Ideas.

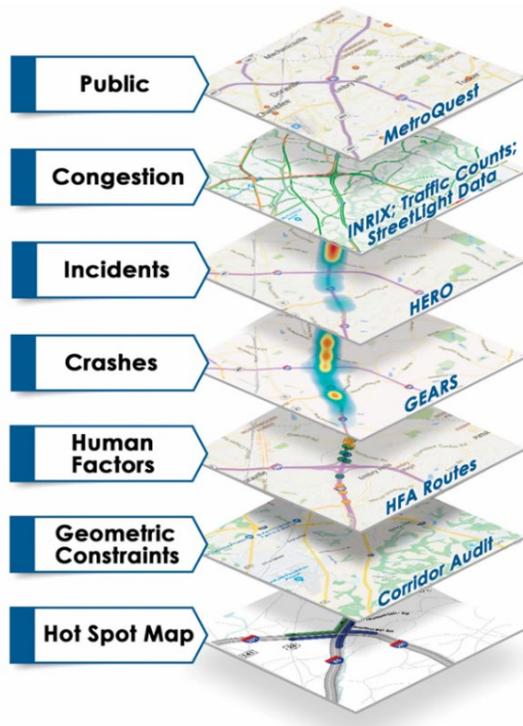


Figure 5. Data Layers for Hot Spot Analysis

The Study Team will review previous transportation studies and conduct stakeholder interviews, innovation team meetings, and workshops with GDOT/GCDOT to obtain input regarding potential improvement alternatives and strategies for the I-85 corridor. This input will be compiled into an all-encompassing list, referred to as the Universe of Ideas. The Universe of Ideas will be continuously expanded throughout each phase of the study as new ideas emerge and as new alternatives are developed to replace or complement existing alternatives.

The input collected from transportation studies and stakeholder interviews will be categorized into groups, which include the following:

- **“Alternatives”** – Input that clearly describes the measures to be taken, the issues the measures would address, and the feasibility of the measures.
- **“Ideas”** – Input that is more general in nature and less clear regarding implementation steps, scope, benefits, and feasibility. Ideas require further clarification or definition to become alternatives.
- **“Problems”** – Input that generally describes issues along the corridor without offering a potential solution.

The alternatives and ideas will be assessed to eliminate those with fatal flaws in feasibility, constructability or implementation and to combine those that are comparable and/or complementary. The resulting

3.1.1 Hot Spot Identification

During the early stage of the study, data sets that establish the existing conditions of the study area will be overlaid to identify corridor **Hot Spots**, or key problem areas. Hot Spots are locations where a high proportion of operational (capacity) and geometric constraints coincide with high crash and incident frequency. The various data sets will be overlaid with one another. By combining and comparing these data sources, interrelated patterns will be identified. Hot Spots have the largest impact on the operation of the I-85 corridor; therefore, identifying improvements that target these areas will yield the greatest benefits for the corridor. This process is illustrated on Figure 5.

The Hot Spots will be used to guide the Study Team to develop problem-solving strategies and improvement ideas along the corridor. The Data Needs memo submitted in April 2019 outlines data sets needed and the data collection schedule.

3.1.2 Development of the Universe of Ideas

alternatives will then be grouped into the following four categories for further evaluation in Tier 1, as shown on Figure 6:

- 1) Small-scale improvements (up to 30): including but not limited to spot improvements such as restriping, additional turn lanes, and ramp terminal improvements
- 2) Medium-scale improvements (up to 15): including but not limited to major interchange modifications and reconstruction such as addition of collector-distributor lanes, total interchange reconfigurations or reconstructions, and new interchange access points
- 3) Corridor-wide improvements (up to 15): corridor-wide large-scale capacity-adding alternatives that may include but are not limited to widening, managed-lane applications, truck-only lanes, and variations in tolling policies
- 4) Other improvements (up to 10): including but not limited to transit/multimodal/traffic and corridor management strategies.

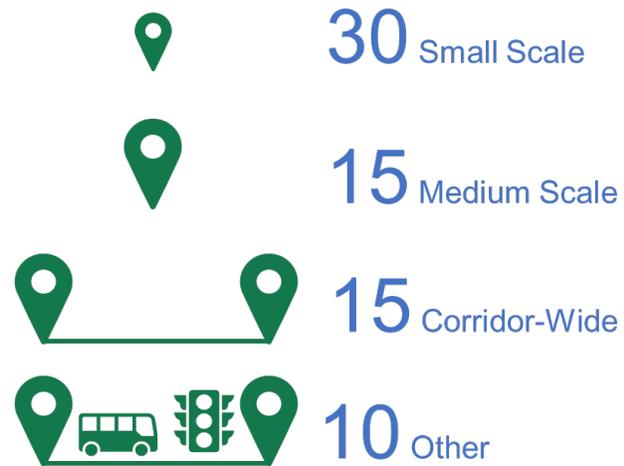


Figure 6. Numbers & Types of Projects to be Evaluated During Tier 1 Screening

The number of projects shown to advance throughout this document are estimates and are included for informational purposes. The comprehensive list of ideas, and the resulting subset of alternatives advancing to Tier 1 Screening, will be presented to GDOT and GCDOT for review before moving onto Tier 1 Screening.

3.2 Tier 1 Screening – Evaluate if the Alternatives Seem to Address an Identified Need or Problem

The purpose of Tier 1 Screening is to evaluate whether the alternatives identified during the previous phase work to improve key goals for the I-85 corridor. The specific evaluation criteria to be used to evaluate Tier 1 Alternatives will be based on PEL study Purpose and Need and professional judgement of the Study Team. Performance measures for each objective identified for Tier 1 analysis will be developed based on the types of data anticipated to be available at the time of the Tier 1 analysis. Additionally, alternatives will be further developed and evaluated for feasibility and constructability, as described below.

3.2.1 Feasibility Analysis

The feasibility analysis is undertaken by studying the benefits and costs of each alternative. Benefits are typically measured in the form of mobility and safety improvements along the corridor, though other measures may be identified. For example, some benefits, such as time savings, can be monetized. Traffic modeling/analysis serves as the primary quantitative method for evaluating feasibility in Tier 1.

Conceptual roadway layouts will be developed as part of Tier 1 Screening to evaluate high-level roadway geometry; assess consistency with traffic modeling; identify safety, environmental, community, and

economic impacts; and develop planning-level cost estimates. The roadway analysis will include a review of the alternatives to determine impacts on rights-of-way and buildings, environmental resources, construction feasibility, and construction timeline.

By conducting an environmental screening process, environmental resources will be identified and assessed for potential issues and/or impacts. The screening process will include a review of the natural (such as wetland), cultural (such as historic places), physical (such as Underground Storage Tanks), and social environmental (such as schools) resources around and along the I-85 corridor. The full list of environmental resources to be analyzed and how these resources will be identified can be found in the *I-85 Corridor Study Environmental Screening* documentation.

An estimated implementation timeline will be developed using short-, mid-, and long-term time frames for full design and construction of each alternative. These time frames are defined as follows:

- Short-term is defined as less than 5 years to design and construct. Alternatives that are within the existing footprint and do not require additional right-of-way, are low cost, have no or minimal environmental and community impacts, and can be constructed quickly are considered short-term.
- Mid-term is defined as between 5 and 10 years to design and construct. Alternatives that may require a small amount of right-of-way acquisition, are of medium cost, have moderate environmental or community impacts, and/or would include some complications to construct are considered mid-term.
- Long-term is defined as 10+ years to design and construct. Alternatives that are high cost, have high right-of-way impact, involve moderately high to high environmental or community impacts, and/or include other more significant complications to implement are considered long-term.

Planning-level cost estimates, which include preliminary engineering, construction, right-of-way, and contingency costs, will be developed for each alternative. The importance of determining estimated cost at this early stage is primarily to inform the magnitude and complexity of the alternative. Costs will continue to change through refinement of the alternatives; therefore, estimates will be provided as a range. Proposed ranges for cost analysis purposes are provided in Table 1.

Table 1. Cost Estimate Ranges

Cost Estimate Ranges
\$ ≤ \$1M
\$1M ≤ \$5M
\$5M < \$ ≤ \$50M
\$50M < \$ ≤ \$100M
\$100M < \$ ≤ \$200M
\$200M < \$ ≤ \$500M
\$500M < \$ ≤ \$1B
\$ > \$1B

Cost estimates will include a unit size (length, width, depth) or unit number and a current unit cost to determine a cost for each line item applicable to an alternative. Examples of line item costs include, but are not limited to, the following:

- Necessary demolition of existing transportation infrastructure (e.g., ramps, bridges, roads, retaining walls, etc.)
- New structures (e.g., pavement, concrete, curbs, excavation, backfill, retaining walls, lighting, etc.)
- Addition or modification of signalization
- Earthwork and grading
- Restriping
- Temporary provisions during construction
- Ongoing maintenance

3.2.2 Constructability Analysis

Constructability refers to how efficiently and easily a structure can be built based on certain criteria. For the constructability analysis, the Study Team will coordinate with GDOT and GCDOT to determine whether there is available budget to implement the alternatives and the preferred time frame to construct the alternatives. Based on the availability of budget and estimated time frame, alternatives are evaluated with constructability tiers – high constructability, medium constructability and low constructability. The Study Team will also conduct physical barrier studies to screen alternatives as to their level of difficulty to design and construct. Finally, the political and financial constraints of the alternatives will be considered as well. The Study Team will obtain continual feedback from roadway design, traffic modeling, and planning personnel throughout Tier 1 Screening to select alternatives for Tier 2 Screening.

3.2.3 Alternatives Advancing to Tier 2 Screening

Based on the results of the Tier 1 Screening, the list of improvement alternatives advancing to Tier 2 Screening will be refined and narrowed as follows and as shown on Figure 7:

- Small-scale (spot) improvements: Narrow to 20 or less improvements.
- Medium-scale (major interchange modification and reconstruction) improvements: Narrow to 10 or less improvements.
- Corridor-wide improvements: Narrow to 5 or less improvements.
- Other improvements: Conduct a more in-depth analysis of up to 10 improvements identified in Tier 1 Screening.



Figure 7. Anticipated Number of Projects to Be Evaluated During Tier 2 Screening

3.3 Tier 2 Screening – Measure How Well Individual Projects Work

While Tier 1 Screening answered the question of “Does the proposed solution work?,” Tier 2 Screening will focus on addressing the question “How well does each of the proposed improvements work?” in meeting the PEL Study Purpose and Need identified for the I-85 study corridor. The Tier 2 Screening will be more detailed based on the following:

- In-depth travel demand and traffic modeling
- Safety and operational analysis
- Refined roadway design layouts and impact analysis
- Financial feasibility analysis

The Tier 2 Screening process consists of two major steps, project evaluation and project prioritization, which are described in the following subsections.

3.3.1 Step 1: Project Evaluation

The first step of the Tier 2 Screening process is to finalize a list of project evaluation criteria and detailed performance metrics to analyze an alternative’s relative effectiveness in meeting the I-85 PEL Study Purpose and Need. Figure 8 illustrates a sample project evaluation framework, including potential criteria and performance metrics. This project evaluation framework will be further refined based on the development of the PEL Purpose and Need, and will incorporate input from stakeholders and the general public. The performance metrics will also be further tailored to reflect the various improvement types.

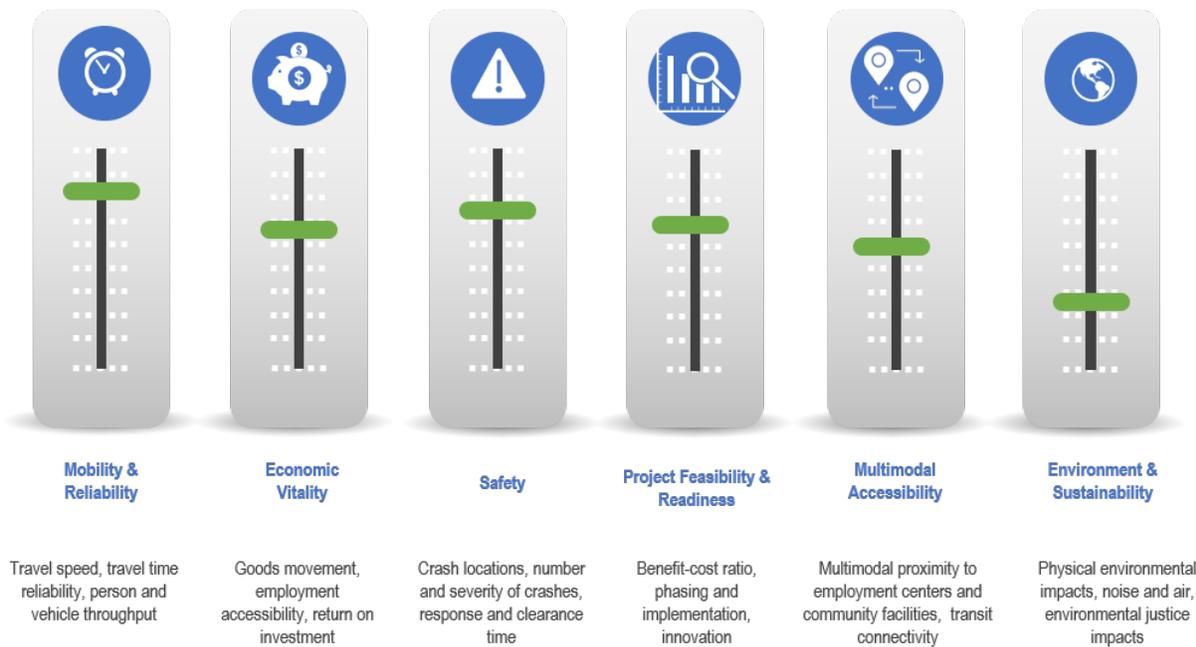


Figure 8. Sample Project Prioritization Framework

3.3.2 Step 2: Project Prioritization and Ranking

Once the evaluation criteria are finalized, the Study Team will develop three weighting scenarios reflecting the feedback obtained from the stakeholder committee and the general public during the engagement process for the study regarding the criteria they most value for prioritizing improvements. For example, Economic Vitality could be more important to one group than the other. Three *potential* weighting scenarios include:

- Stakeholder Weighting Scenario
- General Public Weighting Scenario
- Hybrid Scenario reflecting input from stakeholders and the general public and recommendations from GDOT and GCDOT

Results from the public and stakeholder engagement during Tier 1 will be used to formulate the weighting scenario for the general public.

The Study Team will apply the three weighting scenarios selected to the individual performance metrics and evaluation criteria scores for each project. Each project within the different improvement categories (small-scale, medium-scale, corridor-wide, and other improvements) will be assigned a single overall composite score, as illustrated on Figure 9, for project prioritization and ranking. The Study Team will automate the process of scoring and ranking projects with an Excel-based project prioritization tool. Projects that consistently appear at the top of the rankings, regardless of weighting of the evaluation criteria, will move into the final phase of Tier 3 Screening.



Figure 9. Example of Project Score

3.4 Tier 3 Screening – Finalization of Alternatives

Tier 3 Screening will further refine the list of alternatives advancing from Tier 2, and will result in the final list of recommended projects to be advanced for implementation. This will be accomplished through layout refinements, more detailed project evaluations, and compatibility studies. Tier 3 will focus on a systematic assessment of how the selected alternatives will

effectively address the I-85 PEL Study Purpose and Need, resulting in projects that can be advanced with independent utility that are also compatible to be combined for significant corridor-wide benefits. To properly lay out the impact of each finalized alternative, the Study Team will also perform future scenario planning analyses to demonstrate how each alternative might perform under forecasted projections.

The Tier 3 Screening process consists of three major steps, Detailed Project Evaluation, Project Compatibility, and Future Scenario Planning, which are described in the following subsections (Figure 10).

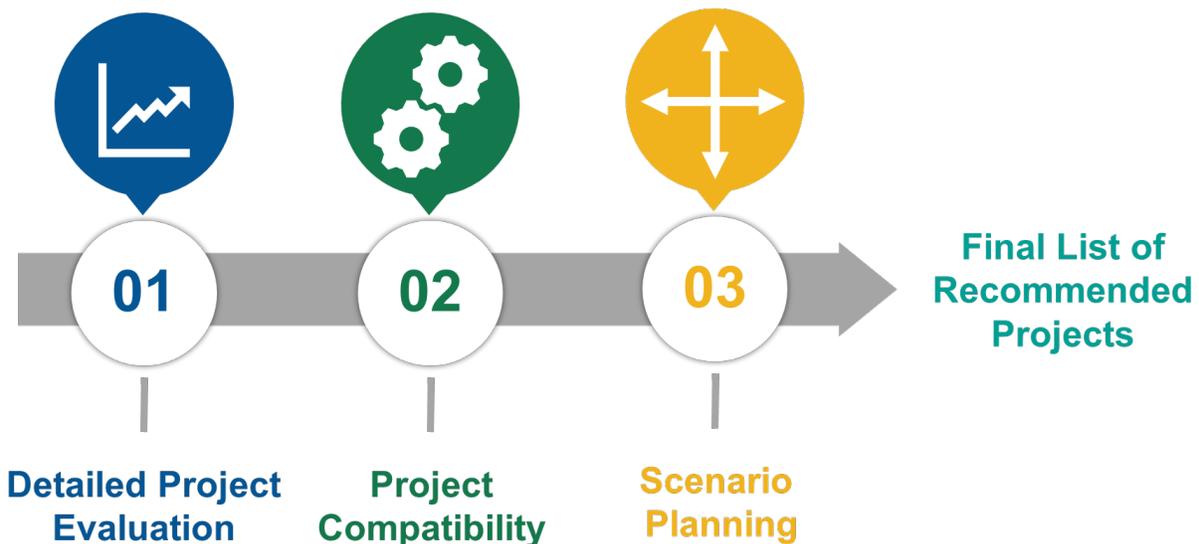


Figure 10. Tier 3 Evaluation Process

3.4.1 Step 1: Detailed Project Evaluation

The first step in the Tier 3 Screening process is to evaluate the systematic transportation and economic impacts of selected alternatives. Similar to Tier 2 Screening, the assessment will be conducted based on travel demand and traffic modeling, safety and operational analysis, roadway design analysis, and financial feasibility analysis. Each individual alternative will be evaluated based on specific criteria and performance metrics, as discussed for the Tier 2 Screening. Performance metrics may be modified or updated based on the types of data available at the time of Tier 3 Screening. The results of the evaluation will be used to compare each alternative's ability to fulfill the PEL Study Purpose and Need.

The number of alternatives to be evaluated will be determined at the conclusion of the Tier 2 Screening process. However, it is possible that previously identified operational improvements will be revised and/or additional operational improvements will be identified in this step as part of evaluation and alternative design refinement processes. Refinements will also allow the Study Team to develop elements such as planning-level costs to be used for evaluation and implementation.

3.4.2 Step 2: Project Compatibility

In assuring that each finalized alternative is a viable recommendation, measuring compatibility amongst each project is necessary. The Study Team will refine the geometric design layouts of the improvements. Horizontal and vertical alignments will be developed for key locations to consider the resulting impact to the surroundings and right-of-way. Physical compatibility of the improvements will be assessed using these results.

Impacts will be measured using GIS Spatial Analysis tools to evaluate factors such as impacted properties, residential and commercial relocations, and community demographic characteristics. A Compatibility Matrix will be developed to demonstrate which alternatives are physically incompatible to assist with the prioritization and selection process. Table 2 presents an example of a Compatibility Matrix. Its purpose is to compare the compatibility among alternatives. In this example, Alternative 1 is incompatible with Alternative 4. Alternative 2 is incompatible with Alternative 3 and 4.

Table 2. Example of Compatibility Matrix

	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Alternative 1	✓				
Alternative 2	✓	✓			
Alternative 3	✓	✗	✓		
Alternative 4	✗	✗	✓	✓	
Alternative 5	✓	✓	✗	✗	✓

3.4.3 Step 3: Future Scenario Planning

The future is uncertain, but decisions that will affect future conditions are typically made at the present. To finalize the list of recommended alternatives, the Study Team will use a future scenario planning approach. Scenario planning will assist the Study Team to make better-informed decisions for development of preferred alternatives, with a focus on anticipating and meeting future changing needs.

Scenario Planning (Figure 11) is a tool that helps strategically plan for plausible futures and make informed decisions. Scenarios are stories that describe how the world might look in the future, based on an analysis of driving forces and a review of critical uncertainties and predetermined elements. They are not predictions or forecasts, but rather anticipations of how conditions may vary in the future. Thus, they guide important decisions to be made regarding policy, resources and key activities. Scenarios simplify some of the apparent complexity of the world and provide an analytical framework to understand how the future might turn out.

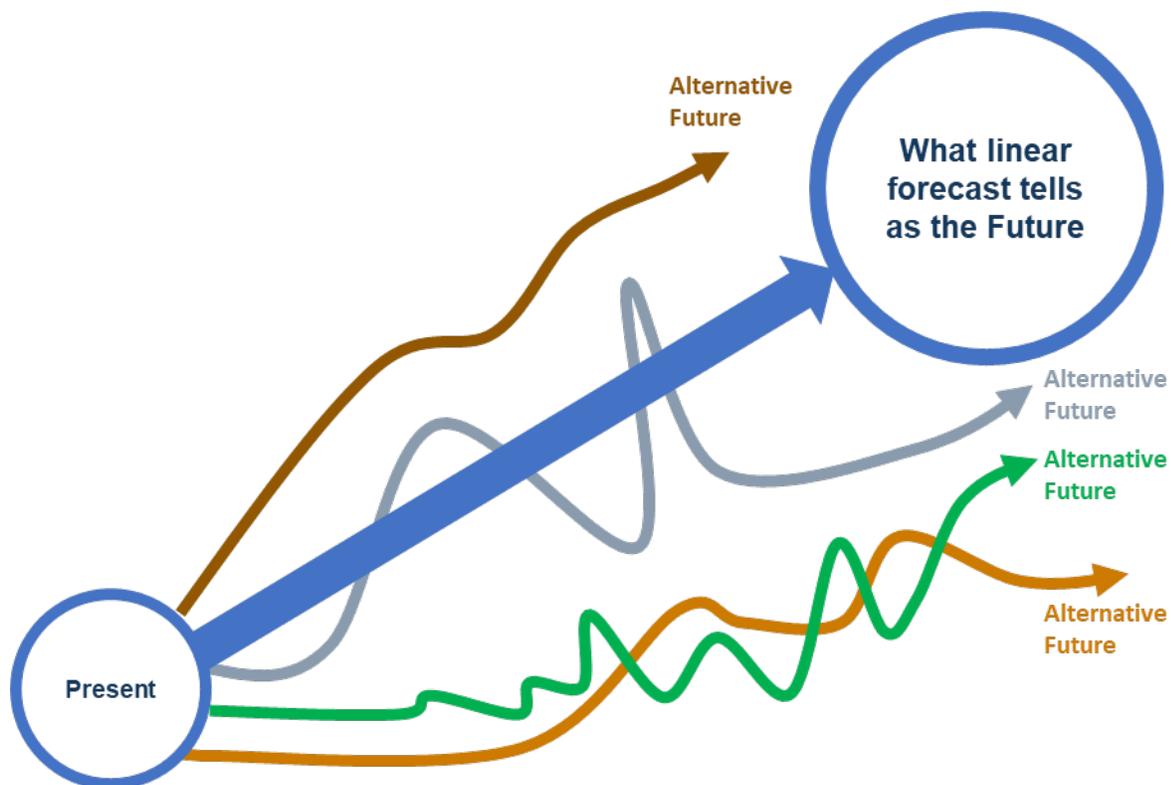


Figure 11. Scenario Planning

With a 15 to 20-year long-range projection, the Study Team will assess how certain driving forces of change (such as adoption of new technologies, changes in development patterns, and/or investments in transit) might impact the I-85 corridor in the future. Best practices and tools for conducting a scenario analysis will be reviewed and evaluated before recommending a preferred tool for the I-85 PEL Study. The following steps will be used to measure the potential impacts on the corridor. Figure 12 is an example scenario study.

Step 1: Identify Driving Forces of Change (e.g. Autonomous Vehicles, Increased port traffic, etc.)

Step 2: Develop Axes of Uncertainties (e.g. Level of adaptation rates for Autonomous Vehicles, Attitudes towards the shared-mobility model)

Step 3: Construct Scenario Narratives

Step 4: Test Projects in each Scenario

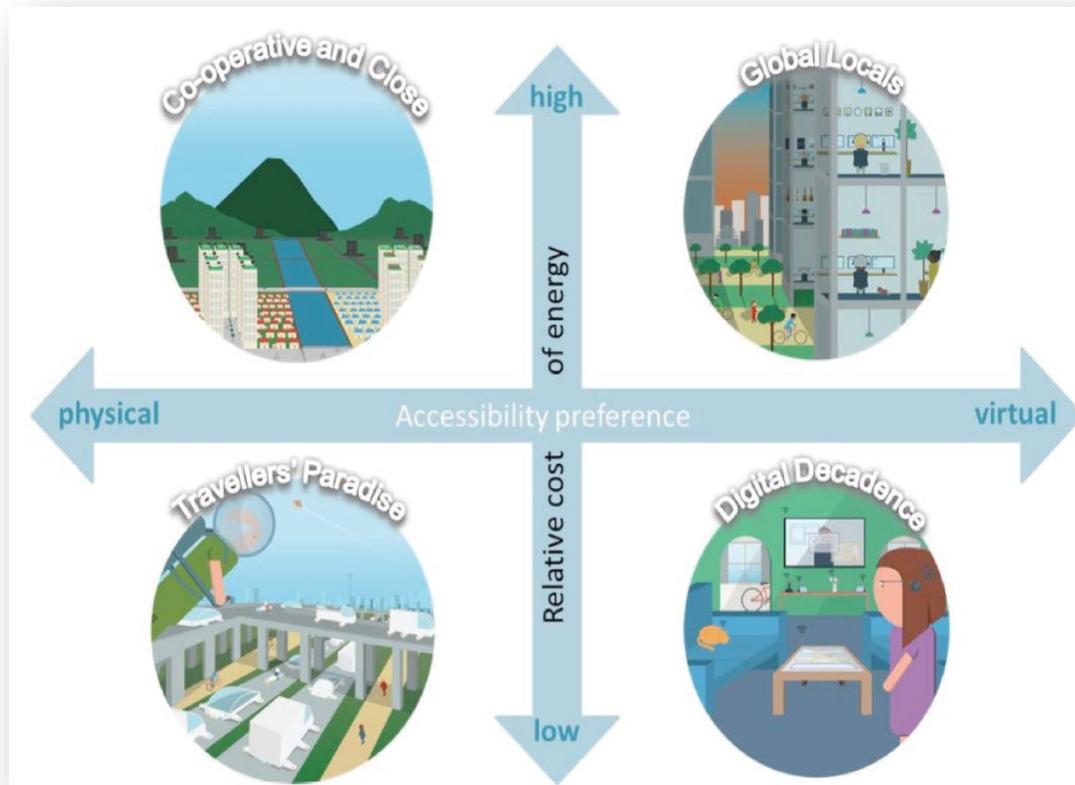


Figure 12. Example of Scenario Development¹

3.5 Considerations in the Evaluation Process

Critical considerations throughout all tiers of the evaluation process include the types and levels of methodologies and tools used for analysis, scenario planning for the future (i.e., futureproofing), and planning and environmental linkages (PEL). These elements are described below.

3.5.1 Analysis Methodologies and Tools by Tier

Different analysis methodologies and tools will be used to conduct the traffic and operational analyses, revenue estimations, safety analysis, roadway evaluation, and benefit-cost analysis for each of the three evaluation tiers. The Study Team will assess analysis tools, create a list of pros and cons, and recommend the preferred analysis tool(s) for each of the three tiers.

¹ Source: New Zealand Ministry of Transport's Future Demand Project <https://www.transport.govt.nz/multi-modal/keystrategiesandplans/strategic-policy-programme/future-demand/>

3.5.2 Planning and Environmental Linkages

As part of the Planning & Environmental Linkages framework, the existing and future operational, mobility, and safety issues and problem areas identified along the I-85 study corridor will be used to inform the project's Need and Purpose under NEPA, as well as the limits of future projects identified for the corridor. The Study Team, with input from stakeholders, will develop and prioritize a range of improvement alternatives to address the identified issues, documenting the planning and screening processes and decisions made to provide the foundation for future project-level environmental reviews. The intention, upon concurrence from FHWA, is to incorporate by reference the alternatives screening methodology and results in future NEPA processes for improvement alternatives. In accordance with 23 U.S.C. 168, the public and stakeholders will be notified of the intention to incorporate the study product by reference in a future environmental review process.

The Study Team, in collaboration with resource agencies and other stakeholders will conduct a preliminary assessment of environmental concerns and other important issues associated with the corridor that need to be considered during planning and that will inform future NEPA processes. Environmental stewardship will be encouraged by incorporating this environmental screening analysis into the planning process.

The public/stakeholders and local, state, and federal resource agencies will be included and involved throughout the process, including early identification of their concerns and interests. The use of PEL aims to streamline and improve project delivery while reducing duplication of efforts.

3.6 Recommendations

Preliminary recommendations, consisting of the preferred alternative output from the Tier 3 Screening, will be presented to GDOT, GCDOT, the Stakeholder Committee, and the general public for input. Once the recommendations have been finalized, a detailed funding strategy and phasing plan will be developed.

3.6.1 Funding Strategy

Each preferred alternative is expected to include a program of diverse projects, which will be eligible for different funding sources. The funding strategy will include developing a matrix of potential funding sources by project type. Specifically, the strategy will identify a complete list of potential funding sources at the county, regional, state, and federal levels, including potential grant opportunities. Furthermore, historical revenue streams will be evaluated since collections began as a result of the Transportation Funding Act of 2015 to determine opportunities to utilize funds for the preferred alternatives.

3.6.1.1 Benefit-Cost Analysis For Federal Grant Applications

Many federal grant opportunities, including BUILD and INFRA grants, among others, require a robust benefit-cost analysis (BCA) compliant with U.S. Department of Transportation (USDOT) BCA Guidance for Discretionary Grant Programs.² A detailed BCA will be conducted for large-scale, corridor-wide preferred alternatives so that regardless of which preferred scenario(s) is selected for implementation, grant applications are ready for submittal. Turnaround time for application submittal is typically two to three months. The approach to develop BCA may be different for medium- and small- scale preferred alternatives.

² USDOT. 2018. USDOT Benefit-Cost Analysis Guidance for Discretionary Grant Programs. December, 2018 <https://www.transportation.gov/sites/dot.gov/files/docs/mission/office-policy/transportation-policy/14091/benefit-cost-analysis-guidance-2018.pdf>

3.6.1.2 Emissions Analysis For Federal Grant Application(s)

An emissions analysis will be conducted for the preferred scenario(s), or portions of the preferred scenario(s), to provide support for Congestion Mitigation Air Quality (CMAQ) funding applications. The Atlanta Regional Commission (ARC) has a CMAQ Emissions Calculator based in Excel that utilizes emission rates from the U.S. Environmental Protection Agency's (USEPA's) Motor Vehicle Emissions Simulator (MOVES) model. The I-85 North HOV lanes have been a Transportation Control Measure (TCM) in the Atlanta ozone State Implementation Plan. Any changes that has the potential to alter the current TCM would require the identification and implementation of a substituting TCM. Currently, ARC has plans to improve the tool to better calculate emission benefits for managed-lane projects. It is expected that the improved tool will be ready by the time the preferred scenario(s) is ready and thus, can be used to calculate emissions for all or portions of the projects. Having the emission benefits of the program of projects readily available will not only help with CMAQ grant applications but will also help with other federal grant applications that often include environmental and health benefits as one of the merit criteria for selection.

3.6.2 Implementation Phasing Plan

Once there is a solid understanding of potential revenue streams to fund the program of projects in the preferred scenario(s), a phasing plan will be developed for programming and construction of the program of projects, including identifying the ideal timing of the preliminary engineering, right-of-way, and construction phases. At a minimum, this phasing plan will account for the following:

- Programming of the preferred scenario in the Atlanta Metropolitan Planning Organization's Long-Range Transportation Plan (LRTP) and Transportation Improvement Program (TIP), including coordinating with the LRTP/TIP amendment cycle and air quality conformity determination process
- Cost of various components within the preferred scenario(s)
- Revenue stream
- Logical termini and potential segmentation of the corridor to facilitate phasing
- Coordination with GDOT's Office of Innovative Delivery and the Major Mobility Investment Program
- Coordination with locally planned project construction in Gwinnett County
- Environmental considerations, including level of NEPA documentation
- Right-of-way acquisitions, if applicable
- Constructability considerations and related design assumptions
- Futureproofing and/or scenario planning considerations
- Maintenance-of-traffic considerations
- Contracting considerations, including coordination with GDOT Operations on available contract vehicle(s) for streamlined purchasing of various technology products that are already available within the GDOT contract catalog

To conclude, the Evaluation Memo is a living document and will be updated as the project progresses. It is a reference for methodology for the I-85 PEL Study. The evaluation framework, criteria and details of the alternatives will be added and revisited as the Project Team continues working with GDOT/GCDOT and stakeholder groups.



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