

NCHRP 08-36, Task 106

Synthesis of Practices for Prioritizing Enhancement and Nonmotorized Transportation Projects

Requested by:

American Association of State Highway and
Transportation Officials (AASHTO)
Standing Committee on Planning

Prepared by:

**PARSONS
BRINCKERHOFF**

The information contained in this report was prepared as part of NCHRP Project 08-36, Task 106, National Cooperative Highway Research Program (NCHRP).

Special Note: This report **IS NOT** an official publication of the NCHRP, the Transportation Research Board or the National Academies.

Acknowledgements

This study was conducted for the AASHTO Standing Committee on Planning, with funding provided through the National Cooperative Highway Research Program (NCHRP) Project 08-36, Research for the AASHTO Standing Committee on Planning. The NCHRP is supported by annual voluntary contributions from the state departments of transportation. Project 08-36 is intended to fund quick response studies on behalf of the Standing Committee on Planning. The report was prepared by Reno Giordano with guidance from David Rose, PhD, both of Parsons Brinckerhoff. The project was managed by Lori L. Sundstrom, NCHRP Senior Program Officer.

Disclaimer

The opinions and conclusions expressed or implied are those of the research agency that performed the research and are not necessarily those of the Transportation Research Board or its sponsoring agencies. This report has not been reviewed or accepted by the Transportation Research Board Executive Committee or the Governing Board of the National Research Council.

Table of Contents

EXECUTIVE SUMMARY	1
1 INTRODUCTION	9
1.1 DEFINITIONS: NONMOTORIZED PROJECTS AND TRANSPORTATION ENHANCEMENTS	10
2 CONTEXT FOR PROJECT PRIORITIZATION	13
2.1 PRIORITIZATION AND PROJECT PLANNING AND PROGRAMMING	13
2.2 FUNDING PROGRAM SIGNIFICANCE AND RESEARCH FOCUS	14
2.2.1 Federal Funding Overview	14
2.2.2 Federal Funding Programs	15
2.2.3 State and Local Programs	20
3 EFFECT OF FUNDING PROGRAM PROCESSES AND MANAGEMENT	22
3.1 OVERVIEW	22
3.1.1 Funding Program Administration	22
3.1.2 Project Prioritization Process Development and Implementation	23
3.1.3 Project Selection and Prioritization Responsibility	23
3.1.4 Project Programming Schedule and Frequency	24
3.1.5 Resulting Challenges	25
3.1.6 Implications	25
4 PRIORITIZATION PROCESSES AND METHODS IN PRACTICE	27
4.1 OVERVIEW	27
4.2 PRIORITIZATION METHODS BACKGROUND	28
4.2.1 Project Prioritization Practice	28
4.2.2 Project Prioritization Methods	28
4.3 SUMMARY OF METHODS: TRANSPORTATION ENHANCEMENT PRIORITIZATION	31
4.3.1 Qualitative and Quantitative Scoring Systems	31
4.3.2 Economic Evaluation Tools	35
4.4 SUMMARY OF METHODS: STP-OTHER AND CMAQ PROGRAM PRIORITIZATION	36
4.4.1 Qualitative and Quantitative Scoring Systems	37
4.4.2 Economic Evaluation Tools	39
4.5 SUMMARY OF METHODS: STATE AND LOCAL FUNDING PROGRAM PRIORITIZATION	40
4.6 EXAMPLES IN PRACTICE: INNOVATIONS AND THE APPLICATION OF REFINED QUANTITATIVE METHODS	42
4.6.1 Variations in Prioritization Methods	42
4.6.2 Prioritizing Across Defined Categories	43
4.6.3 Application of Potential/Deficiency Methods and Criteria	46
4.6.4 Application of Cost-effectiveness Measures	48
4.6.5 Benefit-cost Analysis of Bicycle Facilities Tool	50
4.7 CHALLENGES AND RECOMMENDATIONS	51
4.7.1 Project Selection Subjectivity	52
4.7.2 Insufficient or Limited Data	52
4.7.3 Recommendations	53

APPENDIX A: SURVEY OF NONMOTORIZED TRANSPORTATION PROJECT PRACTICIONERS

APPENDIX B: THE NONMOTORIZED TRANSPORTATION PILOT PROGRAM

Tables

TABLE ES-1:	ENHANCEMENT AND OTHER BICYCLE AND PEDESTRIAN PROJECT SELECTION/PRIORITIZATION CRITERIA USED BY STATE DOTs AND MPOs	5
TABLE ES-2:	ENHANCEMENT AND OTHER BICYCLE AND PEDESTRIAN PROJECT PRIORITIZATION CRITERIA WITH GREATEST IMPORTANCE AS REPORTED BY STATE DOTs AND MPOs	6
TABLE 1-1:	TRANSPORTATION ENHANCEMENT ACTIVITIES	11
TABLE 2-1:	AVERAGE ANNUAL FEDERAL FUNDING FOR ENHANCEMENT AND OTHER BICYCLE AND PEDESTRIAN PROJECTS FY 1992 – FY 2011 (MILLIONS).....	15
TABLE 2-2:	FEDERAL PROGRAMS THAT SUPPORT BICYCLE AND PEDESTRIAN PROJECTS.....	17
TABLE 2-3:	SELECTED STATE AND LOCAL STP AND CMAQ SET-ASIDES FOR BICYCLE AND PEDESTRIAN PROJECTS	21
TABLE 4-1:	ENHANCEMENT AND OTHER BICYCLE AND PEDESTRIAN PROJECT SELECTION/PRIORITIZATION CRITERIA	29
TABLE 4-2:	THE IMPORTANCE OF SCORING CRITERIA FOR ENHANCEMENTS AS REPORTED BY DOTs	33
TABLE 4-3:	THE IMPORTANCE OF SCORING CRITERIA FOR ENHANCEMENTS AS REPORTED BY MPOs	34
TABLE 4-4:	BENEFITS STATE DOTs AND MPOs ARE CONSIDERING FOR ECONOMIC EVALUATION TOOL APPLICATION TO ENHANCEMENT PROJECT PRIORITIZATION	36
TABLE 4-5:	THE IMPORTANCE OF SCORING CRITERIA FOR STP-OTHER-FUNDED BICYCLE AND PEDESTRIAN PROJECTS AS REPORTED BY DOTs AND MPOs	37
TABLE 4-6:	THE IMPORTANCE OF SCORING CRITERIA FOR CMAQ-FUNDED BICYCLE AND PEDESTRIAN PROJECTS AS REPORTED BY DOTs AND MPOs	38
TABLE 4-7:	BENEFITS STATE DOTs AND MPOs ARE CONSIDERING FOR ECONOMIC EVALUATION TOOL APPLICATION TO STP-OTHER OR CMAQ PROJECT PRIORITIZATION.....	40
TABLE 4-8:	SELECTED STATE AND LOCAL FUNDING PROGRAMS THAT SUPPORT BICYCLE AND PEDESTRIAN PROJECTS.....	41
TABLE 4-9:	PPACG 2011–2012 ENHANCEMENT EVALUATION CRITERIA AND WEIGHTING	43
TABLE 4-10:	EXAMPLES OF CROSS-MODE PRIORITIZATION.....	45
TABLE 4-11:	ATLANTA REGION BICYCLE TRANSPORTATION & PEDESTRIAN WALKWAYS PLAN PROJECT PRIORITIZATION CRITERIA	50
TABLE 4-12:	NCHRP BENEFIT-COST ANALYSIS ONLINE TOOL USE AT A SAMPLE OF STATE DOTs AND MPOs	51

Figures

FIGURE 1-1:	DISTRIBUTION OF FEDERAL FUNDING BY TE ACTIVITY FY 1992 – FY 2011 (IN MILLIONS OF DOLLARS, NOT INCLUDING ARRA).....	12
FIGURE 2-1:	FEDERAL BICYCLE AND PEDESTRIAN IMPROVEMENT FUNDING SHARE BY PROGRAM FY 1992 – FY 2011 (NOT INCLUDING ARRA).....	18
FIGURE 2-2:	FEDERAL BICYCLE AND PEDESTRIAN IMPROVEMENT FUNDING SHARE BY PROGRAM FY 1992 – FY 2011 (INCLUDING ARRA).....	18
FIGURE 2-3:	FEDERAL FUNDING FOR BICYCLE AND PEDESTRIAN IMPROVEMENTS BY PROGRAM FY 1992 – FY 2011	19

Executive Summary

This document presents the results of National Cooperative Highway Research Program (NCHRP) 08-36, Task 106, a research project that synthesizes current practice for prioritizing enhancement and other nonmotorized transportation projects.

Enhancements and Nonmotorized Projects

For the purpose of this research, nonmotorized projects include:

- Transportation enhancement activities as defined in federal statute and eligible for funding under the federal Transportation Enhancement program (prior to the enactment of Moving Ahead for Progress in the 21st Century [MAP-21]). It is a 10 percent set-aside of the Surface Transportation Program (STP) for projects that “enhance” the existing surface transportation system across 12 activities, including bicycle and pedestrian projects, landscaping and scenic beautification, historic preservation and rehabilitation, and certain types of environmental mitigation.
- All other standalone bicycle and/or pedestrian projects funded with any combination of federal, state, or local funds, where standalone means not incorporated as a component of a larger motorized transportation project.

The research was conducted prior to the enactment of MAP-21, which has changed the way states can choose to spend federal funds on these types of projects. While the research finds that the prior program structure had a major impact on how projects were selected and prioritized, the findings regarding the state-of-the-practice should remain valid.

Purpose. The research sought to answer the following questions:

- What methods are used to prioritize enhancement and other nonmotorized transportation projects?
- What processes are in place to apply these methods of project selection and prioritization?
- What challenges are faced by state departments of transportation (DOTs) and their partners in applying best practice processes and methods for project programming and prioritization and what are they doing or aspiring to do to improve?

The impetus for answering these questions is to understand how state DOTs and their partners can ensure that nonmotorized projects—just as with motorized transportation projects—are defined, programmed, and prioritized to meet plan goals and objectives while being a cost-effective use of funds and providing accountability to policymakers and the public for their expenditure.

Approach. The following research approach was used to answer these questions:

- An initial examination of federal programs that support enhancement and other nonmotorized transportation projects to understand the context within which these projects are defined, funded, and selected.

- A survey of all 50 state DOTs (43 DOTs responded) and a sample of metropolitan planning organizations (MPOs) (38 of 73 responded) on their methods for project selection and prioritization.
- A detailed analysis of the survey results and prioritization process documentation provided by survey respondents and available on agency websites, supported in some cases with direct follow-up with select DOTs and MPOs.

Federal Funding Program Focus

The Transportation Enhancement program and other federal programs for which bicycle and pedestrian projects are eligible for funding have a significant effect on project selection and prioritization because these programs are, by far, the dominant sources of nonmotorized projects' funding. As a result, the program requirements tend to dictate outcomes.

- The Transportation Enhancement program is a highly defined but diverse funding program. Because 12 often disparate activities are eligible, state DOTs and MPOs tend to program transportation enhancement funding without a consistent, direct connection to long-term plans, choosing instead to operate their programs as a series of periodic, standalone funding opportunities for local partners.
- In the absence of a transportation enhancement program, enhancement activities outside bicycle and pedestrian improvements would not likely be defined and programmed as unique projects that relate to typical goals and objectives established through the transportation planning process (e.g., increase mobility, improve safety, reduce emissions).
- Transportation enhancement funding has averaged about \$500 million per year from 1992 through 2011, with 50 percent going to bicycle and pedestrian projects (plus an additional 7 percent for related safety and rail-trail projects).
- Because the majority of enhancement activity to date has been bicycle and pedestrian improvements, and because, as defined, "other" nonmotorized projects *are* bicycle and pedestrian improvements funded outside the Transportation Enhancement program, much of the research findings relates to bicycle and pedestrian project consideration.
- Overall, bicycle and pedestrian projects are funded mostly through federal programs at an average of about \$400 million per year (the Transportation Enhancement program makes up about 56 percent of this total).
- Federal funding for bicycle and pedestrian projects outside the Transportation Enhancement program has averaged about \$176 million per year with about half attributed to the Surface Transportation Program (STP) and Congestion Mitigation and Air Quality Improvement (CMAQ) program and the remaining half to at least eight other programs.

Planning Versus Programming. Transportation planning process products (long-range transportation plans or bicycle and pedestrian master plans) set long-term visions of the future, establish goals and objectives, and suggest specific strategies to address them. The planning process often develops categories of need to implement these strategies and address the goals and objectives. From there, projects are programmed based on funding availability and project readiness. Project prioritization takes place within categories of need during the planning process, but when ultimately programmed, projects

are often influenced by funding availability and potential restrictions attached to applied funding programs. For these reasons, the significance of a funding program as measured by its contribution to overall spending and each program's process requirements shape the context for project selection and prioritization.

State and Local Roles. STP and CMAQ funds are administered primarily at the regional metropolitan level. State transportation enhancement funds may be administered by a state DOT or suballocated to MPOs or local government entities. Although a much smaller share of total spending, state and local funding programs that rely on revenues from state or local sources (e.g., state sales tax) are also used to fund bicycle and pedestrian projects.

Effect of Funding Program Processes and Management

State DOT and MPO management of transportation enhancement programs (and processes to program them) can inhibit applying a prioritization process that clearly relates projects selected back to established goals and objectives.

- Establishing a clear set of goals and objectives among the 12 transportation enhancement activities is difficult.
- Several agencies cited a disconnect between projects selected by MPOs and those ultimately aggregated and selected at the state level.
- Several agencies reported that their application and selection process is too complex, with time-consuming and occasionally redundant questioning.
- Local project sponsor knowledge with a transportation enhancement program and interest in participating can vary regionally.
- Periodic calls for transportation enhancement projects often bear little connection to past solicitations. During each funding cycle, local jurisdictions and agencies compete anew for project awards without reference to prior selections or an overall plan. Bicycle and pedestrian projects selected through STP and CMAQ programs more often reference long-range transportation and master plans or require projects to have already been identified through those processes.
- Prioritization of bicycle and pedestrian improvements as “enhancements” are often governed by criteria and processes established for programming a state or metropolitan region’s transportation enhancement program, which may differ from processes and criteria for bicycle and pedestrian projects programmed outside of it (such as with STP or CMAQ funds). The application of two sets of processes and criteria complicate the ability to relate project selections back to plan goals and objectives on a consistent basis.

Implications. The management of states’ transportation enhancement programs, commonly as a standalone grant program, have typically resulted in project selections and prioritization that are less directly linked to broader planning processes than for other federal funding programs, including STP and CMAQ. Goals and objectives established in states and regions’ long-range planning documents and bicycle and pedestrian master plans often are not strongly reflected in their respective transportation

enhancement programs. Because of this, bicycle and pedestrian projects selected for funding within a transportation enhancement program do not evidence a direct relation to these planning documents as frequently as those selected for funding through STP or CMAQ programs. Those agencies that have provided straightforward and focused guidance on their enhancement programs, have made clear how projects should relate to broader planning initiatives' goals and objectives, and have conducted extensive outreach with local partners noted greater success with soliciting and funding "good" projects and achieving broad-based, informed participation.

Prioritization Processes and Methods in Practice

Prioritization of transportation enhancements and bicycle and pedestrian projects rely predominantly on qualitative criteria and evaluation methods with some application of quantitative methods.

- A broad array of criteria (Table ES-1) are used to evaluate and prioritize enhancements and bicycle and pedestrian projects—the relative importance of which varies across projects funded with transportation enhancement, STP, or CMAQ program funds (Table ES-2). Prioritization criteria importance is also different for state DOTs versus MPOs among transportation enhancement programs.

TABLE ES-1: ENHANCEMENT AND OTHER BICYCLE AND PEDESTRIAN PROJECT SELECTION/PRIORITIZATION CRITERIA USED BY STATE DOTs AND MPOs

✓	Technical merit (feasibility, meets design standards, realistic scope/schedule/budget)
✓	Importance (level of documented priority)
✓	Level of support (from the community, from government)
✓	Relationship to/consistency with adopted plans, policies, or other investments
✓	Leverage / amount of financial match or overmatch (amount beyond minimum federal or state requirement)
✓	Project readiness / stage of completion (feasibility, preliminary engineering, environmental clearance, right-of-way acquisition, final design)
✓	Enhances livability / demonstrates quality of experience / improves quality of life / improves population health
✓	Enhances environmental and/or community sustainability
✓	Supports mixed use development, regional growth centers, activity centers, or smart growth
✓	Supports multimodal transportation alternatives, transit connections
✓	Benefits specific populations (transportation disadvantaged, economically distressed areas, tourism)
✓	Total population served / level of exposure or access / amount or density of nearby population/employment
✓	Provides connectivity among other facilities or regions of activity, adds to or enhances existing network
✓	Completes planned corridors, fills gaps
✓	Addresses safety, reduces crashes
✓	Evidence of a long-term plan (preservation, maintenance, ownership, operations)
✓	Demonstrates innovation or unique features
✓	Contributes to wide geographic dispersion of funds
✓	Loss of opportunity, delay is detrimental
✓	Addresses multiple enhancement activities (transportation enhancement projects only)

TABLE ES-2: ENHANCEMENT AND OTHER BICYCLE AND PEDESTRIAN PROJECT PRIORITIZATION CRITERIA WITH GREATEST IMPORTANCE AS REPORTED BY STATE DOTs AND MPOs

Transportation Enhancements - DOTs
<ul style="list-style-type: none"> ✓ Technical merit ✓ Level of support ✓ (Tie) Addresses safety; Project readiness
Transportation Enhancements - MPOs
<ul style="list-style-type: none"> ✓ Provides connectivity among other facilities or regions of activity, adds to or enhances existing network ✓ Completes planned corridors, fills gaps ✓ Supports multimodal transportation alternatives, transit connections
Surface Transportation Program – DOTs and MPOs
<ul style="list-style-type: none"> ✓ Addresses safety ✓ (Tie) Provides connectivity, adds to existing network; Completes planned corridors, fills gaps ✓ Level of support
Congestion Mitigation and Air Quality Improvement Program – DOTs and MPOs
<ul style="list-style-type: none"> ✓ Supports multimodal transportation alternatives, transit connections ✓ Technical merit ✓ (Tie) Relationship to/consistency with adopted plans, policies, or other investments; Provides connectivity, adds to existing network; Completes planned corridors, fills gaps

- Most state DOTs and MPOs apply a qualitative approach to evaluating these criteria and prioritizing enhancement projects (all activity types, including bicycle and pedestrian). The same is true for bicycle and pedestrian projects programmed with STP and CMAQ funds, although the use of quantitative methods in combination with qualitative ones is more prevalent for these funding sources than for projects funded through transportation enhancement programs.
- Unlike when programming funds, the application of more rigorous, objective prioritization processes and quantitative methods is more often applied to long-range transportation plans and bicycle and pedestrian master plans, where the restrictions of funding program requirements do not necessarily play a major role. State DOTs and MPOs apply these methods to evaluating prioritization criteria much less frequently when actually programming enhancement, STP, and CMAQ program funds.
- Cost-effectiveness measures are occasionally used to supplement typical qualitative approaches to project selection and prioritization. Methods that compute a cost-effectiveness measure are not as rigorous as benefit-cost analyses, but may be suitable in the context of enhancement or other bicycle and pedestrian project prioritization.

Qualitative and Quantitative Scoring Systems. The majority of methods applied to enhancement and bicycle and pedestrian project prioritization are qualitative scoring systems, which evaluate and score information or data subjectively against established criteria (as in Table ES-1) that relate to pre-determined goals. Projects are ranked in order of total “points” scored. Due to the subjectivity of the

evaluation, the results may not be independently reproducible. Sixty-three percent of survey respondents indicated the use of a qualitative scoring system, occasionally in combination with another method.

On the other hand, quantitative scoring systems evaluate information or data objectively against criteria represented by established values or value ranges, and consequently the results are independently reproducible since no subjective weighing of the criteria takes place. These scoring systems were applied less frequently in practice, and criteria scored in this manner were often combined with qualitative criteria, resulting in the application of a hybrid qualitative-quantitative scoring system. Fourteen percent of survey respondents indicated the standalone use of a quantitative scoring system; overall, 45 percent indicated its use in combination with other methods (mostly qualitative).

Potential/Deficiency Measures. A small number of state DOTs and MPOs use a potential/deficiency scoring system. Potential or deficiency scores are developed using qualitative or quantitative conditions or characteristics (e.g., physical location, congestion levels/level of service, crash rates) to indicate the “potential” for bicycle or pedestrian activity or “deficiency” that inhibits activity. Projects are then ranked based on scores or indices that prioritize areas with the greatest potential or deficiencies. Prioritization scores may also be used as criteria in a qualitative or quantitative scoring system. Generally, the use of this method is applied to the development of a long-range transportation plan or bicycle/pedestrian master plan rather than to project selection for funding programs.

Cost-effectiveness Measures. Several DOTs and MPOs apply cost-effectiveness measures to their project selection and prioritization. Most often, these measures are used for bicycle and pedestrian projects funded outside transportation enhancement programs. Some agencies refer to these analyses as “benefit-cost,” but they are more accurately characterized as “criterion-to-cost” ratios or “score-to-cost” ratios, where the numerator can be represented by non-monetized “benefits” or numerical scores computed as part of a broader project selection or prioritization method. In general, agencies do not apply rigorous benefit-cost analyses that monetize all project benefits delivered over the life of a project, discounted to the present. Nonetheless, some agencies indicated that they are undertaking efforts to better measure project benefits, or they would like to do so. Specific project benefits cited the most by agencies in these cases were economic development, decreased auto use, mobility, and safety.

Outcomes from the Application of Qualitative Methods

State DOTs and their partners are challenged to establish enhancement and nonmotorized project prioritization methods that are as technically driven as those applied to motorized projects due to often inadequate project evaluation data and a consequent reliance on qualitatively evaluating project criteria.

- Overall, enhancement and other bicycle and pedestrian project prioritization is more qualitative than quantitative. Project criteria evaluation is based more on potentially preferential judgment or data interpretation than analytical rigor. Depending on agency or regional context, however, this may or may not be seen as an area in need of improvement.
- Data quality and availability to measure enhancement and other bicycle and pedestrian projects’ expected impacts and benefits is an ongoing challenge. Performance measurement, data collection,

and well-developed methodologies for quantifying and monetizing the benefits of nonmotorized projects have not been advanced to the level of motorized projects, nor are their applications widespread in practice.

- The general approach of soliciting projects from individual local partners may obscure regional priorities and make difficult the use of a prioritization method that considers projects from a broader, perspective—as is done during regional long-range and master planning. Solicited projects may not demonstrate, or have the data available to be capable of demonstrating, more regional benefits (e.g., economic development or environmental improvement).

Recommendations. Some prioritization methods such as multi-criteria decision analysis and pair-based ranking help manage the subjectivity of selection criteria. The use of multiple evaluators or technical committees drawn from a variety of participating agencies or disciplines is also an option. Some agencies have successfully applied cost-effectiveness measures to their processes, even if they incorporate qualitative measurement of benefits or outcomes.

If project selection and prioritization at the programming stage are more closely related to existing plans developed through a performance-based planning process, the drawbacks of qualitative methods can also be diminished. A long-range transportation plan or bicycle and pedestrian master plan produced within a framework of clear, performance-driven goals and objectives (and which itself may apply more sophisticated quantitative methods for project identification and prioritization) can lay the groundwork for a desirable outcome at the programming stage. That is, “projects that implement the plan” can be a significant evaluation criterion for funding program prioritization. Indeed, several MPOs highlighted a strong link between project selection and the identification of priority bicycle and pedestrian corridors or objectives through a regional goal-setting process, a bicycle/pedestrian master plan, or their long-range transportation plans.

1 Introduction

This document presents the results of National Cooperative Highway Research Program (NCHRP) 08-36, Task 106, a research project that synthesizes current practice for prioritizing enhancement and other nonmotorized transportation projects, where other nonmotorized transportation projects are defined to be bicycle and pedestrian facilities. The research was conducted prior to the enactment of the Moving Ahead for Progress in the 21st Century Act (MAP-21), which has changed the way states can choose to spend federal funds on these types of projects. The research findings should remain valid.

The research sought to answer the following questions:

- **What methods are used to prioritize enhancement and other nonmotorized transportation projects?**
- **What processes are in place to apply these methods of project selection and prioritization?**
- **What challenges are faced by state departments of transportation (DOTs) and their partners in applying best practice processes and methods for project programming and prioritization and what are they doing or aspiring to do to improve?**

The impetus for answering these questions is—just as with motorized transportation projects—to understand how state DOTs and their partners can ensure that nonmotorized projects are defined, programmed, and prioritized to meet plan goals and objectives while being a cost-effective use of funds, and providing accountability to policymakers and the public for their expenditure.

The following research approach was followed to answer these questions:

- **Literature review and other fact finding to inform survey development.** The methodology began with a modified literature review, as little prior research was identified that directly addressed enhancement and nonmotorized project prioritization. This involved an initial examination of federal programs that support enhancement and other nonmotorized transportation projects to understand the context within which these projects are defined, funded, and selected. A select overview of state and regional Transportation Enhancement programs and other programs that fund bicycle and pedestrian projects was then conducted to aid in the development of a survey instrument, the primary research tool used to synthesize the state of the practice at the state and regional metropolitan levels.
- **Online survey of state DOTs and MPOs.** All 50 state DOTs and a sample of major MPOs were surveyed as to the prioritization processes they employ for enhancement and other bicycle and pedestrian projects. The survey instrument was administered online at a dedicated web address (a PDF version of the survey was available upon request and is provided in Appendix A). It was designed to solicit detailed information on prioritization process methods and application, as well as actual documentation of the process, whether publically available or not. It queried enhancement and bicycle and pedestrian funding programs, prioritization methods and criteria applied, administrative

details, strengths and weaknesses, and aspects that work well and those that could use improvement.

- **Review of survey results and other source documentation.** The survey was administered to all 50 state DOT bicycle and pedestrian coordinators and all 50 state transportation enhancement managers, as well as the primary point of contact for bicycle and pedestrian planning at 73 MPOs, selected based on population served. Response rates of 76 percent, 61 percent, and 52 percent were achieved among the three respective groups.

Survey results were analyzed in addition to conducting a thorough review of prioritization process source documents and supporting information provided by survey respondents or available electronically in the public domain, including a selective examination of MPO planning documents (LRTPs and TIPS) and metropolitan and city bicycle and pedestrian plans. In a few cases, direct follow-up with select DOTs and MPOs was conducted.

The report is organized into four chapters:

- **Chapter 1** introduces the research purpose, approach, and provides a definition for transportation enhancements and nonmotorized projects.
- **Chapter 2** provides the context for nonmotorized project prioritization and emphasizes the significance of federal funding programs to the ultimate selection of enhancement and other nonmotorized projects by state DOTs and local agencies. It presents statistics and trends on federal support for these types of projects and a rationale for a close examination of a select few.
- **Chapter 3** discusses the effects of funding program processes and management on project selection and prioritization processes. Findings and implications are drawn from the general administration of these funding programs, the development and implementation of prioritization processes, the entities responsible for prioritization decision-making, and the frequency and schedule with which project selection and prioritization.
- **Chapter 4** presents detailed research findings on enhancement and nonmotorized prioritization processes and methods used in practice. It begins with an overview of prioritizing transportation projects and the methods examined in the research, followed by individual sections summarizing prioritization methods used for transportation enhancements and other programs that support nonmotorized projects. The chapter includes findings on more innovative methods and those that have applied refined quantitative techniques, and concludes with additional challenges and recommendations on implementing best practice.

1.1 Definitions: Nonmotorized Projects and Transportation Enhancements

For the purpose of this research, nonmotorized projects include:

- Transportation enhancement activities as defined in federal statute (23 U.S.C. 101(a)(35)) and eligible for funding under the federal Transportation Enhancement program (prior to the enactment of MAP-21)

- All other standalone bicycle and/or pedestrian projects funded with any combination of federal, state, or local funds, where standalone means not incorporated as a component of a larger motorized transportation project

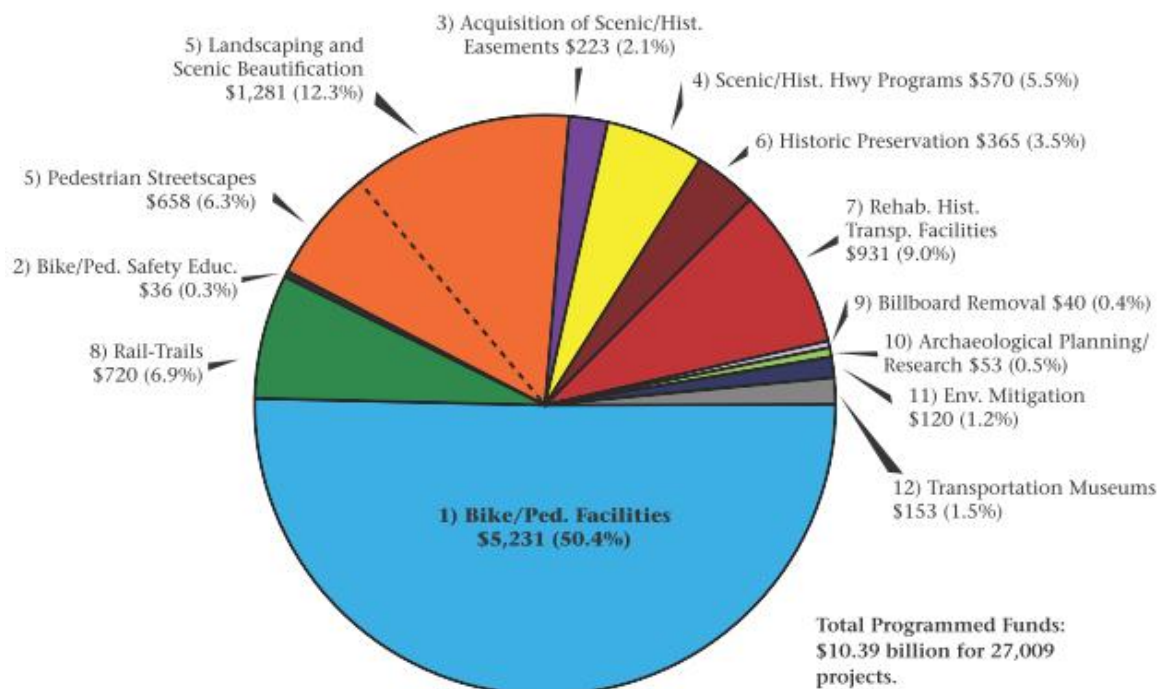
The Transportation Enhancement (TE) program is a 10 percent set-aside of the Surface Transportation Program (STP) through which projects that address one or more of a defined set of 12 activities (project categories) that “enhance” the existing surface transportation system are eligible for funding. These activities as provided in federal statute are listed in Table 1-1. The distribution of enhancement funding across these categories since program inception is illustrated in Figure 1-1.

TABLE 1-1: TRANSPORTATION ENHANCEMENT ACTIVITIES

<ol style="list-style-type: none">1. Provision of facilities for pedestrians and bicycles.2. Provision of safety and educational activities for pedestrians and bicyclists.3. Acquisition of scenic easements and scenic or historic sites (including historic battlefields).4. Scenic or historic highway programs (including the provision of tourist and welcome center facilities).5. Landscaping and other scenic beautification.6. Historic preservation.7. Rehabilitation and operation of historic transportation buildings, structures, or facilities (including historic railroad facilities and canals).8. Preservation of abandoned railway corridors (including the conversion and use of the corridors for pedestrian or bicycle trails).9. Inventory, control, and removal of outdoor advertising.10. Archaeological planning and research.11. Environmental mitigation—<ol style="list-style-type: none">a. to address water pollution due to highway runoff; or,b. reduce vehicle-caused wildlife mortality while maintaining habitat connectivity.12. Establishment of transportation museums.
--

Source: Federal Highway Administration (http://www.fhwa.dot.gov/federalaid/guide/guide_current.cfm#c65)

FIGURE 1-1: DISTRIBUTION OF FEDERAL FUNDING BY TE ACTIVITY FY 1992 – FY 2011 (IN MILLIONS OF DOLLARS, NOT INCLUDING ARRA)



Source: Transportation Enhancements Spending Report: FY 1992 through FY 2011. Washington, DC: National Transportation Enhancements Clearinghouse, 2012.

As shown in Figure 1-1, bicycle and pedestrian projects have received about 57.6 percent of all Transportation Enhancement funds from 1992 to 2011 (Activities 1, 2, and 8), with landscaping and scenic beautification (Activity 5; 18.6 percent) and historic preservation and rehabilitation (Activities 3, 6, and 7; 14.6 percent) comprising much of the rest. These data compiled by the National Transportation Enhancements Clearinghouse, however, do not exactly match that of the Federal Highway Administration (FHWA). The FHWA Fiscal Management Information System indicates that about 44 percent of enhancement projects have been bicycle and pedestrian improvements based on those coded as such (bicycle and pedestrian facility, bicycle and pedestrian safety, and rail-trail). This difference occurs because some projects that were categorized in the predominantly bicycle and pedestrian TE categories (Activities 1, 2, and 8) have not been included.

Although this research has focused equally on enhancements and “other” nonmotorized projects, because the majority of enhancement activity to date has been bicycle and pedestrian improvements, and because, as defined, “other” nonmotorized projects *are* bicycle and pedestrian improvements funded outside the Transportation Enhancement program (Sections 2.2.2 and 2.2.3 in the following chapter introduce the significant number of federal and state or local programs that support bicycle and pedestrian projects), much of the research findings and discussion that follows relates to bicycle and pedestrian project consideration.

2 Context for Project Prioritization

The Transportation Enhancement program and other federal programs for which bicycle and pedestrian projects are eligible for funding have a significant effect on project selection and prioritization because these programs are, by far, the dominant sources of nonmotorized projects' funding. As a result, the program requirements tend to dictate outcomes.

Like all transportation projects, nonmotorized improvements derive from established transportation planning processes. At the project programming stage, project selection and prioritization are significantly influenced by funding source, which is primarily federally driven—both in terms of funding levels and program requirements—and are mode specific (i.e., enhancement or other bicycle and pedestrian projects are not typically compared against motorized projects). Accordingly, the majority of this project's research was organized around federal-aid funding programs, beginning with the Transportation Enhancement program itself (bicycle and pedestrian projects plus all other “enhancement activities”) as well as other programs that support just bicycle and pedestrian projects (potentially in addition to motorized projects).

2.1 Prioritization and Project Planning and Programming

To begin to understand practices for prioritizing enhancement and other nonmotorized transportation projects, it is necessary to place project prioritization within the framework of the typical approach to performance-based planning and programming. This process sets a long-term vision for the future, establishes goals and objectives, and suggests specific strategies to address them. Often the planning process develops categories of need to implement these strategies and address the goals and objectives.

For traditional motorized (roadway/highway) projects, categories of need typically relate to physical and operational requirements, for example capacity, preservation, and safety. For bicycle and pedestrian projects, categories of need are similar, often focusing on gap filling, connectivity, and safety. However, bicycle and pedestrian projects comprise a much smaller component of state DOTs and their partners' work programs relative to motorized infrastructure, and are generally lumped into a single mode-specific category for planning and project prioritization purposes. Proposed projects are evaluated against criteria specific to bicycle and pedestrian modes and typically are not compared and prioritized directly against motorized projects. In some cases, however, broader policy objectives such as economic development or sustainability can play a larger role in decisions related to prioritizing projects across modes. Enhancement projects aside from bicycle and pedestrian projects are more difficult to categorize based on need and are typically evaluated subjectively using criteria established by a state or metropolitan region's Transportation Enhancement program.

The results of the planning process are commonly embodied in a long-term planning document such as a long-range transportation plan (LRTP) or master plan. From there, projects are programmed based on funding availability and project readiness. Project prioritization takes place within categories of need during the planning process, but when ultimately programmed, projects are often influenced by funding amount and timing, and potential restrictions attached to the programs themselves. Other prescribed requirements such as adhering to a geographically equitable distribution of funds may also influence

project selection. Project priorities may evolve from the planning to programming stage based on these considerations. Because of this dynamic, more sophisticated tools and prioritization criteria are potentially applied during long-range planning exercises, but projects selected in this manner tend to be more illustrative than definitive.

The next section elaborates on the influence and detail of funding programs, primarily from the federal level due to the influence of policy and the overwhelming reliance on federal aid to fund enhancements and bicycle and pedestrian projects.

2.2 Funding Program Significance and Research Focus

For nonmotorized projects, and especially enhancements, current, significant levels of federal funding and the rules governing eligibility for federal programs play a large role in planning and prioritization approaches taken by states and metropolitan regions. Therefore, an understanding of the federal programs that fund nonmotorized projects is necessary to examine processes that prioritize them.

Since the Intermodal Surface Transportation Efficiency Act (ISTEA) was enacted in 1992, federal-aid program funding as well as policy support for enhancement and other nonmotorized projects have steadily increased alongside the popularity of these programs among DOTs' customers and partners. Since 1992, for example, funding for bicycle and pedestrian projects increased 70-fold and from 2005 through 2011 averaged nearly \$600 million per year. Including all enhancement activities in addition to bicycle and pedestrian activities, approximately \$880 million per year in federal funds was spent on nonmotorized projects during this period.

In addition to the level of federal financial support, the very existence of a specifically defined funding program for transportation enhancements has a significant effect on project prioritization. In the absence of a transportation enhancement program, enhancement activities outside bicycle and pedestrian improvements (such as landscaping or historic preservation) likely would not be defined and programmed as unique projects that relate to typical goals and objectives established through the transportation planning process (e.g., increasing mobility, improving safety, reducing emissions).

In addition to the Transportation Enhancement program, the research examined in depth the federal Surface Transportation Program (STP) and the Congestion Mitigation and Air Quality Improvement (CMAQ) program, as explained later in this section. State and local programs setting aside a certain portion of allotted STP or CMAQ funding or funded with state or locally generated revenues were also considered.

2.2.1 Federal Funding Overview

Prior to ISTEA, bicycle and pedestrian projects received limited attention from a federal policy perspective and equally little federal funding. The Transportation Enhancement program did not exist. Federal funding for bicycle and pedestrian projects averaged only about \$8.5 million per year (FHWA, 2012) during the four fiscal years before ISTEA (FY 1988–FY 1991). In addition, many federal programs contained restrictions on funding bicycle and pedestrian projects and the amount of federal money states could spend was capped.

ISTEA marked a significant shift in direction by dramatically increasing federal funding for bicycle and pedestrian projects, introducing the Transportation Enhancement program, and generally making bicycle and pedestrian projects eligible for federal aid by recognizing them in statute (23 U.S.C. 217(f)) as highway projects. Funding for enhancements as well as bicycle and pedestrian projects outside the Transportation Enhancement program increased steadily from ISTEA through the next two federal reauthorization periods, the Transportation Equity Act for the 21st Century (TEA-21) in 1998 and the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) in 2005. The American Recovery and Reinvestment Act of 2009 (ARRA) also provided a two-year increase in funding over baseline authorization. Table 2-1 presents these federal funding trends.

TABLE 2-1: AVERAGE ANNUAL FEDERAL FUNDING FOR ENHANCEMENT AND OTHER BICYCLE AND PEDESTRIAN PROJECTS FY 1992 – FY 2011 (MILLIONS)

Authorization Period	Transportation Enhancements			Bicycle and Pedestrian Outside of Enhancements	Total Bicycle and Pedestrian (including Enhancements)
	<i>Bicycle and Pedestrian Only</i>	<i>All Other Enhancements</i>	<i>Total</i>		
ISTEA (FY 1992 – FY 1997)	\$102.9	\$187.1	\$290.0	\$27.7	\$130.6
TEA-21 (FY 1998 – FY 2004)	\$223.9	\$300.8	\$524.7	\$107.8	\$331.7
SAFETEA-LU (FY 2005 – FY 2011)	\$264.5	\$285.4	\$549.9	\$331.7	\$596.2
SAFETEA-LU (FY 2005 – FY 2011) + ARRA (FY 2009 – FY 2010)	\$331.6	\$330.9	\$662.5	\$370.7	\$702.3
<i>Average (FY 1992 – FY 2011) Not including ARRA</i>	<i>\$201.9</i>	<i>\$261.3</i>	<i>\$463.1</i>	<i>\$162.1</i>	<i>\$364.0</i>
<i>Average (FY 1992 – FY 2011) Including ARRA</i>	<i>\$225.3</i>	<i>\$277.2</i>	<i>\$502.5</i>	<i>\$175.8</i>	<i>\$401.1</i>

Source: FHWA (http://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/bipedfund.cfm)

Federal funding data imply, though, that the Federal-Aid Highway Program has had a significant impact on enhancement and other bicycle and pedestrian project selection across states and local regions. It follows that an understanding of federal programs that support these projects is critical to projects' prioritization, as program requirements drive decisions on which projects are eligible and ultimately selected for inclusion in states' STIPs and metropolitan regions' TIPs. This outcome is most apparent with the Transportation Enhancement program itself, since the definition of "enhancement" projects and the funding that must be spent on them (or otherwise forfeited) are prescribed by federal statute.

2.2.2 Federal Funding Programs

In addition to the Transportation Enhancement program, many other federal programs are eligible to fund bicycle and pedestrian projects, as implied by the level of funding in the column labeled "Other Bicycle and Pedestrian" in Table 2-1. These programs are listed in Table 2-2 and their contributions to total funding for bicycle and pedestrian projects are illustrated in Figure 2-1 and Figure 2-3 (including and not including ARRA, respectively). Their funding levels over time are shown in Figure 2-3.

Among all programs, the Surface Transportation Program after the TE set-aside (STP-Other) and the Congestion Mitigation and Air Quality Improvement program were selected on which to focus the

research in addition to the Transportation Enhancement program because they comprise significant shares of federal support since ISTEA (10 percent and 11 percent, respectively, without accounting for ARRA). These two funding sources are the primary vehicles states and metropolitan regions turn to when using federal funding to support bicycle and pedestrian improvements. Further detail on these two programs is provided in the sections that follow.

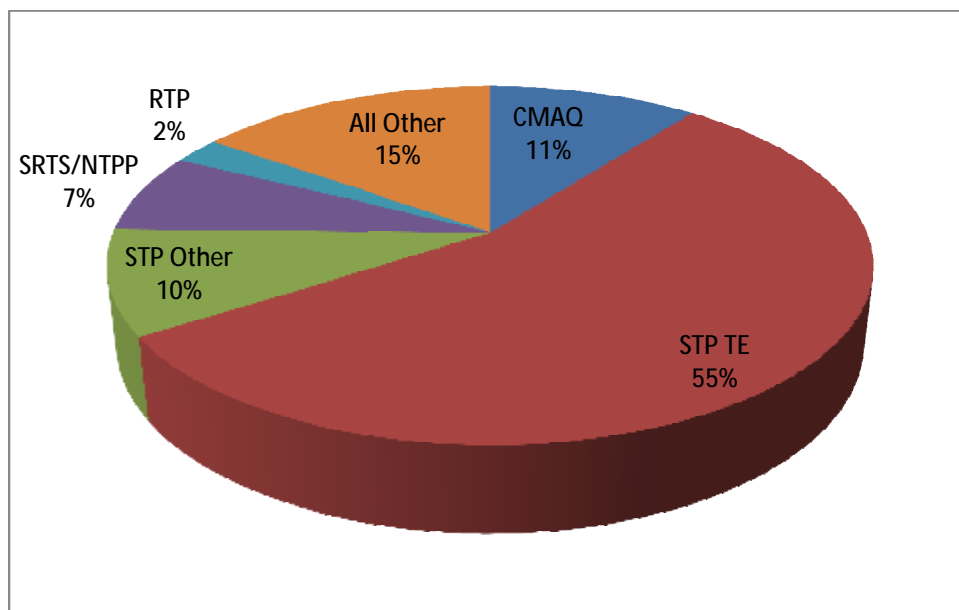
Other federal programs summarized in Table 2-2 and included in the pie charts were not a focus of the research for several reasons. These include Safe Routes to School (SRTS), the Recreational Trails Program (RTP), and all other programs lumped under “All Other.” Specifically, SRTS was not selected because it is not a traditional infrastructure funding program. It maintains a narrower project focus with a specific target population and geographical extent (school children and projects within approximately two miles of a school). It also incorporates non-infrastructure projects such as education, encouragement, and enforcement. Similarly, RTP also was not selected because of its narrow focus on recreation, rather than traditional utilitarian mobility. RTP projects are also for nonmotorized and motorized use alike. All other federal programs provide a relatively minor share of bicycle and pedestrian projects, and often are often used to fund a motorized project with a bicycle and pedestrian component. Finally, the Nonmotorized Transportation Pilot Program (NTPP) was a special pilot program under SAFETEA-LU that provided approximately \$25 million apiece to four select communities to demonstrate how improved walking and bicycling networks can increase rates of walking and bicycling. A detailed look at these four communities’ programs is included in Appendix B. Each community’s program structure, goals, and prioritization processes—to the extent they were applied—are summarized, including input from three of four regions’ program managers.

TABLE 2-2: FEDERAL PROGRAMS THAT SUPPORT BICYCLE AND PEDESTRIAN PROJECTS

Program	Description	Introduced	Eligibility
Transportation Enhancement (STP TE)	Projects that “enhance” surface transportation including bicycle/pedestrian, landscaping, historical and cultural preservation, and others	ISTEA	12 defined activities, 3 of which predominantly bicycle/pedestrian
Surface Transportation Program (STP Other)	Remaining apportionment after TE set-aside suballocated by population and to any area of the state to broadly fund surface transportation improvements	ISTEA	Broad eligibility for bicycle/pedestrian projects
Congestion Mitigation and Air Quality Improvement (CMAQ) Program	Projects that contribute to attainment or maintenance of national ambient air quality standards for ozone, carbon monoxide, and particulate matter	ISTEA	Bicycle and pedestrian projects that can demonstrate a reduction in a region’s nonattainment or maintenance criteria pollutants
Nonmotorized Transportation Pilot Program (NTPP)	SAFETEA-LU pilot program for 4 regions to demonstrate how improved walking and bicycling networks can increase rates of walking and bicycling	SAFETEA-LU	As determined by the 4 pilot sites
Safe Routes to School (SRTS)	Infrastructure projects that substantially improve the ability of students to walk and bicycle to school and non-infrastructure activities that encourage walking and bicycling to school	SAFETEA-LU	Bicycle and pedestrian projects generally within 2 miles of a primary or middle school (grades K–8)
Recreational Trails Program (RTP)	Projects to develop and maintain recreational trails and trail-related facilities for both nonmotorized and motorized uses	ISTEA	Recreational bicycle and pedestrian trails (non-utilitarian)
All Other	Bicycle and pedestrian projects may also be funded through Highway Safety Improvements Program (HSIP); High Priority Projects; National Highway System; Transportation, Community, and System Preservation; National Scenic Byways; and others		

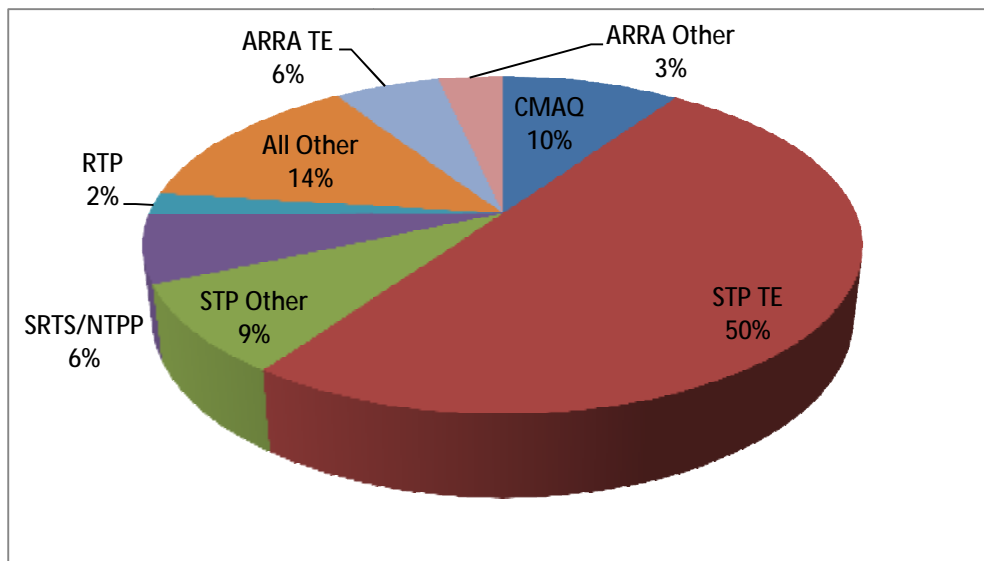
Source: FHWA and Parsons Brinckerhoff

**FIGURE 2-1: FEDERAL BICYCLE AND PEDESTRIAN IMPROVEMENT FUNDING SHARE BY PROGRAM
 FY 1992 – FY 2011 (NOT INCLUDING ARRA)**



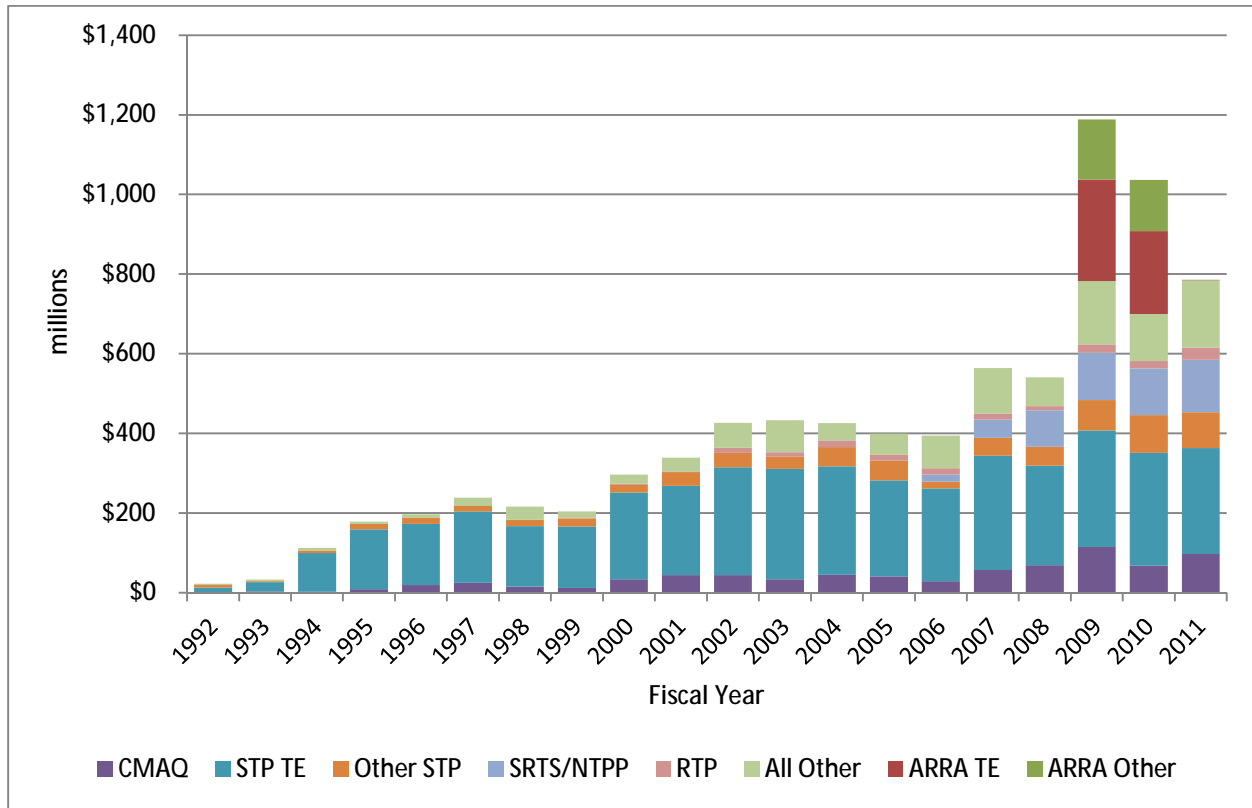
Source: FHWA (http://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/bipedfund.cfm)
 Notes: RTP only FY 1999 – FY 2011; SRTS/NTPP only FY 2006 – FY 2011; HSIP included in STP Other FY 2004 – FY 2011

**FIGURE 2-2: FEDERAL BICYCLE AND PEDESTRIAN IMPROVEMENT FUNDING SHARE BY PROGRAM
 FY 1992 – FY 2011 (INCLUDING ARRA)**



Source: FHWA (http://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/bipedfund.cfm)
 Notes: ARRA TE = 3% set-aside for TE activities; ARRA Other = STP augmentation; RTP only FY 1999 – FY 2011; SRTS/NTPP only FY 2006 – FY 2011; HSIP included in STP Other FY 2004 – FY 2011

FIGURE 2-3: FEDERAL FUNDING FOR BICYCLE AND PEDESTRIAN IMPROVEMENTS BY PROGRAM FY 1992 – FY 2011



Source: FHWA (http://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/bipedfund.cfm)

Surface Transportation Program (Other)

The 10 percent set-aside within STP is not the only avenue to fund nonmotorized (bicycle and pedestrian) transportation projects. After the Transportation Enhancement program set-aside, STP funding is distributed on a sub-state basis, whereby 62.5 percent is allocated by population (>200,000, ≤200,000, and <5,000) and 37.5 percent can be distributed to any area of the state. These STP funds can be used on a broad range of surface transportation capital, planning projects, and operational improvement projects. These projects include bicycle and pedestrian walkways for non-recreational purposes as listed in 23 U.S.C. 133(b)(3). Most of the STP funds for bicycle and pedestrian projects come from the sub-allocation to urban areas with populations greater than 200,000 and from the sub-allocation to any area of the state. These allocations are collectively called STP-Other in this report and are variously referred to by agencies as STP-Urban, STP-Metro, STP-Flex, and others. Some states and metropolitan regions devote a certain percentage of STP funding specifically to bicycle and pedestrian program or set of projects.

Notably, ARRA provided a \$26.66 billion augmentation to STP in FY 2009 and FY 2010. The STP augmentation directed 3 percent (\$799.8 million) to the TE program, significantly increasing its total funding for those years (total indicated as ARRA TE in Figure 2-2). Of the remaining \$25.86 billion in ARRA STP augmentation, states decided to spend about 1.1 percent (\$279.4 million) on bicycle and pedestrian improvements, according to the FHWA Fiscal Management Information System (total indicated as ARRA Other in Figure 2-2).

Congestion Mitigation and Air Quality Improvement Program

The Congestion Mitigation and Air Quality Improvement program was first authorized in ISTEA. CMAQ funding is apportioned to states and MPOs based on county populations residing within ozone and carbon monoxide nonattainment and maintenance areas also taking into account air quality problem severity. Eligible projects include “cost-effective congestion mitigation activities that provide air quality benefits” (23 U.S.C. §149(f)(3)(A)), which can include bicycle and pedestrian projects. Since SAFETEA-LU, federal statute instructs priority be placed on these forms of projects (as well as diesel retrofits and other emission reduction activities), although it acknowledges that state and local agencies retain ultimate authority to select qualifying projects (23 U.S.C. §149(f)(3)(B)). FHWA guidance further states that state and local agency project selection processes should “clearly identify the basis for rating projects, including ... cost effectiveness” and “give priority consideration to those that will create the greatest emissions reductions for the least cost” (FHWA, 2008). Accordingly, many agencies conduct cost-effectiveness analyses for CMAQ bicycle and pedestrian projects, although the robustness of the methodology varies. As with STP funding, some metropolitan regions set aside a percentage of CMAQ funding to a bicycle and pedestrian projects.

2.2.3 State and Local Programs

State and local programs that support bicycle and pedestrian projects include those that are funded with state or local revenue sources and those that specifically set aside portions of STP or CMAQ funding.

State and Local Funding Programs

In some states and metropolitan regions, dedicated state or local funding is used to support nonmotorized transportation projects. As with federal nonmotorized project funding outside the

Transportation Enhancement program, state and local program support focuses exclusively on bicycle and pedestrian improvements for the purposes of this research. These dedicated resources can come from the state level, as in Oregon where it sets aside on a biennial basis state highway funds derived from state motor fuel taxes and automobile-related fees for its Bicycle-Pedestrian Grant Program. The funding and program can also be locally managed, as in San Diego County where a portion of both the statewide and voter-approved, county-level sales tax that is devoted to transportation purposes funds the Active Transportation Program for bicycle and pedestrian projects. The existence of these programs may imply greater than average importance placed on these modes at a statewide or regional level. Unlike federal spending, which for bicycle and pedestrian projects is closely tracked in the FHWA Fiscal Management Information System and for enhancements by the FHWA-supported National Transportation Enhancements Clearinghouse, no comprehensive data exist on total expenditures of state and local resources, although it is substantially less than federal aid.

Dedicated Use of STP and CMAQ Funding

Some states and metropolitan regions devote a defined percentage of their STP or CMAQ (metropolitan regions only) funding to bicycle and pedestrian projects, while others simply fund them on an ad hoc basis, often in competition with other eligible project types. For STP, these other projects often include roadway projects, and for CMAQ, other emission-reducing measures such as transit improvements and transportation demand strategies. Table 2-3 presents a selected group of MPOs and one state DOT that devote a defined percentage of their STP or CMAQ funding to bicycle and pedestrian projects. These agencies and their programs' prioritization processes were examined in depth under the assumption that there may be more to learn from them than from those who do not specifically set aside STP or CMAQ funds for bicycle and pedestrian projects.

TABLE 2-3: SELECTED STATE AND LOCAL STP AND CMAQ SET-ASIDES FOR BICYCLE AND PEDESTRIAN PROJECTS

Agency	Program	Set-aside
Capital Area MPO (Austin)	STP-Urban	15% devoted to bicycle and pedestrian projects
Chicago Metropolitan Area for Planning	CMAQ	31% devoted to bicycle and pedestrian projects
Maricopa Association of Governments (Phoenix)	CMAQ	17% devoted to bicycle and pedestrian projects
Memphis Urban Area MPO	STP-Urban	7.5% devoted to bicycle and pedestrian projects
Nashville MPO	STP-Urban	15% for Active Transportation Program (bicycle and pedestrian projects, and transit-supportive projects)
Puget Sound Regional Council (Seattle)	STP-Urban & CMAQ	10% for nonmotorized projects
Vermont	STP	Periodic set-aside for Bicycle and Pedestrian Program

Source: Parsons Brinckerhoff

3 Effect of Funding Program Processes and Management

State DOT and MPO management of transportation enhancement programs (and processes to program them) can inhibit applying a prioritization process that clearly relates projects selected back to established goals and objectives.

Those agencies that have provided straightforward and focused guidance on their enhancement programs, made clear how projects should relate to broader planning initiatives' goals and objectives, and have conducted extensive outreach with local partners noted greater success with soliciting and funding "good" projects and achieving broad-based, informed participation.

3.1 Overview

A set of questions in the survey focused on the execution and management of programming transportation enhancement, STP-Other, and CMAQ funds from the perspective of project selection and prioritization processes. The management of states' transportation enhancement programs, commonly as a standalone grant program, typically have resulted in project selections and prioritization that are less directly linked to broader planning processes than for other federal funding programs, including STP and CMAQ. Goals and objectives established in states and regions' long-range planning documents and bicycle and pedestrian master plans often are not strongly reflected in their respective transportation enhancement programs. Because of this, bicycle and pedestrian projects selected for funding within a transportation enhancement program do not evidence a direct relation to these planning documents as frequently as those selected for funding through STP or CMAQ programs.

The remainder of this chapter presents the results of survey questions and responses that explored the following process and management topics, from which resulting challenges and implications are drawn.

- General administration of enhancement, STP-Other, and CMAQ programs
- Development and implementation of prioritization processes
- Responsible entities for prioritization decision-making process
- Frequency and schedule with which project selection and prioritization take place

3.1.1 Funding Program Administration

Because the Transportation Enhancement program is a federal-aid program, FHWA provides guidance and oversight but leaves most of the details to the states, which manage and administer distinct programs for soliciting and selecting projects. Some states choose to suballocate their transportation enhancement funding. In these cases, funds are suballocated for the most part to MPOs, but, as in the case of Montana, they can also be suballocated to local (city and county) and tribal governments. The state DOT may simply accept the selections made at the metropolitan level and administer the funds or, in addition, provide formal review and approval. Project prioritization may take place at one or more of these state, regional, or local levels. No matter the arrangement, local jurisdictions and other qualified

entities typically apply to the state or regional program on a periodic basis as if it were a grant program, although funding is provided only on a reimbursable basis.

For STP-Other and CMAQ funding allocation, project selection and prioritization mostly takes place at the MPO level, since MPOs are the direct recipients of CMAQ funding and a minimum suballocated share of STP funding based on population.

For all three federal funding programs, nonmotorized project selection and prioritization are often performed on a “call for project” application basis.

3.1.2 Project Prioritization Process Development and Implementation

The survey asked about administrative characteristics of prioritization processes employed by state DOTs and MPOs. Four related questions queried:

- If the prioritization process was developed through a structured and informed procedure (e.g., incorporating stakeholder input, applied knowledge of prior process outcomes, tested on a trial basis)
- If the process is formalized in a policy or instructional document
- If the process is accessible to the public (e.g., available online)
- If the process is periodically reviewed and updated as necessary

With respect to TE programs, only about one-third of state DOT respondents indicated their prioritization processes were developed through a planned exercise and that it is formalized in a policy or instructional document. Less than one-quarter said the process is accessible by the public. For MPOs, about half indicated that the process was structured, is formalized in policy, and is available to the public. About half of state DOTs said they periodically review or update the process; this percentage was about two-thirds for MPOs. Among CMAQ and STP-Other programs, only MPO responses were sufficient in number to draw any conclusions. But notably, for all four administrative characteristic questions and for both program types, the vast majority of MPOs answered affirmatively. It appears that TE program prioritization processes have been subject to less formal development and execution and that generally greater process rigor is exhibited by MPOs than state DOTs.

3.1.3 Project Selection and Prioritization Responsibility

When programming transportation enhancement, STP-Other, and CMAQ funding, project selection and prioritization is most often performed by agency staff or an agency-managed committee or working group.

- In a few instances, an advisory committee is composed of members appointed by an elected official.
- A combination of staff and committee can also be employed. (For example, technical scoring is performed by agency staff and subsequently reviewed by a committee that finalizes funding allocations, taking into account more subtle trade-offs between project size, technical merit, and cost-effectiveness.)
- Uncommonly, applicants to a program, (local jurisdictions or agencies) self-score their project submissions, which are then checked by agency staff.

No discernable preference for agency staff or committee-led responsibility exists among those who responded to the survey, nor is there any distinction regarding responsibility across TE, STP, or CMAQ programs. (Among the relatively small number of state and local programs that fund bicycle and pedestrian programs, the survey indicated that agency staff is charged with project selection and prioritization more often than a special committee.)

Selection Committees

Respondents remarked on both the positive attributes and the drawbacks of those responsible for their respective project selection processes. Among those agencies that employ a technical advisory/coordinating committee or working group, many lauded the multidisciplinary benefits of the team, where membership diversity and multiple perspectives help to arrive at a balanced and transparent consensus that ultimately select the “best” projects and identifies (and offers the opportunity to correct) “fatal flaws or [other] issues” prior to a funding commitment. Committee membership is the most diverse among TE programs, where input from non-transportation departments such as historic and environmental resources is sometimes sought due to the nature of the assorted activities included in the TE program. On the other hand, this diversity (with respect to enhancements) was cited by one state DOT as problematic, resulting in scoring that was too divergent. The DOT eliminated its scoring committee, which included other state agencies such as historic resources, conservation and recreation, and public transportation, and now only uses headquarter and district office enhancement staff.

At the metropolitan level, several MPOs noted that selection or advisory committee membership often includes local jurisdictions—the very ones who also apply to STP or CMAQ programs. Politicization, bias, and conflicts of interest were occasionally cited in these cases. Conversely, a lack of elected official representation can cause problems after project selections are made, as two regions highlighted obstacles and process delay due to disagreement with the scoring results.

Agency Staff

Those who rely primarily on agency staff commended the objectivity these approaches can produce, as technical procedures and criteria evaluation are often well developed and without the controversy committee involvement can generate. However, a few agencies noted challenges with resources and sufficient staff availability to complete all the necessary project review processes. In the case where project applicants self-score their projects, an upward bias is possible. Subsequent agency review, and more importantly a “firm set of guidelines” for the scoring process, can abate this issue. Absent objective, quantitative evaluation criteria, though, it may be difficult to avoid inflated or biased inputs.

3.1.4 Project Programming Schedule and Frequency

Programmatic prioritization processes often conform to a schedule for a “call for projects.” They can occur on a regular (e.g., biennial) basis or on a more ad hoc, opportunistic schedule based on the availability of funding. Cycles of federal reauthorization have had some impact on schedule, especially as the expiration of one authorization bill nears and the outcome of the next is initially unclear, potentially introducing uncertainty into funding levels and availability, as well as the continuation of the program itself. More significantly, state budgeting practices and their expectation and estimation of available federal program funding impact DOT and MPO decision-making processes on when to solicit and prioritize projects. In some cases, a policy decision has been made to devote a certain percentage of STP or CMAQ funding to bicycle and pedestrian projects, and a project selection and prioritization process must take

place, often even if projects have already been prioritized in the past, as priorities may shift and project readiness varies. At the metropolitan level, prioritization may occur in conjunction with updates to the TIP, which agencies often do on an annual or biennial basis.

3.1.5 Resulting Challenges

The survey provided a number of specific challenges agencies face when selecting and prioritizing projects in a programming context, especially with regard to transportation enhancement programs, that relate to funding program processes and management.

Several agencies cited a disconnect between projects selected by MPOs and those ultimately aggregated and selected at the state level. In one example, MPOs of a particular state focus their enhancement project selections on just bicycle and pedestrian projects, whereas the state seeks to award projects from all 12 enhancement categories. As a related challenge, some agencies observed difficulties selecting and prioritizing between the various activities, especially infrastructure (e.g., bicycle and pedestrian facilities) versus non-infrastructure (e.g., educational activities, historic preservation, and scenic beautification) projects. In more than one case, a state DOT's desire to optimally distribute TE funding throughout the state conflicts with MPOs' project selections or results only in partially funding project selections. In another scenario, a state DOT considers MPO project selections on an advisory basis, with one MPO reporting that most times the advice is not honored.

Prioritization of bicycle and pedestrian improvements as "enhancements" are often governed by criteria and processes established for programming a state or metropolitan region's Transportation Enhancement program, which may differ from processes and criteria for bicycle and pedestrian projects programmed outside of it (such as with STP or CMAQ funds). The application of two sets of processes and criteria complicate the ability to relate project selections back to plan goals and objectives on a consistent basis.

Several agencies reported that their application and selection process is too complex, with time-consuming and occasionally redundant questioning. Local project sponsor participation can vary based on interest and knowledge of the TE program. Challenges with local project sponsor education of program eligibility requirements, application process, and more generally, the requirements of project development when receiving federal aid are also present.

For STP-Other and CMAQ programs, difficulties with local partner relationships and agreement on project scoring criteria were manifest. A lack of regional consideration on project priorities or focusing on individual local jurisdiction needs rather than a broader bicycle and pedestrian network was also cited by agencies as an obstacle.

3.1.6 Implications

Greater success is met with relatively simple and straightforward transportation enhancement programs that make clear their goals and evaluation criteria. Program guidance and outreach can help educate participants and stakeholders. For example, the New York State Department of Transportation conducts extensive outreach with local municipalities and holds workshops to advise on program guidance changes (although at the same time, it acknowledges that its application is complex). Other agencies apply a multi-step application process that allows for outreach and feedback opportunities to applicants to help hone their projects for approval.

Establishing well-defined goals and objectives among the disparate activities within the TE program is challenging. Some agencies select a subset of the 12 TE activities or redefine them in a way that better match program objectives and make it simpler to administer and prioritize. For example, the Metropolitan Council (Minneapolis-St. Paul) recategorized the 12 TE activities (scenic & environmental, bicycle/pedestrian connections, historic & archaeological, streetscape/pedestrian enhancements), each with separate application questions and ranking criteria. Others choose to focus on just bicycle and pedestrian projects and, in a few cases, combine TE funding with other federal and state resources for nonmotorized transportation—effectively prioritizing across multiple funding programs.

The many and disparate activities within the TE program have also led to project awards spreading resources too thinly in an effort to ensure a widespread geographic dispersion. In Virginia, for example, this had led to many projects receiving only a portion of the requested funding. To address this problem, the Virginia Department of Transportation maintains separate priority scoring processes for new project applications and projects that are “existing,” i.e., those that have received prior funding for planning, environmental work, or construction of earlier phases of the project. Existing projects are scored on progress made in environmental review, design, and right-of-way acquisition, as well as the status of prior phases if applicable. Existing projects that score the highest priority are those that have progressed through all applicable phases of project development and are essentially ready for construction. New projects must go through a more rigorous and comprehensive scoring process applying criteria such as demonstrated need, project benefit, and available project resources.

The challenges cited for STP-Other and CMAQ programs suggest that a greater focus on establishing regional priorities and formalizing them through the transportation planning process would help provide a forum for consensus among participating local jurisdictions. Broader goals and objectives and agreed-upon evaluation criteria can be established in a master plan or other planning document, which can later guide the selection and prioritization of projects at the programming stage.

4 Prioritization Processes and Methods in Practice

Prioritization of transportation enhancements and bicycle and pedestrian projects rely predominantly on qualitative criteria and evaluation methods with some application of quantitative methods.

At the same time, state DOTs and their partners are challenged to establish enhancement and nonmotorized project prioritization methods that are as technically driven as those applied to motorized projects due to often inadequate project evaluation data and a consequent reliance on qualitatively evaluating project criteria.

If project selection and prioritization at the programming stage are more closely related to existing plans developed through a performance-based planning process, the drawbacks of qualitative methods can be diminished. A long-range transportation plan or bicycle and pedestrian master plan produced within a framework of clear, performance-driven goals and objectives can lay the groundwork for a desirable outcome at the programming stage. That is, “projects that implement the plan” can be a significant evaluation criterion for funding program prioritization. Some specific prioritization methods can also help to manage the subjectivity of selection criteria. The use of multiple evaluators or technical committees drawn from a variety of participating agencies or disciplines is an option. In addition, some agencies have successfully applied cost-effectiveness measures to their processes, even if they incorporate qualitative measurement of benefits or outcomes.

4.1 Overview

A broad array of criteria are used to evaluate and prioritize enhancements and bicycle and pedestrian projects, the relative importance of which varies across projects funded with transportation enhancement, STP, or CMAQ program funds. Most state DOTs and MPOs apply a qualitative approach to evaluating these criteria and prioritizing enhancement projects (all activity types including bicycle and pedestrian). The same is true for bicycle and pedestrian projects programmed with STP and CMAQ funds, although the use of quantitative methods in combination with qualitative ones is more prevalent for these funding sources than for projects funded through transportation enhancement programs.

The application of more rigorous, objective prioritization processes and quantitative methods is more often applied to long-range transportation plans and bicycle and pedestrian master plans, where the restrictions of funding program requirements do not necessarily play a major role. However, state DOTs and MPOs apply these methods to evaluating prioritization criteria much less frequently when actually programming enhancement, STP, and CMAQ program funds. Project criteria evaluation is often based more on potentially preferential judgment or data interpretation than analytical rigor. Nonetheless, depending on agency or regional context, this may or may not be seen as an area in need of improvement.

This chapter presents the findings of the survey and accompanying research on the specific processes and methods used in practice to prioritize enhancement and other nonmotorized projects. It begins with an overview of prioritizing transportation projects and the methods examined in the research. Individual sections follow that respectively summarize transportation enhancement, STP-Other and CMAQ program,

and state and local program project prioritization. Building on these three sections, a detailed examination of more innovative methods and the application of refined quantitative techniques highlight examples of current best practice. The chapter concludes with additional challenges and recommendations on implementing best practice.

4.2 Prioritization Methods Background

An overview of applying prioritization processes to the selection of transportation projects and the methods used in practice that were explored in the survey underpin the findings of the research and are presented in this section.

4.2.1 Project Prioritization Practice

The literature review affirmed that there is a well established body of practice for planning, programming, and prioritizing motorized transportation projects that address safety, mobility, preservation, and other transportation system performance objectives. This is complemented, in many states and MPOs, by ongoing work to develop better measures and tools for assessing the extent to which transportation projects support their broader policy objectives. The movement toward performance-based planning and the use of performance measurement to drive the allocation of resources and the selection of projects has resulted in ongoing work to improve methods for prioritizing projects. The current fiscal environment has provided further impetus to better ensure that prioritization methods evaluate the benefits or return-on-investment of projects against the policy objectives set for them. Even so, prioritization processes for nonmotorized projects are not as well developed and understood as their motorized project counterparts.

Applying project prioritization best practice should result in the selection of projects that clearly relate back to stated goals and objectives and implement strategies that address them. Those projects deemed the best or most effective at meeting needs derived from this process should precede those that do so to a lesser extent. Effective project prioritization ensures that public revenues are used fairly and equitably. It affords stakeholders a transparent process that clearly explains why projects were chosen. These requirements imply that the prioritization process should be understandable to stakeholders and the public and should hold up under examination. Recent research presented at the 85th Annual Meeting of the Transportation Research Board formalizes these prioritization process characterizations as being *rational* and *defensible* (Turochy and Willis, 2006). The researchers state that “a *rational* procedure is one with clear steps in a sequence that can ideally be understood by the layperson, while a *defensible* procedure is one that is open to scrutiny with respect to the data used in the process and which resultant scores or rankings assigned to projects evaluated are related to the attributes of proposed improvements.”

4.2.2 Project Prioritization Methods

The literature review identified several types of prioritization methods for examination in the context of enhancement and other bicycle and pedestrian projects, as described in the following sections. It also identified a comprehensive list of criteria (Table 4-1) used to evaluate enhancement and other bicycle and pedestrian projects for selection and prioritization purposes. The completeness of the criteria list was confirmed through pre-survey testing and a post-survey exercise that compared prioritization criteria in documentation acquired directly from survey respondents with that used in the survey.

TABLE 4-1: ENHANCEMENT AND OTHER BICYCLE AND PEDESTRIAN PROJECT SELECTION/PRIORITIZATION CRITERIA

✓	Technical merit (feasibility, meets design standards, realistic scope/schedule/budget)
✓	Importance (level of documented priority)
✓	Level of support (from the community, from government)
✓	Relationship to/consistency with adopted plans, policies, or other investments
✓	Leverage / amount of financial match or overmatch (amount beyond minimum federal or state requirement)
✓	Project readiness / stage of completion (feasibility, preliminary engineering, environmental clearance, right-of-way acquisition, final design)
✓	Enhances livability / demonstrates quality of experience / improves quality of life / improves population health
✓	Enhances environmental and/or community sustainability
✓	Supports mixed use development, regional growth centers, activity centers, or smart growth
✓	Supports multimodal transportation alternatives, transit connections
✓	Benefits specific populations (transportation disadvantaged, economically distressed areas, tourism)
✓	Total population served / level of exposure or access / amount or density of nearby population/employment
✓	Provides connectivity among other facilities or regions of activity, adds to or enhances existing network
✓	Completes planned corridors, fills gaps
✓	Addresses safety, reduces crashes
✓	Evidence of a long-term plan (preservation, maintenance, ownership, operations)
✓	Demonstrates innovation or unique features
✓	Contributes to wide geographic dispersion of funds
✓	Loss of opportunity, delay is detrimental
✓	Addresses multiple enhancement activities (transportation enhancement projects only)

Qualitative Scoring System

A qualitative scoring system evaluates information or data subjectively against established criteria that relate to pre-determined goals. Each criterion is assigned a maximum number of points and information or data are scored accordingly. Criteria or groups of related criteria may be weighted relative to others. Projects are ranked (prioritized) in order of total points scored. Alternatively, information is simply judged subjectively without ascribing points and projects ranked in order determined by an evaluator(s). In all cases, the results may not be independently reproducible.

The sample criterion below could be part of a qualitative scoring system, where it would be scored based on the maximum number of points assigned.

Level of community support as known by project evaluator(s) or provided by funding program applicant (20 points maximum)

Any number of additional criteria with assigned points and potential weighting factors would comprise a possible qualitative scoring system.

Quantitative Scoring System

A quantitative scoring system evaluates information or data objectively against criteria that are represented by values or value ranges. Each criterion is assigned a maximum number of points and information or data are scored accordingly. Criteria or groups of related criteria may be weighted relative to others. Projects are ranked (prioritized) in order of total points scored. Results are independently reproducible since no subjective weighing of the criteria takes place.

The sample criterion below could be part of a quantitative scoring system, where it would be scored based on the maximum number of points assigned.

Project right-of-way acquired: 100% (10 points); 75-99% (5 points); 50-74% (3 points); <50% (0 points)

Any number of additional criteria with assigned points and potential weighting factors would comprise a qualitative scoring system.

Hybrid Qualitative-Quantitative Scoring System

Qualitative and quantitative evaluation criteria, as illustrated in the examples above, can be combined to form a hybrid qualitative-quantitative scoring scheme for ranking (prioritizing) projects.

Potential/Deficiency Scoring System

Potential or deficiency scores can be used as criteria in a qualitative or quantitative scoring system or as a standalone prioritization method. Potential or deficiency scores are developed using qualitative or quantitative conditions or characteristics (e.g., physical location, congestion levels/level of service, crash rates) to indicate the “potential” for bicycle or pedestrian activity or “deficiency” that inhibits activity. In the case of a potential/deficiency scoring system, projects are ranked based on scores or indices that prioritize areas with greatest potential or deficiency. Often this method is applied to the development of a long-range transportation plan or bicycle/pedestrian master plan rather than to project selection for funding programs.

Economic Evaluation Tools

Economic evaluation tools include cost-effectiveness and benefit-cost analysis. Like potential/deficiency scores, the results can be used as criteria in a qualitative or quantitative scoring system or form the basis of a standalone prioritization method. Both measure a project’s expected outcomes relative to its costs, but in the case of a benefit-cost analysis, all project benefits are quantified and monetized over time and discounted back to the present. Cost-effectiveness simply relates any measure of benefit or outcome to cost, likely without its monetization or evaluation over time.

In all methods described above, projects under consideration can be selected based on relative merit or on a standalone basis (Turochy and Willis, 2006). Projects prioritized based on relative merit involve comparing criteria scores among the entire set of projects considered. Projects prioritized on a standalone basis are not dependent on the scores of other projects under consideration. Most often

in a competitive environment, where the number of proposed (and most likely, desired projects) exceeds available resources, prioritization based on relative merit takes place. This is also specifically true of qualitative scoring systems where comparing prospective projects to one another helps to provide bounds to the subjective nature of the process.

4.3 Summary of Methods: Transportation Enhancement Prioritization

Prioritization of transportation enhancement projects, both bicycle and pedestrian and the other nonmotorized activities, overwhelmingly relies on qualitative scoring systems. Hybrids methods that combine both qualitative and quantitative scoring systems techniques are also in use, but are typically weighted toward the qualitative.

The use of potential/deficiency scoring systems or economic evaluation tools are largely absent from enhancement prioritization. Some agencies and regions, however, are attempting to or are considering the application of more refined quantitative methods, including economic evaluation tools.

4.3.1 Qualitative and Quantitative Scoring Systems

Twenty-one responding states and 11 responding MPOs indicated that either a qualitative or quantitative scoring system was used to prioritize transportation enhancement projects. Respondents indicated that these scoring systems are used exclusively, in combination with one another, or in combination with a potential/deficiency scoring system or economic evaluation tool. However, upon further exploration of responding agency processes by examining documentation available on the Internet and included with submitted surveys, the use of potential/deficiency scoring systems or economic evaluation tools could not be confirmed. It is postulated that in the small number of cases where these methods were indicated, the respondent misunderstood the definitions of these processes or overrepresented the characteristics of their own prioritization process.

Detailed information on the criteria used in the qualitative and quantitative scoring systems were collected in the survey by asking respondents to indicate on a scale of 1 to 5 the importance of various criteria, with 1 indicating “minor importance” and 5 indicating “major importance.” The criteria presented are those presented in Table 4-1. Respondents had the opportunity to input their own in an “Other” category, but it was little used.

Scoring sophistication varied among qualitative scoring systems. In its most basic form, a transportation enhancement program application might ask open-ended questions about project description, purpose, and benefits. A reviewer would then interpret the answers within the context of certain criteria, such as those in Table 4-1, and subjectively assign the project points based on how well the project appeared to meet the criteria. More sophisticated applications feature questions framed directly within the context of specific criteria, inquiring about specific data or characteristics, and better indicating to the applicant the correlation between the quality of information or data to be provided and the points assigned to that particular criterion. Quantitative scoring systems—which in many cases were combined with qualitatively scored questions in the same application or prioritization process—take this one step further. A quantitative scoring system specifies values or qualities a particular criterion may have, and points are

assigned to the values or range of values for purposes of project scoring along that criterion. With a quantitative scoring system, objective, data-driven scores are achieved.

For those criteria in Table 4-1 selected by respondents, their indicated relative importance serves as a proxy for any applied weighting factors ascribed to each. In this manner, it is more straightforward to assess in general which are the more significant and less significant criteria, without concern for the arbitrary and varied scales agencies apply in weighing one criterion (or set of criteria) against another. For example one agency may assign 25 points each to four criteria in the table for a total of 100 points. Another agency may use all the criteria in the table and assign each various numbers of points that sum to 100. It is much simpler to compare these two examples by examining the relative importance each would assign to the criteria they use. Table 4-2 ranks the criteria by importance among state DOTs and Table 4-3 ranks the criteria among responding MPOs. The levels of importance are presented on a scale from 1 to 5.

The differences in criteria importance between state DOTs and MPOs are worth noting. Criteria considered to be the most important by state DOTs relate strongly to the feasibility and general merit of the project: whether it has a realistic design, schedule, and budget; whether project development has advanced sufficiently; and whether it has broad support. Although these considerations are also important to MPOs, issues germane to metropolitan transportation system development garnered greater significance: network enhancement or connectivity; corridor completion or gap filling; and support for a multimodal transportation system. These more system-specific considerations make sense for a planning-oriented agency that focuses on the needs of a defined metropolitan region compared with the broader mission of a state DOT to deliver and operate a statewide transportation system with a strong focus on highway infrastructure.

The relationship between prioritized enhancement projects and existing plans is important to note. State DOTs and MPOs agree on the significance of relating the project to existing plans, policies, and other investments; however, the criterion is only of moderate importance (3.5). This result may suggest a difficulty in doing so due to transportation enhancement program requirements or the ways in which agencies structure them. The importance of plan or policy consistency was greater for STP-Other and CMAQ programs as noted in Section 4.4.1.

TABLE 4-2: THE IMPORTANCE OF SCORING CRITERIA FOR ENHANCEMENTS AS REPORTED BY DOTs

Major Importance	
✓ Technical merit (feasibility, meets design standards, realistic scope/schedule/budget)	5.0
✓ Level of support (from the community, from government)	4.6
✓ Addresses safety, reduces crashes	4.1
✓ Project readiness / stage of completion (feasibility, preliminary engineering, environmental clearance, right-of-way acquisition, final design)	4.1
✓ Provides connectivity among other facilities or regions of activity, adds to or enhances existing network	3.8
✓ Completes planned corridors, fills gaps	3.5
✓ Relationship to/consistency with adopted plans, policies, or other investments	3.5
✓ Leverage / amount of financial match or overmatch (amount beyond minimum federal or state requirement)	3.3
✓ Importance (level of documented priority)	3.2
✓ Supports multimodal transportation alternatives, transit connections	2.9
✓ Evidence of a long-term plan (preservation, maintenance, ownership, operations)	2.9
✓ Enhances livability / demonstrates quality of experience / improves quality of life / improves population health	2.5
✓ Addresses multiple enhancement activities (transportation enhancement projects only)	2.4
✓ Benefits specific populations (transportation disadvantaged, economically distressed areas, tourism)	2.1
✓ Enhances environmental and/or community sustainability	1.6
✓ Contributes to wide geographic dispersion of funds	1.6
✓ Supports mixed use development, regional growth centers, activity centers, or smart growth	1.4
✓ Total population served / level of exposure or access / amount or density of nearby population/employment	1.4
✓ Loss of opportunity, delay is detrimental	1.3
✓ Demonstrates innovation or unique features	1.0
Minor Importance	

Sample size = 21 responding DOTs

TABLE 4-3: THE IMPORTANCE OF SCORING CRITERIA FOR ENHANCEMENTS AS REPORTED BY MPOS

Major Importance	
✓ Provides connectivity among other facilities or regions of activity, adds to or enhances existing network	5.0
✓ Completes planned corridors, fills gaps	4.9
✓ Supports multimodal transportation alternatives, transit connections	4.6
✓ Addresses safety, reduces crashes	3.9
✓ Technical merit (feasibility, meets design standards, realistic scope/schedule/budget)	3.6
✓ Level of support (from the community, from government)	3.5
✓ Relationship to/consistency with adopted plans, policies, or other investments	3.5
✓ Supports mixed use development, regional growth centers, activity centers, or smart growth	3.5
✓ Project readiness / stage of completion (feasibility, preliminary engineering, environmental clearance, right-of-way acquisition, final design)	3.3
✓ Total population served / level of exposure or access / amount or density of nearby population/employment	3.3
✓ Enhances livability / demonstrates quality of experience / improves quality of life / improves population health	3.1
✓ Importance (level of documented priority)	2.9
✓ Enhances environmental and/or community sustainability	2.4
✓ Benefits specific populations (transportation disadvantaged, economically distressed areas, tourism)	2.2
✓ Evidence of a long-term plan (preservation, maintenance, ownership, operations)	2.1
✓ Addresses multiple enhancement activities (transportation enhancement projects only)	2.0
✓ Loss of opportunity, delay is detrimental	1.7
✓ Contributes to wide geographic dispersion of funds	1.4
✓ Demonstrates innovation or unique features	1.3
✓ Leverage / amount of financial match or overmatch (amount beyond minimum federal or state requirement)	1.0
Minor Importance	

Sample size = 11 responding MPOs

4.3.2 Economic Evaluation Tools

Two state DOTs indicated that economic evaluation tools were applied to the prioritization process in place for their respective transportation enhancement programs. Both state DOTs also used a qualitative scoring system, and it was clear that the economic evaluation tool—specifically benefit-cost analysis—was applied on a supplementary basis, incorporated into the broader qualitative evaluation. Also in both cases, neither respondent indicated that specific benefits were actively being measured for the purposes of the benefit-cost analysis. In one case, benefit-cost was simply a consideration to be judged qualitatively and assigned a score from 1 to 10, as with numerous other qualitative criteria. In the other state DOT instance, its TE program instructions refer to “level of benefit for cost, within the community context” as a consideration under a broader “Financial Factors” prioritization criteria, as well as “weighting the cost to administer a project against the benefits expected” under an “Administrative Obligation” criterion.

Overall, the research indicated that economic evaluation tools are simply not used in existing TE program prioritization processes to any meaningful extent. However, eight state DOTs and eight MPOs indicated that they are considering or would like to apply an economic evaluation tool analysis to their prioritization of TE projects. A few agencies also indicated that they are actively attempting to measure certain benefits, but no one benefit was identified as being measured by more than a few agencies.

Table 4-4 indicates how many of the 16 total agencies are considering certain types of benefits for measurement in a potential economic evaluation tool application. The table distinguishes between those benefits for which the agency possesses the data or ability to collect it and those for which the agency does not. Decreased auto use, economic development, mobility benefit, and safety are being considered by at least two-thirds of the 16 agencies; however, all four benefits have data collection challenges. Few of those agencies indicated that they had the data or ability to collect in order to evaluate these benefits. Overall though, data collection is a challenge regardless of benefit. Only in the case of air quality, transportation equity, and transit use did about half of the responding agencies indicate they possessed the appropriate data or ability to collect it. This is not surprising, as measurement of these benefits have a precedent. Air quality benefits are measured in conjunction with the conformity process; measuring equity relies on readily available socioeconomic and demographic data; and transit agencies generally have a good understanding of their usage characteristics and trends. Extending measurement of these benefits to the purposes of evaluating enhancement projects may not represent a significant added challenge.

TABLE 4-4: BENEFITS STATE DOTs AND MPOs ARE CONSIDERING FOR ECONOMIC EVALUATION TOOL APPLICATION TO ENHANCEMENT PROJECT PRIORITIZATION

	Would Like to Measure and Apply	Have Data or Ability to Collect It	No Data or Ability to Collect It
Decreased auto use	12	1	11
Economic development	12	3	9
Mobility benefit (value of trip)	11	1	10
User safety benefits	11	2	9
Environmental sustainability	9	1	8
Air quality improvements	9	4	5
Livability	8	1	7
Visual/aesthetic improvements	8	1	7
User health benefits	8	1	7
Decreased energy consumption	8	2	6
Transportation equity	8	4	4
Increased transit use	8	5	3
User recreation benefits	7	0	7
Cultural/historic preservation	7	1	6
Community cohesiveness	7	1	6
Improved land use decisions	7	2	5
Increased tourism	7	2	5
Urban revitalization	7	2	5

In general, state DOTs and MPOs had equal desires when considering various benefits for an economic evaluation tool application. A few benefits were of greater interest to MPOs than DOTs, including mobility benefit, user health benefits, improved land use decisions, and transportation equity, which are often issues of greater focus in metropolitan regions.

Only three of the eight state DOTs and two of the eight MPOs report that they are actively undertaking efforts to measure and apply certain benefits to an economic evaluation tool analysis. Three of these five agencies reported measuring increased transit use, and two of the five agencies reported measuring safety, decreased auto use, transportation equity, and economic development. Several other benefits are being measured by just one of these five agencies.

4.4 Summary of Methods: STP-Other and CMAQ Program Prioritization

Similar to the findings for enhancement projects, qualitative scoring systems or hybrid qualitative-quantitative scoring systems that are more subjectively weighted were the predominant finding among prioritization processes for STP-Other and CMAQ programs. About three times as many MPOs as state DOTs provided a survey response for these programs, reflecting the fact that they are more commonly responsible for these programs' administration and funding allocation. Several MPOs did indicate the use of more quantitative prioritization criteria incorporating cost-effectiveness measures.

Overall, five state DOTs and 14 MPOs provided a survey response about bicycle and pedestrian project prioritization using other Surface Transportation Program funding. Three state DOTs and 10 MPOs

responded regarding their CMAQ programs. These respondents include those agencies that devote a defined portion of their STP or CMAQ program funding to bicycle and pedestrian projects, as shown in Table 2-3.

4.4.1 Qualitative and Quantitative Scoring Systems

As with qualitative and quantitative scoring systems for TE programs, the scoring criteria and their importance for STP-Other and CMAQ programs were captured in the survey. Table 4-5 ranks the criteria for STP-Other-funded programs by importance among state DOTs and MPOs. Table 4-6 presents the criteria for CMAQ-funded programs. No distinction is made between responses from the two agency types because of the smaller number received than for TE programs.

TABLE 4-5: THE IMPORTANCE OF SCORING CRITERIA FOR STP-OTHER-FUNDED BICYCLE AND PEDESTRIAN PROJECTS AS REPORTED BY DOTs AND MPOs

Major Importance	
✓ Addresses safety, reduces crashes	5.0
✓ Provides connectivity among other facilities or regions of activity, adds to or enhances existing network	4.5
✓ Completes planned corridors, fills gaps	4.5
✓ Level of support (from the community, from government)	4.3
✓ Relationship to/consistency with adopted plans, policies, or other investments	4.1
✓ Supports multimodal transportation alternatives, transit connections	4.0
✓ Supports mixed use development, regional growth centers, activity centers, or smart growth	3.7
✓ Benefits specific populations (transportation disadvantaged, economically distressed areas, tourism)	3.5
✓ Technical merit (feasibility, meets design standards, realistic scope/schedule/budget)	3.3
✓ Importance (level of documented priority)	3.2
✓ Leverage / amount of financial match or overmatch (amount beyond minimum federal or state requirement)	3.1
✓ Enhances livability / demonstrates quality of experience / improves quality of life / improves population health	3.1
✓ Total population served / level of exposure or access / amount or density of nearby population/employment	3.0
✓ Project readiness / stage of completion (feasibility, preliminary engineering, environmental clearance, right-of-way acquisition, final design)	2.9
✓ Enhances environmental and/or community sustainability	2.3
✓ Contributes to wide geographic dispersion of funds	2.0
✓ Evidence of a long-term plan (preservation, maintenance, ownership, operations)	1.7
✓ Demonstrates innovation or unique features	1.4
✓ Loss of opportunity, delay is detrimental	1.0
Minor Importance	

TABLE 4-6: THE IMPORTANCE OF SCORING CRITERIA FOR CMAQ-FUNDED BICYCLE AND PEDESTRIAN PROJECTS AS REPORTED BY DOTs AND MPOs

Major Importance	
✓ Supports multimodal transportation alternatives, transit connections	5.0
✓ Technical merit (feasibility, meets design standards, realistic scope/schedule/budget)	4.6
✓ Relationship to/consistency with adopted plans, policies, or other investments	3.9
✓ Provides connectivity among other facilities or regions of activity, adds to or enhances existing network	3.9
✓ Completes planned corridors, fills gaps	3.9
✓ Benefits specific populations (transportation disadvantaged, economically distressed areas, tourism)	3.5
✓ Addresses safety, reduces crashes	3.5
✓ Level of support (from the community, from government)	3.3
✓ Project readiness / stage of completion (feasibility, preliminary engineering, environmental clearance, right-of-way acquisition, final design)	3.3
✓ Enhances livability / demonstrates quality of experience / improves quality of life / improves population health	3.3
✓ Enhances environmental and/or community sustainability	3.3
✓ Total population served / level of exposure or access / amount or density of nearby population/employment	3.3
✓ Evidence of a long-term plan (preservation, maintenance, ownership, operations)	3.3
✓ Supports mixed use development, regional growth centers, activity centers, or smart growth	2.7
✓ Contributes to wide geographic dispersion of funds	2.5
✓ Importance (level of documented priority)	2.3
✓ Demonstrates innovation or unique features	2.1
✓ Leverage / amount of financial match or overmatch (amount beyond minimum federal or state requirement)	1.8
✓ Loss of opportunity, delay is detrimental	1.0
Minor Importance	

The majority of the STP-Other- and CMAQ-funded programs for bicycle and pedestrian projects are managed by MPOs, as their funding is typically suballocated to metropolitan regions. Hence the ranking of the criteria in Table 4-5 and Table 4-6 is largely based on MPO response. There are no substantial differences between the criteria rankings for the two programs, although safety, which ranks the most important for STP-Other programs, only garners moderate importance for CMAQ programs (5.0 vs. 3.5). Safety clearly is a significant criterion for judging expenditures of STP-Other—the most flexible of the funding programs examined in the research—and is also often a principal criterion for prioritizing traditional roadway improvements and other projects eligible under STP. Since CMAQ's focus is to demonstrate improvement in a nonattainment or maintenance area's air quality, safety does not rank as highly. It is surprising, though, that environmental sustainability does not rank higher for CMAQ, although it was a more important criterion than it was for STP-Other (3.3 vs 2.3).

Finally, the relationship between projects prioritized for STP-Other and CMAQ programs and existing plans, policies, and other investments ranked near the top in importance (4.1 for STP-Other and 3.9 for CMAQ). These figures are greater than the 3.5 assigned to the criterion by both state DOTs and MPOs for

enhancement projects, suggesting that STP- and CMAQ-funded bicycle and pedestrian projects are better linked to plans and policies than enhancement projects are. Of course enhancement project selection is complicated by its other eligible activities, of which approximately 50 percent are not bicycle and pedestrian projects.

4.4.2 Economic Evaluation Tools

As with the general observation for TE programs, economic evaluation tools (namely cost-benefit analysis) are not applied to any substantial extent to the selection and prioritization of bicycle and pedestrian projects funded by STP-Other or CMAQ programs. The survey responses did include, however, two state DOTs and nine MPOs that indicated the use of economic evaluation tools, but upon further verification, the number of valid instances was reduced. Even so, among the remaining noteworthy applications, most of the processes are better characterized as more basic cost-effectiveness calculations (which were found to be used by other agencies as well) or “criterion-to-cost” or “score-to-cost” ratios that do not monetize any benefits or criteria evaluation results in the ratio’s numerator. The use of these measures by specific agencies are discussed further in Section 4.6.4.

As introduced in Section 2.2.2, CMAQ program evaluation often includes a cost-effectiveness component to demonstrate how well a proposed project contributes to a reduction in criteria pollutants and improvement in air quality relative to its cost. Some agencies refer to this analysis as cost-benefit, although in only a few instances did it appear that the benefits of emissions reductions were monetized. More often a simple reduction in pollutant amount (e.g., measured in kilograms) is divided by cost, and the “benefit” is simply this reduction in volume. It is not translated into a monetary benefit to, for example, the environment, the economy, or public health. On the other hand, this additional computation may not be deemed necessary in order to properly judge or weight the effectiveness of the project against others under consideration or a baseline of not implementing it at all.

Nine state DOTs and MPOs indicated that they are considering or would like to apply an economic evaluation tool analysis to their prioritization of STP-Other- or CMAQ-funded bicycle and pedestrian projects. As before with TE projects, Table 4-7 indicates which types of project benefits agencies would like to measure for project selections and how many have the ability or data to do so. There is a fairly even spread among the benefits, with economic development being cited the most, as it was with TE project evaluation. If you consider those benefits that respondents indicated their agency is actively attempting to measure, the results are more even, as air quality improvements and transportation equity—the two benefits that appear at the bottom of the list in the table—were mentioned the most frequently.

What the STP-Other and CMAQ results do reveal is that agencies have greater access to the data or the ability to collect it for the benefits they wish to measure. Whereas in the case of TE project evaluation only a little more than 20 percent of the desired benefits has data available or obtainable to measure them, nearly 50 percent of the desired benefits in the case of STP-Other and CMAQ projects has or potentially has the necessary supporting data. This result reinforces the difficulty in obtaining the data needed to measure TE project benefits, possibly in part because the program funds more than just bicycle and pedestrian projects—projects whose benefits are not easily quantifiable or commonly considered (as with landscape improvements or historic preservation). In addition, STP and CMAQ program policies and management stipulate or allow for better and more frequent data collection efforts

because they fund more than just nonmotorized projects; and in many cases, bicycle and pedestrian projects must compete against these other types of transportation improvements.

TABLE 4-7: BENEFITS STATE DOTs AND MPOs ARE CONSIDERING FOR ECONOMIC EVALUATION TOOL APPLICATION TO STP-OTHER OR CMAQ PROJECT PRIORITIZATION

	Would Like to Measure and Apply	Have Data or Ability to Collect It	No Data or Ability to Collect It
Economic development	8	5	3
User health benefits	7	2	5
User recreation benefits	7	4	3
Livability	7	3	4
Environmental sustainability	6	2	4
Decreased energy consumption	6	3	3
Improved land use decisions	6	2	4
Urban revitalization	6	2	4
Mobility benefit (value of trip)	5	4	1
User safety benefits	5	3	2
Decreased auto use	5	2	3
Community cohesiveness	5	3	2
Visual/aesthetic improvements	5	2	3
Cultural/historic preservation	5	2	3
Increased transit use	4	3	1
Increased tourism	4	2	2
Air quality improvements	3	2	1
Transportation equity	3	2	1
Other(s)	2	1a	1b

^a Mode shift; ^b Not indicated

4.5 Summary of Methods: State and Local Funding Program Prioritization

Section 2.2.3 introduced state and local funding programs that support bicycle and pedestrian improvements substantially through dedicated state or local resources. Table 4-8 summarizes a select number of programs in four states and two local regions (counties). A general assessment of their project prioritization processes reveals similar findings to methods applied to programs that distribute funds from federal programs. Funding allocated through two state-level programs in California leave project selection and prioritization to counties and cities in keeping with a large percentage of transportation funding in that state. Most often projects and their level of priority are already identified in an LRTP or local bicycle and pedestrian master plan. Other state-level programs in Maryland, Oregon, and Washington use qualitative and/or quantitative scoring systems to evaluate projects submitted through a competitive grant application process. Prioritization criteria are chosen based on program purpose and goals.

Two example county-level initiatives are supported with voter-approved sales taxes. In Pima County, Arizona (Tucson region), voter approval of a 20-year county sales tax for transportation was accompanied with an expenditure plan that included a prioritized list of bicycle and pedestrian projects, selected based on qualitative and quantitative evaluation of continuity, population served, economic

benefit, ease of implementation, and safety. Projects ultimately funded still must go through an application process where local jurisdictions submit projects to the RTA's Greenway, Pathway and Bike Element managed by a Bike/Pedestrian Working Group, but priority is granted to those projects that are "included in/and consistent with the voter-approved RTA Plan" (Regional Transportation Authority, 2011).

In San Diego County, a Bicycle and Pedestrian Working Group within the San Diego Association of Governments (SANDAG) manages a process to which local jurisdictions apply for funding from the Active Transportation Program, which is supported by a voter-approved local sales tax and the County's allocation of a statewide sales tax apportionment (see Table 4-8). Qualitative and quantitative criteria are applied to select and prioritize submitted projects. In its most recent call for projects, the criteria incorporated the objectives and scoring of projects in the County's 2050 Regional Bicycle Plan. In addition to information provided by applicants, SANDAG staff perform a GIS analysis to determine how well the project fairs based on proximity to population and employment, population and employment densities, and activity centers. SANDAG also applies a "cost-benefit" determination. The calculation is more accurately characterized, however, as a simple cost-effectiveness measure or "score-to-cost" ratio, as the "benefits" are not monetized but rather represented by summing the criteria's qualitatively and quantitatively computed scores.

TABLE 4-8: SELECTED STATE AND LOCAL FUNDING PROGRAMS THAT SUPPORT BICYCLE AND PEDESTRIAN PROJECTS

Location	Program	Funding and Purpose	Prioritization Process
California	Bicycle Transportation Account	1.04 cents per gallon from state motor vehicle fuel tax deposited in account; projects improve safety and convenience for bicycle commuters	Funds suballocated to counties and cities based on population; processes determined locally
California	Transportation Development Act (TDA) Article 3	¼-cent portion of statewide sales tax goes to a Local Transportation Fund (LTF) per the TDA; approximately 2 percent devoted to bicycle and pedestrian projects (Article 3)	LTF suballocated to counties and cities based on population; processes determined locally
Maryland	Bikeways Program	Broadly-defined bicycle improvement grant program	Hybrid qualitative-quantitative scoring system applied to projects submitted by application
Oregon	Bicycle-Pedestrian Grant Program	Biennial allotment of state highway funds (state motor fuels tax, vehicle registration fees, weight-mile tax) awarded to county and city projects and distributed to DOT regions	Qualitative scoring system using weighted criteria
Washington	Pedestrian and Bicycle Safety Program	Allocation of state funds through the state budgeting process to targeted safety improvements	Most recent call for projects was by invitation based on crash statistics; prioritization by risk location assessment
Pima County (Tucson)	Regional Transportation Authority (RTA)	Countywide sales tax (20 years) supporting a pre-determined list of bicycle projects and a separate allocation for shared use paths	Project selection by working group based on projects listed and prioritized in voter-approved RTA Plan
San Diego County	Active Transportation Program	2% of TransNet ½-cent local sales tax in combination with TDA Article 3 funds support bicycle and pedestrian projects	Hybrid qualitative-quantitative scoring system, includes cost-effectiveness criterion

4.6 Examples in Practice: Innovations and the Application of Refined Quantitative Methods

Among the survey respondents and additional agency and bicycle/pedestrian planning research were found several innovative and noteworthy applications of prioritization process methodologies and tools. These include variations or enhancements to the typical qualitative or hybrid qualitative-quantitative scoring systems used in practice, performing cross-categorical prioritization, the use of potential/deficiency scores, and the application of cost-effectiveness measures. The survey also queried use of a tool developed through NCHRP to assist in benefit-cost analyses of bicycle and pedestrian projects.

4.6.1 Variations in Prioritization Methods

Two notable variations in methods to prioritize enhancement projects that help to facilitate the use of subjective criteria and reduce potential bias were identified in the research: multi-criteria decision analysis and pair-based ranking.

Multi-criteria Decision Analysis

The MPO for the Colorado Springs metropolitan region—the Pikes Peak Area Council of Governments (PPACG)—applies a multi-criteria decision analysis to its transportation enhancement project selection and prioritization process (and to all projects considered for the TIP). With a multi-criteria decision analysis, the importance of both qualitative and quantitative evaluation criteria can be determined among a group of people that may not all agree on their relative contributions to the evaluation process. In general a multi-criteria decision analysis determines the relative weightings applied to the evaluation criteria taking into account as many interested parties as desired (experts, stakeholders, the public) in a transparent and straightforward process.

For PPACG, the weightings applied to scoring the evaluation criteria are determined by asking the project reviewers—in this case the Transportation Enhancement Subcommittee—to rank and rate the criteria. Ranking involves assigning a rank based on perceived importance on a nine-point scale. Similarly, rating assigns each criterion a percentage score between 0 and 100; thus, all criteria's ratings must add up to 100. The rankings and ratings for each criterion are then summed across all reviewers and assigned a relative weight by dividing by the respective totals. The weighted rankings and ratings are averaged to arrive at a combined weight for each criterion, which becomes the weight applied during the scoring process. For PPACG's TE program, scoring takes place on a nine-point scale across 12 criteria. By way of illustration, the TE evaluation criteria and their respective combined weights for PPACG's 2011–2012 TE Program selections are shown in Table 4-9. Note that the most heavily weighted "Project Cost and Estimated Benefit" criterion was deemed to be more than three times more important than the least weighted "Sponsoring" criterion. The weighting of these criteria take into account the diverse membership of the PPACG Community Advisory Committee to which the TE Subcommittee reports, with members from the cities and counties comprising the PPACG region, several community organizations, and members of the public at large.

TABLE 4-9: PPACG 2011–2012 ENHANCEMENT EVALUATION CRITERIA AND WEIGHTING

Transportation Enhancement Evaluation Criteria		Weighted Average
Access	Will the project provide access (within ½ mile for pedestrian or transit projects/within 3 miles for bicycle projects) to the following locations: Employment / Business / Shopping / Residential / Recreation / Civic / Education centers?	9.65
Connectivity	Does the project provide a missing link, extend connections, or eliminate a barrier that inhibits use of a facility?	10.15
Safety	Does the project address a safety hazard or safety concern?	9.73
Sponsoring	Is more than one sponsoring entity supporting the project?	3.46
Opportunity/Risk	Can the project be “piggybacked” with other project(s)? Is there risk of lost opportunity?	9.88
Financial Partnerships	Have financial contributions been committed to the project by other organizations / partners?	5.42
Overmatch	Is the sponsoring entity(ies) providing overmatch to the project?	4.81
Project Readiness	Is the project ready to be implemented (i.e., facility acquired, preliminary engineering complete, NEPA work complete?)	5.42
Social Equity	Does the project serve a low-income or minority community? (“Serve” is defined as the project starting, ending, or passing through a low-income or minority community.)	5.50
Multimodal Use	Does the project accommodate multimodal use (bicycle, pedestrian, equestrian, transit access, etc.) and provide an alternative to driving?	6.85
Context Sensitivity	What is the relationship between the project and existing amenities, which include, but are not limited to, natural areas, natural bodies of water, cultural sites, historic sites, parks, etc.?	5.42
Project Cost and Estimated Benefit	What is the regional benefit as determined by number of users, context enhancement or other benefits?	12.69

Source: PPACG (<http://ppacg.org/downloads/func-startdown/712/>)

Pair-based Ranking

A pair-based ranking methodology is applied by the North Dakota Department of Transportation to its Transportation Enhancement program. With this method, each project is evaluated against every other project on a one-on-one basis. Evaluations are based on an identified list of qualitative criteria and performed by a 10-member task force. Projects are ranked in order from most to least pair-wise evaluation preferences. This process, however, is only practical in cases where there are a small number of projects from which to select (as is the case in North Dakota), otherwise it becomes intractable. Pair-wise ranking methods should be used in cases where criteria are subjective, since the scheme is inherently based on preference between pairs of projects. The impact of subjectivity is reduced by considering each project against every other, instead of on standalone basis, effectively resulting in multiple evaluations of the same project rather than just one.

4.6.2 Prioritizing Across Defined Categories

Chapter 2 introduced the significance of funding programs and mode when prioritizing enhancement and other bicycle and pedestrian projects, and the majority of processes examined in the research confirmed the prevalence (and, to an extent, necessity) for applying a prioritization process within these contexts. In a few instances, however, agencies prioritize their projects using multiple funding programs or across modal categories, highlighting some notable outcomes.

Use of Multiple Funding Programs

Prioritizing enhancement and other bicycle and pedestrian projects by federal funding program at both the state and metropolitan levels is common. Bicycle and pedestrian projects funded through states' transportation enhancement programs for the most part are prioritized separate from other bicycle and pedestrian projects. In a few instances, though, project selection and prioritization takes place in concert with an effort to capitalize on multiple funding programs, including transportation enhancement programs. These examples imply less of a focus on programs themselves and greater emphasis on efficiency and achieving goals and objectives. It should be noted that this strategy implies the focus of TE funding in these cases, if the program is used, is principally bicycle and pedestrian projects.

In recent years, the Wisconsin Department of Transportation (WisDOT) has managed a Statewide Multimodal Improvement Program that combines federal (STP) and state funding in its State Bicycle and Pedestrian Facilities Program with its TE funding. The simple rationale on WisDOT's TE Program website states: "because the TE program also extensively funds bicycle and pedestrian facilities, the two programs share the same application, review and selection process" (WisDOT, 2012).

In the San Francisco Bay Area, a similar approach is underway. The newly introduced OneBayArea Grant combines federal and state funding suballocated to the nine-county Metropolitan Transportation Commission (MTC) region, including STP, CMAQ, and TE. Project selection is managed by MTC for regional programs and by county-level Congestion Management Agencies (CMA) for funds that are further suballocated. Bicycle and pedestrian improvements are eligible activities for the funds suballocated to CMAs. Responsibility for developing a project selection process and evaluation criteria, as well as conducting outreach, issuing a call for projects, and selecting projects is left to CMAs. These processes are ongoing until June 2013 and subject to changes in federal legislation requirements.

Also at the metropolitan level, the Mid-Ohio Regional Planning Commission (MORPC), the MPO for the Columbus, Ohio metropolitan region, solicits projects from public agencies within its urban area to implement with federal funds suballocated to the region by the state DOT. In its most recent solicitation, the suballocated funding from STP, CMAQ, and the TE programs are not treated separately. MORPC uses an overall application process designed around its LRTP goals (economy, natural resources, energy, collaboration, health/safety/welfare, sustainable neighborhoods) and six project categories (major widening/new roadway, minor widening/intersections/signals, bike/pedestrian, transit, system preservation, other). The use of a particular funding program is only determined once project application information is used to evaluate criteria developed for each goal and project category pair.

The benefits from this approach are easy to see. Prioritizing across multiple funding programs permits a project selection process with greater flexibility and allows for a more projects to be considered and weighed against one another. A stronger focus can be placed on a broader set of statewide or regional goals. At the same time, the administrative burden of managing multiple project selection processes with differing requirements and criteria is reduced. On the downside, TE projects other than bicycle and pedestrian improvements are not easily comparable within this type of selection process. If the policy decision has been made, however, to focus primarily on bicycle and pedestrian projects, this concern is diminished.

Prioritizing Across Mode Category

Prioritizing bicycle and pedestrian projects across modes occurs infrequently, but in a few notable examples, it can lead to greater emphasis being placed on assessing projects against broader policy objectives. One example is the prioritization process used by the MPO in the Albuquerque, New Mexico metropolitan region (Mid-Region Council of Governments [MRCOG]) to develop its TIP. A “master project scoring list” compiles “all projects into a comprehensive inventory for comparison between projects and across mode types” (MRCOG, 2009a). This master list identifies the projects which most (and least) effectively address the regional goals that are set in MRCOG’s LRTP, listed in Table 4-10.

TABLE 4-10: EXAMPLES OF CROSS-MODE PRIORITIZATION

MRCOG (Albuquerque)		Hillsborough MPO (Tampa)	
Goal (Performance Measure)	Mode-specific scoring?	Performance Measure	Mode-specific scoring?
Quality of Life (Air Quality, Safety, Environmental Justice, Preserve Existing Infrastructure)	No	Minimizing Impacts on Natural, Historic, Cultural or Archeological Resources	No
		Making Regional Connections	Yes
Mobility of People and Goods (Geographic Need, Volume/People Movement, Intermodal Connectivity, Alternate Modes, Performance Strategy)	Yes	Reducing Traffic Congestion	Yes
		Supporting Community Plans and Minimizing Community Impacts	No
Economic Activity and Growth (High Activity Areas, Private Sector – Freight, Local Priorities)	No	Alternatives to Driving Alone	Yes
		Improving Access to Activity Centers (Shopping, Jobs, Tourism, Education, and/or Medical)	Yes
		Enhancing Goods Movement	Yes
		Safety (Reducing Crashes)	Yes
		Supporting Security and Improving Emergency Evacuation	No
		Improving Existing Facilities	No

Source: MRCOG, Hillsborough MPO

Nonetheless, MRCOG acknowledges that “some federal funding categories are only available for certain types of projects. In these instances a project’s overall score is less important than how it scores against like projects” (MRCOG, 2009a). Because of this, most of the evaluation criteria for the first and third regional goal above are applied across all modes, but for the “mobility of people and goods” goal, the criteria vary by mode. In the end, the agency produces separate prioritization lists by mode as well as the master list. MRCOG notes that “this method of comparison highlights the roadway, transit, or any other project which most effectively addresses regional goals compared to other projects of the same type” (MRCOG, 2009a). Even so, neither list is definitive when it comes time to ultimately program projects into the TIP, highlighting (as discussed previously) the inescapable significance of funding categories to the ultimate project selection process.

A second example is found at the Hillsborough MPO (Tampa, Florida), which applies a similar methodology to its 2035 LRTP. Ten broad performance measures, each with a weighting factor, are used to identify and prioritize projects across all modes. Some criteria are scored equally regardless of mode, while others’ scorings are mode specific. Only after projects are prioritized through this process are

funding categories considered to select and program actual projects. For bicycle and pedestrian projects, funding comes from the MPO's STP-Urban allotment. Hillsborough MPO notes that a key consideration in developing the LRTP prioritization process was that it reflect the priorities of the MPO into the TIP process, assuring consistency and continuity (Hillsborough MPO, 2012).

In both cases—MRCOG and Hillsborough MPO—some goals have mode-specific scoring criteria, while others have criteria that are applied equally to all modes. Even if the criteria may differ, every project regardless of mode is evaluated against the same set of broad, regional goals prior to final TIP programming. Table 4-10 summarizes the goals and indicates which ones use mode-specific criteria and which ones do not. The table highlights the intuitive finding that broader, mode-independent goals include environmental protection, economic development, and community preservation.

4.6.3 Application of Potential/Deficiency Methods and Criteria

Prioritization processes for states' or regions' transportation enhancement, STP, or CMAQ funding programs generally do not use potential/deficiency scoring systems. Their application to the development of metropolitan regions' long-range transportation plans or bicycle/pedestrian master plans at the statewide, regional, and municipal levels are more common. In these instances, potential/deficiency indices or factors are used to develop plan priorities or as a criteria within another method of prioritization.

As discussed in the Survey Results section below, however, some respondents did indicate the use of a potential/deficiency scoring system, which upon further investigation were better characterized as other forms of prioritization methods.

Potential/Deficiency Indices

The City of Portland, Oregon is credited with first applying potential and deficiency indices to proposed pedestrian projects (FHWA, 1999b) when it was developing a pedestrian master plan in the mid-1990s. Its application has been used elsewhere since; some examples include the cities of Anchorage, Sacramento, Burlington, Vermont, and Wilmington, Delaware, as well as statewide applications in Arizona and Georgia. Applying potential and deficiency indices results in prioritizing projects in areas with deficient pedestrian infrastructure but where the existing built environment characteristics tend to promote more walking or the desire to walk (Cascade Bicycle Club, 2012). The indices can be calculated using qualitative or quantitative measures that assess existing deficiencies or a project's potential from among a chosen set of attributes: physical, environmental, policy, degree of public support, etc. Many of these criteria are the same as used generally in a qualitative or quantitative scoring system (see Table 4-1), but in this case, they are adapted to the potential/deficiency framework.

Continuing an example from the previous section, MRCOG (Albuquerque) prioritizes projects across all modes for its TIP but notes that when actual programming takes place, the result can change. The agency links its prioritization process to three broad performance measures established in the LRTP, one of which is "quality of life" (Table 4-10). It applies a Pedestrian Composite Index (PCI) as one means of evaluating pedestrian project "safety," one of several performance measures of quality of life (bicycle projects use crash rates). The PCI "identifies areas or markets by their potential for pedestrian activity" using a Pedestrian Activity Index (potential) composed of "positive indicators of pedestrian activity (e.g., pedestrian volume, presence of schools or parks)" and a Pedestrian Deterrent Index (deficiency)

consisting of “elements that discourage pedestrian activity (e.g., absence of pedestrian facilities, high pedestrian crash rates, high traffic speed or volume)” (MRCOG, 2009b). A low Pedestrian Activity score and high Pedestrian Deterrent score indicate an area where a pedestrian improvement would have great benefit.

Latent Demand Score

Another means of quantifying the potential for bicycle or pedestrian travel is the Latent Demand Score (LDS), which can be used to prioritize projects as a sole criterion or incorporated into a broader qualitative and/or quantitative scoring system. The LDS was developed as a means to estimate the level of bicycling or pedestrian activity along a defined roadway segment if a proper facility existed (FHWA, 1999b). Potential demand is determined by analyzing the proximity and trip generation potential of activity centers using probabilistic gravity model techniques. No state DOT or MPO that responded to the survey indicated that the LDS criterion is applied to prioritizing nonmotorized projects within their TE, STP, CMAQ, or non-federal programs. Nonetheless, as with other potential/deficiency methods, the LDS has found use in a longer-term planning context. The Atlanta Regional Commission’s (ARC) 2007 bicycle and pedestrian master plan prioritizes projects using seven criteria, one of which is potential bicycle travel demand as measured using the Latent Demand Method, which yields an LDS. The master plan defines the Latent Demand Method as follows (ARC, 2007a):

A methodology for estimating the potential demand for non-motorized travel at a location based on proximity and mix of origins and destinations; those locations where there are higher occurrences of evenly mixed origins (e.g., residences) and destinations (e.g., workplaces and retail establishments) will usually have higher potential demand for biking and walking; this potential could be released with improvements to biking and walking conditions.

ARC’s most recent solicitation for projects funded with its STP-Urban allocation predates the bicycle and pedestrian master plan, so the opportunity to link the projects prioritized in the master plan to a major funding source for bicycle and pedestrian projects has not yet fully occurred. In 2012, however, projects will be specifically solicited for ARC’s new Last Mile Connectivity Program as part of its fiscal year 2012–2017 TIP. In the latter four years, \$10 million per year in STP-Urban funding (plus a 20 percent local match) is devoted to this new program, which will fund bicycle and pedestrian projects consistent with the goals and objectives of the 2007 master plan and the region’s most recent LRTP. The exact process for selecting and prioritizing projects for this new program is yet to be determined.

Quantifying Quality

A set of measures related to those that characterize the potential for bicycle or pedestrian activity are indices or scores developed to quantify the *quality* of bicycle and pedestrian facilities. Examples of these measures include bicycle or pedestrian Level of Service, Stress Level, Compatibility Index, Interaction Hazard Score, and environmental factors. These measures typically use some combination of quantifiable physical characteristics (e.g., motor vehicle traffic volume and speeds, lane or sidewalk width, pavement quality, etc.), along with potentially more subjective attributes (such as ease of street crossings) to develop an overall index of suitability for bicycle or pedestrian travel (FHWA, 1999a). To the extent that quality is useful in estimating demand, such measures can be incorporated into or complement a potential/deficiency determination. These measures have been used on occasion in the development of long-range transportation plans and bicycle and pedestrian master plans.

Tools

Indices or factors used in a potential/deficiency scoring system can be developed to a high degree of analytical sophistication when applying GIS or Excel-based tools to quantify the project environment's characteristics. There are no widely accepted standards or methods for applying these techniques, but several applications exist on a plan-specific basis. For example, the Seattle Pedestrian Master Plan prioritization method utilizes a GIS-based methodology for conducting a pedestrian demand assessment (identifying and weighing pedestrian generators), an equity analysis (identifying areas that would benefit based on socioeconomic and health data), and an assessment of corridor function (identifying streets that are intended to serve a greater function for pedestrians). Following these analyses, high priority project areas are selected and a GIS-based needs assessment conducted based on environmental and infrastructure characteristics. Finally, potential/deficiency scores are generated using the potential demand and needs assessment results to prioritize projects where demand and inhibitors to walking are the greatest (Cascade Bicycle Club, 2012). The feasibility of applying such a rigorous methodology at the programming stage of project prioritization is questionable, but such techniques do lend themselves well to long-range and master planning at the regional or municipal level.

Survey Results

It should be noted that several survey respondents did indicate that a potential/deficiency scoring system is applied to bicycle and pedestrian program prioritization, but in reviewing documentation provided by the respondent or available on the responding agency's website, it was determined that these processes generally are better characterized as quantitative or hybrid qualitative-quantitative scoring systems with criteria that could be applicable to a potential or deficiency analysis, if formalized in such a framework. The Denver Regional Council of Governments (DRCOG) is one example of this.

DRCOG uses a comprehensive quantitative scoring system to evaluate bicycle and pedestrian projects for inclusion in its six-year TIP. To fund these projects, DRCOG devotes 100 percent of its TE funding to bicycle and pedestrian improvements. It divides projects into new construction, upgrades to existing facilities, and reconstruction of existing facilities. For each project type, evaluation criteria are scored quantitatively, several of which could be applied in a potential/deficiency analysis. Because only bicycle and pedestrian projects are considered, this type of analysis is possible, as other TE activities would not easily be accommodated in a potential/deficiency analysis. The agency applies a "connectivity" criterion to evaluate gap closures, access to key activity generators and local areas, barrier eliminations, and transit access that could, in part, measure the "potential" of accommodating increased or new bicycle and pedestrian activity. Other criteria could help measure deficiencies, including a "safety" criterion that considers crashes, vehicle–nonmotorized conflicts, and the adequacy of lighting.

4.6.4 Application of Cost-effectiveness Measures

Cost-effectiveness measures are employed by several DOTs and MPOs, more often to bicycle and pedestrian projects funded outside TE programs. Some agencies refer to these analyses as "benefit-cost," but they are more accurately characterized as "criterion-to-cost" ratios or "score-to-cost" ratios, where the numerator can be represented by non-monetized "benefits" or numerical scores computed as part of a broader project selection or prioritization method. For example, the weighted scores calculated using a list of qualitative and/or quantitative criteria can be summed and then divided by total project cost to yield a cost-effectiveness measure comparable among a set of projects under consideration. Other cost-

effectiveness measures may take on a slightly different construct, for example with the cost of the project being divided by the number of expected users who will “benefit” from its implementation.

Several examples of cost-effectiveness measures are found in practice in the following metropolitan regions. Prioritization process examples come from STP-Other, CMAQ, and TE programs, as well as a bicycle and pedestrian master plan.

- **Minneapolis-St. Paul** – The MPO for the Minneapolis-St. Paul region, the Metropolitan Council, applies a cost-effectiveness criterion to prioritization of bikeway and walkway projects funded with its STP-Urban allocation. Using project location details and maps provided by project applicants, staff calculate four measures of cost-effectiveness by dividing total project cost by current and projected future population and current and projected employment within traffic analysis zones within one mile of the project limits. Each of these measures, which base a cost-effectiveness determination on a facility's number of potential users, are considered equally in generating an overall cost-effectiveness score. Overall, cost-effectiveness is about 21 percent of a project's prioritization score.
- **Denver** – DRCOG's cost-effectiveness evaluation criterion for new, upgraded, or reconstructed bicycle or pedestrian facilities included in its TIP is measured as total cost per person miles traveled. Points are awarded along a straight line interpolation between the established minimum and maximum point thresholds. Person miles traveled are computed by multiplying the estimated pedestrian or bicycle user base, the percent using the facility under evaluation, and the average trip distance. A project's user base is the estimated number of daily bicycle and/or pedestrian trips that start and/or end within a 1.5-mile radius of the project area for a bicycle project and a 0.5-mile radius for a pedestrian project. DRCOG staff compute these user bases from its travel demand model.
- **Chicago** – The Chicago Metropolitan Agency for Planning (CMAP) recently revised its project prioritization and selection process for CMAQ funding. The agency specifically solicits bicycle and pedestrian projects for the program, which makes up nearly one-third of funding (see Table 2-3), and manages the process through a Bicycle and Pedestrian Task Force. The task force focuses on projects that achieve mode shift from single-occupant vehicles to nonmotorized and transit modes. Each proposed project is analyzed from a descriptive, quantitative, and plan consistency perspective. Quantitative GIS-based analysis that assesses access to transit, system gap closure, and elimination of barriers to achieve mode shift is akin to evaluating the potential for bicycle and pedestrian activity. Following the recommendations made by the task force to the overall CMAQ Project Selection Committee, CMAP staff perform an air quality analysis to rank projects in order of: dollars per kilogram (kg) of volatile organic compounds (VOC) eliminated; dollars per kg of oxides of nitrogen eliminated; dollars per 1,000 [motorized] trips eliminated; dollars per 1,000 vehicle miles traveled eliminated; and daily kg of VOC eliminated.
- **Colorado Springs** – PPACG evaluates a “Project Cost and Estimated Benefit” as one criterion in its prioritization of TE projects (see Table 4-9). (As explained in that section, the weight of this criterion was determined by multi-criteria decision analysis and is the most important among 12 criteria.) The agency assigns the criterion a score of 0, 3, 6, or 9 based on “the regional benefit as determined by number of users, context enhancement, or other benefits” relative to overall project cost (PPACG, 2009). Number of users is determined using a GIS analysis, while the context and other benefits are determined subjectively from project application information.

- **Atlanta** – As introduced in Section 4.6.3 in the discussion on Latent Demand Score, ARC prioritizes bicycle and pedestrian projects in its 2007 master plan using seven criteria, presented in Table 4-11. Priority scores (cost-effectiveness) are computed using a formula that sums the first six criteria (each assigned a percentage weighting in a manner recommended by a consultant team) and divides by the cost. ARC notes that the priority score is “based upon traditional benefit-cost ratios used in infrastructure investment planning and programming” and “provides an indication of the relative value of improving a transportation facility with respect to other (candidate) transportation facilities” (ARC, 2007b).

TABLE 4-11: ATLANTA REGION BICYCLE TRANSPORTATION & PEDESTRIAN WALKWAYS PLAN PROJECT PRIORITIZATION CRITERIA

Criteria	How Measured
1. Existing bicycle conditions	Bicycle Level of Service evaluation
2. Potential bicycle travel demand	Latent Demand Method (see Section 4.6.3)
3. Public input	Number of “votes” each segment received on response forms used by participants at the Community Open House Workshops
4. Severity of congestion	Travel Time Index (ratio peak-period travel time to free-flow travel time calculated by ARC)
5. Level of bicycle-friendly policies in relevant jurisdiction	Determined by ARC staff based on accommodation of bicyclists in adopted roadway standards, requirements in local land development code, bicycle parking requirements, ongoing bicycle programs, staff commitments, and funding allocations (This criterion was not used in the master plan but is expected to be applied to future projects that seek ARC funding assistance)
6. Segment passes through a Livable Centers Initiative (LCI) or Station Community	LCI sites are those jurisdictions participating in a program that encourages jurisdictions to link transportation improvements to land use development strategies; Station Communities are defined regions within 1 mile of existing and planned high capacity transit stations
7. (Unit) facility construction cost	Per mile planning cost estimates based on experience in other communities nationwide

Source: ARC (http://documents.atlantaregional.com/bikeped/Final_BikePed_plan_Appendices.pdf)

4.6.5 Benefit-cost Analysis of Bicycle Facilities Tool

NCHRP Report 552, *Guidelines for Analysis of Investment in Bicycle Facilities*, published in 2006, represents the most comprehensive research (and some of the only research) on methodologies and tools for estimating the costs of bicycle facilities and evaluating their potential value and benefits. The report presents criteria for identifying benefits and methods for estimating both direct benefits to users and indirect benefits to the broader community. In conjunction with the research report, an online tool (Benefit-Cost Analysis of Bicycle Facilities available at <http://www.bicyclinginfo.org/bikecost/>) was developed to apply the research in practice. It is a “step-by-step worksheet for estimating costs, demands, and benefits associated with specific facilities under consideration” (Krzek, Barnes, et al., 2006).

To further gauge the level of benefit-cost tool application to nonmotorized projects evaluation and prioritization, the survey asked if the NCHRP-developed tool had been used at the respondents’ respective agencies. Table 4-12 presents the results of this question. Clearly these survey responses

reinforce the finding that little benefit-cost analysis is being performed in practice. In the one case where a DOT indicated that the online tool is being used regularly or extensively, it is not actually applied to prioritizing TE projects, as the same survey response indicated that only a qualitative scoring system is applied.

TABLE 4-12: NCHRP BENEFIT-COST ANALYSIS ONLINE TOOL USE AT A SAMPLE OF STATE DOTs AND MPOs

	Regularly or Extensively	For a Single Project or Small Number of Projects	Informally or Experimentally	No	Total
<i>Transportation Enhancements</i>					
DOT	1	0	9	23	33
MPO	0	0	1	14	15
<i>STP-Other</i>					
DOT	0	0	1	4	5
MPO	0	1	5	8	14
<i>CMAQ</i>					
DOT	0	0	0	3	3
MPO	0	1	3	6	10

Notes: Total number of unique DOTs: 36; Total number of unique MPOs: 39

4.7 Challenges and Recommendations

For more than 20 years, bicycle and pedestrian projects have been eligible for federal funding and transportation enhancements have been embodied in its own federal-aid program. Both state DOTs and MPOs report confidence in and comfort with their project prioritization processes that have been applied over multiple funding cycles. Many note that they “work well,” are “well understood,” have been “proven over time,” or that nothing needs improvement.

However, as state DOTs and their partners continue to seek defensible, consensus-driven, and cost-effective project selections that successfully promote goals and objectives promulgated in their policies and plans, challenges abound to develop and apply prioritization processes to enhancement and other bicycle and pedestrian projects that produce outcomes on par with processes in place for traditional motorized projects. In addition to the challenges related to funding program processes and management (as detailed in Chapter 3), inadequate project evaluation data and a consequent reliance on qualitatively evaluating project criteria, which can in some instances lead to overly subjective project selection, are challenges agencies are currently facing.

At the same time, the research has uncovered agencies or regions that are applying processes that better link investments to plan outcomes and in some cases benefit from the application of more objective, data-driven methods.

4.7.1 Project Selection Subjectivity

Project selection subjectivity is a direct result of agencies' application of qualitative scoring systems or hybrid systems that are predominantly qualitative. Prioritization outcomes using these methods are not independently reproducible to the extent that those that apply more objective, quantitative procedures are. Several explanations for the general subjectivity of enhancement and other bicycle and pedestrian project prioritization processes are offered.

- Limited evaluation criteria and data are available on which to judge enhancement activities outside of bicycle and pedestrian infrastructure projects. Even in the case of bicycle and pedestrian facilities, data collection and benefit measurements as a practice are not nearly at the same level as for motorized projects.
- When programming and prioritizing projects within federal-aid funding programs, several factors impact what projects can be considered: total obligation authority (amount of funding) and the timing of its availability relative to project need and readiness; the common desire to distribute funding on a geographic or modal basis; and any constraints imposed by the federal-aid program itself (e.g., CMAQ projects must show air quality benefits and the Transportation Enhancement program defines in statute what qualifies as an "enhancement"). Overall, program definition, funding level, and timing form a determinant framework for projects selected and prioritized. In a broader planning environment, as with the development of an LRTP or bicycle and pedestrian master plan, these constraints are diminished or absent. The criteria and methods applied to prioritization can be selected independent of funding source and program and can better facilitate the application of more advanced, data-driven processes.
- The general approach of soliciting projects from individual local partners may obscure regional priorities and make difficult the use of a prioritization method that considers projects from a broader, more holistic perspective—as is done during regional long-range and master planning. This approach favors subjectivity over objectivity because it has the potential to elicit projects that may not demonstrate, or have the data available to be capable of demonstrating, more regional benefits (e.g., economic development or environmental improvement). In addition, projects are necessarily prioritized based on relative merit rather than on a standalone basis. This does not necessarily yield poor project selection, but it is possible that project comparisons from among those considered can overshadow broader goals and objectives or a baseline performance target.
- Principally an artifact of the TE program, the research findings show that cyclic calls for projects bear little connection to past solicitations. During each funding cycle, local jurisdictions and agencies compete anew for project awards without reference to prior selections or an overall plan. Bicycle and pedestrian projects selected through STP-Other and CMAQ programs more often referenced LRTPs and master plans or required projects to have already been identified through those processes.

4.7.2 Insufficient or Limited Data

Data quality and availability to measure enhancement and other bicycle and pedestrian projects' expected impacts and benefits is an ongoing challenge with no easy solution. Performance measurement, data collection, and well-developed methodologies for quantifying and monetizing the benefits of nonmotorized projects have not been advanced to the level of motorized projects, nor are their applications widespread in practice. These limitations are the primary constraint to applying more

rigorous quantitative analyses to prioritization processes, such as benefit-cost analysis. Indeed, a few MPOs remarked that they lacked the data and ability to conduct benefit-cost analysis, although desired. Nonetheless, more sophisticated, data-driven evaluation criteria, cost-effectiveness measures, and other means of expressing project benefits are currently being applied in several regions, primarily at the metropolitan level. A few MPOs cited cost-effectiveness measures and the use of other quantitative criteria as strengths of their project prioritization processes.

It should be noted that cost-effectiveness and other score-to-cost ratios do not possess the full attributes of a benefit-cost analysis. By not monetizing benefits, which serve to normalize all evaluation criteria for comparability, the potentially arbitrary assignment of criteria weighting remains. In addition, cost-effectiveness analyses do not adequately take into account streams of costs and benefits over time nor do they typically account for the time value of money. Ultimately, benefit-cost analyses are more defensible and better able to compare different projects across modes, but cost-effectiveness analyses can still serve nonmotorized project prioritization well. If cross-mode prioritization is not necessary (e.g., prioritizing just bicycle and pedestrian projects) cost-effectiveness can be a valuable tool in the face of limited data, able to reduce the subjective nature of qualitative prioritization processes.

4.7.3 Recommendations

One partial solution within the context of TE programs is to apply more quantitative approaches to just bicycle and pedestrian infrastructure projects. This is simple enough if a policy decision is made to only fund those forms of enhancements, but even if all enhancement activities are considered, it may be possible to apply two different sets of project evaluation criteria and prioritization processes, one to bicycle and pedestrian facilities and another to all other forms of enhancements. Since the two categories are not readily comparable, it may be necessary to devote two separate allotments of funding to them.

Project selection and prioritization subjectivity can be managed. Section 4.6.1 discussed the use of multi-criteria decision analysis by the Pikes Peak Area Council of Governments to assign weights to evaluation criteria in a less biased and arbitrary manner, built on consensus among stakeholders. Subjective judgment can also be reduced through the use of multiple reviewers or committee. Metropolitan Council uses two reviewers to score each criterion in its TE project evaluation. Many state DOTs and MPOs rely on technical committees or working groups comprising representatives from various disciplines and local partners. A possibility exists, though, of politicizing the process or including membership from the same entities seeking project selection and funding. And, a lack of quantitative data to perform more objective analysis remains an additional challenge.

If, however, project selection and prioritization at the programming stage (i.e., prioritizing projects by federal, state, or local funding program) are more closely related to existing plans developed through a performance-based planning process, the drawbacks of subjectivity can be diminished. A long-range transportation plan or bicycle and pedestrian master plan produced within a framework of clear, performance-driven goals and objectives (and which itself may apply more sophisticated quantitative methods for project identification and prioritization) can lay the groundwork for a desirable outcome at the programming stage. That is, “projects that implement the plan” can be a significant evaluation criterion for funding program prioritization. Indeed, several MPOs highlighted a strong link between project selection and the identification of priority bicycle and pedestrian corridors or objectives through a regional goal-setting process, a bicycle/pedestrian master plan, or their LRTPs.

Finally, as noted earlier, many survey respondents indicated general satisfaction with their prioritization processes, remarking that the process “works well” or is “well understood” by participants and the public. Just because many of the processes relied on subjective scoring methods to select and prioritize projects does not mean the process was unsuccessful or in clear need of improvement. Nonetheless, it is not clear whether any measurement of project success or goal achievement has taken place to judge whether the best projects are actually being selected through the applied prioritization process. Post hoc performance measurement of enhancement and other bicycle and pedestrian projects to relate back to applied prioritization criteria and methods is a subject in need of further research.

References

- Atlanta Regional Council, *Atlanta Region Bicycle Transportation & Pedestrian Walkways Plan* (June 2007a). http://documents.atlantaregional.com/bikeped/Final_BikePed_plan_Report.pdf.
- Atlanta Regional Council, *Atlanta Region Bicycle Transportation & Pedestrian Walkways Plan Appendices* (June 2007b). http://documents.atlantaregional.com/bikeped/Final_BikePed_plan_Appendices.pdf.
- Cascade Bicycle Club, *The Benefits of Bicycle and Pedestrian Projects: Quantifying and Prioritizing Non-Motorized Transportation Investments* (March 2012).
- Federal Highway Administration, "Federal-Aid Highway Program Funding 1988-1991 for Pedestrian and Bicycle Facilities and Programs." http://www.fhwa.dot.gov/environment/bicycle_pedestrian/funding/bipedfund_preistea.cfm. (As of July 31, 2012).
- Federal Highway Administration, *Guidebook on Methods to Estimate Non-Motorized Travel: Overview of Methods*, Publication No. FHWA-RD-98-165 (July 1999a). http://safety.fhwa.dot.gov/ped_bike/docs/guidebook1.pdf.
- Federal Highway Administration, *Guidebook on Methods to Estimate Non-Motorized Travel: Supporting Documentation*, Publication No. FHWA-RD-98-166 (July 1999b). http://safety.fhwa.dot.gov/ped_bike/docs/guidebook2.pdf.
- Federal Highway Administration, *The Congestion Mitigation and Air Quality (CMAQ) Improvement Program under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users Final Program Guidance* (October 2008). http://www.fhwa.dot.gov/environment/air_quality/cmaq/policy_and_guidance/cmaq08gd.pdf.
- Hillsborough County Metropolitan Planning Organization, *Transportation Improvement Program for Fiscal Years 2012/13 – 2016/17* (June 5, 2012). http://hillsboroughtip.edats.com/attachments/dnt6kJRZBO_Final%20TIP%2012-13.pdf.
- Krizek, Kevin J., Gary Barnes, et al., *Guidelines for Analysis of Investments in Bicycle Facilities*, National Cooperative Highway Research Program Report 552 (2006). http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_552.pdf.
- Mid-Region Council of Governments, *Project Prioritization Guidebook* (PPP Introduction) (2009a). http://www.mrcog-nm.gov/images/stories/pdf/transportation/tip/PPP/PPP_Introduction.pdf.
- Mid-Region Council of Governments, *Project Prioritization Guidebook* (Goal 1 Quality of Life) (2009b). http://www.mrcog-nm.gov/images/stories/pdf/transportation/tip/PPP/Goal_1_Quality_of_Life.pdf.
- Pike Peak Area Council of Governments, "Meeting Agenda of the Transportation Enhancement Subcommittee." (July 22, 2009). <http://ppacg.org/downloads/func-startdown/593/>.

Regional Transportation Authority, "RTA Policies, Objectives, and Procedures (POP) Roadway, Safety, and Environmental and Economic Vitality Elements." (January 2011).

<http://www.rtamobility.com/images/stories/pdfs/RTAAdmin/RTAPolicy-2011-01-27.pdf>.

Turochy, Rod E. and James R. Willis. "Prioritization Procedures for Proposed Transportation Improvements at the Metropolitan Level." Transportation Research Board Annual Meeting 2006 Paper #06-0156.

Wisconsin Department of Transportation, "Local Transportation Enhancements (TE) Program." (Last modified June 27, 2012). <http://www.dot.wisconsin.gov/localgov/aid/te.htm>.

Appendix A: Survey of Non-Motorized Transportation Project Practitioners

NATIONAL COOPERATIVE HIGHWAY RESEARCH PROGRAM
PROJECT 08-36(106)
SYNTHESIS OF PRACTICES FOR PRIORITIZING ENHANCEMENT PROJECTS AND NON-MOTORIZED TRANSPORTATION PROJECTS

SURVEY OF NON-MOTORIZED TRANSPORTATION PROJECT PRACTITIONERS

Introduction

This survey is designed to determine the current methods used by state DOTs and MPOs to select and prioritize transportation enhancement and other non-motorized transportation projects. In an environment of restricted budgets, the need to choose projects that provide the best and most efficient use of resources is becoming ever more critical. Compared with highway projects, best practice knowledge for selecting and prioritizing transportation enhancements, such as bicycle and pedestrian projects, is not as well understood - or developed. This study seeks to fill this knowledge gap, the results of which will be documented in a best practice summary report.

The project has been requested by the AASHTO Standing Committee on Planning (SCOP) through the National Cooperative Highway Research Program. AASHTO SCOP - your colleagues and partners - believe the outcome of this project to be beneficial and timely to state DOTs, MPOs, and the broader transportation community. Its success depends on your participation.

The survey will not take a lot of your time, approximately 20 minutes. As a person with direct knowledge and stake in the development of these selection and prioritization processes, your expertise is highly valued. Thank you for your participation.

Please contact the project researcher if you have any questions:
Reno Giordano
giordanor@pbworld.com

A) User Identification

*A1) Your name:

A2) Telephone number:

A3) Email address:

*A4) Agency name:

*A5) Select your agency type:

Department of Transportation

Metropolitan planning organization or state-created regional planning organization/association

Other (please specify):

*A6) Select your position/role:
(check all that apply)

State DOT Transportation Enhancement Coordinator

State DOT Bicycle and Pedestrian Coordinator

District/Division Bicycle and Pedestrian Coordinator

Transportation Planner

Program Manager

Other (please specify):

B) Non-motorized Transportation Project Programs - Federal

B1) In your state or region, which of the following Federal programs' project selection/prioritization processes do you have direct knowledge of or responsibility for? Please include consideration of dedicated set-asides within the STP or CMAQ programs for non-motorized transportation projects.
(Check only one)

- Transportation Enhancements
- Surface Transportation Program (other than Transportation Enhancements) [This includes STP funds distributed on a sub-state basis to any area of the state and areas based on population - urbanized areas with >200,000 population, areas with <200,000 population and areas with <5,000 population]
- Congestion Mitigation and Air Quality
- None of the above

C) Program Project Selection/Prioritization Processes - Federal

***C1) For the Federal program you just selected, what kind of project selection/prioritization methods are in use?**

Check all that apply; a prioritization process may use more than one of the following in combination:

Qualitative Scoring System

Responses/data are scored subjectively based on established criteria; criteria are assigned points for weighting against one another.

Example: Describe how your project has broad community support (20 points total)

Quantitative Scoring System

Responses/data are scored against criteria with predetermined values or qualities; results may be assigned points for weighting criteria against one another.

Example: Select how much right-of-way has been acquired: a) 100% (10 points), b) 75-99% (5 points), c) 50-74% (3 points), d) <50% (0 points)

Potential-/Deficiency-based Scoring System

This is a more structured version of a qualitative or quantitative scoring system used for bicycle or pedestrian projects that measures the potential for bicycle or pedestrian activity or need (deficiency) based on existing conditions or characteristics.

Economic Evaluation Tools

These include benefit-cost analysis and triple bottom line analysis. With benefit-cost, project benefits are quantified and monetized to compare with project costs. If social and environmental effects are included, the analysis is often referred to as triple bottom line and is conducted within a framework of sustainability.

Other (Please upload relevant documentation at the end of this survey.)

None

If you checked Qualitative and/or Quantitative Scoring System in Question C1, answer Questions C3–C6. Otherwise continue to Question C7.

**If you checked Economic Evaluation Tools in Question C1, answer Question C7.
Otherwise continue to Question C8.**

C) Program Project Selection/Prioritization Processes - Federal (cont.)

C3) We would like to understand in more detail the specifics of the qualitative and/or quantitative scoring systems used, as you just indicated, including criteria for project selection/prioritization and processes that drive its application.

At the end of this survey, please upload any available documentation describing the specific project selection/prioritization process in use.

For the criteria listed below, used in the qualitative and/or quantitative scoring systems, indicate each criterion's level of importance relative to the others on a scale from 1 to 5, where 5 is of "major importance" and 1 is of "minor importance." Your response should correlate with the relative weighting or number of "points" assigned to each criterion.

	Minor Importance		Major Importance		
	1	2	3	4	5
Selection/Prioritization Criteria for Qualitative and/or Quantitative Scoring Systems					
Technical merit (feasibility, meets design standards, realistic scope/schedule/budget)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Importance (level of documented priority)	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Level of support (from the community, from government)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Relationship to/consistency with adopted plans, policies, or other investments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leverage / amount of financial match or overmatch (amount beyond minimum federal or state requirement)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Project readiness / stage of completion (feasibility, preliminary engineering, environmental clearance, ROW acquisition, final design)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhances livability / demonstrates quality of experience / improves quality of life / improves population health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhances environmental and/or community sustainability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supports mixed use development, regional growth centers, activity centers, or smart growth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supports multimodal transportation alternatives, transit connections	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Benefits specific populations (transportation disadvantaged, economically distressed areas, tourism)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Total population served / level of exposure or access / amount or density of nearby population/employment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provides connectivity among other facilities or regions of activity, adds to or enhances existing network	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completes planned corridors, fills gaps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Addresses safety, reduces crashes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evidence of a long-term plan (preservation, maintenance, ownership, operations)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Demonstrates innovation or unique features	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contributes to wide geographic dispersion of funds	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Loss of opportunity, delay is detrimental	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Addresses multiple enhancement activities (Transportation Enhancement projects only)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

C) Program Project Selection/Prioritization Processes - Federal (cont.)

C4) Who is responsible for conducting the qualitative and/or quantitative scoring for the project selection/prioritization process?
(check all that apply)

- Agency staff
- Coordinating Committee / Advisory Committee / Working Group with ad hoc membership
- Coordinating Committee / Advisory Committee / Working Group with membership appointed by an elected official
- Other (please describe):

C5) What are the strengths and weaknesses of having the selected group(s) perform the project selection/prioritization?



*C6) Indicate which of the following characterizes the qualitative and/or quantitative scoring systems used in the project selection/prioritization process:
Check all that apply.

- The process was developed through a structured and informed procedure (e.g., incorporated stakeholder input, used prior knowledge or outcomes, tested on a trial basis)
- The process is formalized in a policy or instructional document
- The process is accessible to the public (e.g., available online)
- The process is periodically reviewed and updated as necessary
- Other (please specify):

C) Program Project Selection/Prioritization Processes - Federal (cont.)

C7) For those economic evaluation tools applied, including benefit-cost and triple bottom line analyses, what are the benefits being measured? What benefits would you like to be able to capture? At the end of this survey, please upload any available documentation for those economic evaluation tools applied, including benefit-cost and triple bottom line analyses.

Note that some benefits may overlap or be duplicative (e.g., environmental sustainability and air quality improvements). Please select those that best match your process.

Check all that apply.

	Is being measured and applied	Would like to measure and apply	Check if data or the ability to collect it exists
Benefits Measured for Economic Evaluation Tools			
Mobility benefit (value of trip)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User safety benefits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User health benefits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User recreation benefits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decreased auto use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental sustainability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air quality improvements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decreased energy consumption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Increased transit use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Livability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improved land use decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transportation equity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Community cohesiveness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increased tourism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Economic development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Urban revitalization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visual/aesthetic improvements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cultural/historic preservation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other(s) (Please specify below)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you selected "Other(s)", please specify:

C) Program Project Selection/Prioritization Processes - Federal (cont.)

*C8) You indicated that an economic evaluation tool is not in use in your agency's project selection/prioritization processes (including benefit-cost and triple bottom line). Is your agency considering or would like to apply such analysis?

Yes

No

If Yes, continue to Question C9, otherwise skip to Question C10.

C) Program Project Selection/Prioritization Processes - Federal (cont.)

C9) Please indicate which benefits your agency is considering or would like to apply to the use of an economic evaluation tool. Note that some benefits may overlap or be duplicative (e.g., environmental sustainability and air quality improvements).
 Check all that apply.

	Actively attempting to measure and apply	Would like to measure and apply and have the data or ability to collect it	Would like to measure and apply but don't have the data or ability to collect it
Benefits Considered for Economic Evaluation Tools			
Mobility benefit (value of trip)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User safety benefits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User health benefits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User recreation benefits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decreased auto use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental sustainability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air quality improvements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decreased energy consumption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increased transit use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Livability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Improved land use decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transportation equity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Community cohesiveness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increased tourism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Economic development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Urban revitalization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visual/aesthetic improvements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cultural/historic preservation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other(s) (Please indicate below)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you answered "Other(s)", please specify:

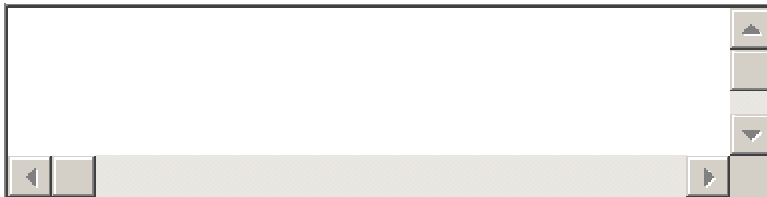
C) Program Project Selection/Prioritization Processes - Federal (cont.)

C10) Please complete the following with respect to the project selection/prioritization process(es) you indicated are in use for the selected program:

C10a) What aspects of the process(es) work well?

A large, empty rectangular text box with a light gray border. It features a vertical scrollbar on the right side and a horizontal scrollbar at the bottom, indicating it is a scrollable text area.

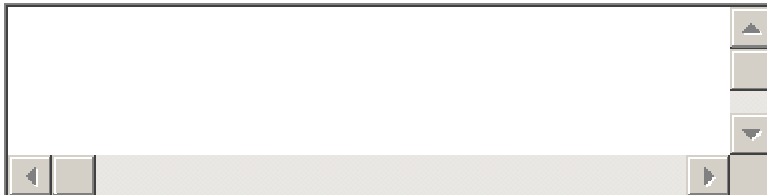
C10b) What aspects of the process(es) could use improvement or are planned to be improved?

A large, empty rectangular text box with a light gray border. It features a vertical scrollbar on the right side and a horizontal scrollbar at the bottom, indicating it is a scrollable text area.

C10c) Were the process(es) based on or influenced by one(s) from another state or region?

- Yes
- No

C10d) If "Yes", which one(s)?

A large, empty rectangular text box with a light gray border. It features a vertical scrollbar on the right side and a horizontal scrollbar at the bottom, indicating it is a scrollable text area.

D) Non-motorized Transportation Project Programs - State or Local

***D1) Does your state or region fund bicycle, pedestrian, or other enhancement projects through a dedicated state or local funding program (for example, with a dedicated portion of the state highway fund/account or a local option tax)?**

Yes

No

If Yes, continue to Question D2, otherwise skip to Question F1.

D) Non-motorized Transportation Project Programs - State or Local (cont.)

D2) Please briefly describe the program including the types of projects and its source(s) of funding.

*Name of program:

*Brief description:

*D3) Does the state or local program have a defined project selection/prioritization process?

Yes

No

If Yes, continue to Question D4, otherwise skip to Question F1.

*D4) Do you have direct knowledge of or responsibility for this state or local program's project selection/prioritization process?

Yes

No

If Yes, continue to Question E1, otherwise skip to Question F1.

E) Program Project Selection/Prioritization Processes - State or Local

***E1) For the State or Local program you just selected, what kind of project selection/prioritization methods are in use?**

Check all that apply; a prioritization process may use more than one of the following in combination:

Qualitative Scoring System

Responses/data are scored subjectively based on established criteria; criteria are assigned points for weighting against one another.

Example: Describe how your project has broad community support (20 points total)

Quantitative Scoring System

Responses/data are scored against criteria with predetermined values or qualities; results may be assigned points for weighting criteria against one another.

Example: Select how much right-of-way has been acquired: a) 100% (10 points), b) 75-99% (5 points), c) 50-74% (3 points), d) <50% (0 points)

Potential-/Deficiency-based Scoring System

This is a more structured version of a qualitative or quantitative scoring system used for bicycle or pedestrian projects that measures the potential for bicycle or pedestrian activity or need (deficiency) based on existing conditions or characteristics.

Economic Evaluation Tools

These include benefit-cost analysis and triple bottom line analysis. With benefit-cost, project benefits are quantified and monetized to compare with project costs. If social and environmental effects are included, the analysis is often referred to as triple bottom line and is conducted within a framework of sustainability.

Other (Please upload relevant documentation at the end of this survey.)

None

If you checked Qualitative and/or Quantitative Scoring System in Question E1, answer Questions E3–E6. Otherwise continue to Question E7.

If you checked Economic Evaluation Tools in Question E1, answer Question E7. Otherwise continue to Question E8.

E) Program Project Selection/Prioritization Processes – State or Local (cont.)

E3) We would like to understand in more detail the specifics of the qualitative and/or quantitative scoring systems used, as you just indicated, including criteria for project selection/prioritization and processes that drive its application.

At the end of this survey, please upload any available documentation describing the specific project selection/prioritization process in use.

For the criteria listed below, used in the qualitative and/or quantitative scoring systems, indicate each criterion’s level of importance relative to the others on a scale from 1 to 5, where 5 is of “major importance” and 1 is of “minor importance.” Your response should correlate with the relative weighting or number of “points” assigned to each criterion.

	Minor Importance		Major Importance		
	1	2	3	4	5
Selection/Prioritization Criteria for Qualitative and/or Quantitative Scoring Systems					
Technical merit (feasibility, meets design standards, realistic scope/schedule/budget)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Importance (level of documented priority)	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
Level of support (from the community, from government)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Relationship to/consistency with adopted plans, policies, or other investments	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leverage / amount of financial match or overmatch (amount beyond minimum federal or state requirement)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Project readiness / stage of completion (feasibility, preliminary engineering, environmental clearance, ROW acquisition, final design)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhances livability / demonstrates quality of experience / improves quality of life / improves population health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enhances environmental and/or community sustainability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supports mixed use development, regional growth centers, activity centers, or smart growth	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Supports multimodal transportation alternatives, transit connections	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Benefits specific populations (transportation disadvantaged, economically distressed areas, tourism)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Total population served / level of exposure or access / amount or density of nearby population/employment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provides connectivity among other facilities or regions of activity, adds to or enhances existing network	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Completes planned corridors, fills gaps	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Addresses safety, reduces crashes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Evidence of a long-term plan (preservation, maintenance, ownership, operations)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Demonstrates innovation or unique features	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contributes to wide geographic dispersion of funds	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Loss of opportunity, delay is detrimental	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Addresses multiple enhancement activities (Transportation Enhancement projects only)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

E) Program Project Selection/Prioritization Processes – State or Local (cont.)

E4) Who is responsible for conducting the qualitative and/or quantitative scoring for the project selection/prioritization process?
(check all that apply)

- Agency staff
- Coordinating Committee / Advisory Committee / Working Group with ad hoc membership
- Coordinating Committee / Advisory Committee / Working Group with membership appointed by an elected official
- Other (please describe):

E5) What are the strengths and weaknesses of having the selected group(s) perform the project selection/prioritization?



*E6) Indicate which of the following characterizes the qualitative and/or quantitative scoring systems used in the project selection/prioritization process:
Check all that apply.

- The process was developed through a structured and informed procedure (e.g., incorporated stakeholder input, used prior knowledge or outcomes, tested on a trial basis)
- The process is formalized in a policy or instructional document
- The process is accessible to the public (e.g., available online)
- The process is periodically reviewed and updated as necessary
- Other (please specify):

E) Program Project Selection/Prioritization Processes – State or Local (cont.)

E7) For those economic evaluation tools applied, including benefit-cost and triple bottom line analyses, what are the benefits being measured? What benefits would you like to be able to capture? At the end of this survey, please upload any available documentation for those economic evaluation tools applied, including benefit-cost and triple bottom line analyses.

Note that some benefits may overlap or be duplicative (e.g., environmental sustainability and air quality improvements). Please select those that best match your process.

Check all that apply.

	Is being measured and applied	Would like to measure and apply	Check if data or the ability to collect it exists
Benefits Measured for Economic Evaluation Tools			
Mobility benefit (value of trip)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User safety benefits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User health benefits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User recreation benefits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decreased auto use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental sustainability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air quality improvements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decreased energy consumption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Increased transit use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Livability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Improved land use decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transportation equity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Community cohesiveness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increased tourism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Economic development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Urban revitalization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visual/aesthetic improvements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cultural/historic preservation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other(s) (Please specify below)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

If you selected "Other(s)", please specify:

E) Program Project Selection/Prioritization Processes – State or Local (cont.)

*E8) You indicated that an economic evaluation tool is not in use in your agency's project selection/prioritization processes (including benefit-cost and triple bottom line). Is your agency considering or would like to apply such analysis?

Yes

No

If Yes, continue to Question E9, otherwise skip to Question E10.

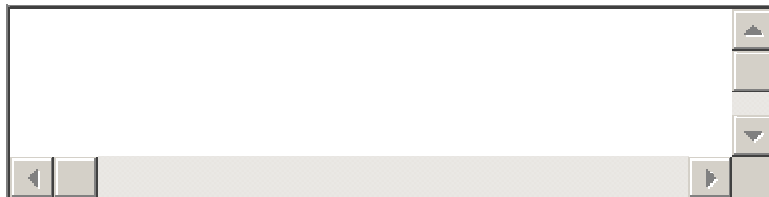
E) Program Project Selection/Prioritization Processes – State or Local (cont.)

E9) Please indicate which benefits your agency is considering or would like to apply to the use of an economic evaluation tool. Note that some benefits may overlap or be duplicative (e.g., environmental sustainability and air quality improvements).
 Check all that apply.

	Actively attempting to measure and apply	Would like to measure and apply and have the data or ability to collect it	Would like to measure and apply but don't have the data or ability to collect it
Benefits Considered for Economic Evaluation Tools			
Mobility benefit (value of trip)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User safety benefits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User health benefits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
User recreation benefits	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decreased auto use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Environmental sustainability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Air quality improvements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Decreased energy consumption	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increased transit use	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Livability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Improved land use decisions	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Transportation equity	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Community cohesiveness	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Increased tourism	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Economic development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Urban revitalization	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Visual/aesthetic improvements	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cultural/historic preservation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other(s) (Please indicate below)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

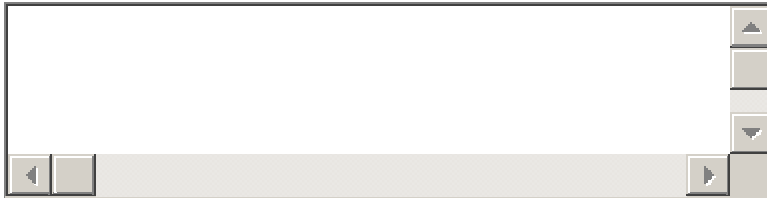
If you answered "Other(s)", please specify:



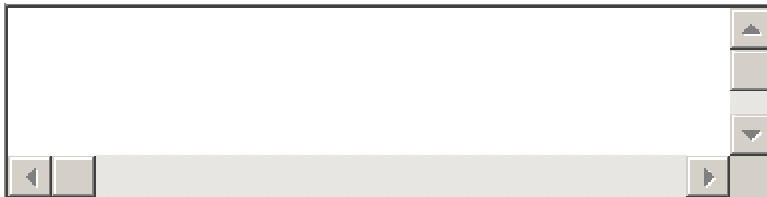
E) Program Project Selection/Prioritization Processes – State or Local (cont.)

E10) Please complete the following with respect to the project selection/prioritization process(es) you indicated are in use for the selected program:

E10a) What aspects of the process(es) work well?

A large, empty rectangular text box with a light gray border. On the right side, there are three small, vertically stacked square buttons with upward-pointing triangles. On the bottom side, there are two small square buttons with left-pointing triangles and two small square buttons with right-pointing triangles.

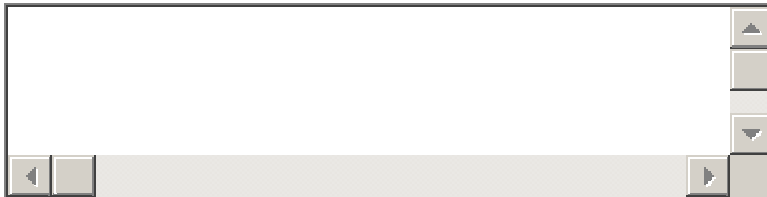
E10b) What aspects of the process(es) could use improvement or are planned to be improved?

A large, empty rectangular text box with a light gray border. On the right side, there are three small, vertically stacked square buttons with upward-pointing triangles. On the bottom side, there are two small square buttons with left-pointing triangles and two small square buttons with right-pointing triangles.

E10c) Were the process(es) based on or influenced by one(s) from another state or region?

- Yes
- No

E10d) If "Yes", which one(s)?

A large, empty rectangular text box with a light gray border. On the right side, there are three small, vertically stacked square buttons with upward-pointing triangles. On the bottom side, there are two small square buttons with left-pointing triangles and two small square buttons with right-pointing triangles.

F) Final Questions

***F1) Regardless of the project selection/prioritization methods selected, do any of the criteria used in the selection/prioritization processes incorporate livability or environmental sustainability measures?**

The U.S. Department of Transportation defines these two terms in the following manner:

- **Livability:** Fostering livable communities through place-based policies and investments that increase transportation choices and access to transportation services for people in communities across the U.S.
- **Environmental Sustainability:** Improving energy efficiency, reducing dependence on oil, reducing greenhouse gas emissions and benefiting the environment.

Yes

No

***F2) Has your agency used the online Benefit-Cost Analysis of Bicycle Facilities tool developed through the National Cooperative Highway Research Program (available at <http://www.bicyclinginfo.org/bikecost/>)? Check only one.**

Regularly or extensively

For a single project or small number of projects

Informally or experimentally

No

Thank you for completing this survey.

This project will be greatly enhanced if you are able to provide actual documentation on the project selection/prioritization processes you selected in this survey. We are interested in all non-motorized transportation project programs, especially those in this survey:

- Transportation Enhancements
- Surface Transportation Program (other than Transportation Enhancements)
- Congestion Mitigation and Air Quality
- Any state or regionally funded program

Please consider providing documentation on the processes you selected in the survey:

- § Qualitative Scoring System
- § Quantitative Scoring System
- § Potential-/Deficiency-based Scoring System
- § Economic Evaluation Tools
- § Others

Documentation could include explanatory material on process criteria and methodology, business rules or management direction, policy statements, and lessons learned or process evaluations.

Please forward material to:

[Reno Giordano](#)
Parsons Brinckerhoff

[SEND EMAIL](#)

Appendix B: Non-Motorized Transportation Pilot Program

Program Overview

Section 1807 of SAFETEA-LU established the Nonmotorized Transportation Pilot Program (NTPP) in August 2005. The purpose of the program is to explore the effects of improvements to bicycling and pedestrian infrastructure in prompting shifts from motorized vehicles to nonmotorized modes of transportation. The program has provided nearly \$25 million over a four-year period to four pilot communities: Columbia, Missouri; Marin County, California; Minneapolis, Minnesota; and Sheboygan County, Wisconsin. The program was promoted by the Rails to Trails Conservancy and gained support from a number of Congressmen whose constituencies included communities with strong nonmotorized transportation programs.

The pilot communities were given the freedom to select the improvements that would be implemented with NTPP funds, with the instructions that the monies were to be used “to construct...a network of nonmotorized transportation facilities including sidewalks, bicycle lanes and pedestrian and bicycle trails that connect directly with transit stations, schools, residences, businesses, recreation areas, and other community activity centers.”¹ The NTPP also required the pilot communities to gather statistical information on transportation mode share shifts before and after the implementation of the improvements and accompanying educational and promotional programs. The intent of the program was to “demonstrate the extent to which bicycling and walking can carry a significant part of the transportation load, and represent a major portion of the transportation solution within selected communities.”²

The four pilot communities provide a variety of settings varying in scale, density, and preexisting level of nonmotorized transportation infrastructure. The communities have also used different processes to identify the improvements that were implemented under the NTPP. These processes are described in detail in the following sections and include both quantitative and more qualitative approaches, as well as processes that were internal to the sponsoring agencies and others that were competitive.

¹ *Report to the U.S. Congress on the Outcomes of the Nonmotorized Transportation Pilot Program*, SAFETEA-LU Section 1807, Federal Highway Administration, April 2012, p. 1.

http://www.fhwa.dot.gov/environment/bicycle_pedestrian/ntpp/2012_report/final_report_april_2012.pdf.

² SAFETEA-LU, Section 1807.

GetAbout Columbia

Columbia, Missouri's GetAbout Columbia program was administered by the Department of Public Works (DPW). A city of 108,500 with an area of 53 square miles, Columbia is a college town with other large institutional employers and a long history of commitment to nonmotorized transportation. As of 2005 the city had 350 miles of sidewalks, 28 miles of bike lanes and 25 miles of shared use paths. The city completed a PedNet Master Plan in 2001 which focused on on-street facilities and was later incorporated in the region's long-range transportation plan (LRTP). In 2004, the city adopted a "complete streets" policy requiring that street improvements include provisions for bike and pedestrian improvements. That same year it also completed a Parks Plan focused on developing a network of off-street trails.

Columbia's preexisting plans were not coordinated, so after receiving the NTPP grant, planners in Columbia integrated them into a single system that focused on filling gaps. They took the plan to the public and integrated input they received from the community to identify a comprehensive set of potential improvements totaling \$60 million. The DPW wanted to cut the list of potential projects in half to a shortlist of \$30 million of improvements for approximately \$22.5 million in funding. Columbia officials purposefully over-programmed in the event that if delays were incurred with certain projects, others could be advanced in their place. This proved prudent as some projects captured in the outreach and plan review effort did not go through the public process and were expected to incur implementation delays.

In order to help identify a short list of projects that would be pursued through the program, the city established a 30-person Citizen Advisory Board. Its primary role upfront was to help identify which of the proposed projects would achieve greater mode shift. DPW staff and the advisory board also reviewed the projects to identify which could reduce barriers to sidewalks, on-street bike lanes and off-street trails, as this would encourage shifts to nonmotorized modes. GetAbout Columbia director Ted Curtis conveys that the review process did not involve the preparation of formal evaluation criteria or specific numerical rankings. Rather it was more subjective and relied on iterative assessments and judgment as to which projects provided the most cost effective means to encourage mode shift. "The review was not scientific. It was more like a chef creating a dish."³ The process was internal to the city and was underpinned by iterative collaborative thinking and decision-making.

The assessment was accomplished in three phases.

1. DPW staff drafted an initial version of the plan.
2. The plan was reviewed by the Citizen Advisory Board as well as the Parks Commission and the Bike/Ped Commission, and the public. DPW staff updated the plan based on the collective input received.
3. The revised plan was approved by the City Council.

Trail projects were the most expensive components of the plan and were often located further from the city center. Expensive pieces closer to the city core involved intersection reconfiguration. The plan also

³ Ted Curtis, personal communication, July 3, 2012.

incorporated bike and pedestrian facilities in existing roads, underpasses, and bridges that crossed barriers such as interstate highways.

To date, 22 of 27 total projects have been completed and the remaining five will or are being built. The program has benefitted from an additional \$6 million funding augmentation from SAFETEA-LU continuing resolutions. Mr. Curtis reports that Columbia feels like a different place since GetAbout Columbia was launched. The city's analysis reveals that there has been a 147 percent increase in peak period bicycle trips and a 47 percent increase in walking trips since the program was implemented. Columbia will continue to improve the system in the future, and as new street improvements are implemented, they will include bike/ped aspects.

WalkBikeMarin

Marin County has a population of 252,409 and an area of 520 square miles. The county's WalkBikeMarin program focuses on the eastern urban corridor exclusively, which is 121 square miles. It has a well established culture of recreational biking and its temperate climate allows year-round bike/ped activities. The county's first bicycle master plan was completed in 1975. In 2000 the county participated as a national pilot community for the Safe Routes to School program, and in 2004, it passed a countywide sales tax that includes dedicated funding for nonmotorized infrastructure. The county also has an active Bike Coalition that advocates for cycling issues and was integral to the award of the NTPP.

As of 2005, Marin County had 35.8 miles of bike lanes, 33.7 miles of shared-use paths, as well as sidewalks on major roads. Prior to receiving the grant, in 2006 the Transportation Authority of Marin (TAM) directed all communities in Marin County to prepare local bicycle plans independent of the NTPP. They then reviewed the plans and made sure that they were consistent with state requirements. After receiving the NTPP grant, Marin's DPW, working with TAM, integrated the community bike plans into a county plan and vetted the program with the public. This process led to the identification of \$220 million in potential bike/ped improvements.

In order to help select the projects that would be included in the NTPP, DPW assembled a 19-member Citizen Advisory Committee. The committee adopted a two-tiered screening process to identify candidate improvements. The process began with a fatal flaw screening assessing the following attributes:

- Ability to be delivered by the conclusion of the NTPP
- Agency control of needed right-of-way
- Community support for the project
- Local government support

Approximately 50 projects advanced through the fatal flaw screening. Those remaining were sorted into five categories:

1. Primary Network
2. Local Feeder Network
3. Countywide Projects
4. Planning Studies
5. Outreach and Education

The Citizen Advisory Committee then developed a series of separate ranking criteria for each of the five categories and also decided what proportion of the NTPP monies should be allocated to each of the categories. They completed a matrix assessment of the projects in each of the categories and included the top performers until the funding caps were reached. The matrix evaluation scored projects for the different criteria; some of which were scored yes/ no or on a scale of 1 to 5. Each criterion was given a point value and the projects were ranked based on the number of points they received.

The Citizen Advisory Committee's recommendations were given to the director of the DPW who passed them on to the County Board of Supervisors. In some cases certain recommendations were adjusted to achieve greater geographic equity. One of the most important criteria was whether improvements would close a gap in the existing bike/ped network. The county's existing bike/ped network included many individual segments, with complex and costly gaps between them due to the local topography and narrow street right-of-way. Proximity of improvements to activity nodes such as schools, community centers, or transit and ferry stations was another important criterion.

Local officials were eager to leverage NTPP funds with monies from other sources for larger projects. In the end, the county was able to leverage the \$22.5 million it received from the NTPP to achieve a total investment of \$47 million.

None of the NTPP monies could be used to assess the effectiveness of the demonstration, so performance monitoring was funded locally. While the county's data showed a mode shift of 64 percent in favor of cycling and 21 percent in favor of walking, those outcomes would have been much stronger if the latter data point had been extended into 2011, as a number of WalkBikeMarin's major projects were not yet open.⁴

⁴ Dan Dawson, personal communication, July 5, 2012.

Sheboygan County NOMO

Sheboygan County, Wisconsin is located approximately 40 miles north of Milwaukee on the western shore of Lake Michigan. The county has a population of 115,507 and an area of 500 square miles. Although the county had a strong culture of recreational biking, it had a limited history of utilitarian biking prior to receiving its NTPP grant. As of 2005 the County had 414 miles of sidewalks, 1.75 miles of bike lanes, and 35.5 miles of shared use paths. Its largest project, Old Plank Trail, encouraged some local communities to develop bicycle lanes prior to receiving the NTPP grant, but these efforts were ad hoc and uncoordinated. The county did not have a bicycle master plan in place; however, it did have a recreational plan that addressed trails.

The county's first activity after receiving the NTPP grant was to develop a bicycling master plan. The plan established goals and objectives for the program and identified bike/ped projects for the county extending out to 2035. As part of the process, the county also established a 30-person Citizens Advisory and Technical Committee (CATC) to help guide the master planning process and advise on the administration of the NTPP. The CATC included a wide cross section of users from all over the county. Members of the CATC attended numerous public meetings. The development of the master plan provided the public with ample opportunity to voice their input.

After the master plan was completed the county held three solicitations for projects from local communities. The county's approach was to invite local communities to apply to it as the grant holder to gain support for local projects that they would implement. The county planning department used the existing County Stewardship Process as a model to develop a review and rating system to adjudicate the proposals and select projects to be funded through the NTPP. The ranking criteria were provided to the bidders as part of the solicitation. County staff rated and ranked each of the proposals, which were recorded in a rating spreadsheet. Their rankings were then reviewed by the CATC, which made adjustments based on their local knowledge. The CATC then provided the county Board of Supervisors with their recommendations. Most of them were accepted without change, but in a small number of cases, the Board of Supervisors denied funding.

The county received 70 applications for projects and roughly half of those received funding. The program also leveraged an additional \$8.5. Some local communities received contributions in-kind including donated land, easements, and legal advice.

Bike Walk Twin Cities

Prior to receiving its NTPP grant, the Twin Cities region had made several significant investments in nonmotorized transportation improvements, but they had been made on a project-by-project basis and the region lacked a comprehensive plan. In 2005 the region had 1,751 miles of sidewalk, 38 miles of bike lanes and 77 miles of shared use paths. The NTPP grant area included Minneapolis and St. Paul, as well as portions of 13 adjacent communities, making it the largest region to receive the grant.

The Bike Walk Twin Cities program was administered by Transit for Livable Communities (TLC), a St. Paul-based transportation non-profit. TLC's Board of Directors appointed the Bike Walk Advisory Committee (BWAC) to advise on funding strategies and project selection. BWAC assisted in reviewing project applications and coordinating with the city of Minneapolis and other local agencies.

TLC issued three solicitations for projects in the following categories: planning, operations, infrastructure, bike/walk streets, and innovative demonstrations. BWAC developed criteria to process, rank and recommend projects to be funded. While TLC coordinates the NTPP program, the local municipalities implement NTPP projects.