ADVANCING MAJOR TRANSIT INVESTMENTS THROUGH PLANNING AND PROJECT DEVELOPMENT

Version 1.1

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Federal Transit Administration
Office of Planning
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Note on Version 1.1 of *Advancing Major Transit Investments through Planning and Project Development*

The following presents Version 1.1 of FTA's revised guidance on advancing New Starts projects through planning and project development. This guidance is intended as an update to FTA's current *Guidance on Requests for New Starts Projects to Enter Preliminary Engineering (PE) and Final Design* (September 1999), and includes several significant enhancements to that document. First, whereas the 1999 document was originally issued as internal guidance to FTA Regional Office staff, this revised guidance is written for the broader transit community, including FTA grantees and other agencies which may be interested in the planning and project development process for major transit capital investments. Second, this guidance focuses less on the specific PE and final design decision points (including the New Starts evaluation and rating process) and more on the planning and project development activities that precede the FTA approval action. The intent here is to emphasize the principles of sound planning and project management as a means of developing transit capital investment projects. Third, this guidance explains FTA's interest in becoming more actively involved in the early stages of local corridor and sub-area planning, and identifies specific activities and products of the planning and project development process which FTA would like to provide assistance on.

Version 1.0 of this guidance was issued in November 2002 to FTA Headquarters and Regional office staff for review and comment. Version 1.1 incorporates FTA staff comments, but does not reflect the entirety of FTA's expectations for local conduct of the preliminary engineering and final design stages of development. FTA's Office of Program Management (TPM) is continuing to develop materials which more fully describe project management principles, products, and programmatic requirements, particularly as they relate to the demonstration of an agency's technical capability to advance a major capital investment through project development. Rather than wait for the completion of this information, FTA sees value in issuing a "beta" Version 1.1 of this guidance to the broader transit community, and to solicit their ideas and suggestions on it. Subsequent versions of this document will incorporate both user comments and TPM's enhanced guidance on project development and management.

We hope that you find this guidance helpful, and welcome your thoughts and questions on it. Please send any comments or questions to Sean Libberton, FTA Office of Planning Innovation, at sean.libberton@fta.dot.gov.

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INTRODUCTION

The Transportation Equity Act for the 21st Century (TEA-21) / Federal Transit Act 49 USC 5300 requires that FTA approve the advancement of all projects pursuing discretionary Section 5309 New Starts funding into the preliminary engineering (PE) and final design stages of project development. Specifically, 49 USC 5309 (e)(6) requires that the basis for PE/final design approval is the Federal Transit Administration's (FTA) evaluation of a candidate project's performance against the New Starts criteria, leading to an overall project rating of "Highly Recommended," "Recommended," or "Not Recommended." In September 1999, FTA issued *Guidance on Requests for New Starts Projects to Enter Preliminary Engineering and Final Design* to address these requirements, and to define the milestones for determining when and how proposed transit capital investments shall be considered for advancement through the project development process.

In December 2000, FTA issued its *Final Rule on Major Capital Investment Projects (49 CFR Part 611)*, as required by 49 USC 5309(e)(5). The rule established the procedures that FTA shall use to evaluate candidate New Starts projects. Like the September 1999 Guidance, the final rule outlined – but did not substantively address – the critical role that the planning and project development process plays in the shaping of transit capital investments. In fact, it is this very process, undertaken at the local level to support local decisionmaking, which provides the forum for developing not just "competitive" New Starts projects, but projects which best meet local goals and objectives for improved mobility, cleaner air, community development, and quality of life.

FTA's *FY 2003 Strategic Business Plan* identifies a "commitment to delivering the highest value for America's investment" in public transportation as one of the agency's core values. To that end, it is FTA's intent not to simply "insert" itself in the project development process at the point of approving a project's entrance into preliminary engineering or final design, but to add value throughout the process by providing responsive technical assistance and improved tools to help local stakeholders generate the information necessary to support effective local decisionmaking. Consequently, key themes of this guidance include the importance of objective and defensible transportation planning and subsequent project development efforts to facilitate local[1] decisionmaking and ongoing environmental, engineering, and design management, *and* FTA's early and ongoing partnership with local agencies and stakeholders to assist in this process. It must be emphasized that the intent of this guidance is not to provide detailed technical direction on corridor planning and project development, but to

[1] Throughout this document, the word "local" is used in describing decisionmakers, agencies, requirements, funding, etc. to contrast with their Federal counterparts. "Local" is not intended to exclude the increasing number of State agencies involved in transit. Most transit agencies are managed by boards of local government officials, so "local" is a convenient modifier that should be interpreted to include State agencies whenever appropriate.

simply emphasize the key planning and project management principles that should guide the development of major capital transportation investments. All available (or soon-to-be issued) FTA technical guidance and resources relating to corridor planning and project development will be referenced, as appropriate (a list of supporting technical assistance materials is provided as an appendix to this document). Of particular note is FTA's guidance on *Procedures and Technical Methods for Transit Project Planning*, originally issued in 1991 and available from FTA via email at planningmailbox@fta.dot.gov. Several chapters of this guidance have recently been updated and are available (as are other technical resources) on FTA's New Starts website at www.fta.dot.gov/library/policy/ns/ns.htm ; other updated chapters will be posted in the near future.

This guidance is organized around the three broad categories of "criteria" defined by 49 USC 5309(e)(1), which provides the basis for FTA approval to advance candidate investments through the project development process. The first of these criteria – and Part I of the guidance - is the **planning and project development process** itself. 49 USC 5309(e)(1)(A) states that all New Starts projects not exempted from the criteria (see the introduction to Part III below) must be based upon the results of an alternatives analysis and preliminary engineering. Part I describes some of the key elements of a planning-level alternatives analysis (AA) which provides the information that local decisionmakers need to make an informed decision on how to address identified transportation needs in the study area (and which must be satisfied in order to be considered for advancement into project development). In addition to the definition of the alternatives to be analyzed, this section also highlights several other planning activities – definition of planning goals and objectives, evaluation of alternatives, and documentation of analytical methodologies and results - which are all critical components of the alternatives analysis study process.

New Starts Criteria

49USC5309(e)(1) *New Starts Criteria* sets forth three primary requirements for candidate New Starts projects. Specifically, New Starts projects must be:

(A) based on the results of alternatives analysis and preliminary engineering;

(B) justified based on a comprehensive review of its mobility improvements, environmental benefits, cost effectiveness, and operating efficiencies; and

(C) supported by an acceptable degree of local financial commitment, including evidence of stable and dependable financing sources to construct, maintain, and operate the system extension

Part I of this guidance further introduces the planning and project management "triggers" which establish a proposed project's readiness to advance from AA into PE (and, later, PE into final design), and FTA actions to facilitate that advancement. Key products of the local planning and project development process are described, as are FTA's recommendations for their breadth and

content. In sum, this guidance establishes that FTA will not consider a request to enter preliminary engineering (or final design) unless the project for which the request is being made was planned (and developed) according to the planning, environmental, and project management principles outlined in this guidance. Accordingly, this document focuses far more on the planning and project development process than has previous FTA guidance on advancing New Starts projects into preliminary engineering and final design.

Lastly, Part I of this guidance identifies several specific elements of the alternatives analysis study that FTA requests the opportunity to review and comment upon. FTA has three primary objectives for becoming more actively involved in the conduct of local corridor studies: 1) to assist local agencies in addressing technical and procedural issues early in the study process, rather than at the end when it may be too late to efficiently solve them; 2) to ensure that FTA requirements for alternatives analysis are met (this includes the selection of a New Starts Baseline Alternative and documentation of planning-level information needed to perform a Before and After Study, should the resulting project eventually receive a Full Funding Grant Agreement for the project); and 3) to gain sufficient understanding of the resulting project to support FTA's decision to advance it into PE and, later, final design. FTA does not "approve" any aspect of the alternatives analysis. However, failure to provide FTA with an adequate opportunity to participate in the alternatives analysis could result in additional study effort necessary to ensure consistency with FTA policies, regulations, and good planning practices, as described in this (and other) FTA guidance. Such additional work could further result in significant delays in the processing of the request to enter into PE.

FTA notes that its Office of Program Management is currently developing more detailed guidance on its expectations for the conduct of preliminary engineering and final design, and on the specific project management and PE milestones which must be met in advance of New Starts projects' progression through the project development process. This information will be included in subsequent versions of this guidance.

Part II of this guidance outlines the statutory **project justification** and **local financial commitment** criteria used by FTA to assess the merits of candidate New Starts projects. Specifically, 49 USC 5309(e)(1)(B) requires that New Starts projects "be justified based on a comprehensive review of (their) mobility improvements, environmental benefits, cost effectiveness, and operating efficiencies." 49 USC 5309(e)(1)(C) further requires that there be adequate local financial support for New Starts projects. FTA's *Final Rule on Major Capital Investment Projects* defines several measures that address these project justification and local financial commitment criteria. Part II of this guidance summarizes these measures (including FTA's measures for cost effectiveness, mobility improvements, and transit supportive land use) and describes how FTA uses them to evaluate New Starts projects at each stage of development.

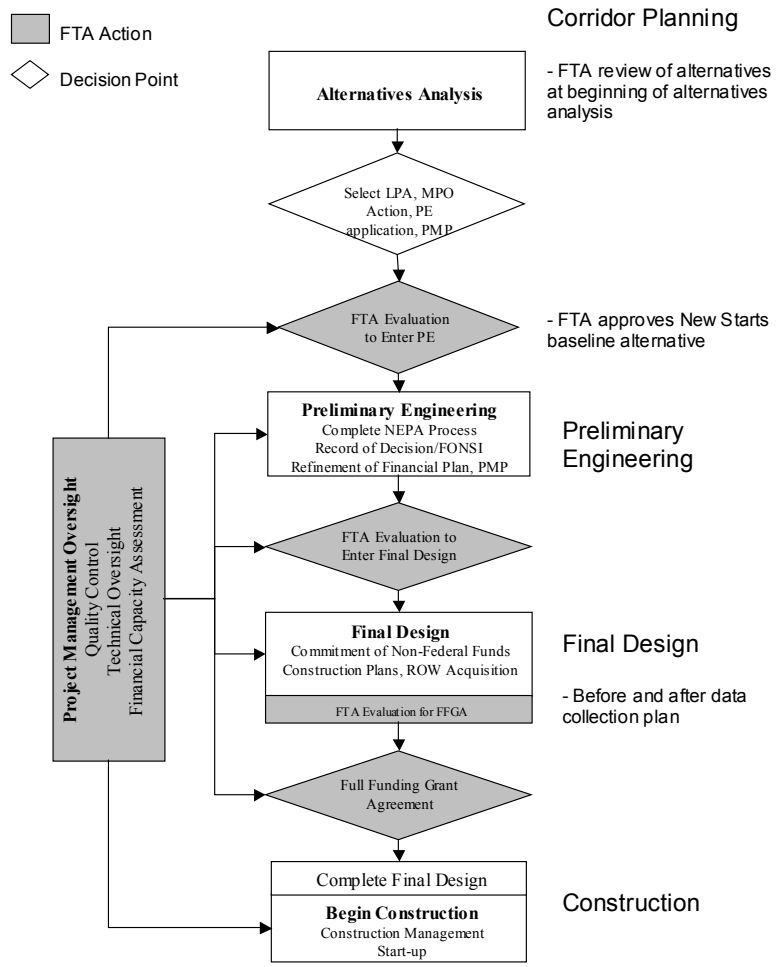
Part III *Exempt Projects* clarifies TEA-21's New Starts provisions for projects which are exempt from 49 USC 5309(e), particularly as they relate to advancing through planning and project development. 49 USC Section 5309(e)(8)(A) exempts projects which request Section 5309 New Starts funding of less than $25 million from many of the requirements contained in Part II of this guidance. Please note, however, that any exemption under 5309(e)(8)(A) applies only to the New Starts criteria serving as the basis for FTA's approval to advance to preliminary engineering and final design for such projects. Project sponsors that seek less than $25 million in New Starts funding must still base their proposed investments on sound planning principles and procedures, and must adequately demonstrate the management and technical capabilities to design, build, and operate the project. The basis for advancing exempt projects through the planning and project development process is described in Part III.

Finally, several appendices are included which provide further information on advancing major capital transit investments through the planning and project development process. Appendix A provides detailed guidance on FTA's procedures for *Selection of the New Starts Baseline Alternative*. The New Starts Baseline Alternative is intended to serve as a "base" condition against which the incremental benefits (and costs) of a proposed major transit capital investment are measured. Appendix B summarizes the process that FTA uses to evaluate a project's justification and financial criteria. This process has evolved since publication of the *Final Rule on Major Capital Investment Projects*; an update to Appendix B is currently under development and will be issued in a subsequent version of this guidance. Finally, Appendix C concludes this document with a bibliography of related guidance and other (mostly world wide web-based) resources to assist local agencies in advancing candidate projects through planning and project development.

PART I PLANNING AND PROJECT DEVELOPMENT

49 USC 5309(e)(1)(A) establishes a process for the planning and development of New Starts projects consisting of alternatives analysis and preliminary engineering (the satisfactory completion of which results in the commencement of final design). This process is presented graphically in Figure I below and discussed throughout the following sections of this guidance.

Figure I
Planning and Project Development Process for New Starts Projects



FTA intends that this process (through the completion of preliminary engineering) be carried out as part of the overall metropolitan planning and environmental review processes, as specified by 23 CFR Part 450 *FTA/FHWA Joint Final Rule on Metropolitan and Statewide Planning* and 23 CFR Part 771 *Final Rule on Environmental Impact and Related Procedures*, respectively. As such, planning and project development activities for New Starts projects should not require any more rigor or detailed technical analysis than would be expected for the

adequate study and subsequent development of any major transportation (transit, highway, or multimodal) project in a given corridor[2]. This analysis includes (among other activities) the identification of specific transportation problems in the corridor; the definition of reasonable alternative strategies to address these problems; the development of forecasts for these alternatives in terms of environmental, transportation, and financial impacts; and an evaluation of how each alternative addresses transportation problems, goals, and objectives in the corridor. These analytical activities are intended to provide local decisionmakers with the necessary information on which to base the selection of a specific transportation project design concept and scope for inclusion in the fiscally constrained long range plan and to advance it into preliminary engineering and the completion of the environmental review process.

FTA emphasizes that a locally managed multimodal transportation planning and project development process simply reflects a "common sense" approach to problem solving. At the regional or "systems" level, (carried out as part of the metropolitan planning process) this process entails an inventorying of current and forecast travel patterns, an identification of regional transportation problems and issues, and the prioritization of transportation corridors in greatest need of more detailed planning and analysis. Systems planning further provides a framework for identifying systemwide service, fare and other policy parameters, as well as the short- and long-range regional transportation network improvements to be assumed in subsequent planning analysis. A corridor-level analysis then focuses on a specific transportation need (or set of needs), identifies alternative actions to address these needs, and generates the information needed to select an option for implementation. The analysis typically addresses such issues as costs, benefits, environmental and community impacts, and financial feasibility to support project selection. Consequently, an alternatives analysis spans a wide range of technical disciplines, ranging from engineering to patronage forecasting to the natural and social sciences. It must be noted that this analysis takes place within the context of a proactive public involvement effort to ensure that it both responds to issues

New Starts Criteria

49USC5309(e)(1) *New Starts Criteria* sets forth three primary requirements for candidate New Starts projects. Specifically, New Starts projects must be:

(A) based on the results of alternatives analysis and preliminary engineering;

(B) justified based on a comprehensive review of its mobility improvements, environmental benefits, cost effectiveness, and operating efficiencies; (see Section II.I)

(C) supported by an acceptable degree of local financial commitment, including evidence of stable and dependable financing sources to construct, maintain, and operate the system extension; (see Section II.II)

[2] Throughout this document, the word "corridor" means a geographic area that encompasses the origins, destinations, and primary paths of the majority of trips affected by the identified transportation problem or need. "Corridor" in this sense does not mean a specific transportation facility right-of-way, as it may in other contexts.

of concern to the community *and* is presented in a way that facilitates public understanding of its technical results such as anticipated costs, transportation benefits, and adverse impacts.

In many respects, systems and corridor-level planning are key steps in project development since it as at these points that the context is set for the selection of a project for implementation. The alternatives analysis study establishes the improvements that will be achieved, the costs that will be incurred, and the environmental consequences that will result. Subsequent project development activities undertaken in preliminary engineering focus on the refinement of the selected project's design and alignment, the scope of environmental mitigation measures, and the completion of the project's financial plan (including securing local funding commitments to construct and operate the proposed project).

Key Elements of Systems Planning

Corridor and systems planning takes place within the policy, program, and technical context of metropolitan planning. As such, several key aspects of the broader metropolitan process affect the quality of analysis and strength of a community's resolve in recommending a corridor investment proposal for inclusion in the region's financially constrained long-range plan. These quality factors include:

- A proactive, ongoing public involvement process.
- A systematic, continuing performance monitoring program that reports transportation service and mobility patterns on at least a corridor level.
- A set of recently validated travel demand forecasting techniques that incorporates proven sensitivity to the policy variables considered in the alternatives analysis.
- A reliable process for forecasting capital and ongoing operations and maintenance costs of corridor investment proposals.
- A coordinated, interagency process for projecting the stream of future revenue, across a range of sources, that could reasonably be expected to be available to fund the selected investment proposal.
- A cooperative transportation/air quality planning process in areas designated as being in non attainment or maintenance of air quality standards.
- A metropolitan planning organization that supports informed, responsive, consensus-based interagency decision-making.

Useful guidance, training opportunities, and technical assistance are available through the FTA/FHWA Metropolitan Capacity Building (MCB) Program (www.mcb.fhwa.dot.gov).

Ideally, then, the planning and project development process reflects a continuum of policy development, technical studies, and decisionmaking activities, where broad regional problems are identified and prioritized; options for addressing specific problems in specific corridors are identified, evaluated, and narrowed; and optimal investment strategies are selected and advanced for more detailed analysis and, ultimately, implementation and operation. The following briefly describes the major phases of this process: alternatives analysis (AA); preliminary engineering (PE); and final design. The following further provides specific guidance for sponsors of candidate New Starts on the planning, environmental, and project management milestones that FTA considers before

accepting a request to advance projects through this process (i.e. from AA into PE, and from PE into final design).

I.I Alternatives Analysis

A corridor planning study in which one or more of the alternatives under study is, or includes, a fixed guideway facility is often referred to as an alternatives analysis. The name "alternatives analysis" has as its basis the New Starts planning provisions contained in Federal legislation; in fact, alternatives analysis is synonymous with multimodal corridor planning consistent with the principles of both the major investment study (MIS) process practiced in many areas around the country, and the Draft Environmental Impact Statement (DEIS) required by the National Environmental Policy Act of 1969 (NEPA). Regardless of what the study is called, its intent is the same: to identify and compare the costs, benefits, and impacts of a range of transportation alternatives as a means of providing local decisionmakers with the information necessary to implement the most appropriate transportation solutions in priority corridors.

Guiding Principles of Alternatives Analysis

Planning provides a foundation for effective decisionmaking. Alternatives analysis studies best support local decisionmaking by adhering to the following key principles:

- Early and ongoing participation by a wide range of stakeholders. Alternatives analysis is a local process, but can benefit from the participation of Federal and state resource and funding agencies.
- Identification of project purpose and need, goals, and objectives.
- Comprehensive. multidisciplinary analysis of a range of reasonable alternative transportation strategies and investments, which respond to purpose, need, goals, and objectives.
- Development of evaluation measures which reflect purpose, need, goals, and objectives, and which isolate the incremental differences in impacts of each alternative.
- Identification and documentation of consistent land use, fare, and policy assumptions and the methodologies used in the analysis of impacts.
- Analysis and evaluation of alternatives at a level of detail necessary to support the planning decision-at-hand.
- Selection of a locally preferred alternative based upon full disclosure of estimated costs, benefits, and impacts; informed judgment about which analyzed option best addresses corridor purpose and need given identified impacts; *and* the most likelihood of generating the political and financial support necessary to be implemented.

Alternatives analysis can be viewed as a bridge between systems planning at a metropolitan scale (which identifies regional travel patterns and transportation corridors in need of improvements) and preliminary engineering (where a project's design is refined sufficiently to incorporate the avoidance, minimization, and mitigations necessary to complete the environmental process). AA is the process for reaching a broad consensus on exactly what type of improvement(s) best meet locally defined goals and objectives for a specified corridor. Because it involves specialized technical analyses and an evaluation of transportation alternatives that have varied effects on the surrounding community, the alternatives analysis is

necessarily a collaborative process. The AA study typically involves local transportation planning agencies (including the metropolitan planning organization) and service providers, local governments, state and Federal resource agencies, potential funding partners, and (through a formal citizen participation process) the general public.

As with the MIS, there is a multitude of ways that an alternatives analysis can be coordinated with the environmental review required by NEPA. NEPA itself mandates that the EIS reflect an analysis of all reasonable alternatives, so the careful coordination of the alternatives analysis and NEPA review is essential to the efficiency of the study and to public and interagency understanding of the process. Various coordination methods have been used, such as "incorporation by reference" to carry the alternatives analysis results into a NEPA document, or use of a first-tier or programmatic EIS as an alternatives analysis. While the decision to conduct the AA either “within” or “outside” the NEPA process is an important milestone which should be agreed upon as early as possible within the study process, FTA emphasizes that the appropriate level of analysis is a function of the complexity of the corridor and its transportation needs, not of the regulatory framework. The level of analysis should be commensurate with the planning decision at hand, that is, the analysis of every issue should be carried just far enough to make an intelligent selection of a preferred transportation design concept and scope from the alternatives available. The National Transit Institute, through funding provided by FTA and FHWA, is developing a series of training courses and related materials on the linkage between planning and NEPA, which will provide further detail on the relationship between alternatives analysis and NEPA review and environmental documentation.

The alternatives analysis consists of a number of important activities, each of which is guided by key planning principles. These activities are introduced and described below. An over-riding principle of the alternatives analysis is the early and continuing participation by FTA in the study process. It is FTA’s intent to partner with local agencies in the conduct of their corridor planning activities to facilitate the analysis and to ensure that all FTA and other Federal requirements are met.

As noted previously, more detailed information on the conduct of an alternatives analysis can be found in FTA’s *Procedures and Technical Methods for Transit Project Planning.*

I.I.I Scope of Work

Corridor planning can be a highly complex technical process. When fixed guideway alternatives are involved, the process can be as challenging as any transportation planning effort can be. Although there are a number of technical and managerial difficulties inherent in conducting such studies, corridor planning proceeds most smoothly when the work to be done by each participating agency

- and the time and resources required to do the job - are carefully documented in advance.

Consequently, a well-crafted scope of work is a critical component to the success of the planning effort. Ideally, the scope of work is a management tool which includes not only a detailed description of technical activities (tasks and subtasks) to be performed in the study, but identifies the relationship between these activities and defines their deliverables; clarifies the roles and responsibilities of agencies participating in the study; describes the organizational structure which guides the analysis, including the make-up of any policy or technical advisory committees; identifies major review and decision points (including those requested by FTA, as documented by this guidance); and sets forth a realistic schedule and budget for completing the study.

Corridor planning studies will include tasks for data collection, estimating the capital and operating costs of each alternative, forecasting ridership and other travel characteristics, assessing transportation, social, and environmental impacts, undertaking public involvement activities, and evaluating funding and financing strategies. These activities represent the technical underpinnings that support all corridor-level investment decisions. Nevertheless, the scope of work for each AA study will be unique, because it reflects the status of planning in the corridor, the kinds of alternatives to be considered, and other issues of importance to local decisionmakers.

The scope of work must clearly indicate the level of effort that will be required for each task. Level of effort will be a function of the amount of detailed information needed to make a reasoned decision from among the alternatives being studied and (for New Starts projects) to develop the necessary information on project justification and local financial commitment to support a request to FTA to advance a locally preferred alternative (LPA) through project development. This information includes the development of the transportation system user benefits measure, which FTA uses to evaluate the cost effectiveness and travel time benefits of candidate New Starts projects. Calculation of user benefits may require some modifications to the regional travel demand model set employed in the alternatives analysis study effort in order to produce the set of fixed person trip tables and generalized cost files which are read into the “Summit” software developed by FTA to generate the measure; this modification should be included in the scope of work. Furthermore (and more importantly), the reports and thematic maps produced by Summit should be used by the technical study staff as a diagnostic tool for reviewing the completeness (and comparability) of each alternative’s operating plan; for identifying potential transportation network coding errors; for re-evaluating model specifications; and to thoroughly examine how the alternatives may impact (positively or negatively) discreet travel markets, in terms of transit travel times and costs. Ample time and resources for this analysis, and the subsequent corrections and modifications to the alternatives and/or forecasting tools that it may result in, should be provided for in the study scope

and schedule. More information on the user benefits measure is provided in Section II.I.I of this guidance.

FTA further notes that the scope of work must provide for all necessary documentation of information to support the undertaking of a Before and After Study, if the project sponsor intends to pursue a Full Funding Grant Agreement for the resulting LPA. This requirement is generally satisfied by an adequate documentation effort (in the form of technical reports or appendices) of the independent variables, assumptions, and methodologies used to define transit service levels and to estimate capital and O&M costs and ridership patterns. Additional guidance on documentation of the AA study effort (and the Before and After Study) is provided in Section I.IV of this guidance and in FTA's *Procedures and Technical Methods for Transit Project Planning.*

Corridor planning schedules and costs vary widely from one area to the next. FTA has observed that many study schedules are overly ambitious in terms of the time needed to complete the work effort, i.e. collect data, code the transportation networks, validate and run the travel demand models (including equilibration of transit operating plans), perform analysis, provide for adequate public involvement, etc. It is not unusual for alternatives to be refined during the study process, and sometimes modifications in alignments and system access points require additional analysis not adequately accounted for in the study schedule. Consequently, many studies do not meet planned milestones, resulting in schedule slippage which may undermine stakeholder confidence in the analytical effort and its results and which may further result in cost overruns or the need to re-allocate budget among study functions. On the other hand, where schedule is maintained but necessary analysis foregone, the study will likely yield flawed results, leading to the presentation of inaccurate information to decisionmakers on the true costs and benefits of studied alternatives.

As an aid to reasonable schedule setting, and to help ensure that the work is complete enough to satisfy both good planning practice and FTA requirements for alternatives analysis, FTA requests the opportunity to review and comment upon the scope of work of local corridor planning studies that may result in the selection of a transportation improvement requiring New Starts funding.

I.I.II Problem Statement, Planning Goals and Objectives, and "Purpose and Need"

A clear understanding of transportation problems in a corridor plays a critical role in the alternatives analysis study. A well-conceived and documented statement of the problem for which alternative solutions are being analyzed is therefore a key early step of the corridor planning process. Although it is specifically required by NEPA regulations and typically serves as its own chapter in a Draft and Final EIS, the definition of a concise, direct "purpose and need" statement can help guide the conduct of any corridor-level analysis, whether or not it is a part of a NEPA review. Purpose and need for a project establishes the problems

which must be addressed in the study; serves as the basis for the development of project goals, objectives, and evaluation measures; and provides a framework for determining which alternatives should be considered as reasonable options in a given corridor. More fundamentally, the statement of purpose and need serves to articulate – and justify - why an agency is proposing to spend potentially large amounts of taxpayer's money to study and implement a project, which may cause significant environmental and community impacts, and why these impacts are justified.

The systems planning process typically serves as the primary source of information for identifying specific corridor problems and establishing the goals and objectives for an improvement. Information on existing and forecast travel demand, the condition of transportation infrastructure, air quality, traffic accident rates, etc., all contribute to problem identification and the need for improvements. From the identification of the problem springs the development of project goals and objectives that specify, in part, the desired outcomes of an improvement to the corridor. "Purpose and need," (either within or outside of the NEPA process) then, frames subsequent analytical requirements in that the information generated from the alternatives analysis must be able to respond to the problems, goals, and objectives derived from it.

A study's problem statement and supporting goals and objectives for improvement should be developed with great care. Definition of a vague problem – for example, the need for additional transportation capacity in a corridor – could result in a very large number of alternatives which could be thought of as being "reasonable," thus widening the analysis to more options than what ideally needs to be considered. On the other hand, too narrow a definition might unduly constrain the range of alternatives. In no case should the need for a project be expressed in modal terms (e.g. need for additional highway lanes; need for a light rail system). Rather, need is a function of the problem at hand (need to improve mobility, need to reduce vehicular traffic through a community; etc.). The ideal problem statement results in the development of a manageable number of distinct strategies designed to achieve some level of improvement in forecast conditions. Simply put, if an alternative does not address the "purpose and need" for a project it should not be included in the analysis.

The Federal Highway Administration's (FHWA) *Guidance for Preparing and Processing Environmental and Section 4(f) Documents* has identified a number of considerations which may assist in the explanation of the need for a proposed action. Although the guidance applies to analyses conducted under NEPA, the following items reflect (for illustrative purposes; they are not intended to be all-inclusive) several common sense questions and considerations that need to be recognized early in any alternatives analysis study:

- *Project Status* – What is the planning history of the corridor, including actions taken to date, other agencies and governmental units involved, actions pending, schedules, etc.

- *Capacity* - Is the capacity of facilities and services in the corridor inadequate for the present movement of people and goods? Projected demand? What capacity is needed? What time of day? What is the level(s) of service for existing and proposed facilities and systems?

- *System Linkage* - Is the proposed project a "connecting link?" How does it fit in the transportation system?

- *Legislation* - Is there a Federal, State, or local governmental mandate for the action?

- *Social Demands or Economic Development* - New employment, schools, land use plans, recreation, etc. What projected economic development/land use changes indicate the need to improve or add to system capacity?

- *Modal Interrelationships* - How will the proposed alternatives interface with and complement the performance of highways and transit systems, airports, rail and port facilities, etc.?

- *Safety* - Is the proposed project necessary to correct an existing or potential safety hazard? Is the existing traffic accident rate excessively high? Why? How will the proposed alternatives improve it?

Perhaps most important is the role of a focused statement of purpose and need in galvanizing community awareness and public support for the study. Within the context of the metropolitan planning process, the public presumably has been involved in identifying pressing accessibility and mobility needs throughout the region. Engaging the affected public in the development of a statement of the rationale and dimensions of an ensuing corridor study firmly places it within the region's documented needs agenda. This, in turn, should facilitate a better public understanding of the importance of the study effort, as well as broader support for the study's findings and recommendations.

As part of its desire to provide early and ongoing assistance to local corridor planning efforts, FTA requests the opportunity to review and comment upon the problem statement and corresponding goals and objectives developed for every alternatives analysis which is likely to result in the selection of a transportation improvement requiring Federal funding.

I.I.III Definition of Alternatives

The development of the various alternatives to be considered in the alternatives analysis process follows closely after the definition of purpose and need. The definition of these alternatives is a very important part of the study process. Without a set of alternatives that a) meet the study's problem statement and goals and objectives for improvement; b) are structured to isolate the differences between potential solutions to an identified transportation problem; and c) highlight the trade-offs inherent in the selection of a preferred alternative, even the highest quality technical analysis cannot produce the full set of information needed by decisionmakers.

Guiding Principles in the Development of Alternatives

- The alternatives should include all reasonable modes and alignments.
- Each alternative should directly address the clearly stated problem(s) in the corridor. If an alternative does not satisfy the purpose and need for an improvement, it should not be included in the analysis.
- The alternatives should be designed to optimize their performance.
- The policy setting and land use assumptions must be consistent across alternatives.
- Appropriate no-build and transportation system management (TSM) alternatives should be developed.
- Alternatives should be well-defined and documented so that stakeholders have a good understanding of them, and of the differences between them.

The development and definition of alternatives is typically an iterative process. FTA's *Procedures and Technical Methods for Transit Project Planning* outlines three distinct phases in the development of alternatives. First, a broad *conceptual definition of alternatives* may be defined within systems planning, and refined through subsequent analysis of reasonable modes, alignments, and operating strategies. Initial activities of the corridor analysis are focused on narrowing the range of alternatives to a more manageable number to carry forward in the study. This "screening" and further refining of alternatives typically results in a *detailed definition of alternatives*. Ultimately, these surviving detailed alternatives - which include operating policies (fares, service frequencies, capacities) feeder bus plans, parking (capacities and user costs) and other policy and design features - are refined, analyzed, and documented in what is typically titled a *Final Definition of Alternatives Report*. FTA requests the opportunity to review the alternatives at the point of their detailed definition, and again in the *Final Definition of Alternatives Report*, as a part of its ongoing review of the technical alternatives analysis process and as a basis for its selection of a New Starts Baseline Alternative.

As noted, the set of "build" alternatives carried through an alternatives analysis must address the "purpose and need" for considering a major transportation investment in the corridor and should encompass a range of reasonable options, including low, intermediate, and high cost strategies. This range should include "minimum operable segments" of fixed guideway alignments, to provide flexibility in advancing a project should not all desired funding be available. In order to maintain the comparability of the benefits of alternatives, each alternative should be defined to optimize its performance; moreover, the policy (fares, parking fees,

etc.) and land use setting in which the alternatives are defined and analyzed must be unbiased and consistent across the alternatives. The intent is to ensure that any differences in the costs and benefits between alternatives are attributable to the alternatives themselves and not to the underlying policy and land use assumptions (although supplemental sensitivity analyses may also be included in the study, if desired, to explore the implications of different service, fare, and/or land use policies).

In addition to defining a number of appropriate Build Alternatives, the study sponsor must also identify a No-build Alternative and at least one Transportation System Management (TSM) Alternative. The No-build Alternative is a requirement of NEPA regulations and serves as the baseline for establishing the environmental impacts of the alternatives, the financial condition of implementing and operating agencies, and the cost-effectiveness of the TSM Alternative (typically required for the selection of a New Starts Baseline Alternative, as discussed in Appendix A). Typically, the No-build Alternative can be defined in one of two ways:

1. An alternative that incorporates "planned" improvements that are included in the fiscally constrained long-range plan for which need, commitment, financing, and public and political support are identified and are reasonably expected to be implemented.
2. A conservative definition that adds only "committed" improvements – typically those in the annual element of the transportation improvement program or local capital programs – together with minor transit service expansions and/or adjustments that reflect a continuation of existing service policies into newly developed areas.

The TSM Alternative must be defined as the “best that can be done” to address the identified problems in the corridor without constructing a new transit guideway. While lower in cost than the Build Alternatives, the TSM Alternative may still carry some significant costs, particularly when the transportation problems in the corridor are complex and the associated build options are extremely capital intensive. The TSM Alternative may include transportation system upgrades such as intersection improvements, minor road widening, traffic engineering actions, bus route restructuring, shortened bus headways, expanded use of articulated buses, reserved bus lanes, contra-flow lanes for buses and High Occupancy Vehicles (HOVs) on freeways, special bus ramps on freeways, expanded park/ride facilities, express and limited-stop service, signalization improvements, signal pre-emption, passenger information systems, and timed-transfer operations. The key factor in defining the TSM is that it must serve the same travel markets and provide as close a level of service as the Build Alternatives under study, absent a corresponding level of capital investment.

In most cases, the TSM Alternative will be used as the Baseline Alternative for determining the incremental costs and benefits of candidate New Starts projects.

Additional guidance on the selection of the New Starts Baseline Alternative is provided in Appendix A of this guidance.

I.I.IV Analytical Assumptions, Methodologies, and Results

As previously noted, the alternatives analysis study encompasses a number of technical analyses addressing travel demand impacts, environmental impacts (air quality, noise, and natural resources, etc.,), social impacts (neighborhood, cultural/historical, environmental justice, etc.), land use, economics, capital and O&M costs, and several others, depending on the nature of the corridor and the purpose and need. For transportation improvements in the corridor. These analyses, in turn, are dependent upon a broad data collection effort, the identification of policy input variables (land use, transit service policies, fare policies), and the application of a wide array of technical planning tools (geographic information systems; travel demand, financial, and other forecasting models; operations simulation software, etc.). Such analyses result in the generation of measurable outputs relating to a number of different attributes (costs, travel characteristics, community impacts) which allow stakeholders to understand the incremental costs and benefits between the transportation alternatives being studied, and provide decisionmakers with the information necessary to select a preferred alternative for further engineering and design.

FTA's *Procedures and Technical Methods for Transit Project Planning* summarizes the technical underpinnings of, and considerations for, a number of important analyses. These analyses require the use of consistent and reasonable measures, data inputs, and analytical assumptions in order to provide un-biased information on the costs, benefits, and impacts of studied alternatives. The definition of input variables will have significant effects on the ultimate outcome of the forecasting procedures used to predict future impacts; such information must be carefully selected and documented, so that study stakeholders may understand the cause of the effect (results). As noted previously, policy and land use assumptions should be held constant across alternatives to ensure that it is the benefits of the alternatives themselves that are captured in the analyses. Similarly, modal bias constants and coefficients used to model future travel behavior must be reasonably estimated to ensure the integrity of the forecast results. In its *Reporting Instructions for the Section 5309 New Starts Criteria* (available at www.fta.dot.gov/library/policy/ns/2002/), FTA has identified a number of specific technical principles and assumptions which every alternatives analysis must follow; moreover, FTA requires that the Chief Executive Officer of the local sponsoring agency certify that these principles have been adhered to in the planning and development of the project and the calculation of its New Starts criteria. Figure II on the following page presents this *Certification of Technical Assumptions* statement.

Figure II
Certification of Technical Assumptions

LEAD AGENCY CERTIFICATION
OF TECHNICAL ASSUMPTIONS IN THE DEVELOPMENT OF
THE NEW STARTS CRITERIA SUBMISSION

The (*Name of Submitting Agency*), acting in the capacity as lead agency for (*Project Name*), the proposed New Starts project, understands that the Section 5309 New Starts criteria are used to evaluate the worthiness of proposed projects across the nation and that it is important that project sponsors address the criteria in a consistent manner.

As Chief Executive Officer of _(*Name of Submitting Agency)* I hereby certify that (*Name of Submitting Agency*) has followed FTA's Reporting Instructions on Section 5309 New Starts Criteria in the preparation of this submission, including:

- Assuming identical highway and transit networks outside the corridor for the Baseline and the Build alternatives for the travel demand forecasts;
- Defining the build alternative as the project for which we are seeking FTA New Starts funding ;
- Developing ridership forecasts for the New Starts project that are based on the same set of growth forecasts and land use assumptions that are used to estimate ridership for the Baseline alternative;
- Allocating the population and employment growth on the basis of locally adopted land use plans;
- Analyzing the Build and Baseline Alternatives within the same basic policy setting, i.e., the model assumptions, parameters, and inputs are the same for all alternatives except for changes in the transportation network or other data that are directly attributable to each alternative.
- Reporting the New Starts criteria and specific measures only for the Section 5309 New Starts transit investment and not for the complete build alternative.

Any methods and assumptions that differ from those described in this section have been discussed with and concurred in by FTA.

_____ _____
Chief Executive Officer Date

FTA treats this certification, and the principles it conveys, very seriously. More specifically, FTA will not evaluate candidate New Starts projects for the purposes of advancing them into PE (or final design) unless the sponsoring agency's CEO signs this statement, and FTA's review of the technical study elements (as outlined in this guidance) finds substantive compliance with the it's abiding planning principles.

The documentation of assumptions, methodologies, and results of these analyses is a critical component of any planning study. In alternatives analysis, documentation of these study elements takes on increased importance in that they form the basis of identifying, isolating, and understanding the tangible

differences between proposed solutions to a given corridor purpose and need. The identification and documentation of study assumptions is a key early milestone in the corridor analysis, as it feeds the analytical processes used to generate desired information. Meanwhile, the documentation and disclosure of these assumptions provides a mechanism for study staff and stakeholders to better understand the results of the analytical process, and to defend them to project reviewers and critics.

Documentation of assumptions and results helps meet other objectives as well. FTA has long believed that a comparison of planning-level *forecasts* of project scope, cost, and performance with the *actual* scope, cost, and performance of implemented New Starts investments would provide the transit and transportation planning communities with a better understanding of the impacts of major transit capital investments and the analytical methods and procedures used to generate the information needed to support local decisionmaking. This enhanced understanding would, in turn, help identify needed improvements to related tools and techniques for corridor planning. The *Final Rule on Major Capital Investment Projects* includes a provision whereby New Starts project sponsors seeking an FFGA must submit a complete plan for collection and analysis of information to identify the impacts of their projects and the accuracy of the forecasts that were prepared during project development. During final design, projects seeking FFGAs will be required to submit to FTA a plan for data collection and analysis. If the project results in an executed FFGA, this plan must be implemented, resulting in the conduct and completion of a Before and After Study.

Travel Demand Forecasting Assumptions

There is significant variability in the travel demand forecasting models maintained by agencies across the country. However, a number of good practices have evolved that ensure consistent treatment of alternatives. The basic guiding principle in developing model input assumptions is to make sure that the travel forecasting approach does not bias the results in favor of any particular alternative. FTA requires the following modeling practices:

- Model assumptions regarding socio-economic variables and land use, modeling parameters, and inputs are the same for all alternatives.
- Assumptions about travel times and operating speeds of transit services must be consistent among the alternatives.
- Access, egress, walking, waiting, and transfer times must be estimated consistently for all alternatives.
- Transit vehicle operating speeds in mixed traffic must reflect anticipated congestion and flow characteristics.
- Transit sub-mode bias constants cannot be used without submitting technical justification to FTA.
- Factors to convert daily ridership to annual ridership must be consistent among all alternatives and must reflect the operator's recent experience. Any annualization factor over 300 requires a written justification.
- The highway network and zone system must be the same among all alternatives except for changes that result from the alternatives themselves.
- Highway volume-time functions used to determine highway link speeds and assignments based on traffic volumes need to be the same among all alternatives.
- Assumptions about highway tolls and parking costs need to be the same among all alternatives.

FTA is currently developing guidance (anticipated to be available in early 2003) on the scope of data collection and analytical activities in support of the Before and After study requirement. In

summary, local project sponsors must assemble information on five project characteristics:

1) *Project Scope* – the physical components of the project, including environmental mitigation;
2) *Service Levels* – the operating characteristics of the guideway, feeder bus services, and other transit services in the corridor;
3) *Capital Costs* – total costs of construction, vehicles, engineering, management, testing, and other capital expenses;
4) *Operation and Maintenance Costs* – incremental operating/maintenance costs of the project and the transit system; and,
5) *Ridership Patterns* - origin/destination patterns of transit riders on the project and in the corridor, and farebox revenues for the transit system.

Although a formal plan for the Before and After Study is not required until final design (and only then for projects seeking a FFGA), candidate New Starts project sponsors must be aware that the "before" element of the study relating to predicted project impacts requires that assumptions and resulting information for each of the five characteristics described above must be documented at the conclusion of alternatives analysis (and later, at the conclusion of preliminary engineering).

FTA emphasizes that project sponsors have wide discretion in the documentation of analytical assumptions and methodologies so long as they capture the information necessary to understand the technical underpinnings of the study results. FTA is interested in reviewing the technical documentation of every AA that may result in local selection and implementation of a major transit capital investment project. Of particular interest to FTA is the technical information that supports the travel demand analysis of the proposed alternatives and the development of the New Starts project justification criteria, including the new transportation system user benefits measure. FTA therefore encourages the submission of forecasting assumptions and draft forecast results related to the criteria (and other common travel demand data) as early in the study as possible so that any questions, issues, and concerns can be expeditiously addressed within alternatives analysis, rather than when a request to begin preliminary engineering is submitted. This information must clearly identify and explain the use of any practices or methods that are inconsistent with the FTA principles and assumptions outlined in this (and other) FTA guidance.

Finally, FTA requests project sponsors to submit documentation of the various technical methodologies (often called methodology reports, and typically addressing analyses such as travel demand forecasting, air quality modeling, the development of O&M costs, etc.) used to support the alternatives analysis study. As above, no specific format for this information is required; rather, the documentation submitted to FTA should not exceed the level of documentation produced to meet the needs of the local study sponsor and other stakeholders.

I.I.V Preliminary Financial Plans

A solid financial plan facilitates the selection and implementation of new services and capital improvements and the ongoing operation and maintenance of the transit system. The financial plan presents the recent financial history of the transit agency, describes its current financial health, documents projected costs and revenues into the future, and demonstrates the reasonableness of key assumptions underlying these projections. Ultimately, the financial plan developed during alternatives analysis helps decisionmakers understand the costs of not only constructing each alternative, but of operating and maintaining them on an annual basis and their relative impact on the operating agency's ability to continue to provide its existing (and other planned) transit services.

Guiding Principles of Transit Financial Planning

- The general content of the financial plan is constant throughout planning and project development, but is continually refined to support decision milestones and the greater specificity of costs and revenues generated as part of the process.
- The cornerstone of a project's financial plan is a systemwide capital and operating cash flow analysis that covers a period of at least 20 years.
- Figures in the financial plan should be inflated to year of expenditure dollars.
- Projected revenues and costs (including expansion projects) included in the financial plan should be consistent with those carried in the region's financially constrained long range transportation plan.
- Capital cost estimates should include a range of costs reflecting significant risk factors.
- Operating and maintenance cost estimates should be linked to service levels (and be consistent with the long range plan).
- Justification for forecast growth in cost and revenues should be well-documented.

Financial planning for major transit investment projects recognizes two key principles. First, the general content of the financial plan remains the same throughout the planning and project development process. Basic information on the financial health of an agency, and the financial feasibility of specific projects, is established through the analysis of current and forecast costs, revenues, funding sources, and financing mechanisms. Second, the details of the financial information will continually be refined as projects advance through planning and development. Project cost estimates become more reliable as the project scope is defined in greater detail and funding strategies become more certain as funds are committed to the project. Consistent with the other technical components of the project development process, the level of the financial analysis increases as the study moves from a relatively broad comparison of alternatives (as in alternatives analysis) to engineering, design, and mitigation for a specific LPA.

The preliminary financial plans developed during alternatives analysis will include a review of the capacity of existing funding sources to support the capital and operating costs of the alternatives. It may also include the exploration of new funding sources, such as dedicated transit tax revenues and bonding, as well as innovative financing techniques such as toll revenue credits and cross-border leasing.

The primary product of a financial plan at the alternatives analysis stage of development is an agency-wide 20-year cash flow projection that includes the capital and operating plans for the agency as a whole and for any proposed alternatives. The remaining content of a financial plan is the information to support all the assumptions and inputs that contribute to the cash flow projection and the financial analysis of agencies assumptions, capital and operating plans and financial strategies.

FTA evaluates the financial plan of New Starts projects as part of its decision to approve their advancement into preliminary engineering. FTA looks at the financial health of the transit agency and funding partners, the reliability of proposed funding sources, and the reasonableness of assumptions relating to revenue growth rates, project capital and operating cost estimates, and future systemwide (rail and bus) service levels and costs. Additional guidance on the development of financial plans is contained in FTA's *Guidance on Transit Financial Plans* and *Procedures and Technical Methods for Transit Project Planning* (available at www.fta.dot.gov/library/policy/ns/ns.htm).

I.I.VI Evaluation of Alternatives

An evaluation of the alternatives is the penultimate activity in the study process, and should provide the information necessary for local officials and the general public to understand the relative costs and benefits among alternatives and to select a locally preferred alternative to advance into further detailed analysis. The evaluation of alternatives brings together all of the preceding analysis – transportation, environmental, land use, financial, etc. – and presents them such that decisionmakers can see the trade-offs between alternatives and make an informed judgment about which alternative best address the corridor's purpose and need *and* has the most likelihood of generating the political and financial support necessary to be implemented.

The evaluation framework must be focused on the transportation problems identified in the project's purpose and need, and should reflect the corresponding project goals and objectives that drive the alternatives analysis. Typically, evaluation measures are selected to assess how well (or poorly) each alternative meets these goals and objectives. Common categories of goals, objectives, and (therefore) measures include

1. *Effectiveness* - the extent to which alternatives solve the stated transportation problems in the corridor;
2. *Impacts* - the extent to which the alternatives impact --- positively or negatively - nearby natural resources and neighborhoods, air quality, the adjacent transportation network and facilities, land use, the local economy, etc.;
3. *Cost effectiveness* – the extent to which the costs of the alternatives are commensurate with their benefits;

4. *Financial feasibility* – the extent that funds required to build and operate the alternatives are likely to be available;
5. *Equity* – that is, the costs and benefits of the alternatives are distributed fairly across different population groups.

While the evaluation of alternatives occurs near the end of the alternatives analysis, the development of an evaluation methodology and the identification of supporting measures should be a high priority item in the early stages of the study; this ensures that the analytical process produces the information necessary to "feed" the measures. The measures should be comprehensive in that they address all of the stated goals and objectives, but should be structured to avoid redundant presentation of the same benefits. To the extent possible, the measures should quantify impacts rather than express subjective judgments on the nature of the impact; they should further provide an appropriate perspective on the magnitude of the impacts. For example, the relocation of one million square feet of new office space to proposed station areas may appear significant when presented by itself, but is probably more meaningful when also expressed as a percentage of total development in the corridor.

It is important to emphasize that the evaluation of alternatives is focused on local decisionmaking. Thus, while the New Starts project justification and local financial commitment criteria described later in this guidance include a number of measures which FTA uses to evaluate the relative merits of candidate projects competing for New Starts funding, they may not reflect a set of ideal measures for use in local decisionmaking. Project staff and stakeholders are free to select their own evaluation measures (which may or may not include the New Starts criteria), so long as they support the need for decisionmakers and the general public to understand the relative costs and benefits among alternatives.

Guiding Principles in the Evaluation of Alternatives

- Evaluation measures should be developed early in the analysis process so that the choice of measures is not biased by the results of the analysis, and to ensure that the analysis generates the information necessary to support the evaluation.
- Evaluation measures should address all of the stated objectives for the corridor. The measures are derived directly from the study's defined purpose and need.
- Where possible, evaluation measures should be quantifiable rather than purely quantitative.
- Evaluation measures should provide a context so that the magnitude of the impacts can be placed in perspective.
- Measures should be structured to avoid a redundant presentation of the same benefits.
- Selection of a preferred alternative is a local decision; therefore, evaluation measures should address locally-defined needs, goals, and objectives. FTA New Starts criteria measures for project justification and local financial commitment may or may not be useful measures for serving local information needs.

I.I.VII Development of FTA Measures of Project Justification and Local Financial Commitment (New Starts Criteria)

Sponsors of New Starts projects develop information on project justification and local financial commitment as part of the transportation, air quality, land use, and

financial elements of the alternatives analysis. This information is subsequently submitted to FTA with the formal request to enter into preliminary engineering. Additional information on FTA's measures to support the statutory New Starts criteria for project justification and local financial commitment is provided in Sections II.II and II.III of this guidance. Detailed guidance on the development of these measures is contained in FTA's *Reporting Instructions for the Section 5309 New Starts Criteria*.

I.I.VIII Other Activities

Alternatives analysis is considered completed when the alternative selected for advancement through project development is formally adopted by the metropolitan planning organization (MPO) into the region's financially constrained long-range transportation plan. This action confirms local consensus to implement the project, and that adequate regional funding capacity exists for its construction and operation through the life of the plan (typically 20-25 years). In areas in nonattainment of national ambient air quality standards, project adoption in the constrained long range plan ensures that its implementation will be part of a regional program of transportation improvements, policies, and other measures to achieve future conformity with the air standards.

Although alternatives analysis is a planning activity, it is important that issues related to the management and undertaking of subsequent engineering and design work are understood and considered before advancing a project into further development. Therefore, FTA stresses that candidate New Starts project sponsors will need to demonstrate the technical capability and capacity to carry out the preliminary engineering effort prior to submitting a formal request for entrance into PE. Consequently, project sponsors should be encouraged to begin development of a project management strategy during alternatives analysis.

This strategy is typically documented by a project management plan (PMP). The PMP is a dynamic management tool which is intended to describe how subsequent phases of project development --- preliminary engineering, final design, construction, and start-up --- will be managed by the lead local agency, in accordance with FTA's *Final Rule on Project Management Oversight (49 CFR 633) Project Management Oversight Program Operating Guidance*. FTA acknowledges that not all elements of the PMP can be comprehensively addressed at the pre-PE stage of development. By the completion of alternatives analysis, however, the PMP should, at a minimum, focus on how the next stage --- preliminary engineering --- of project development will be managed, and address the other required elements in a *general* way, commensurate with the stage of development. Similarly, FTA's expectations for, and review of, the PMP prior to advancing into PE will be commensurate with the project's very early stage of development.

The PMP will guide the subsequent PE and final design effort, and will become increasingly detailed as the project develops. More information on the project management plan is provided in Section I.III.IV of this guidance.

I.II Request to Enter Preliminary Engineering

Consistency with the planning and project management principles described briefly in this guidance (and more thoroughly in FTA's *Procedures and Technical Methods for Transit Project Planning* and *Project Management Oversight Program Operating Guidance*) and compliance with each of its specified activities, milestones, and approvals is necessary before FTA can consider a local project sponsor's request to advance a selected fixed guideway transit project into the preliminary engineering stage of project development. Table I below re-summarizes each of the items described in Section I.I of this guidance which must be met in advance of FTA's consideration of a request to enter PE.

Table I
Preliminary Engineering Required Milestones

Conduct of Alternatives Analysis	
FTA Review of Documentation	• Scope of Work • Problem Statement, Goals, and Objectives • Definition of Alternatives • Documentation of Study Assumptions, Results, and Methodologies
FTA Action	• Selection of New Starts Baseline Alternative
Local Action	• LPA from AA adopted in region's financially constrained long range plan
Demonstration of Technical Capability to undertake Preliminary Engineering	
FTA Action	• Acceptance of PMP

A formal request to enter preliminary engineering is submitted by the New Starts project sponsor to its FTA Regional Office. The request must provide evidence that each of the milestones described above have been achieved. The request must also include the full range of New Starts criteria for project justification and local financial commitment. FTA's *Final Rule on Major Capital Investment Projects* requires FTA to issue its decision on a request to enter into PE within 30 days of a formal submission of such a request. However, FTA does not consider a request to be formal until each of the requirements described above have been satisfied. Therefore, it is extremely important that candidate New Starts project sponsors work closely with their FTA Regional Office in order to ensure that all required information is submitted in a manner which does not cause delay in the processing of the PE request. The FTA Regional Office will notify the project sponsor by letter or email when FTA has "accepted" that all required milestones

have been met and when the formal 30-day evaluation and approval period commences.

The FTA Regional Office will coordinate with the FTA Office of Planning on the evaluation of the New Starts project justification and local financial commitment criteria. Project reviews and evaluations that result in an overall project rating of *Recommended* or *Highly Recommended* may be approved for entrance into preliminary engineering. Projects that are rated *Not Recommended* against the New Starts criteria may not be approved. The FTA Regional Administrator will respond to the project sponsor via letter the results of this review - and the ultimate approval/disapproval decision - within 30 days of the acceptance of the PE request. For projects that are approved, the letter will confirm pre-award authority for all preliminary engineering activities and will identify any conditions of the approval. Such conditions will generally reflect specific areas of transportation, environmental, or financial analysis, or project management requirements, which FTA may have concerns with and which the project sponsor must address during the PE effort.

FTA notes that its evaluation of a project's land use and local financial commitment will be commensurate with the stage of its development. That is, while the measures that make up these criteria are constant throughout project development, the standard by which ratings are assigned differs. This is because while the development of land use policies and tools should take place as early in the planning process as possible, these policies and tools would be expected to become more concrete and fully developed as a project advances through project development. Similarly, as a project proceeds through the project development process, its cost estimates and local funding commitments will become much more solid. Additional information on these criteria and FTA's evaluation of them are addressed in sections II.II and II.III of this guidance and in Appendix B, *New Starts Evaluation and Rating Process*.

I.III Preliminary Engineering

During the preliminary engineering phase of project development, local project sponsors refine the design of the locally preferred alternative to the extent necessary to complete the NEPA process, taking into consideration all reasonable design options. Preliminary engineering results in estimates of project costs, benefits, and impacts for which there is a much higher degree of confidence. The proposed project's New Starts criteria are similarly refined in the preliminary engineering phase of development. In addition, project management plans should be finalized, products of the PE effort that demonstrate the technical capability of the project sponsor to advance further in development should be substantially completed, and local funding sources committed to the project (if not previously committed).

Preliminary engineering for a major capital investment project is considered complete when FTA declares in the environmental Record of Decision (ROD) or

Finding of No Significant Impact (FONSI) that the NEPA process has been completed, and when the project sponsor has adequately demonstrated to FTA its capability to implement and operate the proposed investment. The following briefly summarizes key elements of the preliminary engineering phase of development.

I.III.I Environmental Review

As noted, preliminary engineering includes completion of the NEPA process. Most New Starts projects involve significant environmental and community impacts and therefore require an Environmental Impact Statement (EIS). Where the alternatives analysis study is undertaken concurrently with a traditional Draft EIS, preliminary engineering is limited to the conduct and completion of the Final EIS on the locally preferred alternative. Where an alternatives analysis is completed prior to initiation of the NEPA process, preliminary engineering would encompass both the Draft and Final Environmental Impact Statements. In this scenario, FTA's PE approval would be for the preferred alternative (and any design options) selected from the alternatives analysis and advanced into the NEPA process. Conduct of an alternatives analysis prior to initiating the NEPA process must provide for substantive public involvement and adhere to the guiding principles identified in this guidance in order for its results (including the dismissal of other alternative strategies to meet corridor purpose and need) to be carried forward into the EIS.

In the case of a "tiered" EIS, the "Tier 1" analysis and review generally satisfies AA while the PE effort would be undertaken in subsequent tiers.

In all cases, the Final EIS addresses comments and questions generated from the public review of the Draft EIS, and focuses on the avoidance and mitigation of impacts. Mitigation decisions often require substantive collaboration with local, state, and Federal resource agencies, and may require significant additional analysis and refinement of the LPA's design concept in order to adequately mitigate identified environmental, socioeconomic, and transportation impacts. FTA requires that local project sponsors provide firm commitments to implementing the required mitigation measures specified in a Final EIS before issuance of an environmental ROD.

The refinement of project costs, benefits, and impacts is further undertaken as part of the environmental review process, and is discussed below.

I.III.II Refinement of Costs, Benefits, and Impacts

Preliminary engineering results in a level of design that permits the identification, with a high degree of confidence, of the full costs, benefits, and impacts of the locally preferred alternative. In contrast to alternatives analysis, which involved an evaluation of multiple alternatives at a relatively broad level of detail, preliminary engineering requires a higher degree of detailed analysis on a single alternative. The differences in approaches between the two phases of

development reflect the nature of the decision at-hand, with alternatives analysis providing decisionmakers with adequate information to distinguish between the costs and benefits of "competing" solutions to locally-identified transportation problems, and preliminary engineering generating more detailed analysis of how to implement the preferred solution, to mitigate undesirable impacts, and to estimate capital costs at a much higher level of detail than necessary in earlier planning.

Throughout preliminary engineering, capital cost estimates and schedules are presented in increasingly detailed unit cost breakdowns for the proposed project. Confidence in cost estimates increases as the project scope and precise alignment are finalized, environmental mitigation activities and other cost escalation risk areas are more accurately specified, and changes to the original design and cost estimates become apparent. The project construction (and subsequent operation) schedule is further defined, permitting a more accurate escalation of costs to their year-of-expenditure.

In addition to capital costing, preliminary engineering provides an opportunity for more detailed planning and analysis. This is true, for example, for feeder bus planning, which may have been equilibrated across several alternatives during alternatives analysis, but which now should be re-optimized for the LPA. Furthermore, enhanced design of transit stations included in the LPA may require some modifications to feeder bus plans in terms of how buses access the facility, and how many can be accommodated at any single moment (thus requiring an adjustment to bus volumes and/or frequencies). More sophisticated traffic impact analyses may also be necessary during preliminary engineering in order to more accurately design necessary traffic mitigation measures.

Where more recent land use forecasts become available or policy variables change since completion of alternatives analysis, revised travel demand forecasts should be undertaken. Since such forecasts are used in traffic, air, and noise analysis, as well as the design of passenger facilities, the preliminary engineering effort may require significant "planning" resources.

I.III.III Financial Plan

Financial planning activities during preliminary engineering build upon the preliminary exploration of funding strategies undertaken in previous planning work. As project costs are refined, the financial analysis focuses on the evaluation of proposed funding sources, increasingly detailed revenue forecasting, and the securing of local funding commitments. Evidence of local financial commitment to the project may include legislative documentation, resolutions approving funding, account balances, a bonding prospectus and agency debt covenants, signed joint development agreements, or legally binding agreements with state and/or local agencies committing funds. By the end of preliminary engineering, virtually all non-Federal funding sources should be committed to the project.

Project operating costs and revenues are similarly subject to further detailed analysis and refinement throughout the PE effort. Ultimately, the 20-year systemwide cash flow which emerges from preliminary engineering should provide strong evidence of the sponsoring agency's ability to construct and operate the fixed guideway investment, as well as its capacity to continue to operate and maintain existing transit services and any other planned improvements to the regional transit system. FTA evaluates this financial plan as part of its decision to approve a project's advancement into the final design stage of development (see Section I.IV below and Section II.II later in this guidance).

I.III.IV Project Management

The preliminary engineering effort is guided by the project management plan (PMP) first identified in Section I.I.VIII. A transit capital investment project's PMP establishes the approach, policies, and procedures for undertaking PE. Activities and functions covered under the PMP include the identification of the roles and responsibilities of key participants in the engineering effort; quality control and assurance; design management; real estate and other property acquisition; risk management; safety and security; construction and procurement management; testing and preparation for revenue start-up; human resources, labor relations, and dispute resolution; and legal requirements, assurances, and agreements. As noted previously, the PMP is a dynamic document which is continually updated to reflect the current stage of project development , the status of project budget and schedule, and the increasing sophistication of the parameters being applied to project design (and, ultimately, construction).

Guiding Principles of Project Management

The project management plan (PMP) is intended to guide project development from preliminary engineering through final design, construction, and revenue operations. The PMP is a dynamic document which should include the following key elements:

- Staff organization complete with reporting relationships, job functional descriptions, and job qualifications.
- Complete budget for the project management organization.
- Project development and construction schedule.
- Document control procedures and record keeping.
- Change order procedures should be established.
- Quality control and quality assurance procedures.
- Materials testing policies and procedures.
- Internal plan implementation and reporting requirements.
- Criteria and procedures for operational system testing.
- Periodic updates of the plan reflecting budget, schedule, financing, and ridership estimates.

FTA typically assigns project management oversight (PMO) contractors to projects undergoing PE to ensure that the engineering effort progresses in accordance with FTA requirements, and that the project sponsor is adequately preparing for the final design stage of development. Additional information on FTA's expectations for the management of preliminary engineering (and subsequent project development) is provided in FTA's *Final Rule on Project Management Oversight (49 CFR 633)*;

Project Management Oversight Program Operating Guidance; and course materials for the National Transit Institute's *Management of Transit Construction Project Seminar*.

The Office of Program Management is developing additional guidance on preliminary engineering principles and products, including the identification of the specific milestones that must be met prior to advancing a New Starts project into final design. These milestones include (but are not limited to) the development of a vehicle fleet management plan, which documents the project's vehicle specifications, procurement process, and approach for their integration within the larger transit system, and real estate and acquisition plans which address a myriad of right-of-way and related appraisal and relocation assistance issues. This information will be incorporated in future versions of this guidance.

I.III.V Value Engineering

Value engineering (VE) is a systematic evaluation of a project design to obtain the most value for every dollar of cost. By carefully investigating costs, availability of materials, construction methods, shipping costs and physical limitations, planning and organizing, cost/benefit values, and similar cost influencing items, an improvement in the overall cost of a project can be realized. The entire VE effort is aimed at identifying these cost savings, and at eliminating (or modifying) of anything that adds to the project cost without adding to its functional capabilities.

The Office of Program Management is developing additional guidance on value engineering, and FTA's expectations for an appropriate level of VE at the preliminary engineering stage of project development. This information will be incorporated into future versions of this guidance.

I.IV Request to Enter Final Design

Project sponsors which have completed preliminary engineering and which have provided evidence of their technical capability to advance into final design must request FTA approval to enter the final design stage of project development. Like the approval to enter into PE, FTA's approval to enter final design is based upon the achievement of planning, environmental, and project management milestones, and a review and evaluation of the project's New Starts criteria. Consequently, the request should include evidence that the requirements discussed above (and resummarized in Table III on the following page) have been satisfied, as well as updated project justification and local financial commitment criteria.

The Office of Program Management is developing additional guidance on preliminary engineering principles and products, including the identification of the specific milestones that must be met prior to advancing a New Starts project into final design. This information will be incorporated in future versions of this guidance.

Table II
Final Design Required Milestones

Completion of Preliminary Engineering	
FTA Action	• Issuance of ROD/FONSI
Demonstration of Technical Capability to undertake Final Design	
FTA Action	• Acceptance of Updated PMP
	• Acceptance of Fleet Management Plan
	• Acceptance of Real Estate and Acquisition Plan

The request to enter into Final Design is submitted to the FTA Regional Office, which coordinates with the FTA Offices of Program Management and Planning on the final review of materials supporting the request. In order to ensure an expeditious processing of the final design request, these materials should have already been substantively reviewed and generally accepted as part of FTA's ongoing dialogue with, and project management oversight of, the project sponsor. Once FTA has found that the milestones presented in Table II have been satisfied, it will notify the sponsor that the proposed project meets the threshold for being considered to advance into final design, and the evaluation of the project's New Starts criteria will commence. Like the PE approval process, project reviews and evaluations that result in an overall project rating of *Recommended* or *Highly Recommended* may be approved for entrance into final design. Projects that are rated *Not Recommended* against the New Starts criteria may not be approved.

The *Final Rule on Major Capital Investment Projects* requires that FTA complete its formal review of the New Starts criteria and make its decision to approve or disapprove the final design request within 120 days of submission.

I.V Final Design

Final design is the last phase of project development, and includes right-of-way acquisition, utility relocation, and the preparation of final construction plans (including construction management plans), detailed specifications, construction cost estimates, and bid documents. The project's financial plan is finalized, and a plan for the collection and analysis of data needed to undertake a Before and After Study (which is required of all projects seeking an FFGA) is developed.

The Office of Program Management is preparing guidance on FTA's expectations for grantee conduct of final design. This information will be included in future versions of this guidance.

I.V.I Before and After Study Plan

As noted previously, FTA's *Final Rule on Major Capital Investment Projects* requires that project sponsors seeking Full Funding Grant Agreements submit a complete plan for the collection and analysis of information to identify the impacts of their projects and the accuracy of their forecasts. This requirement originates with the Government Performance and Results Act (GPRA), and reflects FTA's desire to a) develop a greater understanding of the actualized benefits of New Starts projects, once implemented and in operation and b) the degree to which forecasts prepared as part of project planning and development are realized, and the reasons why.

FTA requires the development of a plan that outlines data collection and analysis activities in support of the study during the final design stage of development. This Before and After Study Plan should cover the collection of information on the five characteristics of the project and its associated transit services described in Section I.I.IV (project scope, transit service levels, capital costs, O&M costs, and ridership patterns). The Plan should further address how the data measuring the effects of the New Start project will be collected and how the subsequent analysis of travel patterns and costs "before" and "after" implementation and operation of the project will be undertaken. Ultimately, the Before and After Study Plan should provide a framework which permits the project sponsor to:

- collect information on existing and future transit services and travel characteristics in a manner which ensures comparability;
- perform the analysis of before and after data to discern the effects of the project on the sponsor's costs, overall transit services, and ridership;
- assess the consistency between predicted project characteristics and performance and its actual characteristics and performance; and
- identify the reasons for any disparity (should any exist) between predicted and actual outcomes.

FTA approves the Before and After Study Plan prior to execution of the Full Funding Grant Agreement (FFGA). Costs of data collection and analyses associated with the Before and After Study shall be treated as a project cost.

The FTA Office of Planning shall provide technical assistance to New Starts project sponsors in the development of the Before and After Study Plan as well as the conduct of each Study. Additional guidance on the Before and After Study is anticipated to be available in early 2003.

PART II Project Justification and Local Financial Commitment Criteria

After first meeting the planning, environmental, and project management requirements which demonstrate satisfactory completion of alternatives analysis and preliminary engineering (as outlined in Part I of this guidance), candidate projects seeking to advance through project development are subject to FTA evaluation against the New Starts project justification and local financial commitment criteria. Projects may enter into the next stage of development only if rated *Recommended* or *Highly Recommended*, based on these criteria. Projects rated *Not Recommended* will not be approved to advance.

The following sections detail the New Starts project justification and local financial commitment criteria defined by TEA-21, and the measures FTA uses to reflect these criteria. Of particular note is an introduction to FTA's transportation system user benefit measure used in the calculation of travel time savings and project cost effectiveness. Specific instructions for calculating and reporting the measures described below is included in FTA's *Reporting Instructions for Section 5309 New Starts Criteria* (June 2002).

Part II of this guidance concludes with a brief summary of FTA's process for evaluating the New Starts justification and financial criteria and measures; a more detailed description of FTA's rating procedures is provided in Appendix B *New Starts Evaluation and Rating Process*.

New Starts Criteria

49USC5309(e)(1) *New Starts Criteria* sets forth three primary requirements for candidate New Starts projects. Specifically, New Starts projects must be:

(A) based on the results of alternatives analysis and preliminary engineering; *(See Part I)*

(B) justified based on a comprehensive review of its mobility improvements, environmental benefits, cost effectiveness, and operating efficiencies; and

(C) supported by an acceptable degree of local financial commitment, including evidence of stable and dependable financing sources to construct, maintain, and operate the system extension.

II.I Project Justification

TEA-21 reaffirms FTA's long-standing New Starts project justification criteria. FTA uses a candidate project's justification criteria to measure its estimated impacts in terms of mobility improvements, environmental benefits, operating efficiencies, and cost-effectiveness. In addition, the degree of transit supportive land use and planned development patterns at both the corridor and regional level is reviewed and evaluated. Finally, FTA may consider other factors that may not be adequately addressed by the other New Starts criteria. Table III below provides a summary of the New Starts project justification criteria and the measures FTA uses to evaluate the merits of candidate New Starts projects.

Table III
Project Justification Criteria and Measures

Project Justification Criteria	Measures
Mobility Improvements	• Transportation System User Benefits • Number of Low-Income Households • Employment Near Stations
Environmental Benefits	• Change in Regional Pollutant Emissions • Change in Regional Energy Consumption • EPA Air Quality Designation
Operating Efficiencies	• Operating Cost per Passenger Mile
Cost Effectiveness	• Hours of Transportation System User Benefits divided by Incremental Cost
Existing Land Use, Transit Supportive Land Use Policies, and Future Patterns	• See factors described in Figure II (Section II.I.II)
Other Factors	• At discretion of project sponsor (see Section II.I.III)

II.I.I Quantitative Criteria

The four statutory project justification criteria defined by 49 USC 5309(e)(1)(A) – mobility improvements, environmental benefits, operating efficiencies, and cost effectiveness – are also referred to as the "quantitative" New Starts criteria. That's because the measures used to reflect these criteria are quantitative products of the project planning and development process. Each of the measures is calculated with the basic outputs of the travel demand forecasting and cost estimation process – patronage, modal travel times, vehicle and passenger miles traveled, and capital and O&M costs. Most of the measures are intended to capture the incremental difference in estimated benefits between the New Starts and baseline alternatives in the forecast year (typically 20-25 years in the future).

Of particular note among the quantitative criteria is FTA's new measure for cost effectiveness. *Transportation system user benefits* represent the incremental estimated mobility impacts, in terms of weighted travel time, of the proposed New Starts project (as compared to the New Starts Baseline Alternative). User benefits are calculated with the special Summit software described in Section I.I.I. The user benefit calculation expressed in time equivalent units (hours) will serve as the denominator of the cost-effectiveness measure. The numerator is annualized capital and operating costs, resulting in a cost effectiveness measure of the form of total project cost per hour of transportation system user benefits.

Guidance on the calculation and reporting of the measures used to reflect the project justification criteria is included in FTA's *Reporting Instructions for Section 5309 New Starts Criteria*. Additional guidance on the transportation system user benefit measure, as well as documentation on the Summit software used to develop the measure (and associated reports intended to support a range of

local planning analysis and forecast diagnosis activities) is currently being developed by the FTA Office of Planning.

II.I.II Transit Supportive Land Use

Candidate New Starts project sponsors submit to FTA at the time of the PE or final design request information that describes the potential for existing and future local and regional land use to support the proposed capital transit investment. FTA staff, with assistance from designated contractors, reviews specifically requested information, supporting documentation, and quantitative land use data prepared by local agencies to assess the **existing land use, transit supportive land use plans and policies, and performance and impacts of policies** associated with proposed New Starts projects. Figure III on the following page presents the categories and factors FTA uses to evaluate supporting land use for New Starts projects.

Figure III
Land Use Rating Categories and Factors

I. Existing Land Use
a. Existing Land Use

III. Performance and Impacts of Policies
a. Performance of Land Use Policies b. Potential Impact of Transit Project on Regional Land Use

II. Transit Supportive Plans and Policies
a. Growth Management b. Transit Supportive Corridor Policies c. Supportive Zoning Regulations Near Transit Stations d. Tools to Implement Land Use Policies

IV. Other Land Use Considerations
Exceptional examples, e.g.: • Historic • Environmental • Community preservation • Brownfields redevelopment • Designated Federal Enterprise Zone/Empowerment Community

In general, local agencies are not expected to generate additional analyses, documents, or quantitative data addressing land use issues in order to satisfy the reporting requirement for the *existing land use, transit supportive land use plans and policies, and performance and impacts of policies* criterion. In most instances, agencies will be able to rely on readily available materials that have

been prepared in conjunction with the alternatives analysis or preliminary engineering effort, or other local studies and analyses (local and regional land use plans, local government land use actions, livable communities initiatives, economic development activities, etc.).

To assist the development of accurate project ratings, FTA requests agencies to submit full or relevant portions, as appropriate, of corridor and station area maps, local comprehensive plans and zoning ordinances, local and regional policies and agreements regarding land use planning, documentation of station area planning efforts, and documentation of other tools, incentives, and programs affecting corridor and station area land use. Additional descriptions of the information requested for the *existing land use, transit supportive land use plans and policies, and performance and impacts of policies* criterion are provided in FTA's *Reporting Instructions for Section 5309 New Starts Criteria*.

II.I.III Other Factors

FTA will review and consider any other factors that the New Starts project sponsor believes is appropriate to the decision to approve entrance into the next stage of project development. These "Other Factors" normally include project benefits not captured by the project justification criteria. This measure provides local agencies with an opportunity to add or emphasize additional factors consistent with local policies and actions relevant to the success of the New Starts transit investment. These factors are not formally rated, and their impact on a project's overall project justification rating shall be considered on a case-by-case basis.

Other factors may include:

- Environmental justice considerations and equity issues;
- Opportunities for increased access to employment for low income persons, and welfare to work initiatives;
- Livable communities initiatives;
- Integration of the New Start investment planning with local economic development initiatives;
- Consideration of alternative land use development scenarios in local evaluation and decision making for the locally preferred transit investment decision; and
- Consideration of innovative financing, procurement, and construction techniques, including design-build turnkey applications.

II.II Local Financial Commitment

A candidate New Start project's local financial commitment is measured by the proposed non-New Starts share of total project costs, the stability of the capital financing plan for the entire transit system (with a focus on the proposed project), and the stability of the transit system's operating finance plan.

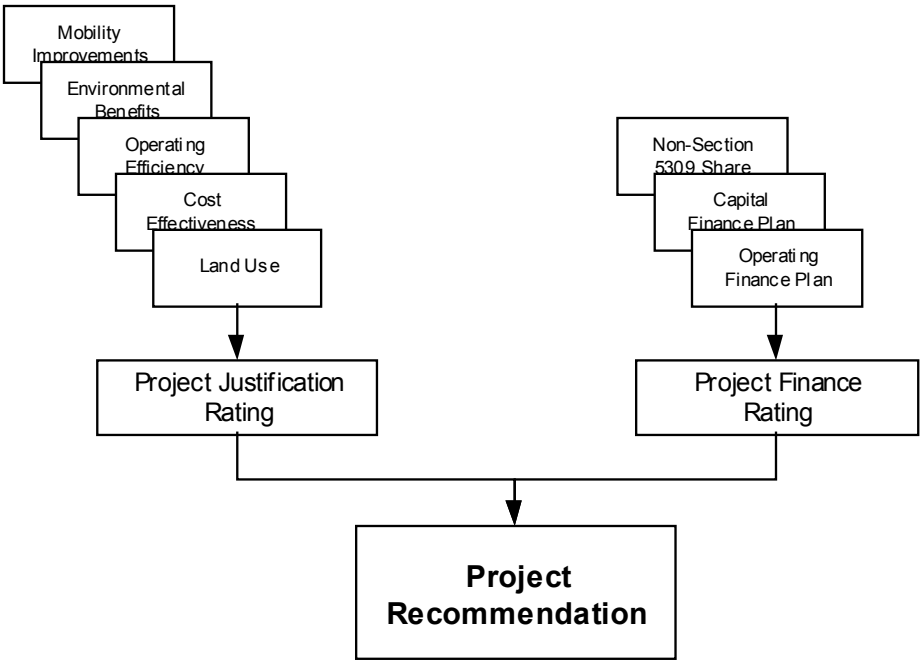
Project sponsors requesting entrance into preliminary engineering and final design must submit documentation addressing the local financial commitment criteria to FTA for evaluation. This documentation is typically satisfied by a comprehensive systemwide financial plan, as described in sections I.I.V (for projects resulting from alternatives analysis) and I.III.III (for projects completing preliminary engineering) of this guidance. More detailed guidance on the development and content of acceptable financial plans is provided in FTA's *Guidance for Transit Financial Plans and Procedures and Technical Methods for Transit Project Planning*. Specific reporting templates and suggested supporting documentation is provided in FTA's *Reporting Instructions for Section 5309 New Starts Criteria*.

FTA notes that increasing demands on limited New Starts resources has brought unprecedented scrutiny to its evaluation of project financial plans, and the proposed share of New Starts funding for major transit capital investments. FTA strongly encourages local project sponsors to pursue a broad range of revenue sources and financing strategies which lessen their burden on the New Starts program, and which, at the same time, makes them more competitive for scarce Section 5309 funding.

II.III New Starts Evaluation and Rating Process

FTA evaluates proposed New Starts projects against the full range of criteria for both project justification and local financial commitment, using a multiple measure method illustrated by Figure IV on the following page.

Figure IV
FTA New Starts Rating Process



FTA analyzes the information submitted by project sponsors and assigns a rating of *high*, *medium-high*, *medium*, *low-medium*, or *low* to each of the individual project justification criteria and to the measures for local financial commitment. These criteria/measure-specific ratings are then combined into summary project justification and finance ratings. No specific weights are assigned to the criteria when combining them into summary ratings, which follow the same rating spectrum (*high* through *low*) as the individual criteria and measures. For determining a project's summary project justification rating, FTA primarily considers transit supportive land use and cost effectiveness. If these primary criteria provide no clear rating, then other project justification criteria are considered. FTA attempts to reflect the unique characteristics and objectives of each New Starts project in consideration of the project justification criteria and other factors.

For the summary finance rating, FTA considers the project's ratings for the capital and operating plans, as well as the non-Section 5309 New Starts share of project costs. The capital financial rating and operating financial rating are based upon the status of the funding proposed in the project's financial plans, the completeness of the financial plan, and the financial capacity of the project sponsor to undertake the major capital investment. FTA designates the funds proposed in each financial plan as existing, committed, budgeted, or planned for the proposed major capital investment and ongoing operations and maintenance costs of the system. Ratings for the non-New Starts share of a project's financial plan reflect FTA's desire to leverage program funding across as many

meritorious projects as possible; consequently, the lower the New Starts share of costs, the higher the rating for this measure.

Summary project justification ratings and finance ratings are used to determine overall project ratings according to the following decision rule:

- ***Highly Recommended****:* Projects must be rated at least *medium-high* for both finance and project justification;
- ***Recommended***: Projects must be rated at least *medium* for both finance and project justification; and
- ***Not Recommended***: Projects not rated at least *medium* in both finance and project justification will be rated as not recommended.

Projects must be rated *Highly Recommended* or *Recommended* to be approved to advance into preliminary engineering or final design, or to be considered for a Full Funding Grant Agreement.

It is very important to emphasize that project evaluation is an on-going process. FTA evaluation and rating occurs annually in support of budget recommendations presented in the *Annual Report on New Starts* as well as when projects request FTA approval to enter preliminary engineering or final design. Consequently, as proposed New Starts projects proceed through the project development process, information concerning costs, benefits, and impacts is refined and the ratings updated to reflect new information.

PART III EXEMPT PROJECTS

49 USC 5309(e)(8)(A) exempts projects which request a Section 5309 New Starts share of less than $25 million from the requirements of Section 5309(e), which includes both the evaluation by FTA of such project's New Starts criteria and any approval to enter PE or final design which is based on the criteria. However, in order to ensure that a) the grantee has the technical, financial, and legal capacity to successfully implement the project, and b) the interests of the Federal government are protected, FTA must approve entrance into preliminary engineering and final design for all projects requesting any amount of New Starts funding.

Instead of basing PE/final design approval on the New Starts criteria, FTA's approval for advancing exempt projects is based on compliance with planning, environmental, and project management requirements which apply to all Federal-aid transit projects. The following provides a summary of these requirements, and suggests several key points that New Starts project sponsors should consider if they choose to advance their project under the Section 5309(e)(8)(A) exemption.

III.I Planning/Environmental

All FTA-funded transportation projects must be drawn from a metropolitan or state transportation plan developed consistent with FTA/FHWA's *Joint Rule on Metropolitan and Statewide Planning*. This regulation sustains the long-standing requirement for a locally-directed comprehensive, coordinated, and continuing transportation planning process which identifies deficiencies on the regional transportation network and results in the development of long range plans and shorter term transportation improvement programs to "manage" the development and implementation of transit and highway improvements which address these deficiencies. This means that all exempt New Starts projects (in urbanized areas) must be included in a financially constrained metropolitan transportation plan.

FTA-funded transportation projects are also subject to the requirements of NEPA and its implementing regulations. Exempt New Starts projects are exempt from certain New Starts requirements but not from NEPA requirements. Such projects must be subjected to the appropriate environmental review, which will be a full public review in an EIS if the exempt project will significantly affect the human environment; a categorical exclusion if the project is documented not to have such impacts; and an environmental assessment if the significance of its impacts is unknown. As with the environmental procedures necessary for non-exempt projects, the FTA regional office will decide, in consultation with the project sponsor, the appropriate level of NEPA review for exempt New Starts projects.

Alternatives analysis is a corridor-level planning activity undertaken as part of the metropolitan planning process. Although not required by statute, FTA strongly

suggests that sponsors of "exempt" New Starts projects conduct an analysis of alternative investment strategies to determine the optimal improvement to implement in a given corridor. As described in Section I.I of this guidance, the scope of such an analysis should be guided by local conditions, the complexity of the transportation needs to be addressed by the proposed New Starts investment, and the level of effort necessary to reach local consensus on selecting a locally preferred alternative.

In addition, FTA encourages projects which are technically exempt from Section 5309(e) to undertake alternatives analysis (and to develop, submit, and be subject to FTA evaluation of the New Starts project justification and local financial commitment criteria when requesting entrance to PE and/or FD) for two important reasons. First, as a project advances through preliminary engineering and on to final design, total resource requirements (including the costs for both capital improvements and mitigation efforts) are more clearly known. In some cases, the more specific analysis of costs and impacts could result in revised project cost estimates that reflect an increase over earlier estimates. When such cost increases lead to an increase in proposed Section 5309 New Starts funding above $25 million, projects are no longer exempt and must prepare and submit to FTA the project justification and local financial commitment criteria before being allowed to advance any further in project development. This requires (at a minimum) the retroactive development (and FTA approval) of a New Starts Baseline alternative and the development of project justification and local financial commitment criteria to support the request for advancement.

Secondly, Section 5309(e)(7) prevents FTA from entering into a full funding grant agreement (FFGA) for any project that has not been evaluated and rated against the New Starts criteria. Therefore, projects that are not subject to FTA's evaluation and rating are ineligible for an FFGA. Recent experience indicates that annual congressional earmarks for projects not under an FFGA rarely exceed $3-5 million; such level of appropriations over a continuous period may result in a longer pay-out schedule than desired, and may add to project financing costs. Exempt projects can ensure their eligibility for the more predictable pay-out schedule of an FFGA by undertaking an alternatives analysis consistent with the principles described in Section I.I of this guidance, and by developing and providing to FTA the full range of New Starts project justification and local financial commitment criteria.

III.II Project Management

FTA expects that sponsors of exempt projects will exercise prudent management over the preliminary engineering and final design stages of project development. FTA must find that such sponsors possess a level of technical capacity that is commensurate with the scope of the project before advancing an exempt project into the next stage of development. The Office of Program Management is currently developing more detailed guidance on its expectations for the

management of PE and final design for exempt projects. This information will be included in future versions of this guidance.

Appendix A
Selection of the New Starts Baseline Alternative

In response to comments submitted by the transit industry and in recognition of the desire to simplify the New Starts evaluation process, the *Final Rule on Major Capital Investment Projects* eliminates the requirement for an evaluation (for the purpose of advancing projects through development and for annual funding recommendations) comparing the New Starts criteria for the build alternative against both the no-build and the TSM alternatives. Instead, the *Final Rule* requires that the proposed New Starts project be evaluated against a single "New Starts Baseline Alternative." FTA selects the New Starts Baseline Alternative for candidate projects prior to approving project entrance into preliminary engineering.

Like the TSM, the New Starts Baseline Alternative should represent the "best that can be done" to improve transit service in the corridor without major capital investment in new infrastructure. At a minimum, the New Starts baseline must include in the project corridor all reasonable cost-effective transit improvements short of the major capital investment often required for a New Starts project. The Baseline Alternative should include relatively low cost actions such as traffic engineering, enhanced bus service and other transit operational changes, and modest capital improvements such as reserved lanes, park-and-ride lots, and transit terminals. The New Starts baseline should be designed to address identified transportation needs in the New Start project's service area and demonstrate the extent to which these problems can be solved without a proposed major capital investment such as a New Starts fixed guideway transit project. However, it is important to note that in some cases the New Starts Baseline Alternative may still result in substantial capital and operating costs, particularly in complex study areas with significant transportation problems.

It must be stressed that the New Starts Baseline Alternative only replaces the no-build and TSM alternatives for the purpose of FTA evaluation. It is expected that the alternatives analysis will result in the definition and evaluation of both no-build and TSM options, with one or the other selected to serve as the New Starts Baseline Alternative. As is obvious from the preceding definition, in most cases the New Starts Baseline Alternative will be the TSM alternative.

The New Starts Baseline Alternative must be defined so that comparisons with the New Starts project isolate the costs and benefits of the proposed major transit capital investment. Depending on the specific corridor and circumstances, and through prior agreement with FTA, the New Starts Baseline Alternative will be defined in one of three general ways:

- First, where the adopted financially constrained long range transportation plan includes all reasonable cost-effective transit improvements within the

study area short of the proposed New Starts project, the no-build alternative that includes those improvements may serve as the New Starts Baseline Alternative.

- Second, where additional cost-effective transit improvements can be made beyond those provided by the adopted plan, the New Starts Baseline Alternative will incorporate those additional cost-effective transit improvements along with the actions in the adopted long range plan. In this case, the New Starts Baseline Alternative is essentially the TSM alternative.

- Lastly, where the proposed New Starts project is part of a multimodal alternative that includes major highway components, the New Starts Baseline Alternative will be the proposed multimodal alternative without the New Starts project and its associated transit services.

In the majority of cases, the second definition listed above will serve as the appropriate New Starts Baseline Alternative. Most metropolitan areas where New Starts projects are proposed would likely fit in this category where additional transit actions short of a New Starts major capital investment are feasible. There will be selected cases where the first definition listed above is appropriate, but these appear likely only in highly urbanized corridors with high current levels of transit service. The third definition, multimodal corridors, will be reviewed closely on a case-by-case basis. FTA staff will work with local project sponsors to examine the specific circumstances related to the definition of alternatives.

FTA must determine whether the TSM alternative or the no-build alternative satisfies the definition of the New Starts Baseline Alternative for each proposed New Starts project. As general guidance, the use of the no-build or no-action alternative as the New Starts baseline is expected to be rare and limited to highly urbanized portions of major metropolitan areas with saturated transit coverage already present. Prior to formal approval of preliminary engineering, FTA must approve the definition of the Baseline Alternative. The following provides the procedure FTA will use to make the selection action.

Step 1: Review set of alternatives at the beginning of the Alternatives Analysis

This review occurs after the alternatives analysis has developed the detailed definitions of the alternatives, but before the technical analysis has begun. (see FTA's guidance on *Procedures and Technical Methods for Transit Project Planning* for more detail on the alternatives development process). FTA does not select a New Starts Baseline Alternative at this stage. The FTA action in Step 1 is simply to concur with the alternatives analysis study team that the no-build and TSM alternatives respond to the transportation problems in the corridor, that the policy and land-use setting is unbiased and consistent across the alternatives, and that the alternatives are defined in accordance

with good planning practice, and are thus likely to result in an acceptable New Starts Baseline Alternative after the technical analysis is complete.

FTA will concur that the set of alternatives defined at the beginning of alternatives analysis are likely to result in an acceptable New Starts Baseline Alternative. This concurrence will be in the form of a memo or e-mail from the regional office.

Step 2: Alternatives Analysis Sponsor Conducts the Technical Analysis and Finalizes the Alternatives

As noted previously, the definitions of the alternatives are continually refined throughout the alternatives analysis as various strategies, system design options, and project elements are tested. The result is a *Final Definition of Alternatives Report* and technical planning information about each alternative. In addition to information on the scope (design and operating characteristics) of each of the analyzed alternatives, the report should include their relative cost effectiveness, as measured by comparisons against the no-build alternative. The main indicator that confirms a properly defined set of alternatives is the cost effectiveness of the build vs. no-build and the TSM vs. the no-build, which can be calculated from the analysis results. Cost effectiveness is currently defined by FTA as the cost per hour of transportation system user benefits.

The TSM, by definition, is the most cost-effective alternative relative to the no-build and should conform to the relationships presented in Figure I below:

Figure I
Rule for Selection of an Appropriate TSM Alternative to Serve as the New Starts Baseline

For illustrative purposes, assume that the cost-effectiveness indices (CEI) are calculated as follows:

CEI for Build vs. No-Build = A

CEI for TSM vs. No-Build = B

The relationship between these measures should be A > B (higher CEI means the alternative is less cost effective).

If the above relationship is not achieved, the definitions of the alternatives may be incorrect and the project sponsor must go back and define an acceptable TSM alternative to serve as the New Starts baseline. A different ordering is permissible in two cases:

1. **The no-build alternative contains most of the critical elements of a good TSM alternative**. In this case, the TSM alternative and the no-build alternative should be functionally indistinguishable. The only time this can happen is when the no-build alternative contains significant TSM-type improvements in the corridor.
2. **The TSM alternative does not make technical sense**. For projects where an existing rail line is being rehabilitated or a single-track facility is being upgraded to double track, no TSM alternative is likely to be significantly better than the no-build.

If either case 1) or 2) is apparent, the project sponsor must present evidence to FTA that the TSM alternative should be discarded and the no-build approved as the baseline.

In addition to the evaluation of cost effectiveness described above, FTA may also review the supporting reports and thematic mapping information produced by the Summit software used to generate transportation system user benefits. This review will confirm the comparability of the Baseline and Build Alternatives operating plans and the identification of network coding or model specification errors which may skew the travel demand forecast results.

Step 3. Select the Baseline Alternative before entry into Preliminary Engineering

If an acceptable Baseline Alternative was defined during alternatives analysis, FTA will select the New Starts baseline in advance of, or in conjunction with, the approval to enter preliminary engineering. This determination will be based upon the review described above. If the TSM alternative is poorly defined, entry into PE will be denied until a proper TSM alternative is developed and presented. If the results of the alternatives analysis show that no cost-effective TSM alternative is possible, FTA may select the no-build as the New Starts Baseline.

FTA must make its finding on the Baseline Alternative before it begins to "process" (that is, review, evaluate, and rate the project's project justification and local financial commitment criteria) any request to advance a project into PE. Consequently, it is in the best interest of the project sponsor to submit to FTA its *Final Definition of Alternatives Report* with all necessary information (including SUMMIT-generated reports) in advance of a formal PE request, if possible. Early submission (and achievement of each of the other milestones described in this guidance) of information ensures a more rapid processing by FTA of the formal PE request.

Appendix B
New Starts Evaluation and Rating Process

This paper describes the basic methodology used by the Federal Transit Administration (FTA) to evaluate, rate and recommend funding for projects included in the *FY 2000 Annual Report on New Starts*. The paper is in the process of being updated to reflect recent modifications to the evaluation and rating process, including the introduction of the transportation system user benefits measure.

FTA reminds the audience of this paper that project evaluation is an on-going process. It is based on an analysis of the Section 5309 New Starts Criteria and documentation submitted to FTA by local agencies. As New Starts projects proceed through project development, the estimates of costs, benefits, and impacts are refined. The FTA ratings and recommendations will be updated annually to reflect new information, changing conditions, and refined financing plans.

I. LEGISLATIVE BACKGROUND

On June 9, 1998, the Transportation Equity Act for the 21st Century (TEA-21) was enacted. It requires the U.S. Department of Transportation to submit an annual report to Congress that includes a proposal on the allocation of amounts to be made available to finance grants and loans for capital projects for new fixed guideway systems and extensions to fixed guideway systems among applicants for those amounts. It also requires that the annual report include the Secretary's evaluations and ratings of the capital projects seeking grants or loans for new or extended fixed guideway systems.

TEA-21 also mandates that proposed New Starts projects must receive FTA approval to advance from alternatives analysis to preliminary engineering, and from preliminary engineering to final design and construction. This approval will be based, in large part, on an evaluation of the proposed project's New Starts criteria.

FTA's evaluations includes a review of each project's New Starts criteria and the assignment of a rating to each criteria. Based on these criteria-specific ratings, candidate New Starts projects may be rated as "highly recommended", "recommended" or "not recommended". FTA's proposed approach to developing these ratings is described in new regulations.

I.A Notice of Proposed Rulemaking

U.S. Department of Transportation regulations currently under development will define the summary project ratings of "recommended", "highly recommended" and "not recommended" as required by TEA-21, document the measures for project justification, determine how FTA will use the summary ratings to approve entry into preliminary engineering and final design and discuss the relationship of the project evaluation process to the planning and project development process. The draft regulation is expected to be released for public comment in a Notice of Proposed Rulemaking (NPRM) in Spring 1999.

I.B Interim Approach Applied in the Annual New Starts Report for FY 2000

Since the Final Rule has not been published, FTA has completed the project evaluations and funding recommendations for FY 2000 based on FTA's existing New Starts criteria and evaluation process as published in the Federal Register on December 19, 1996 (61 FR 67093-106) and amended on November 12, 1997 (62 FR 60756-58) and modified to account for the changes made by TEA-21. For the Annual New Starts Report for FY 2000, FTA applied the rating and evaluation process to forty-two (42) projects in Final Design and Preliminary Engineering.

As proposed New Starts projects proceed through the stages of the planning and project development process, FTA evaluates and rates projects against the full range of criteria for project justification and local financial commitment contained in §5309(e). To assist local agencies in the application and reporting of the criteria, FTA issued the *Technical Guidance on Section 5309 New Starts Criteria* in September 1997. An *Addendum to the Technical Guidance* was issued in October 1998 to further support local agencies. Revised technical guidance to further clarify and reflect TEA-21 New Starts provisions and the final regulations on New Starts evaluation and rating are currently under development.

The following sections identify the specific New Starts ***project justification*** and ***local financial commitment*** criteria applied and outline the New Starts evaluation and rating process.

I.C Project Justification Criteria

Section 5309(e)(1)(B) requires that projects proposed for New Starts funding be justified based on a comprehensive review of the following criteria:

- Mobility Improvements
- Environmental Benefits
- Operating Efficiencies
- Cost Effectiveness

Section 5309(e)(3)(C) requires FTA to further consider mass transit-supportive land use policies and future patterns; subsequently, FTA added the following criteria:

- Transit Supportive Existing Land Use and Future Patterns

Finally, FTA also considers "Other Factors," as required by Section 5309(e)(3)(H)

I.D Local Financial Commitment

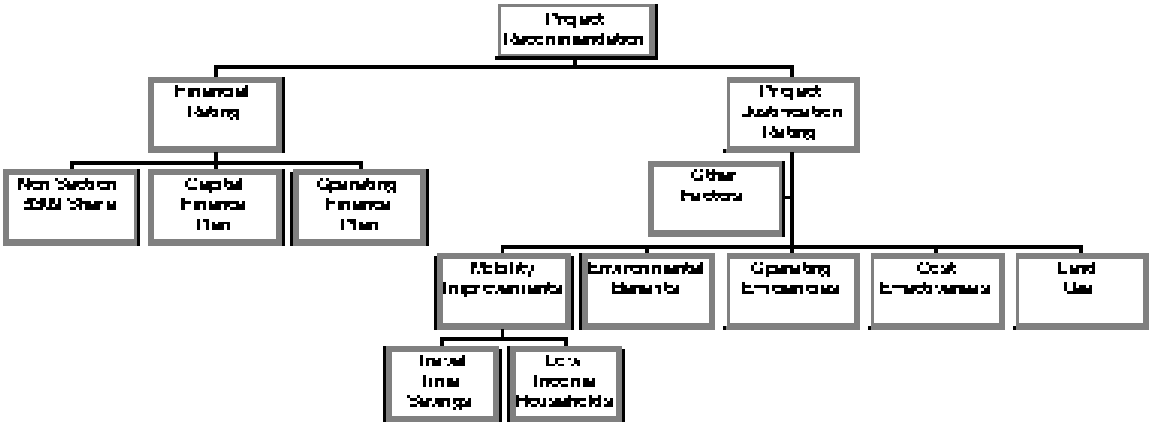
Section 5309(e)(1)(C) requires that proposed projects also be supported by an acceptable degree of local financial commitment, including evidence of stable and dependable financing sources to construct, maintain and operate the transit system. The criteria for the evaluation of the local financial commitment to a proposed project are:

- The proposed share of total project costs from sources other than Section 5309, including Federal formula and flexible funds, the local match required by Federal law and any additional capital funding ("overmatch");
- The strength of the proposed capital financing plan;
- The ability of the sponsoring agency to fund operation and maintenance of the entire system as planned once the guideway project is built.

II. THE EVALUATION AND RATING PROCESS

FTA evaluates proposed new start projects against the full range of criteria for both project justification and local financial commitment, using a multiple measure method illustrated on the following flow chart.

The FTA New Starts Evaluation and Rating Process



II.A Project Recommendation

Consistent with §5309(e)(6), an overall project rating of "highly recommended", "recommended" or "not recommended" is assigned to each proposed project, based on the results of FTA's evaluation of each of the criteria for project justification and local financial commitment.

II.B Project Recommendation Decision Rule

To assign overall project ratings ("highly recommended", "recommended" or "not recommended") to each proposed New Starts project, FTA considers the individual ratings for each of the financial rating factors and project justification criteria. FTA combines this information into summary "finance" and "project justification" ratings for each project. These summary ratings are in turn used to determine *overall* project ratings according to the following decision rule:

- **Highly Recommended** Projects must be rated at least "medium high" for both finance and project justification;
- **Recommended** Projects must be rated at least "medium" for both finance and project justification;
- **Not Recommended** Projects not rated at least "medium" in both finance and justification will be rated as "not recommended"

II.C Ratings: An On-going Process

Again, it is important to emphasize that project evaluation is an on-going process. FTA evaluation and rating occurs annually in support of budget recommendations presented in the annual New Starts report to Congress and when project's request FTA approval to enter into preliminary engineering and final design. Consequently, as proposed New Starts projects proceed through the

project development process, information concerning costs, benefits, and impacts is refined and the ratings updated to reflect new information.

III. FINANCIAL RATING

The following provides a summary of FTA's process for evaluating the local financial commitment of proposed New Starts projects.

III.A Financial Rating

FTA assigns a summary financial rating of "high", "medium high", "medium", "low-medium" or "low" to each project following consideration of individual ratings applied to a) the stability and reliability of the proposed project's capital finance plan and b) the stability and reliability of the proposed project's operating finance plan. These ratings are based on an analysis of the Section 5309 New Starts Criteria and documentation submitted to FTA by local agencies. FTA strongly considers the project development stage of the proposed investment in its evaluation. FTA assigns one of five descriptive ratings "high", "medium high", "medium", "low-medium" or "low" to each of these factors. In addition, the overall financial rating considers the non-Section 5309 share of project capital costs as well as the historic support of new start projects by the applicant.

Individual ratings for each project reflecting non-Section 5309 share, the capital finance plan and the operating finance plan are combined by FTA into an overall financial rating of "high", "medium high", "medium", "low-medium" or "low". FTA gives particular attention to the stability and reliability of the capital finance plan as reflected in the decision rule outlined below.

III.B Financial Rating Decision Rule

If a proposed project's capital finance plan receives a "low-medium" or "low" rating, the overall financial rating for the project cannot be higher than a "low-medium."

FTA's financial assessment and ratings clearly take into account the stage of project development, particularly when considering stability and reliability of the capital finance and operating finance plans. Expectations for firm commitments of non-Federal funding sources are higher as projects progress further through project development. These issues are taken into consideration and reflected by a rating of "high", "medium high", "medium", "low-medium" or "low." The basis for assignment of ratings by stage of project development is documented in FTA's *Technical Guidance* and *Addendum*.

IV. PROJECT JUSTIFICATION RATING

The following summarizes FTA's process for evaluating the project justification criteria of proposed New Starts projects.

IV. A Project Justification Rating

FTA assigns a summary project justification rating of "high", "medium-high", "medium", "low-medium" or "low" to each project based on consideration of the ratings applied to the project justification evaluation criteria:

- mobility improvements;
- environmental benefits;
- operating efficiencies;
- cost-effectiveness;
- transit supportive land use; and
- other factors.

Based on an analysis of the Section 5309 New Starts Criteria and supporting documentation submitted to FTA by local agencies, FTA assigns a descriptive rating ("high", "medium high", "medium", "low-medium" or "low") to each of these criteria. Ratings for each of these criteria are then combined to a summary "high", "medium high", "medium", "low-medium" or "low" project justification rating for each project. FTA gives particular attention to transit supportive land use and cost effectiveness in the determination of the overall project justification rating.

The evaluation and rating of individual project justification criteria is discussed below.

IV. B Mobility Improvements

In its evaluation of the mobility improvements that would be realized by implementation of a proposed project, FTA reviews two measures:

1. travel time savings;
2. the number of low income households served.

Based on an analysis of the Section 5309 New Starts Criteria documentation submitted to FTA by local agencies as part of their application and reporting process, FTA assigns one of five descriptive ratings ("high", "medium high", "medium", "low-medium" or "low") to each of the two measures. These ratings are then combined (with greater emphasis on travel time savings) to assign a mobility improvements rating.

Travel Time Savings This measure reflects the aggregate travel time savings in the forecast year anticipated from the proposed project compared to the no-build and the TSM alternatives. Section 3010 of TEA-21 prohibits the consideration of "the dollar value of mobility improvements". Consequently, FTA evaluates the sum total of estimated hours of travel time saved (or increased). In order to rate projects in comparison to other proposed New Starts, this measure is normalized by the annualized capital costs of the proposed project, resulting in a measure of hours saved per dollar of capital cost. Based on the project information submitted, a composite index is developed which reflects comparison of the new start to both the no-build and the TSM comparisons. In instances where project sponsors provide only a single comparison, no-build or TSM, only the single comparison is used. For the FY2000 submissions, the travel time savings indices range from .007 hours per dollar in annual capital costs to 1.352 hours per dollar in annual capital costs, with a median reported of .058 hours per dollar in annual capital costs. Projects are then ranked according to this normalized composite measure and assigned a "high", "medium-high", "medium", "low-medium" or "low" rating based on its relative ranking compared to the other New Starts projects reported.

Number of Low Income Households Served This measure reflects the absolute number of low income households (defined as below the poverty level) located within ½ mile of the "boarding points", or stations, associated with the proposed project. In order to rate projects in comparison to other proposed New Starts, this measure is normalized by the annualized capital cost of the proposed project, resulting in a measure of persons served per dollar of capital cost. Based on the project information submitted to FTA by local agencies for the FY2000 evaluations, the number of low income households served ranges from 0.1 low income households per million dollars in annual capital costs to 1,453 low income households per million dollars in annual capital costs, with a median reported of 64.30 low income households per million dollars in annual capital costs. Projects are then ranked according to this normalized measure and assigned a "high", "medium-high", "medium", "low-medium" or "low" rating based on its relative ranking compared to the other New Starts projects reported.

IV. C Operating Efficiencies

FTA measures this criterion by evaluating the change in systemwide operating costs per passenger mile in the forecast year, comparing the Section 5309 New Start investment to the no-build and TSM alternatives. Based on the project information submitted to FTA by local agencies, the projects are assigned a "high", "medium" or "low" based on the following decision rule.

- **High**: Projects which realize a 20% reduction or greater in systemwide operating costs vs. the TSM *or* No-Build, with no increase in the other compared alternative.
- **Medium**: Projects that realize a modest reduction or no change in systemwide operating cost vs. the TSM *or* No-Build alternatives; and projects which realize a 20% systemwide reduction in costs vs. one alternative but which realize an increase vs. the other.
- **Low**: Projects that realize an increase in systemwide operating cost vs. both the TSM *and* No-Build.

IV. D Environmental Benefits

In its evaluation of environmental benefits that would be realized through the implementation of a proposed project, FTA considers the following measures:

Current Air Quality Designation by EPA This measure is defined for each of the transportation-related pollutants (ozone, CO, and PM) as the current air quality designation by EPA for the metropolitan region in which the proposed project is located, indicating the severity of the metropolitan area's noncompliance with the health-based EPA standard (NAAQS) for the pollutant, or its compliance with that standard.

Net Change in Air Pollutant Emissions These measures are defined as the net change in emissions of any of the transportation related pollutants for which the U.S. Environmental Protection Agency (EPA) has established health-based National Ambient Air Quality Standards (NAAQS),or in the emissions of a precursor of such a pollutant. The relevant pollutants and precursors are volatile organic compounds (or hydrocarbons), oxides of nitrogen (NOx), carbon monoxide (CO), and particulate matter (PM). Each of the measures is expressed as the annual emissions for the metropolitan region in the forecast year, comparing conditions under the Section 5309 New Start investment first to the no-build conditions and then to conditions under the TSM alternatives.

Net Change in Greenhouse Gas Emissions This measure is defined as the net change in emissions of the primary transportation-related greenhouse gas (carbon dioxide) in the forecast year. The measure is expressed as the difference (in tons) in the annual emissions of carbon dioxide from transportation sources in the metropolitan region, comparing conditions under the Section 5309 New Start investment first to the no-build conditions and then to conditions under the TSM alternative.

Net Change in Regional Energy Consumption This measure is defined as the change in regional energy consumption for transportation purposes in the forecast year, measured in British Thermal Units (BTU), comparing

the Section 5309 New Start investment first to the no-build and then to TSM alternatives.

The environmental benefits of each proposed project are rated high, medium or low based on an analysis of the air quality, emissions and energy consumption documentation submitted to FTA by local sponsoring agencies as part of the application and reporting process. FTA assigns an "environmental benefits" rating based on the following rules:

- **High**: A high rating is assigned to projects: (1) which are located in areas whose nonattainment of the NAAQS for any transportation related pollutant is designated by EPA as serious or worse; ***and*** (2) which have achieved better than average (when compared with all other New Starts projects being rated) reductions (i.e., negative net changes) in emissions related to that serious or worse pollutant; ***and*** (3) which do not cause increases in any other transportation related pollutant. Also receiving a high rating are projects with better than average (when compared with all other New Starts projects being rated) reductions (i.e., negative net changes) in carbon dioxide emissions which do not cause increases in any other transportation related pollutant;
- **Low**: Projects that cause increases (i.e., net positive changes) in the majority of the emissions and energy consumption measures are assigned a "Low" rating ;
- **Medium**: All projects not receiving either a "High" or a "Low" rating receive a "Medium" rating.

IV. E Transit-Supportive Existing Land Use and Future Patterns

In its evaluation of the transit supportive land use affecting transit projects, FTA explicitly considers the following transit supportive land use measures:

- Existing land use;
- Containment of sprawl;
- Transit-supportive corridor policies;
- Supportive zoning regulations near transit stations;
- Tools to implement land use policies;
- Performance of land use policies;
- "Other" land use factors.

Based on information submitted to FTA by local agencies, FTA gauges each of these seven measurement factors by a variety of sub-elements or considerations. These illustrate various aspects of existing and planned transit-supportive land use, such as mixed use development, employment and population density, pedestrian and bicycle capability, directed growth mechanisms, parking policies, and public and private involvement. FTA assigns

an overall land use rating of "high", "medium-high", "medium", "low-medium" or "low" to each project following consideration of the seven factors listed above.

Existing Conditions and Plans and Policies FTA considers the relationship between existing conditions and plans/policies when evaluating projects and assigning overall land use ratings. FTA places a strong weight on existing conditions, including existing station area development, existing zoning, and major trip generators along the corridor because it is FTA's experience that a major fixed-guideway investment requires some level of transit-supportive land use to justify and support the project. However, for some proposed projects not necessarily rated highly for existing conditions, the local efforts at encouraging future transit-supportive development were sufficiently strong to improve the overall land use rating.

Stage of Development When evaluating the land use factors, FTA also takes into consideration the stage of development of a proposed project. The planning and policy oriented factors (existing land use, containment of sprawl, and corridor policies) are relevant in evaluating projects in all stages of project development, but particularly useful for projects early in project development. The implementation oriented factors (supportive zoning regulations, implementation tools, and performance of land use policies) are more applicable in evaluating more advanced projects further along in preliminary engineering or final design.

IV. F Cost Effectiveness

In its evaluation of the cost effectiveness of a proposed project*,* FTA considers the incremental cost per incremental passenger in the forecast year. This measure, expressed in current year dollar value, is based on the annualized total capital investment (Federal and local funds) and annual operating costs divided by the forecast change in annual transit system ridership, comparing the proposed project to the no-build and the TSM alternatives. Based on the project information submitted to FTA by local agencies, a composite index is developed which reflects both the no-build and the TSM comparisons. In instances where project sponsors provide a single comparison, no-build or TSM, only the single comparison is evaluated. For the FY 2000 submissions, the cost-effectiveness indices range from $2.54 per new rider to $48.82 per new rider, with a median reported of $10.39 per new rider. Projects are then ranked according to this normalized measure and assigned a "high", "medium-high", "medium", "low-medium" or "low" rating based on its relative ranking compared to the other New Starts projects reported.

IV. G Other Factors

Consistent with §5309(e)(3)(H), FTA also includes a variety of "other factors" when evaluating project justification, including:

- The degree to which policies and programs (local transportation planning, programming and parking policies etc.) are in place as assumed in the ridership forecasts;
- Project management capability of the applicant;
- Additional factors relevant to local and national priorities and relevant to the success of the project. (This may include issues such as Brownfields, Livable Communities Initiatives, Enterprise Communities/Empowerment Zone programs, local economic development initiatives, welfare to work programs, etc.)

FTA considers other factors in the evaluation of candidate New Starts projects in two ways. For evaluations in support of budget recommendations contained in the annual New Starts report to Congress, other factors are introduced *after* the assignment of an initial summary project justification rating. FTA then evaluates the project's other factors. If the other factors are determined to be particularly significant, FTA may increase the project's initial project justification summary rating by one step (for example, from "low-medium" to "medium") to reflect this significance. Projects with less compelling other factors maintain their initial summary project justification rating.

For preliminary engineering and final design approval, other factors are considered in the same way. In addition, the technical capability of the project sponsor to implement and operate the project are considered within the other factors criteria. This inclusion ensures that project management issues are adequately addressed in FTA's decision to permit advancement into the next stage of the project development process. FTA is currently developing guidance on the preliminary engineering and final design approval process.

V. CONCLUSION

TEA-21 requires that FTA evaluate each candidate New Starts project, and to assign overall project ratings of "highly recommended", "recommended" or "not recommended." FTA undertakes this evaluation and rating for all projects in preliminary engineering and final design included in the annual New Starts report to Congress. FTA also evaluates and rates projects at the point that their sponsors request FTA entry into preliminary engineering and final design.

To assign overall project ratings to each proposed New Starts project, FTA considers the individual ratings for each of the financial rating factors and project justification criteria. FTA combines this information into summary "finance" and

"project justification" ratings for each project. These summary ratings are in turn used to determine *overall* project ratings according to the following decision rule:

- **Highly Recommended** For a proposed project to be "highly recommended", it must be rated at least "medium high" for both finance and project justification;
- **Recommended** For a proposed project to be rated as "recommended", it must be rated at least "medium" in terms of both finance and project justification;
- **Not Recommended** Proposed projects not rated at least "medium" in both finance and justification will be rated as "not recommended"

Again, FTA emphasizes that project evaluation and rating is an on-going process; as proposed New Starts projects proceed through the project development process, information concerning costs, benefits, and impacts is refined and the ratings may be updated to reflect new information.

Appendix C
Planning and Project Development Resources

The following provides a summary of FTA and industry websites, publications, and other resources which are available to provide further guidance on the planning and development of major transit capital investments.

Metropolitan and Systems Planning

Metropolitan and Statewide Planning Programs. FTA. www.fta.dot.gov/office/planning/mswp/index.html.
Summarizes the metropolitan planning process and provides links to other planning resources.

Metropolitan Capacity Building Program. FTA/FHWA. www.mcb.fhwa.dot.gov/.
Provides assistance to staff and officials of regional transportation planning agencies to address the demands of increasingly complex transportation issues.

A Guide to Metropolitan Planning Under ISTEA: How the Pieces Fit Together. FTA/FHWA. 1995. www.fta.dot.gov/library/planning/MTPISTEA/424MTP.html.
Provides a framework for linking the various elements of ISTEA's transportation planning process together in a comprehensive manner as well as information, suggestions, and examples of ways to carry out the process.

Final Rule on Metropolitan and Statewide Planning. FTA/FHWA. 1993. www.fhwa.dot.gov/hep/23cfr450.htm.
Describes the Federal requirements for metropolitan planning, the context of which establishes the need for undertaking an alternatives analysis study.

Alternatives Analysis

Technical Methods for Transit Project Planning. FTA. 1991. Chapters are being updated and will be available beginning in early 2003 at http://www.fta.dot.gov/library/policy/ns/ns.htm.
Describes the technical activities and guiding principles of the alternatives analysis study process, including study organization and management, definition and evaluation of alternatives, travel demand forecasting and analysis, and financial planning.

Guidebook for Transportation Corridor Studies: A Process for Effective Decision-Making. National Cooperative Highway Research Program (NCHRP) Report 435. 1999. Available from the Transportation Research Board. www.trb.org/.
Provides planning professionals and transportation decisionmakers with practical tools and guidance for designing, organizing, and managing corridor and subarea planning studies.

National Environmental Policy Act (NEPA) Process

The Environmental Process. FTA. www.fta.dot.gov/office/planning/ep/index.html.
Summarizes the NEPA process for transit capital projects, describes FTA NEPA responsibilities, and provides useful links to other environmental resources.

Final Rule on Environmental Impact and Related Procedures. FTA/FHWA. 1987. www.fta.dot.gov/office/planning/ep/epp/nepa/23cfr771.htm
Prescribes the policies and procedures of FTA and FHWA for implementing NEPA.

Technical Planning Methods

Documentation of SUMMIT Software. FTA. Available early 2003 at www.fta.dot.gov/library/policy/ns/grqanda.htm.
Provides guidance on the implementation and application of the SUMMIT software to calculate transportation system user benefits.

Travel Estimation Techniques for Urban Planning. NCHRP Report 365. 1998. Available from the Transportation Research Board. www.trb.org/.
Provides a review of travel demand forecasting techniques and transferable parameters for application in simplified planning analysis.

Fare Policies, Structures and Technologies. Transit Cooperative Research Program (TCRP) Report 10. 1996. Available from the Transportation Research Board. www.trb.org/.
Provides guidance to transportation planners, managers, on the effects of transit fare policy, structure, and technology.

Transit Capacity and Quality of Service Manual. TCRP Web Document 6. 1999. www4.nas.edu/trb/crp.nsf/All+Projects/TCRP+A-15.
Provides a consolidated and generally accepted set of transit-capacity and quality-of-service definitions, principles, practices, and procedures for planning, designing, and operating vehicles and facilities.

Rail Transit Capacity. TCRP Report 13. 1996. Available from the Transportation Research Board. www.trb.org/.
Describes appropriate methodologies for estimating the capacity of future rail systems and modifications of existing systems.

Financial Planning

Guidance on Transit Financial Plans. FTA. 1999.
www.fta.dot.gov/office/planning/gftfp/gftfp.pdf.
Describes good practices in financial planning for transit agencies and defines the content and scope of an adequate transit financial plan.

Financial Contractor Guidelines and Standards. FTA. 2002. Available early 2003 at http://www.fta.dot.gov/library/policy/ns/ns.htm.

Provides guidance on conducting financial assessments for FTA's New Starts program, including a discussion of key financial planning factors which FTA considers in its evaluation.

Funding Strategies for Public Transportation. TCRP Report 31. 1998. Available from the Transportation Research Board. www.trb.org/.
Describes the current state of funding for public transportation in the United States, the various circumstances that have contributed to today's funding environment, and specific strategies that transit agencies are pursuing to identify new sources of funding.

Project and Grants Management

Project Management. FTA. www.fta.dot.gov/office/program/pmo.htm
Summarizes FTA project management requirements and provides links to related guidance and information.

FTA Circular 5200.1A Full Funding Grant Agreements Guidance. FTA. 2002. www.fta.dot.gov/library/policy/5200.1/intro.html
Describes FTA procedures and grantee responsibilities for the development and execution of the FFGA instrument.

New Starts Program and Requirements

Planning, Development, and Funding for New Starts Projects. FTA. http://www.fta.dot.gov/library/policy/ns/ns.htm.
A summary of FTA's New Starts program and project development process, with links to other related topics.

New Starts – An Introduction to FTA's Capital Investment Program. FTA. 1999. www.fta.dot.gov/library/policy/ns/itcip/newstarts.pdf.
An introductory brochure to the New Starts program and project development process.

Final Rule on Major Capital Investment Projects. FTA. 2000. www.fta.dot.gov/library/legal/fr12700.pdf.
Regulations on the manner in which FTA evaluates and rates candidate New Starts projects.

Reporting Instructions for the Section 5309 New Starts Criteria. FTA. 2002 www.fta.dot.gov/library/policy/ns/2002/. Provides guidance on how to calculate the measures used by FTA to evaluate New Starts projects.

Guidance on Before and After Studies. FTA. Available early 2003 at http://www.fta.dot.gov/library/policy/ns/ns.htm.
Provides guidance to candidate New Starts project sponsors on the data collection, documentation, and analytical activities necessary to prepare a Before and After Study which expands insights into the actual costs and impacts of major transit investments and the methods used to estimate them.