U.S. Department
of Transportation
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Guidance for Evaluating TCSP Projects

Transportation and Community and System Preservation Pilot Program

Office of Environment and Planning
Federal Highway Administration
U.S. Department of Transportation
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Preface

This guidance is an updated version of the document, *Guidance for the Preparation of TCSP Evaluation Plans*, published in December 1998. It is intended for TCSP applicants preparing an evaluation plan, and for all TCSP grantees who wish to more fully develop and implement their project evaluation. The guidance has been updated to reflect the experience of grantees awarded TCSP grants in FY 1999, 2000, and 2001. Examples from actual evaluation plans are included. Additional information has been provided on what is expected of grantees and on how to develop an evaluation approach. The guidance can be obtained in both PDF and HTML format on the TCSP program web site, http://www.fhwa.dot.gov/tcsp/.

Guidance for Evaluating TCSP Projects was developed by Cambridge Systematics, Inc. under contract to the Federal Highway Administration.

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1. Introduction

IMPORTANCE OF EVALUATION

The purpose of the Transportation and Community and System Preservation (TCSP) Pilot Program is to fund innovative projects that will increase the knowledge of the costs and benefits of different approaches to integrating transportation investments and strategies, community preservation, land development patterns, and environmental quality. Planning and implementation projects may be undertaken at the neighborhood, local, metropolitan, state, and regional levels by states, local governments, tribal governments, and metropolitan planning organizations (MPO) working in cooperation with non-traditional partners. The TCSP is a pilot program explicitly designed to encourage innovative strategies and techniques, the results of which can then be used by other public and private organizations throughout the country. While TCSP funding is not sufficient to implement projects on a nationwide basis, all organizations nonetheless will benefit by being able to easily tap into the experience of others to learn what might be applicable for their own situations and how these new transportation strategies and techniques can be most effectively implemented.

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The careful and systematic evaluation of individual projects is a key component of the TCSP program in order to accomplish this learning and the desired result to transfer experiences. Evaluating projects that are new or experimental in character will indicate the success of various activities at achieving the desired transportation, community, and system preservation objectives. The FHWA will use the results from individual evaluations, in conjunction with other overall program evaluation criteria and methods, to assess the overall effectiveness of the TCSP program. As results and lessons learned from individual TCSP grant awards become available and the overall program can be assessed, the FHWA will coordinate and disseminate results, tools, and information developed under the program.

GUIDANCE OVERVIEW

This guidance is meant to assist grantees in developing and implementing an evaluation plan. Section 2 describes the roles and responsibilities expected of grantees, which include developing an evaluation plan and producing annual evaluation reports. Section 3 provides a suggested approach to evaluation. Appendix A provides more detail on specific evaluation methods, data sources, and questions to ask when conducting an evaluation.

Because “one size does not fit all,” this guidance provides ideas for evaluations rather than a mandated approach. People should not be discouraged from applying for TCSP program funding simply because they lack expertise in particular evaluation methods. Also, evaluations are most successful when people ask the right questions and commit to answering these questions. It is better to select a handful of key methods and measures that are within the project team’s capability to assess – rather than proposing a comprehensive list of evaluation measures and methods that are beyond the limits of available resources. Grantees not already having the desired level of in-house evaluation expertise may want to consider working in cooperation with another agency or a university.

Examples throughout the guidance are drawn from evaluation approaches developed by FY 1999 and FY 2000 grantees. A series of examples focuses specifically on an evaluation plan being implemented in Providence, Rhode Island.

ADDITIONAL ASSISTANCE WITH EVALUATION

Other resources are also available to assist grantees in developing and implementing an evaluation plan. FHWA Division Office and Resource Center staff can answer questions about preparing the application, and can also answer questions about implementing evaluation activities. A series of case studies documenting current TCSP projects are also available; these include information on evaluation approaches. Other potentially useful documents include a bibliography of studies on the relationships between transportation and land use, and a series of three evaluation plan examples. These documents are available on the TCSP program web site, http://www.fhwa.dot.gov/tcsp/.

2. Grantee Roles and Responsibilities

Each TCSP grantee is responsible for conducting a systematic evaluation of their TCSP project. The first step is to develop an evaluation plan, which should be included as part of the TCSP grant application. The evaluation plan will demonstrate the strength of the applicant's commitment to evaluation, which is an important factor in the selection of final grant awards. Once the grant is awarded, the grantee is encouraged to develop their evaluation plan in more detail. The grantee should carry out the activities specified in this plan as part of their grant implementation activities. Grantees should also produce one or more evaluation reports or other products that document the evaluation of the project activities.

EVALUATION PLAN

Each grantee should develop an evaluation plan that describes how they propose to evaluate the project. In developing the evaluation plan, grantees should consider four key factors:

- The overall evaluation approach, including performance measures, data sources, and evaluation methods;
- Budget/resources;
- Responsibilities; and
- Timeframe for activities.

The resources required for evaluation activities must be included in the overall grant budget proposed for the project. Additional guidance on defining an approach to evaluation and addressing the mechanics of evaluation (budget, responsibilities, and timeframe) is provided in Section 3.

Since the overall length of the TCSP project application is limited, and no more than 500 words should be devoted to the evaluation plan, applicants may be able to provide only an overview of the evaluation approach in the application. Once a TCSP grant has been awarded, it is anticipated that the grantee will develop the evaluation plan in more detail. Applicants should specifically identify the data sources, evaluation methods, responsibilities, and timeline for conducting evaluation activities. The initial evaluation plan may also be revised or refined, through a grant agreement, while negotiating the contract terms with FHWA.

While earmarked grantees may receive funds without first submitting an application, FHWA requests an application – including an evaluation plan – from all grantees. In addition, FHWA requests that grantees include an evaluation component in the implementation of their project. To obtain the maximum benefit from the TCSP program, it is important that all projects document their accomplishments, outcomes, and lessons learned.

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PROGRESS REPORTS

As part of their grant implementation responsibilities, grantees are required to submit annual progress reports to their FHWA Division Office. These progress reports should include information on evaluation activities. In addition, grantees may be asked to complete a "project template" on occasion summarizing the project, innovative aspects, evaluation component, status and accomplishments, and lessons learned. FHWA will provide this report template to grantees.

EVALUATION PRODUCTS

The evaluation activities associated with a TCSP grant should result in one or more reports. The reports are intended for the use of cities, counties, states, MPOs, elected officials, citizen groups, and others interested in implementing similar projects, as well as for the benefit of FHWA in reviewing the overall TCSP program. The evaluation plan should explain the proposed approach to reporting.

The grantee should produce a project evaluation report at the completion of the TCSP project. This report should document the process by which the TCSP grant project was developed or implemented, the final product of the grant, and any anticipated outcomes (e.g., travel or community benefits as identified through surveys or modeling). Additional information on the results or outcomes of the project (e.g., observed changes in travel behavior) that are available soon after completion may also be documented in this evaluation report.

Depending upon the nature of the TCSP project and evaluation activities, the grantee may also produce one or more interim evaluation reports. An interim report may cover activities up through a particular milestone, especially if the project contains multiple stages or has a long time horizon for completion. An interim report may also document the results of "baseline" data collection efforts that are undertaken before the project is implemented.

For many types of projects, especially planning projects, it is likely that the full impacts of the project will not occur immediately. Grantees may wish to document additional project outcomes in the future as data on longer-term impacts become available. The evaluation plan should identify any longer-term monitoring and evaluation activities related to the project, even if they extend beyond the time horizon of the actual TCSP grant.

Any interim or final evaluation products – including evaluation reports, presentations, or detailed evaluation plans – should be forwarded to FHWA when appropriate for posting on the TCSP web site. Making this information available will assist other grantees who are planning evaluation activities, and will provide information about projects to anyone who is interested. Public sharing of information and findings represents an important component of the TCSP program's emphasis on learning and knowledge-building.

> *Examples of Evaluation Reports*
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> *Examples of evaluation products from FY 1999 grantees can be found on the TCSP web site. Presentations and reports are available from grantees in Saginaw, Michigan; Providence, Rhode Island and Washington, D.C., as well as other areas.*

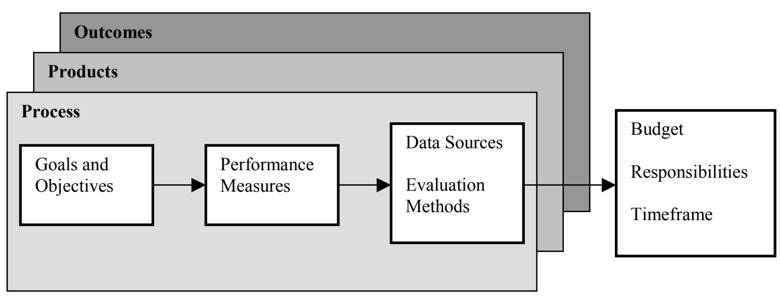
3. Evaluation Approaches

This section discusses how to develop and carry out an evaluation plan. Appendix A describes in more detail specific data sources, evaluation techniques, and key questions to ask in evaluating a TCSP project. Appendix B lists additional references that may be useful for designing and implementing a project evaluation.

A general approach to evaluation is illustrated in Figure 1. First, the project's goals and objectives are defined. Performance measures corresponding to each objective are then identified, as are data sources and evaluation methods for that performance measure. Performance measures and evaluation methods are identified separately for the project's planning or implementation process, products, and outcomes. Finally, the mechanics required to carry out the evaluation are defined, including budget, responsibilities, and timeframe. This process may include some iteration, in which the available resources and timeframe help to determine the choice of performance measure, data sources, and evaluation methods.

The evaluation plan should address all of these factors. A well-thought-out evaluation plan can serve as a "road map" to carrying out the evaluation. While the initial evaluation plan submitted with the TCSP grant application will be limited in its detail, the grantee should develop a more detailed plan soon after the grant is awarded. Developing a detailed evaluation plan at the beginning of the project, rather than waiting until the end to think about evaluation, will make the evaluation process easier for the grantee and also lead to a better evaluation.

Figure 1. Evaluation Approach



MEASURES

The first task in evaluating a project is to define the measures and methods that should be used to evaluate the project. This task includes three basic steps.

1. **Define project goals and objectives**. What is the motivation for undertaking the project? What is the project intended to accomplish? General goals for the TCSP program include improving the efficiency of the transportation system; reducing the environmental impacts of transportation; reducing the need for costly future public infrastructure investments; ensuring efficient access to jobs, services, and centers of trade; and examining private sector

development patterns and investments that support these goals. More specific objectives may be defined as a means of achieving these goals. Goals and objectives for individual TCSP projects may be a subset of the program's goals and objectives. Grantees may also have additional goals and objectives that are important for the project to achieve locally.

2. **Identify performance measures**. Performance measures are quantitative or qualitative measures that indicate the project's success at achieving its stated goals and objectives, e.g., total emissions per capita or land consumed per unit of development. Examples of performance measures are given in Appendix A. Grantees should resist the temptation to establish a comprehensive "laundry list" of performance measures, but instead should identify a few key measures that best reflect the impacts of the program. It is important to select measures that are simple to understand, are as objective as possible, and can be constructed from readily available data sources.

3. **Identify data and information sources and evaluation methods.** Grantees should identify data and information sources to support each performance measure. In the case of quantitative data, grantees should identify both existing sources and potential new data collection efforts. In the case of qualitative data, grantees should identify key sources of information (people, agencies, committees, etc.), along with appropriate techniques for obtaining and evaluating information (interviews, direct observation, etc.) Some potential data sources and evaluation techniques are identified in Appendices A and B.

Table 1 provides examples of goals, objectives, performance measures, data sources, and evaluation methods. These represent a subset of those established for the "Olneyville Square Intermodal Transit Center" TCSP project in Providence, Rhode Island (FY 1999).

Table 1. Examples of Goals, Objectives, Performance Measures, and Data Sources

Goal	Objective	Performance Measure	Data Source	Evaluation Method
Improve the efficiency of the transportation system in the neighborhood	Improve the level of service for transit riders	Number of passengers using transit center	Field counts	Before/after comparison
		Boardings and alightings	Transit agency ridership surveys	Before/after comparison Control group (city-wide)
		Rider assessment of travel experience	Surveys of residents	Before/after comparison
	Connect bus, bicycle, and pedestrian modes of travel	Completion of improvements	Observation	Not applicable
		Number of bicyclists and pedestrians	Field counts	Before/after comparison

Table 1. Examples of Goals, Objectives, Performance Measures, and Data Sources (continued)

Goal	Objective	Performance Measure	Data Source	Evaluation Method
Support the revitalization of the neighborhood	Use the transit center as a focal point and to strengthen neighborhood identify	Perceptions of neighborhood	Surveys of residents and businesses Subjective assessment	Before/after comparison
	Increase the number and diversity of businesses	Number and types of new businesses Number of loans made	Field observations City records	Before/after comparison Control group (city-wide)
	Involve the residents and business owners in improvements	Number and diversity of people attending meetings	Meeting records	Qualitative assessment

ASPECTS

Evaluations can focus on three different aspects of a TCSP project: *process*, *products*, and *outcomes*. The grantee may define separate goals and objectives, performance measures, and evaluation methods for each aspect.

- **Process evaluation** focuses on the approach through which a project is undertaken. A process evaluation can focus on questions such as the number and types of both traditional and non-traditional groups or persons involved, the manner in which these groups have been involved, the degree to which stakeholder commitment and buy-in were achieved, and the nature of the issues which emerged as being important in the deliberations.

- **Product evaluation** focuses on what was produced by the planning or implementation process. The evaluation may describe the plan that was developed or the project that was implemented, and how it represents a change from existing conditions. For example how many additional miles of bikeways were built connecting residential

> *Example: Process and Product Evaluations*
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> *The Metropolitan Washington Council of Governments (MWCOG) has completed an evaluation of its FY 1999 TCSP project. The goal of the project was to implement the circulation system and green space recommendations from the regional transportation plan. An independent consultant observed meetings, interviewed participants, reviewed documents, and described project innovations and lessons learned in an evaluation report. The evaluation focused on process and products, since the timeframe for implementation was too long to observe outcomes.*

neighborhoods with employment and activity centers, public transportation systems, or recreational areas?

- **Outcome evaluation** focuses on determining the effectiveness of the project at achieving the defined transportation, community, and system preservation objectives. How much are vehicle-miles of travel and emissions reduced because of the new bikeways? To what extent are people undertaking additional recreational activity? In contrast to its process and products, a project's outcomes may not be apparent until many years after the project has been completed. This is particularly true when the project involves the development of a plan that will be implemented over many years.

> *Example: Product and Outcome Evaluations*
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> *The Maricopa Association of Governments (MAG) in Phoenix, Arizona is undertaking its "Regional Growing Smarter Implementation Plan" (FY 2000) to identify strategies and implementation tools to direct infrastructure development and preserve open space. MAG will evaluate the effectiveness of its products through a questionnaire to the planning team and local government staff. MAG will also evaluate expected outcomes of these strategies by running its land use and transportation model based on existing and revised local general plans.*

These three aspects of a project are interrelated and important to the evaluation of a TCSP project. Outcome goals are of ultimate interest, but achievement of process and product goals can indicate the likelihood of success at achieving the desired outcomes. Process and product goals are also desirable for their own sake. For example, an open and participatory process is important for ensuring that all viewpoints and potential impacts are considered.

Appendix A provides a more detailed list of questions to ask in evaluating process, products, and outcomes; examples of performance measures and evaluation methods within each of these categories; and potential data sources and data collection methods.

METHODS

A TCSP project evaluation should focus on identifying the nature, magnitude, and distribution of the impacts of a project. Three general approaches may be followed to measure a project's impacts:

- **Qualitative assessment techniques**, such as interviews, surveys, focus groups, review of minutes of meetings, and anecdotal evidence. Evaluation of a project's process and products will rely heavily on qualitative assessment techniques. Qualitative techniques can also be used to evaluate outcomes when: 1) the scale of impacts is too small to be measured directly; 2) resources are not available for quantitative data collection or modeling techniques; or 3) the primary impacts are "soft" effects, such as quality of the community environment, that cannot be easily quantified or valued. Qualitative methods also are useful for verifying findings from quantitative evaluation techniques.

- **Quantitative assessment techniques**, which rely on the measurement of traffic volumes, access to jobs, economic growth, land preservation, or similar impacts before and after project implementation. Quantitative techniques are best suited for evaluating project outcomes that occur within the evaluation timeframe. Quantitative assessment may be based on actual counts or other field data collection; or on surveys of travelers, potential travelers, or businesses to determine behavior before and after the project. It also may include surveys to quantify changes in "soft" variables such as satisfaction with transportation and community characteristics or awareness of the impacts of various transportation or land development alternatives.

- **Analytic procedures or models** that forecast the impacts of a project. Analytical models include regional travel and land use models, simulation models, sketch-planning tools, emission models, and other quantitative forecasting methods. In addition to forecasting a project's impacts in advance, models can be used to convert directly measurable impacts, such as travel changes, into other impacts, such as emissions. Models also can be used to control for external factors and validate the results of before-and-after data analysis. Examples where modeling may be useful include policies that influence the nature and location of development, or actions which change the relative time or cost of travel by different modes. On the other hand, modeling will not be applicable to many types of activities, such as some very small scale projects, enhanced public involvement, or the formation of regional decision-making bodies.

> *Example: Use of Analytical Models*
>
> *Examples of projects using transportation models to forecast impacts of transportation and land use alternatives include the "Regional Growing Smarter Implementation Plan" in Phoenix, Arizona (FY 2000); "Evaluating the Transportation Impact of Possible Futures in Oregon's Willamette Valley" (FY 1999); and Envision Utah in Salt Lake City, Utah, (FY 1999).*

As appropriate, grantees should identify a balanced set of techniques that evaluate the economic, environmental, mobility, and social equity effects of strategies or investments. Ideally, the evaluation approach will include data collection and/or analysis to quantify the impacts of the project on identified performance measures. It also may include development or refinement of analytical models to predict the impacts of the project. Often, however, accurate quantitative measurements or forecasts will either be difficult to obtain or will not be relevant to the type of project being implemented. If this is the case, qualitative assessments should be performed in order to gauge the magnitude and nature of project impacts.

DATA SOURCES

Both qualitative and quantitative data sources can be identified for evaluation. *Qualitative* data sources may include:

- **Field observation**, in which the evaluator attends meetings and workshops and observes activities, participation, and behavior first-hand;
- **Interviews**, which are used to obtain information one-on-one from key people;
- **Focus groups**, which use a structured group discussion to gather information from multiple participants (either key players or a random selection); and
- **Surveys** that ask people to describe their activities, opinions, etc.

Field observations and interviews can be performed with relatively little effort. The most important requirement is to have a neutral party who can ask the right questions and to whom people will speak frankly and openly. Focus groups take somewhat more effort to organize, and typically require a trained moderator. Focus groups can be especially good, however, about bringing out areas of agreement and disagreement. Surveys may vary in their degree of formality, from simple questionnaires issued to a select group of people, to large sample telephone or mail surveys. Surveys may be used to obtain responses from a larger group of people than interviews or focus groups, but interviews and focus groups have the advantage that the interviewee can be asked to elaborate on specific thoughts or ideas in more detail.

To develop data for *quantitative* evaluation, the evaluator has two basic options:

- Analyze existing data sources; or
- Undertake new data collection activities that are project-specific, such as surveys or field counts.

In some cases it may be possible to leverage existing data sources in order to reduce the resources required for evaluation. For example, transit agencies typically conduct ridership counts by route on a regular basis. These data may be used to assess the impacts of a project aimed at increasing transit ridership. A city's parcel-level land use database, if updated regularly, may be used to track development trends. Other existing data sources, such as metropolitan household travel surveys or county-level economic data, may be too aggregate to measure the impacts of individual projects. These sources still may be useful, however, in tracking longer-term trends at a regional level. Projects in Charlottesville, VA, New Orleans, and Portland, OR, are establishing regional "benchmarks" that will be used for long-term monitoring.

When existing data sources are too aggregate, updated infrequently, or simply do not measure the impacts most relevant to the project, the grantee may need to collect additional data. Examples of data that are not likely to be available include bicycle and pedestrian counts, neighborhood travel patterns for non-work trips, or residents' attitudes on various factors such as community quality. The effort involved in collecting project-specific data is not trivial, but valuable information may be gained if the data collection is done well. The grantee must weigh the costs of collection against the potential benefits of the additional information.

Additional examples of existing and new data sources are described in Appendix A. Methods for analyzing data are also discussed briefly in Appendix A, and in more detail in the references listed in Appendix B.

BASELINE FOR COMPARISON

Grantees should select evaluation methods and data sources that can measure a *change* compared to a "baseline" condition. The intent of any TCSP evaluation – whether focused on process, products, or outcomes – is to identify changes that occur relative to conditions expected without the TCSP project. Examples may include quantitative changes such as vehicle-miles of travel (VMT) or infrastructure costs; improved

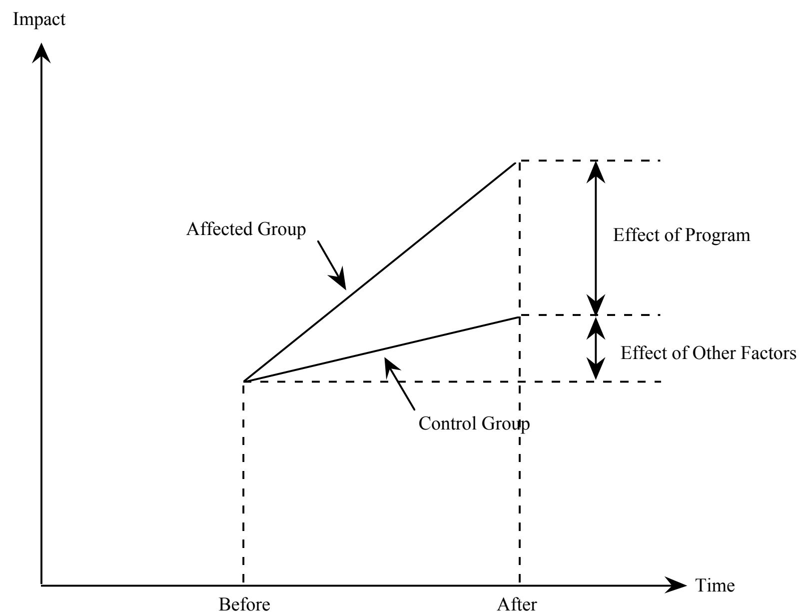
Example: Measuring Changes Through Before-and-After Data Collection

The city of Providence, Rhode Island is developing a transit center in the Olneyville neighborhood as part of a larger urban revitalization project. Evaluation activities are being conducted by studio classes at the University of Rhode Island. A fall 2000 studio documented "baseline" conditions by collecting transit ridership, bicycle, and pedestrian counts, inventorying existing businesses and employment, and conducting a "community perceptions" survey of residents and businesses. A future studio class will document "after" conditions.

physical conditions in a neighborhood; or changes in peoples' attitudes or perceptions. Changes may also occur to processes or ways of doing business; for example, who is involved in planning, and the steps that are taken to develop or implement a project or plan.

The "baseline" conditions for evaluating the project should be established carefully and may or may not be the same as "current" conditions. It is possible that changes in evaluation measures may occur independent of the TCSP project. For example, per-capita VMT may increase due to regional economic growth or decrease as a result of higher fuel prices. Grantees should document the likely extent to which observed changes are due to the project versus other factors. Comparison with a "control group" (e.g., a similar neighborhood or region not affected by the project) is one way of assessing these differences. Other methods relevant to quantitative analysis are discussed in Appendix A. Figure 2 illustrates the effects of a hypothetical TCSP project in comparison to other factors.

Figure 2. Effects of TCSP Project versus Other Factors



MECHANICS

The final step in developing the evaluation approach is to identify the mechanics of the evaluation: budget, responsibilities, and timeframe. Again, the process of designing an evaluation is iterative, and the resources and timeframe available may help to determine the appropriate performance measures, data sources, and evaluation methods.

Budget

The appropriate level of financial resources to commit to evaluation varies according to the project. However, many grantees with strong evaluation approaches typically commit between 10 and 15 percent of TCSP project resources to evaluation activities. Resource requirements may be reduced by using donated or in-kind services, for example, evaluation conducted in-house or by another government agency, or as a university class project.

Responsibilities

Responsibilities for evaluation may vary. In some cases an in-house evaluation may be sufficient, especially if one or more members of the project team has experience in conducting evaluations. In other cases, grantees may wish to have an outside contractor, such as a university, consultant, or non-profit, design and/or implement the evaluation. Particularly for more complex evaluations – for example, designing, implementing, and analyzing a survey – obtaining internal or external expertise will greatly increase the chances of a successful and informative evaluation.

Process and product-based evaluations are easier to do in-house, and primarily require asking the right questions and being willing to learn. An experienced facilitator can also assist in process evaluation, by engaging project participants on an ongoing basis to reflect on their experiences, critiquing how well the process is working, and identifying ways of improving the process. Outside expertise is often required for outcome evaluation, since the considerations in collecting and analyzing data, especially to distinguish program impacts from other factors, can be complex.

Timeframe

Evaluation is an ongoing activity, rather than something that is done only at the end of a project. Early planning and action are critical. The grantee should define specific data collection and analysis approaches, responsibilities, and a timeline at the beginning of the project. "Baseline conditions" data should be collected *before* the project is actually implemented. Also, any mid-course evaluations – for example, an assessment of how well a process is working – should be planned. It may be useful for participants to periodically step back and assess the progress that they are making, and how it compares to what they expected at the beginning of the project. Evaluation plans may evolve over time in response to new challenges or opportunities that arise during the course of the project.

> *Evaluation is an ongoing activity, rather than something that is done only at the end of a project.*

Completion of the TCSP project marks a significant reporting milestone, but it is not necessarily the end of the road in terms of evaluation. Impacts of the project – particularly outcome impacts such as changes in travel patterns or land use – may not be fully apparent until five or even 10 years after completion of the project. Grantees should give consideration to how outcomes can be monitored on an ongoing basis, even if this monitoring does not fall within the time schedule of the TCSP grant. Other post-implementation measures of effectiveness may include whether the project's approach (if successful) has been adopted elsewhere in similar situations, and whether elements of an adopted plan are actually being implemented by local agencies.

Appendix A. Detailed Evaluation Guidance

This appendix provides more detailed guidance on evaluating the process, product, and outcomes of TCSP projects. For process and product evaluations, key questions for obtaining information as background to the evaluation are identified. For outcome evaluations, specific techniques and issues to consider in either estimating or measuring the impacts of the TCSP project are identified. For all three types of evaluations, examples of goals and objectives, performance measures, and evaluation methods relevant to TCSP projects are provided.

The examples of goals and objectives, performance measures, and evaluation methods provided in this section are for illustrative purposes only. Grantees are encouraged to select measures and methods most appropriate to their project and available resources. Also, grantees are encouraged to select a focused list of performance measures that most directly address the project's goals and objectives, rather than producing a comprehensive "laundry list" of all possible measures.

Grantees are encouraged to select a focused list of performance measures, rather than producing a comprehensive "laundry list."

Process Evaluation

Evaluation of the planning, design, or implementation process for a TCSP project can serve a number of useful functions. Process evaluation can identify reasons for success or failure of the plan or project as well as specific strategies and tactics that were most effective. Evaluating specific aspects of the process, such as who participated and their respective roles, also can help indicate how likely the product is to achieve success. For example, extensive participation of a variety of affected parties or groups may mean that the project is more likely to be successful, since potential obstacles and stumbling blocks can be resolved.

A number of techniques can be used to gather information for evaluating the planning, design, or implementation process. These may include:

- Directly observing process activities;
- Interviewing facilitators of the process and process participants; and
- Reviewing documents, including process schedules, timelines, and work plans; participation and attendance lists; meeting agendas and minutes; plans and reports produced; and letters of support.

Questions that can be asked as a basis for evaluating the process include:

- Who participated (organizations, titles, level of authority to act on behalf of organization, etc.);
- Who did not participate; whether they a) opted out or b) were not invited; and why;
- What were the participants' roles (e.g., attend meetings, read and critique materials, produce data/reports, partners in planning, partners in decision-making, etc.);

- What was the process for planning:
  - Establishing agenda (who and how);
  - Scheduling and organizing meetings and other actions;
  - Establishing goals (when and how);
  - Developing background information and supporting analysis (what was performed; how was it used in supporting plan development or project selection);
  - Decision-making process (discussion and vote, discussion to agreement, recommended options and a decision by others, consultation with others followed by decision, etc.);
  - Documented support for goals and decisions;
  - Decision-influencing factors;
- Relationship of process to existing planning, design, or implementation processes and activities, including the metropolitan and statewide transportation planning process;
- Substantive issues covered;
- Timeframe of substantive issues (current focus, future – short-term, future – long-term);
- Actions taken;
- Legitimacy to implement plan or project:
  - Legal authority;
  - Political legitimacy;
  - Financial resources identified.

Documenting answers to the above questions can determine the degree to which the process met its defined goals and objectives. Some process-related goals and objectives for the TCSP program, as well as associated performance measures, are shown in Table A-1. Local agencies may also hold other goals and objectives for activities carried out under the TCSP program. Documenting the answers to these questions also will help in identifying circumstances or actions that influenced the level of success of the final product.

Table A-1. TCSP Process Evaluation
Sample Goals/Objectives and Performance Measures

Goal/Objective	Performance Measures
Involve non-traditional partners	Number/type of groups involved: • Public utility operators • Social services agencies • Community groups • Environmental organizations • Non-profit organizations • Public health agencies • Economic development agencies • Private land development organizations • Home builder associations • Real estate investors • Zoning commissions • Other public or private groups Contribution (policies, actions, ideas) and commitment (financial and other resources) of each group

Table A-1. TCSP Process Evaluation (continued)

Sample Goals/Objectives and Performance Measures

Goal/Objective	Performance Measures
Maintain consistency with Statewide and MPO planning process	Construction projects are ultimately included in approved State or MPO Transportation Improvement Program Projects are included in air quality conformity analysis if required Changes to State or MPO plans are coordinated with other affected jurisdictions Other demonstrated links to planning process
Broaden scope and impact of planning process to integrate transportation, community preservation, environmental activities	Number/type of interests involved: • Public sector • Community/interest groups • Private sector Elements of process/plan/project that affect or consider: • Land development planning • Community preservation • Environmental impacts • Economic development • Social equity • Private sector activities New ways of doing business Evidence of common goals
Achieve stakeholder commitment and buy-in	Results are endorsed by: • Participants • Other affected parties Stakeholders participating in plan development: • Attendance/participation at meetings • Other participation/communication Individuals/organizations/groups not supporting plan Commitment to implementation (through responsibility, funding, etc.)
Process led to learning and innovation	New approaches taken Innovative ideas generated New relationships formed (formal or informal) for implementation
Process is directed at achieving desired TCSP outcomes	Background information and analysis developed to support plan development or project selection: • Empirical evidence based on implementation of other, similar plans or activities • Modeling/forecasting • Surveys • Qualitative assessment of potential impacts Evidence of consideration of this information in planning process Development and implementation of evaluation plan and activities

Evaluating improved links to metropolitan or statewide planning process, as encouraged by TEA-21, is particularly important, although this may not be relevant to all TCSP grants. As applicable, grantees might evaluate their ability to improve connections through the funded project with the broad metropolitan or statewide transportation planning processes at the center of TEA-21. Examples of ways in which projects may link to the planning process include:

- Contributing to alleviation of transportation and related problems identified in the 20-year plan and any regional "visioning";
- Applying performance indicators, possibly including those in a transportation management system;
- Demonstrating support from a public involvement process;
- Developing collaborative partnerships, for example, involving the MPO, state transportation and environmental agencies, city planning agencies, transit, or non-traditional partners; or
- Projecting life-cycle costs developed through financially constrained planning.

With respect to the public involvement process for transportation planning in particular, federal guidelines suggest the following desirable outcomes from public involvement:[1]

- Informed and involved citizens with access to public records and the decision-making process;
- A planning approach that is proactive and open to early participation by all;
- A process that not only encourages broad public participation but also considers and responds to public input;
- Appropriate and early interagency consultation in air quality non-attainment areas;
- Ample opportunity for public comment when the final plan or TIP differs from the draft.

PRODUCT EVALUATION

Product evaluation focuses on what was produced by the planning or implementation activity. Describing the project as it was actually produced or implemented serves as an interim step in identifying the likely outcomes or impacts of the project. Some general questions that can be asked about the product include:

- What was the product of the activity, and how does it compare to what was originally planned?
- What did the product accomplish?
- Why does it matter – what impact did the product make, with respect to both the defined project objectives and the overall objectives of the TCSP program?

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[1] A Guide to Metropolitan Transportation Planning Under ISTEA: How the Pieces Fit Together. U.S. Department of Transportation, Washington, D.C., 1995.

- To whom does it matter – who is impacted?
- What is innovative about the project? What was done that had not been done before?
- What was learned that wasn't already known? What was the added knowledge and how important is it?
- How can the lessons learned from this project be generalized for other situations?

A TCSP product evaluation will differ significantly depending on whether the activity is a planning grant or an implementation grant. In the case of implementation activities, product evaluation can focus on describing what was actually built, or what service was developed, and why it is significant. In the case of planning activities, product evaluation will focus on the content of the plan, agreement, etc. (e.g., what will be achieved if the plan is implemented or the agreement carried out); adoption of the plan; and on provisions to ensure successful implementation of the plan or agreement. While development of the plan or project consistent with the original scope of work, timeline, and budget may be a criterion, this should not limit flexibility in making mid-course modifications to a project. As planning and implementation progresses, it is possible that changes to the project may be incorporated that result in an improved product compared to the original proposal.

Table A-2 shows examples of goals and objectives and performance measures for evaluating a planning grant. Table A-3 shows examples of goals and objectives and performance measures for evaluating an implementation grant.

Table A-2. TCSP Product Evaluation: Planning Grant
Sample Goals/Objectives and Performance Measures

Goal/Objective	Performance Measures
Plan or agreement adopted	Adopted or revised plans, policies, ordinances, processes (by every-one with implementation responsibility) Adopted agreements, memoranda of understanding, etc.
Provisions to ensure plan implementation	Legal authority to implement plan Funding/resources identified to implement plan Provisions for management/oversight of plan implementation Implementation timeline with specific implementation responsibilities Feedback process to monitor/adjust implementation as needed
Other indicators of likelihood of successful implementation	Plan is consistent with other state and locally adopted plans Stakeholder commitment/buy-in Political legitimacy to implement plan: • Outcome of accepted planning process • Support of legislative bodies required to implement plan Who does not support the plan

Table A-2. TCSP Product Evaluation: Planning Grant (continued)

Sample Goals/Objectives and Performance Measures

Goal/Objective	Performance Measures
Plan or agreement is consistent with Statewide and Metropolitan planning processes	Implementation through collaborative partnerships, for example, involving the MPO, state transportation and environmental agencies, city planning agencies, transit, or non-traditional partners Contributes to alleviation of priority area transportation and related problems identified in the 20-year plan and any "visioning" Includes projected life-cycle costs developed through financially constrained planning Includes performance indicators and provisions for monitoring, possibly including those in transportation management systems Includes public involvement consistent with federal guidelines for metropolitan planning (see *A Guide to Metropolitan Transportation Planning Under ISTEA: How the Pieces Fit Together*, U.S. Department of Transportation, 1995.)
Plan is directed at achieving desired TCSP outcomes	Clear statement of purpose and need Consistency with defined goals and objectives

Table A-3. TCSP Product Evaluation: Implementation Grant

Sample Goals/Objectives and Performance Measures

Goal/Objective	Performance Measures
Project is innovative/ provides a learning experience	Something has been accomplished/learned that has not been done before: • Similar projects implemented and/or evaluated elsewhere • External inquiries about the project Changes to improve project during development/implementation phases in response to new information, analysis, etc. Project can be replicated in other areas
Project was successfully completed	Time schedule of completion Cost of project versus what was achieved
Project is consistent with Statewide and Metropolitan planning processes	Contributes to alleviation of priority area transportation and related problems identified in the 20-year plan and any "visioning" Includes projected life-cycle costs developed through financially constrained planning Associated performance indicators and provisions for monitoring, possibly including those in transportation management systems
Plan is directed at achieving desired TCSP outcomes	Project has clear statement of purpose and need Consistency with defined goals and objectives

OUTCOME EVALUATION

Outcome evaluation focuses on determining the project's effectiveness at achieving particular transportation, community, and system preservation objectives, such as reducing emissions or preserving open space. Measuring the outcomes of a project is, in many ways, the most difficult aspect of evaluation. Numerous factors must be considered, such as distinguishing the impacts of the program from other concurrent changes and identifying the time scale over which impacts occur. Measuring outcomes, however, is ultimately of critical importance in determining whether a project is worthwhile. Therefore, grantees are encouraged to give careful thought to how the impacts of the proposed programs can be directly assessed. Grantees are encouraged to seek agreement with both traditional and non-traditional partners regarding the specific set of outcome measures to be evaluated.

As discussed in Section 3, outcome evaluation may be conducted using three techniques:

- Qualitative assessment;
- Quantitative assessment; and
- Analytical procedures or models.

This section provides additional guidance regarding issues to consider in evaluating the outcomes of projects funded through TCSP. Appendix B provides annotated references on how to design an evaluation program and implement specific evaluation methods.

General Measurement Issues

Important issues to consider in designing an outcome-focused evaluation – whether quantitative or qualitative – include:

- **The time scale over which impacts are measured**. In some cases, usage may increase over time as people become aware of the new project or service, and it may take a year or two for a project to achieve significant results. In other cases, such as with changes to land use and development practices, impacts may not be fully apparent for many years. Evaluation plans should identify the anticipated time scale of impacts and include provisions for both near-term and longer-term monitoring of these impacts.

- **Separating the impacts of projects and external factors**. For short-term evaluation, data collected prior to project implementation may be sufficient as a baseline for comparing post-implementation data. For longer-term evaluation, more sophisticated methods may be required to compare measured changes to a future "baseline" level that may be affected by other concurrent changes, such as changes in the economy, demographic trends, or gasoline prices. Techniques for doing this include:

  - *Identifying and documenting changes in other potentially significant factors*. A qualitative assessment of the impacts of these factors, including the magnitude and direction of the changes, can help indicate which factors are most significant in influencing the measured changes. For example, a sharp rise in gasoline or other travel-related prices would be expected to lead to reduced automobile travel.

- *Using control groups*. Trends in travel behavior or land development patterns, for example, can be compared between the community affected by the project and other similar communities which are not affected.
- *Analyzing time-series data*. Time-series data analysis techniques can be used to predict actual versus expected changes and quantify the contribution of other factors to observed changes.

Collecting before-and-after data on both the affected population and control groups can be a particularly effective means of isolating a project's effects, as illustrated in Figure 2. Data collection plans should account for seasonal fluctuations in the variables being measured, in addition to identifying longer-term trends. For example, many areas experience higher levels of pedestrian and bicycle activity in summer than in winter.

- **Sampling and statistical significance**. For quantitative measurement – whether through surveys or field data collection – an appropriate population on which to measure impacts must be determined. Data collection and sampling plans should ensure that the measured impacts are representative of actual impacts on the population. Sample sizes should be selected so that results will be statistically significant given the expected magnitude of project impacts. The use of panel surveys (sampling the same people before and after project implementation) may reduce data collection requirements compared to selection of a random sample both before and after the project. Finally, non-users as well as users should be surveyed, in order to identify barriers to use.

Available Evaluation Methods and Data Sources

Table A-4 illustrates examples of outcome-related goals and objectives of the overall TCSP program, along with associated performance measures and methods for evaluating these measures. These measures are provided as examples and may not be relevant to all projects or measurable in all situations. Grantees are encouraged to define their own short list of meaningful performance measures, as well as those goals and objectives which may be important locally. Grantees are further encouraged to identify the most appropriate and feasible evaluation methods for developing these performance measures.

Table A-5 identifies potential *existing* data sources that can be used for project evaluation. Some general advantages of these sources include:

- Most are readily available from local, state, or national sources;
- The collection methodology is uniform, making them good for comparing one area to another (e.g., transit ridership on a particular route versus the transit system as a whole).

Some general disadvantages of existing sources include:

- The magnitude of change produced by the project is likely to be small in comparison to the baseline level of the data. Therefore, it may be difficult to distinguish the impacts of the project from changes due to other factors.
- The data sources may be too aggregate compared to the geographic area affected by the TCSP project. For example, metropolitan household travel surveys only provide statistically valid data for a large portion of the region, if not the entire region. Economic data sources are commonly available only at the county level or greater.
- There are numerous impacts of potential interest that are not covered by these data sources.

Table A-4. TCSP Outcome Evaluation

Sample Goals/Objectives, Performance Measures, and Evaluation Methods

Goal/Objective	Performance Measures (examples)	Evaluation Method(s)
Improve efficiency of transportation system (maximize use of existing infrastructure)	Percent of trips by non-SOV modes	Before/after counts & ridership surveys Stated-preference surveys Modeling
	Person-miles of travel per vehicle-mile of travel	Regional travel model
	Transit passenger-miles per vehicle revenue-mile	National Transportation Database
	Avoid need for new major construction: • Lane-miles per person • Avoided lane-miles of construction • Maintain LOS without new facilities • Lane-miles per registered driver	• TIP analysis under "baseline" versus "TCSP" condition • Regional travel model: lane-miles required to maintain base level of performance ("baseline" versus "TCSP" condition)
Reduce impacts on environment	Total VMT and VMT/person	Surveys or modeling to determine changes in mode shares, total trips, trip lengths
	Criteria pollutants, greenhouse gas emissions Fuel consumption (total and per person)	Emissions models based on travel impacts (trips, VMT) Energy models and fuel utilization factors
	Community impacts (aesthetics/design, noise): • Community satisfaction	Satisfaction surveys Focus groups Interviews with key local officials
	Land consumption per unit development (square feet or acres per dwelling unit, job, etc.)	Zoning regulations – permitted densities (with versus without program) Actual versus expected development statistics
	Expected growth accommodated within existing urbanized area	Land use databases, mapping of building permits
	Wetland/other habitat preservation/fragmentation: • Amount of preserved habitat space (with versus without program) • Connectivity/fragmentation of natural areas	*Pre:* Zoning regulations – allowable land use/development patterns (with versus without program) *Post:* Actual versus expected preserved land Maps showing natural areas/ecosystems

Table A-4. TCSP Outcome Evaluation

Sample Goals/Objectives, Performance Measures, and Evaluation Methods

Goal/Objective	Performance Measures (examples)	Evaluation Method(s)
Reduce costs of infrastructure investment	Projected life-cycle cost savings: • Costs of "baseline" versus "TCSP" projects in TIP	Analysis of TIP (Baseline versus TCSP conditions) Life-cycle infrastructure cost analysis
	Development of method and/or research study for relating travel or land use changes to infrastructure costs	Application of method
Ensure efficient access to jobs, services, centers of trade	Quantitative accessibility measures (by type of activity, population segment), trips per person for all trip purposes	Travel demand models – before/after accessibility measures Proximity analysis using GIS or manual calculation
	Travel time savings (passenger or freight movements)	Travel demand models Project-specific calculations
	Improvements in access for specific populations/needs: • Total population served • Number of users of new transit service	Usage measurements Interviews with planners, service providers, etc.
	Economic impacts of project: • Property values • Business Sales • Employment	Time-series analysis (before/after studies) Qualitative analysis (surveys of businesses and property owners)
Encourage private sector land development patterns to achieve above objectives	Implemented policies/incentives to affect development patterns	Review of changes in general plan, zoning, tax policies, impact fees, etc.
	Agreements with private developers	Interviews with local officials Review of other agreements
	Changes in development patterns/trends: • Types and character of land use • Densities • Location of new development	Compare new developments to existing developments Compare new developments in area to those elsewhere in region Evidence of developer interest in affected area
	Impacts on performance measures identified for above objectives	Quantitative assessment methods as identified above

Table A-5. Potential Existing Data Sources for Evaluation

Type of Data	Existing Sources
Traffic data (volumes, speeds)	Highway Performance Monitoring System (HPMS); local monitoring stations (Metropolitan Planning Organization, or city or county traffic engineering department)
Transit ridership	Systemwide data: National Transit Database Route or area-specific data: Local transit agency
Personal and household travel characteristics (mode shares, travel time, etc.)	U.S. Census of Population and Housing National Personal Transportation Survey Metropolitan area household travel survey (Metropolitan Planning Organization)
Worksite travel characteristics (mode choice, etc.)	Local Transportation Management Associations, ridesharing agencies
Business sales, employment, income	U.S. Census of Retail Trade County Business Patterns
Land use and development	Local or regional land use databases (Metropolitan Planning Organization, or city or county planning department) Aerial photography (Metropolitan Planning Organization, or city or county planning department) Parcel-level data (city or county assessor's office) Building permits (city or county planning department)

Table A-6 identifies methods for collecting *new* data as well as applications for each method. The most obvious general advantage of new data collection is the ability to collect the specific data that are most directly relevant to evaluating the TCSP project. Data can be collected on attitudes and reasons for changes in behavior, in order to directly associate changes with the TCSP project. Surveys can be conducted in the geographic area most directly affected by the project. The most obvious disadvantage of new data collection is the level of effort involved.

Table A-6. Methods for Collecting New Data

Method	Uses of Method
Quantitative Data Collection	
Field observations of traffic volumes or speeds, transit ridership, pedestrian activity, etc.	Before-after or control group comparison
Random sample telephone/mail surveys	Determine travel behavior (mode choice, trip-making, etc.) Determine satisfaction, awareness, etc.
Workplace, establishment, and visitor surveys	Determine travel characteristics of travelers to specific sites
Transit onboard surveys	Determine transit ridership, trip characteristics, traveler characteristics

Table A-6. Methods for Collecting New Data (continued)

Method	Uses of Method
Surveys of businesses	Determine sales, employment, property value, development impacts, etc.
Stated-preference (hypothetical choice) surveys	Determine what people would do in a hypothetical situation (use for forecasting)
Windshield surveys	Determine land uses and development patterns through observation
Qualitative Data Collection	
Interviews	Obtain information from key persons
Focus groups	Use of a structured group discussion to gather information from multiple participants (either key players or a random selection) Observation of points of common agreement as well as disagreement
Field observation methods	First-hand observation of activities, behavior, etc.
Surveys	Obtain from people involved/affected on participation, opinions, reactions, etc.

Appendix B. Annotated Evaluation References

The following documents provide additional guidance on evaluation-related data collection and analysis. References also are provided on qualitative analysis methods and on the design of planning processes. In addition to addressing generic evaluation issues and methods, many of these documents describe evaluations of specific transportation programs.

TRANSPORTATION-RELATED DATA COLLECTION, EVALUATION, AND EXPERIMENTAL DESIGN

Institute of Transportation Engineers. *Manual of Transportation Engineering Studies.* H. Douglas Robertson, ed. Prentice Hall: Englewood Cliffs, NJ (1994).

> This reference manual discusses data collection methods for traffic volumes and speeds, public transportation, pedestrian activity, goods movement, environmental impacts, and other transportation data. The manual also discusses general methodological issues, including experimental design, survey design, and statistical analysis methods.
>
> Available through the Institute of Transportation Engineers bookstore at 525 School Street, S.W., Suite 410, Washington, D.C. 20024-2797; Phone: 202/554-8050; Fax: 202/863-5486; Internet: http://www.ite.org.

Cambridge Systematics, Inc. and Barton Aschman Associates. *Travel Survey Manual.* Prepared for the U.S. Department of Transportation and U.S. Environmental Protection Agency, Publication No. FHWA-PL-96-029 (Manual) and FHWA-PL-96-030 (Appendices), (1996).

> This guidance manual discusses the design, implementation, and uses of various types of surveys used in transportation planning, including household travel surveys, vehicle intercept and external station surveys, transit onboard surveys, commercial vehicles surveys, workplace and establishment surveys, visitor surveys, parking surveys, and stated response surveys.
>
> The manual can be ordered from the U.S. Department of Transportation at: TASC Subsequent Distribution Office, Ardmore East Business Center, 3341 Q 75th Avenue, Landover, MD 20785; Fax: 301/386-5394; e-mail: SDS.Info@OST.DOT.GOV. Refer to complete title, Travel Survey Manual and Appendices, and publication numbers FHWA-PL-96-029 and FHWA-PL-96-030 when ordering.

Richardson, Anthony, E.S. Ampt, and A.H. Meyburg. *Survey Methods for Transport Planning.* Wiley-Interscience Publications: New York, NY (1995).

> This book discusses elements in designing and implementing various types of surveys used in transportation planning. Specific elements include selection of survey method, sampling procedures, survey instrument design, survey administration, and data processing and analysis.

Cambridge Systematics, Inc., *Economic Impact Analysis of Transit Investments: Guidebook for Practitioners.* Transit Cooperative Research Program: Report 35, National Academy Press, Washington, D.C. (1998).

This reports presents 12 evaluation methods for use in evaluating the economic impacts of transit projects. The report describes uses of each method, advantages and disadvantages, data sources, examples, and provides guidance for selecting methods. Many of the methods and issues discussed are generically relevant to the evaluation of all types of transportation-related projects, as well as to the evaluation of impacts other than economic impacts.

Transit Cooperative Research Program (TCRP) reports can be ordered through the Internet at http://www4.nationalacademies.org/trb/crp.nsf or by writing: Transportation Research Board, National Research Council, 2101 Constitution Avenue, NW, Washington, D.C. 20418.

Economic Development Research Group, Inc., and Cambridge Systematics, Inc. *Guide to Using Empirical Information to Measure the Economic Impact of Highway Facilities.* U.S. Department of Transportation, Federal Highway Administration (forthcoming).

This guide describes how to collect and use both quantitative and qualitative data to measure the impacts of highway projects on local and regional economic development. The methods and data sources described in the guide are equally relevant to the assessment of other transportation-related projects or programs.

Casey, Robert F. and John Collura. *Advanced Public Transportation Systems: Evaluation Guidelines.* Prepared by the U.S. Department of Transportation, Volpe National Transportation Systems Center, for the Federal Transit Administration, Publication Nos. FTA-MA-26-0007-94-2 and DOT-VNTSC-FTA-93-9 (January 1994).

This report provides guidelines for evaluating Advanced Public Transportation Systems, including; identification of performance measures; techniques for collection, deriving, and analyzing data; issues in experimental design; survey methods and execution; and statistical methods. Much of the guidance is relevant to the evaluation of transportation programs in general. The report is available through the National Technical Information Service, Springfield, VA, and on the Internet at http://www.bts.gov/NTL/DOCS/ate.html.

Higgins, Thomas J. and Will L. Johnson. *Evaluating Transportation Programs: Neglected Principles.* Transportation Vol. 26 (1999).

This article provides guidance for the effectiveness evaluation of transportation programs. It discusses the importance of determining the significance of changes in outcome measures before versus after implementation of transportation programs. The article reviews common weaknesses in example evaluations and points to remedies.

QUALITATIVE ASSESSMENT TECHNIQUES

Krueger, Richard A. *Focus Groups: A Practical Guide for Applied Research.* Sage Publications: Thousand Oaks, CA (1992).

Mishler, Elliot G. *Research Interviews: Context and Narrative.* Harvard University Press: Cambridge, MA (1986).

U.S. Department of Transportation. *Community Impact Assessment: A Quick Reference for Transportation.* Federal Highway Administration, Office of Environment and Planning, Publication No. FHWA-PD-96-036: Washington, D.C. (1996).

Yin, Robert. *Case Study Research: Design and Methods.* Sage Publications: Beverly Hills, CA (1992).

PLANNING PROCESSES

United States Department of Transportation. *A Guide to Metropolitan Transportation Planning Under ISTEA: How the Pieces Fit Together.* Publication No. FHWA-PD-95-031 (1995).

Available on the Internet at:
http://www.fta.dot.gov/library/planning/MTPISTEA/424MTP.html

United States Department of Transportation. *Statewide Transportation Planning Under ISTEA*: *A New Framework for Decision-Making*. Publication No. FHWA-PD-96-026 (1996).

United States Department of Transportation. *Metropolitan Transportation Planning Under ISTEA: The Shape of Things to Come* (1997).

United States Department of Transportation, Volpe National Transportation Systems Center, *Enhanced Planning Reviews of 14 Metropolitan Areas*, prepared for FTA and FHWA, 1991-1997.

Available on the Internet at: http://www.fta.dot.gov

Innes, Judith. *Planning Through Consensus Building.* Journal of the American Planning Association (Autumn 1996).

Ozawa, Connie. *Recasting Science: Consensual Procedures in Public Policy-Making.* Westview Press (1991).

Susskind, Lawrence, and J. Cruikshank. *Breaking the Impasse: Consensual Approaches to Resolving Public Disputes.* Basic Books: New York, NY (1987).