U.S. DEPARTMENT
OF TRANSPORTATION

FEDERAL TRANSIT
ADMINISTRATION

# NEW AND SMALL STARTS

# EVALUATION AND RATING PROCESS

# FINAL POLICY GUIDANCE

# AUGUST 2013

# TABLE OF CONTENTS

**I. INTRODUCTION……...3**

**II. PROJECT JUSTIFICATION CRITERIA……...8**
**MOBILITY IMPROVEMENTS…….8**
**ECONOMIC DEVELOPMENT EFFECTS…….....10**
**ENVIRONMENTAL BENEFITS……..20**
**COST EFFECTIVENESS……..26**
**LAND USE…….....29**
**CONGESTION RELIEF…….32**

**III. LOCAL FINANCIAL COMMITMENT…….33**

# I. INTRODUCTION

This document is a companion piece to the final rule published on January 9, 2013 and effective April 9, 2013, which governs how the Federal Transit Administration (FTA) evaluates and rates major new transit capital investments seeking funding under the discretionary "New Starts" and "Small Starts" programs authorized by Section 5309 of Title 49, U.S. Code.
[http://www.fta.dot.gov/exit.php?url=https://connectdot.connectsolutions.com/p45mh3itdxh/]

This policy guidance replaces all previous policy guidance documents published by FTA relating to the New and Small Starts programs. This document describes the measures and methods for calculating the project justification and local financial commitment criteria required by law for New and Small Starts projects and included in the final rule published January 9, 2013. The final rule and its appendix act as a framework for the New and Small Starts project evaluation process, and this policy guidance fills in the details. The mechanics of what project sponsors submit to FTA for evaluation and rating and the forms that must be completed are found in FTA's Reporting Instructions, New and Small Starts templates, and Standard Cost Category worksheets. You can find these documents on FTA's website at http://www.fta.dot.gov/12304.html.

The final rule and this accompanying policy guidance cover the New and Small Starts evaluation criteria and rating process and the before and after study requirements for New Starts projects defined in the Moving Ahead for Progress in the 21st Century Act (MAP-21). They do not cover new items included in MAP-21 that have not yet been the subject of a rulemaking process such as: the core capacity improvement program evaluation and rating process; the program of interrelated projects evaluation and rating process; the pilot program for expedited project delivery; the measures and breakpoints for ratings for the congestion relief criterion; and the process for an expedited technical capacity review for project sponsors that have recently and successfully completed at least one new fixed guideway or core capacity project. They also do not cover how the steps in the New and Small Starts process will be implemented by FTA because of changes made in MAP-21 to those steps. Those items will be the subject of future interim policy guidance and rulemaking, after an opportunity for public comment is provided.

Proposed New and Small Starts projects are evaluated and rated according to criteria set forth in law. The statutory project justification criteria include: mobility improvements, environmental benefits, congestion relief, economic development effects, land use, and cost-effectiveness. The law also requires FTA to examine the following when evaluating and rating local financial commitment: availability of reasonable contingency amounts, availability of stable and dependable capital and operating funding sources, and availability of local resources to recapitalize, maintain, and operate the overall existing and proposed public transportation system without requiring a reduction in existing services. Each criterion is to be rated on a five point scale, from low to high. Summary project justification and local financial commitment ratings are prepared and combined to arrive at an overall project rating.

The following principles were considered while developing the final rule and final policy guidance:

Establishing Breakpoints for Ratings

When possible, FTA established the breakpoints for ratings based on available research that recommended the values. When such research was not available for a particular criterion or measure, FTA established an initial set of breakpoints based on the performance measures available from projects previously and currently in the program. FTA will revisit the breakpoints as performance measures are accumulated from additional projects over time. Any changes in the breakpoints will be proposed in future policy guidance for comment by the public.

Time Horizons for Calculating Measures

FTA believes project evaluation based on existing conditions provides the most easily understood, most reliable, and most readily available information for decision-making. Thus, FTA is requiring all project sponsors to calculate the measures for the evaluation criteria based on current year inputs. Use of current year data increases the reliability of the projected future performance of the proposed project by avoiding reliance on future population, employment, and transit service levels that are themselves forecasts. Consequently, FTA is defining "current year" as close to today as the data (including the American Community Survey) will permit.

FTA recognizes these projects are long term investments. Additionally, because some projects are designed to address and accommodate future growth more so than current congestion problems, they may not generate sufficient benefits to rate well based only on current year conditions. Thus, FTA is allowing project sponsors, at their option, to calculate the evaluation criteria using horizon year based estimates as well as current year estimates. FTA is allowing project sponsors to determine the horizon year they wish to use -- either 10 years in the future or 20 years in the future.

Given the need to balance the enhanced reliability of short-term estimates with the need to account for longer term benefits, when a project sponsor chooses to quantify the measures in both the current year and a horizon year, FTA will compute each criterion rating as a weighted average that considers both years. FTA will give a weight of 50 percent for the current year data and a weight of 50 percent for the horizon year data.

Basis for Comparison

To simplify and streamline the process project sponsors go through to develop materials for submittal to FTA, where possible, FTA has adopted measures that use absolute values rather than incremental values requiring a basis for comparison. However, in some cases, incremental measures remain necessary. When a basis for comparison is required because a measure is based on an incremental value, FTA will use the existing system as a point of comparison when developing current year information. When a project sponsor chooses to submit 10-year horizon information, the no-build alternative (which includes the existing transportation system as well as those transportation investments committed in the Transportation Improvement Plan (TIP) pursuant to 23 CFR Part 450) would be the point of comparison. When a project sponsor choses to submit 20-year horizon information, the existing transportation network plus all projects identified in the Metropolitan Planning Organization's fiscally constrained long range plan (excluding the proposed build alternative) will serve as the point of comparison.

Weighting of Criteria and Measures

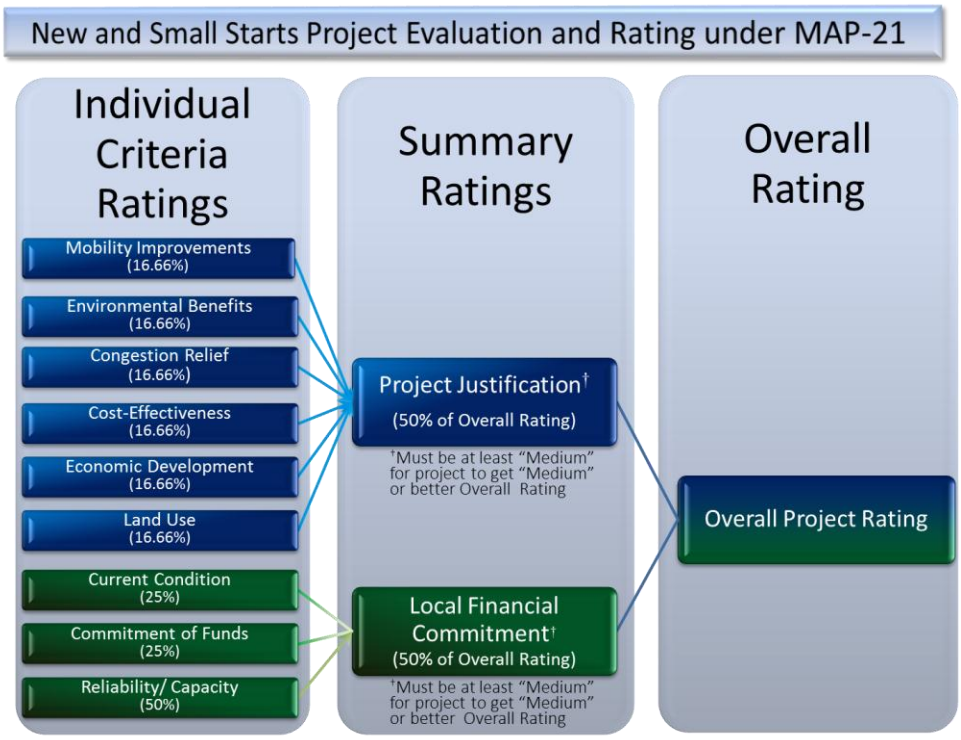
MAP-21 requires FTA to give "comparable, but not necessarily equal" weight to the six project justification evaluation criteria. This final policy guidance specifies that FTA gives equal weight to each of the project justification criteria to arrive at a summary project justification rating. Thus, each of the six is given a weight of 16.66 percent. FTA believes that each of the project justification criteria provides important information about project merit and thus, feels that equal weights are appropriate. Some types of projects may do well on some of the criteria, but not as well on other criteria. Examining the merits of the project as a whole against all of the project justification criteria combined balances what can sometimes be competing policy goals.

MAP-21 does not specify how the local financial commitment criteria should be weighted when arriving at a summary local financial commitment rating. This final policy guidance specifies that FTA will give a 25 percent weight to the current financial condition of the project sponsor, a 25 percent weight to the commitment of non-Section 5309 funds, and a 50 percent weight to the reasonableness of the financial plan submitted by the project sponsor. The proposed New or Small Starts share of the total project capital cost, and whether a project sponsor is providing significant overmatch, will be considered after the above weights are applied. A significant overmatch can serve to increase the summary local financial commitment rating one level. More detail can be found in the financial rating section of this document.

Overall Project Rating

Because of changes made by MAP-21, the final rule does not address how FTA will develop overall New Starts project ratings. Instead, that will be the subject of future subsequent rulemaking. As an interim approach until that rulemaking process is complete, FTA gives 50 percent weight to the summary project justification rating and 50 percent weight to the summary local financial commitment rating to arrive at an overall rating. FTA requires at least a medium rating on both project justification and local financial commitment to obtain a medium or better rating overall.

The chart below outlines the weights given to the various criteria and how they are combined into summary ratings and an overall rating.




Use of Standard Factors Rather than Detailed Analysis

One of FTA's goals in the development of the final rule and final policy guidance was to establish measures that support streamlining of the New Starts and Small Starts process, while maintaining an appropriate degree of analytic rigor as a basis on which to make capital investment grant program funding decisions. Thus, some of the measures are calculated using simplified factoring approaches in order to eliminate undue burden on project sponsors. FTA based the factors on national data.

Simplified estimation of ridership and vehicle miles travelled (VMT)

FTA is making available to project sponsors a simplified national model called Simplified Trips-on-Projects (STOPS) that can be used to estimate trips on the project. FTA believes this tool can significantly streamline the length of time required to generate ridership estimates and vehicle miles travelled data for use in the evaluation measures. Use of STOPS is optional. Project sponsors may choose instead to continue to use their local travel forecasting model if they wish. Project sponsors should contact FTA for assistance in obtaining and using STOPS.

If a sponsor chooses to use STOPS to calculate trips for the mobility and cost effectiveness measures, the sponsor is expected to also use STOPS for calculating the VMT changes used in the environmental benefits measure. If a sponsor chooses instead to calculate trips for the mobility and cost effectiveness measures using its local travel model, the sponsor is expected to also use its local travel model to calculate the change in VMT used in the environmental benefits measure. Should a project sponsor choose to use the local travel model, FTA expects to continue to review the validity of the model, as in past practice, to assure the validity of the results.

The sections that follow in this final policy guidance detail how each criterion is evaluated and rated. For details on the information that must be submitted to FTA for evaluation and rating, please see our updated Reporting Instructions, New and Small Starts templates, and Standard Cost Category worksheets posted on our website.

## II. PROJECT JUSTIFICATION CRITERIA

## MOBILITY IMPROVEMENTS

**Measure:**
FTA evaluates mobility improvements for both New and Small Starts projects as the total number of linked trips using the proposed project, with a weight of two given to trips that would be made on the project by transit dependent persons. Linked trips using the proposed project include all trips made on the project whether or not the rider boards or alights on the project or elsewhere in the transit system. If a project sponsor chooses to estimate trips using the simplified national model FTA has developed called STOPS, then trips made by transit dependent persons are trips made by persons in households that do not own a car. If a project sponsor chooses to estimate trips using their local travel forecasting model, trips made by transit dependent persons are defined in local travel models generally in one of two ways: as trips made by persons in households having no cars or as trips made by persons living in households in the lowest income bracket as defined locally.

FTA assigned a weight of two to trips by transit dependent persons based on information from the 2009 National Household Transportation Survey, which indicates that 8.7 percent of U.S. Households own zero vehicles but make only 4.3 percent of the nation's person trips. If zero-car households had equal opportunity to make trips, i.e., if their mobility was not limited by the existing public transportation system, one could infer that these zero-car households would make more than 4.3 percent of the nation's person trips. To ensure that federal investments in major capital investment transit projects address the travel demand of zero car households equitably, FTA uses a factor of two for the number of trips made by transit dependent persons (8.7% / 4.3% = 2.02).

If a project sponsor chooses to develop project trip estimates based on inputs for a horizon year in addition to estimates based on current year inputs, each is given 50 percent weight when establishing the overall mobility improvements rating. The trips measure proposed is an absolute value rather than an incremental value, so a basis for comparison is not required.

**Calculation:**
The mobility improvements measure is computed by adding together the estimated number of linked transit trips on the project taken by non-transit dependent persons and the number of linked transit trips taken by transit dependent persons multiplied by a factor of two, thereby giving extra weight to these trips.

**Sources of Information:**
**Number of Transit Trips Using the Project:**

- The number of linked transit trips estimated on the project using current year inputs is generated either by the FTA developed simplified national model (which uses census data and ridership experience on existing fixed guideway systems to estimate trips) or the local travel model at the project sponsor’s option.

- If the project sponsor wishes to calculate a horizon year forecast of trips for consideration in the rating, the number of trips in the horizon year is based upon either the FTA developed simplified national model (STOPS) or the local travel model at the project sponsor's option.
- If the project sponsor chooses to calculate a horizon year forecast in addition to a current year forecast, the mobility improvements rating is based on a weighted average that gives 50 percent weight to each.

**Number of Trips by Transit Dependents Using the Project:**

- The number of trips on the project made by transit dependent persons using current year inputs is generated either by the FTA developed simplified national model (STOPS) or the local travel model at the project sponsor's option. Local travel models stratify trips taken in one of two ways – based on household income level or household auto ownership. STOPS uses auto ownership to stratify trips. Thus, trips made by transit dependent persons estimated by STOPS will be those made by households with no cars.

**Breakpoints**

Below are the breakpoints for the Mobility Improvements criterion for both New and Small Starts projects.

| **Rating** | **Mobility Improvements: Estimated Annual Trips (Trips by Non-Transit Dependent Persons plus Trips by Transit Dependent Persons multiplied by 2)** |
|---|---|
| High | ≥ 30 Million |
| Medium-High | 15 Million – 29.9 Million |
| Medium | 5 Million – 14.9 Million |
| Medium-Low | 2.5 Million – 4.9 Million |
| Low | < 2.5 Million |

## ECONOMIC DEVELOPMENT EFFECTS

**Measures**:
The measure of economic development effects is the extent to which a proposed project is likely to induce additional, transit-supportive development in the future based on a qualitative examination of the existing local plans and policies to support economic development proximate to the project.

**Calculation**

- FTA evaluates transit supportive plans and policies, the demonstrated performance of those plans and policies, and the policies and tools in place to preserve or increase the amount of affordable housing in the project corridor. FTA also reports the project sponsor's estimate of the number of U.S. jobs related to design, construction, operation and maintenance of the project although this is not used in developing the rating.

- At the project sponsor's option, an additional quantitative analysis (scenario based estimate) may be undertaken that considers[1]:

    - The extent to which the proposed project would produce changes in development patterns around the transit investment and the resulting magnitude of changes in population and employment, considering:
        - the economic conditions in the project corridor;
        - the mechanisms by which the project would improve those conditions;
        - the availability of land in station areas for development and redevelopment; and
        - a pro forma assessment of the feasibility of specific development scenarios.
    - The estimated change in VMT attributable to the estimated changes in development patterns.
    - The estimated environmental benefits that would come from the VMT change attributable to the estimated change in development patterns. Note that these benefits are counted in the economic development criterion and not added to the benefits assessed in the environmental benefits criterion. These benefits are above and beyond the benefits that come from changes in mode choice that are addressed in the environmental benefits criterion.

  The environmental benefits derived from the optional quantitative economic development scenario analysis are then monetized and compared to the same annualized capital and operating cost of the proposed project as used in the cost-effectiveness calculation. FTA multiplies the resulting ratio by 100 and expresses the environmental benefits derived from the optional quantitative economic development scenario as a percentage.

[1] Economic Development - Future Growth Scenarios: Based upon the current economic conditions, amount of developable land and efforts to improve economic conditions and market demand, local project sponsors and partner agencies may forecast future economic growth scenarios for the proposed station areas. The forecast of various future economic development scenarios should be based upon future development potential based upon various zoning densities, mixes of land use types, comprehensive planning, regional growth boundaries, or other efforts to focus development. This analysis may be used to influence local decisions to adopt policies to improve the economic development potential within a proposed project corridor.

**Sources of information**:

- Transit Supportive Plans and Policies
    - Growth Management;
    - Transit Supportive Corridor Policies;
    - Supportive Zoning Regulations Near Transit Stations; and
    - Tools to Implement Land Use Policies.
- Performance and Impacts of Policies:
    - Performance of Land Use Policies; and
    - Potential Impact of Transit Project on Regional Land Use.
- Tools to maintain or increase the share of affordable housing in the project corridor:
    - Evaluation of Corridor-Specific Affordable Housing Needs and Supply
    - Plans and Policies to Preserve and Increase Affordable Housing such as:
        - Inclusionary zoning and/or density bonuses for affordable housing
        - Employer assisted housing policies
        - Voluntary or mandatory inclusionary housing policies
        - Rent controls or condominium conversion controls
        - Zoning to promote housing diversity
        - Affordability covenants
    - Adopted Financing Tools and Strategies to Preserve and Increase Affordable Housing such as:
        - Target property acquisition, rehabilitation, and development funding for low-income housing within the corridor, including:
            - Low Income Housing Tax Credits
            - Ongoing affordable housing operating subsidies
            - Weatherization and utilities support program
            - Local tax abatements for low-income or senior housing
            - Local of State programs that provide mortgage or other home ownership assistance for lower income and senior households
        - Established land banking programs or transfer tax programs
        - Local or regional affordable housing trust funds
        - Targeted tax increment financing or other value-capture strategies for low-income housing
    - Developer Activity to Preserve and Increase Affordable Housing

The optional scenario analysis could include, but is not required to include, information such as change in regional work force access to transit:

- U.S. Census data analyzed with a Geographic Information System to estimate the work-force population within a 40 minute transit commute of the proposed station locations.

**Breakpoints**

Below is a brief, high level summary of the breakpoints that will be used in evaluating the plans and policies in place. For more detailed information that further clarifies exactly how FTA establishes the ratings, please see our "*Guidelines for Land Use and Economic Development Effects for New and Small Starts Projects*" on the FTA website.

| ***Growth Management*** **(DOES NOT APPLY TO SMALL STARTS)** | | |
|---|---|---|
| Engineering and FFGA | HIGH | Adopted and enforceable growth management and land conservation policies are in place throughout the region. Existing and planned densities and market trends in the region and corridor are strongly compatible with transit. |
| | MEDIUM | Significant progress has been made toward implementing growth management and land conservation policies. Strong policies may be adopted in some jurisdictions but not others, or only moderately enforceable policies (e.g., incentive-based) may be adopted region-wide. Existing and/or planned densities and market trends are moderately compatible with transit. |
| | LOW | Limited consideration has been given to implementing growth management and land conservation policies; adopted policies may be weak and apply to only a limited area. Existing and/or planned densities and market trends are minimally or not supportive of transit. |
| Ratings based on assessment of the following:<br>• Concentration of development around established activity centers and regional transit; and<br>• Land conservation and management. | | |

| ***Transit-Supportive Corridor Policies*** | | |
|---|---|---|
| FFGA/SSGA | HIGH | Conceptual plans for the corridor and station areas have been developed. Local jurisdictions have adopted or drafted revisions to comprehensive and/or small area plans in most or all station areas. Development patterns proposed in conceptual plans and local and institutional plan revisions are strongly supportive of a major transit investment. |
| | MEDIUM | Conceptual plans for the corridor and station areas have been developed. Local jurisdictions have initiated the process of revising comprehensive and/or small area plans. Development patterns proposed in conceptual plans and local and institutional plan revisions are at least moderately supportive of a major transit investment. |
| | LOW | Limited progress, to date, has been made toward developing station area conceptual plans or revising local comprehensive or small area plans. Station area uses identified in local comprehensive plans are marginally or not transit-supportive. |
| Engineering | HIGH | Conceptual plans for the corridor and station areas have been developed. Discussions have been undertaken with local jurisdictions about revising comprehensive plans. Development patterns proposed in conceptual plans for station areas (or in existing comprehensive plans and institutional master plans throughout the corridor) are strongly supportive of a major transit investment. |
| | MEDIUM | Conceptual plans for the corridor and station areas are being developed. Discussions have been undertaken with local jurisdictions about revising comprehensive plans. Development patterns proposed in conceptual plans for station areas (or existing in local comprehensive plans and institutional master plans) are at least moderately supportive of a major transit investment. |
| | LOW | Limited progress, to date, has been made toward developing station area conceptual plans or working with local jurisdictions to revise comprehensive plans. Existing station area uses identified in local comprehensive plans are marginally or not transit-supportive. |
| Ratings based on assessment of the following:<br>• Plans and policies to increase corridor and station area development;<br>• Plans and policies to enhance transit-friendly character of corridor and station area development;<br>• Plans to improve pedestrian facilities, including facilities for persons with disabilities; and<br>• Parking policies. | | |

| ***Supportive Zoning Near Transit*** | | |
|---|---|---|
| FFGA/SSGA | HIGH | Local jurisdictions have adopted zoning changes that strongly support a major transit investment in most or all transit station areas. |
| | MEDIUM | Local jurisdictions are in the process of adopting zoning changes that moderately or strongly support a major transit investment in most or all transit station areas. Alternatively, strongly transit-supportive zoning has been adopted in some station areas but not in others. |
| | LOW | No more than initial efforts have begun to prepare station area plans and related zoning. Existing station area zoning is marginally or not transit supportive. |
| Engineering | HIGH | A conceptual planning process is underway to recommend zoning changes for station areas. Conceptual plans and policies for station areas are recommending transit-supportive densities and design characteristics. Local jurisdictions have committed to examining and changing zoning regulations where necessary. Alternatively, a "high" rating can be assigned if existing zoning in most or all transit station areas is already strongly transit supportive. |
| | MEDIUM | A conceptual planning process is underway to recommend zoning changes for station areas. Local jurisdictions are in the process of committing to examining and changing zoning regulations where necessary. Alternatively, a "medium" rating can be assigned if existing zoning in most or all transit station areas is already moderately transit supportive. |
| | LOW | Limited consideration has been given to preparing station area plans and related zoning. Existing station area zoning is marginally or not transit supportive. |
| Ratings based on assessment of the following:<br>• Zoning ordinances that support increased development density in transit station areas;<br>• Zoning ordinances that enhance transit-oriented character of station area development and pedestrian access; and<br>• Zoning allowances for reduced parking and traffic mitigation. | | |

| ***Tools to Implement Transit-Supportive Plans and Policies*** | | |
|---|---|---|
| FFGA/SSGA | HIGH | Transit agencies and/or regional agencies are working proactively with local jurisdictions, developers, and the public to promote transit-supportive planning and station area development. The transit agency has established a joint development program and identified development opportunities. Agencies have adopted effective regulatory and financial incentives to promote transit-oriented development. Public and private capital improvements are being programmed in the corridor and station areas which implement the local policies and which leverage the Federal investment in the proposed major transit investment corridor. |
| | MEDIUM | Transit agencies and/or regional agencies have conducted some outreach to promote transit-supportive planning and station area development. Regulatory and financial incentives to promote transit-oriented development are being developed, or have been adopted but are only moderately effective. Capital improvements are being identified that support station area plans and leverage the Federal investment in the proposed major transit corridor. |
| | LOW | Limited effort has been made to reach out to jurisdictions, developers, or the public to promote transit-supportive planning; to identify regulatory and financial incentives to promote development; or to identify capital improvements. |
| Engineering | HIGH | Transit agencies and/or regional agencies are working proactively with local jurisdictions, developers, and the public to promote transit-supportive planning and station area development. Local agencies are making recommendations for effective regulatory and financial incentives to promote transit-oriented development. Capital improvement programs are being developed that support station area plans and leverage the Federal investment in the proposed major transit corridor. |
| | MEDIUM | Transit agencies and/or regional agencies have conducted some outreach to promote transit-supportive planning and station area development. Agencies are investigating regulatory and financial incentives to promote transit-oriented development. Capital improvements are being identified that support station area plans and leverage the Federal investment in the proposed major transit corridor. |
| | LOW | Limited effort has been made to reach out to jurisdictions, developers, or the public to promote transit-supportive planning; to identify regulatory and financial incentives to promote development; or to identify capital improvements. |
| Ratings based on assessment of the following:<br>• Outreach to government agencies and the community in support of land use planning;<br>• Regulatory and financial incentives to promote transit-supportive development; and<br>• Efforts to engage the development community in station area planning and transit-supportive development. | | |

| ***Performance of Transit-Supportive Plans and Policies*** | | |
|---|---|---|
| FFGA/SSGA | HIGH | A significant number of development proposals are being received for transit-supportive housing and employment in station areas. Significant amounts of transit-supportive development have occurred in other, existing transit corridors and station areas in the region. |
| | MEDIUM | Some development proposals are being received for transit-supportive housing and employment in station areas. Moderate amounts of transit-supportive development have occurred in other, existing transit corridors and station areas in the region. |
| | LOW | A limited number of proposals for transit-supportive housing and employment development in the corridor are being received. Other, existing transit corridors and station areas in the region lack significant examples of transit-supportive housing and employment development. |
| Engineering | HIGH | Transit-supportive housing and employment development is occurring in the corridor. Significant amounts of transit-supportive development have occurred in other, existing transit corridors and station areas in the region. |
| | MEDIUM | Station locations have not been established with finality, and therefore development would not be expected. Moderate amounts of transit-supportive housing and employment development have occurred in other, existing transit corridors and station areas in the region. |
| | LOW | Other, existing transit corridors and station areas in the region lack significant examples of transit-supportive housing and employment development. |
| Ratings based on assessment of the following:<br>• Demonstrated cases of development affected by transit-oriented policies; and<br>• Station area development proposals and status. | | |

| ***Potential Impact of Transit Project on Regional Development*** | | |
|---|---|---|
| Engineering and FFGA/SSGA | HIGH | A significant amount of land in station areas is available for new development or redevelopment at transit-supportive densities. Local plans, policies, and development programs, as well as real estate market conditions, strongly support such development. |
| | MEDIUM | A moderate amount of land in station areas is available for new development or redevelopment at transit-supportive densities. Local plans, policies, and development programs, as well as real estate market conditions, moderately support such development. |
| | LOW | Only a modest amount of land in station areas is available for new development or redevelopment. Local plans, policies, and development programs, as well as real estate market conditions, provide marginal support for new development in station areas. |
| Ratings based on assessment of the following:<br>• Adaptability of station area land for development; and<br>• Corridor economic environment. | | |

| ***Plans and Policies to Maintain or Increase Affordable Housing in Corridor*** | | |
|---|---|---|
| FFGA/SSGA | HIGH | • Comprehensive affordable housing plans have been developed and are being implemented that identify and address the current and prospective housing affordability needs along the corridor. The plans include efforts to preserve existing affordable housing (both legally binding affordability restricted housing and market-rate affordable housing.) The plans also explicitly address the housing affordability and quality needs of very- and extremely-low income households.<br>• Financing commitments and/or sources of funding and robust financial incentives are secured and available at the local and/or regional level and along the proposed corridor to support affordable housing acquisition (including acquisition of land and/or properties intended to be converted to affordable housing), development and/or preservation consistent with adopted plans and policies. These commitments may include early phase or acquisition financing as well as permanent financing.<br>• Local policies and zoning codes support and encourage significant affordable housing development in transit corridors.<br>• Developers are actively working in the corridor to secure priority development sites and/or maintain affordability levels in existing housing units. |
| | MEDIUM | • Affordable housing plans have been developed and are being implemented that identify and address the current and prospective housing affordability needs along the corridor. The plans include efforts to preserve existing subsidized housing. The plans also explicitly address the needs of very- and extremely-low income households.<br>• Some financial incentives are available along the proposed corridor to support affordable housing acquisition (including acquisition of land and/or properties intended to be converted to affordable housing), development and/or preservation consistent with adopted plans and policies. These commitments may include early phase or acquisition financing as well as permanent financing.<br>• Local policies and zoning codes support affordable housing development in and near transit corridors to a moderate extent.<br>• Developers are starting to work in the corridor to secure priority development sites and/or maintain affordability levels in existing housing units. |
| | LOW | • Affordable housing plans and policies are in development or non-existent, or fail to address key elements such as length of affordability, preservation of existing affordable housing, and the needs of very- and extremely-low income households.<br>• Little or no financial incentives are available to support affordable housing development and preservation.<br>• Local policies and zoning codes support only limited affordable housing development in and near transit corridors.<br>• There is little or no affordable housing development/preservation activity in the corridor. |

| ***Plans and Policies to Maintain or Increase Affordable Housing in Corridor (continued)*** | | |
|---|---|---|
| Engineering | HIGH | Plans and policies are in place in most of the jurisdictions covered by the project corridor that identify and address the current and prospective housing affordability needs along the corridor. The plans outline a strategy to preserve existing affordable housing (both legally binding affordability restricted housing and market-rate affordable housing.) The plans also explicitly address the housing affordability and quality needs of very- and extremely-low income households.<br>Financing commitments and/or sources of funding and robust financial incentives are identified and secured to support affordable housing acquisition (including acquisition of land and/or properties intended to be converted to affordable housing), development and/or preservation consistent with adopted plans and policies. These commitments may include early phase or acquisition financing as well as permanent financing.<br>A strategy is in place to encourage jurisdictions to adopt local policies and zoning codes that support and encourage affordable housing development in transit corridors.<br>Developers are actively working in the corridor to secure priority development sites and/or maintain affordability levels in existing housing units. |
| | MEDIUM | Affordable housing plans are being prepared in most of the jurisdictions covered by the project corridor that identify and address the current and prospective housing affordability needs along the corridor. The plans outline a strategy to preserve existing affordable housing (both legally binding affordability restricted housing and market-rate affordable housing). The plans also explicitly address the housing affordability and quality needs of very- and extremely-low income households.<br>Some financing commitments and/or sources of funding and have been identified and secured to support affordable housing acquisition (including acquisition of land and/or properties intended to be converted to affordable housing), development and/or preservation. These commitments may include early phase or acquisition financing as well as permanent financing.<br>A strategy is in place to encourage jurisdictions to adopt local policies and zoning codes that support and encourage affordable housing development in transit corridors.<br>Developers are starting to work in the corridor to secure priority development sites and/or maintain affordability levels in existing housing units. |
| | LOW | Plans and policies are not in place or being prepared that identify and address the specific housing affordability needs along the corridor.<br>Financing commitments and/or sources of funding have not been identified and secured to preserve and/or build new affordable housing consistent with adopted plans.<br>There is no strategy to encourage jurisdictions to adopt local policies and zoning codes that support and encourage affordable housing development in transit corridors.<br>There is little or no affordable housing development/preservation activity in the corridor |
| Ratings based on assessment of the following:<br>• Evaluation of corridor-specific affordable housing needs and supply;<br>• Plans and policies to preserve and increase affordable housing in region and/or corridor;<br>• Adopted financing tools and strategies targeted to preserving and increasing affordable housing in the region and/or corridor;<br>• Evidence of developer activity to preserve and increase affordable housing in the corridor; and<br>• The extent to which the plans and polices account for long-term affordability and the needs of very- and extremely-low income households in the corridor. | | |

Optional Quantitative Economic Development Scenario

FTA is not specifying a methodology for the optional quantitative economic development scenario. Thus, FTA is not establishing breakpoints at this time. As data is submitted by project sponsors over time, and methodologies are proposed, breakpoints may be established in the future that would be subject to public comment before being finalized. At least initially, FTA intends to examine any optional analyses prepared by project sponsors and assign ratings based on FTA's qualitative assessment of the reasonableness of the analysis and the magnitude of the numbers presented in it.

| **Rating** | **Range** |
|---|---|
| High | TBD |
| Medium-High | TBD |
| Medium | TBD |
| Low-Medium | TBD |
| Low | TBD |

## ENVIRONMENTAL BENEFITS

**Measures**:
FTA evaluates and rates the environmental benefits criterion for New Starts projects based upon the dollar value of the anticipated direct and indirect benefits to human health, safety, energy, and the air quality environment scaled by the annualized capital and operating cost of the project. These benefits are computed based on the change in vehicle miles travelled (VMT) resulting from implementation of the proposed project. Because change in VMT is an incremental measure, a point of comparison is necessary to calculate environmental benefits. To prepare estimates of the measures using current year data, the point of comparison is the existing transit system. If the project sponsor also opts to estimate the measures based on 10-year horizon data, the point of comparison is the no-build transit system (which includes the existing transportation system as well as those transportation investments committed in the Transportation Improvement Plan (TIP) pursuant to 23 CFR Part 450). If the project sponsor chooses to estimate the measures based on 20-year horizon data, the point of comparison is the projects identified in the Metropolitan Planning Organization's fiscally constrained long range plan (excluding the proposed build alternative.) The estimated environmental benefits are monetized and compared to the same annualized capital and operating cost of the proposed New Starts project as used in the cost effectiveness calculation.

For Small Starts projects, MAP-21 requires that the benefits be compared to the Federal share of the project rather than the total cost. Thus, FTA evaluates and rates the environmental benefits criterion for Small Starts projects based on the same benefits calculation as described above for New Starts, but compares the benefits to the annualized capital federal share of the proposed project as directed in law. Federal share includes not only the Small Starts funds being sought, but also any other capital sources of Federal funding.

The standard factors that FTA uses for calculating environmental benefits and data sources are found in the tables below. (See the Appendix for the sources that FTA used to develop the factors.) FTA used data from the Transit Cooperative Research Program study on environmental benefits, "Assessing and Comparing Environmental Performance of Major Transit Investments", and other Federal government data sources to the greatest extent possible.

**Calculation:**

- Environmental benefits include the following subfactors: change in air quality criteria pollutants, change in energy use, change in greenhouse gas emissions, and change in safety. Values for change in energy use and greenhouse gas emissions have been established so as to not double count. (Thus, the valuation of energy use reductions is based only on the economic cost of petroleum dependence identified in Paul N. Leiby, "Estimating the U.S. Oil Security Premium for the 2017-2025 Light -Duty Vehicle GHG/Fuel Economy Rule", Oak Ridge National Laboratory (ORNL), July 15, 2012.) The subfactors are calculated from estimates of changes in automobile and transit vehicle miles traveled (VMT). All measures are converted from VMT into their native units (e.g., tons of emissions or total accidents) using national-level standard conversion factors. The native units are monetized based on standard dollar values. For air quality subfactors, the standard dollar values recognize that a ton of emissions reduced in non-attainment and maintenance areas for certain pollutants is worth more than a ton of emissions reduced in an

attainment area. The monetized values of the various environmental benefits are summed and compared to the same annualized capital and operating cost of the proposed project as is used in the cost effectiveness calculation for New Starts projects and to the annualized Federal share for Small Starts projects.

- Estimates of changes in VMT come from either the local travel model or the simplified national model developed by FTA (STOPS). The change in auto VMT is calculated based upon the change in the number of auto trips between the no-build and build alternatives, multiplied by the difference in auto travel distance between the no-build and build alternatives.
- If the project sponsor chooses to calculate a horizon year forecast in addition to a current year forecast, the environmental benefits rating is based on a weighted average that gives 50 percent weight to each.

**Sources of Information:**

The New and Small Starts templates include all of the conversion factors necessary to calculate changes in air quality, energy use, greenhouse gas emissions, and safety resulting from the changes in highway and transit VMT. The project sponsor is required only to input a few data points and the environmental benefits are automatically calculated in the templates. The factors used in the templates are shown below.

Change in Total Air Quality Criteria Pollutants – Carbon Monoxide (CO), Mono-Nitrogen Oxides ($NO_x$), Particulate Matter ($PM_{2.5}$), and Volatile Organic Compounds (VOC)

For the change in air quality measure, FTA uses emission rates per VMT for automobiles (cars and light trucks) and transit vehicles including buses (diesel, hybrid-electric, and CNG), diesel commuter rail and diesel multiple unit vehicles (DMU), light rail transit vehicles, streetcars, electric commuter rail and electric multiple unit (EMU) vehicles, heavy rail vehicles, and electric buses. Because of the potential for double counting the value in reductions of $PM_{2.5}$ and $PM_{10}$, FTA includes only $PM_{2.5}$ in the air quality measure.

## Change in Air Quality Emissions Factors

| Mode | For Current Year Estimates | | | | For 10-year Horizon Estimates | | | | For 20-year Horizon Estimates | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *(grams/VMT)* | | | | | | | | | | | |
| | CO | $NO_x$ | VOC | $PM_{2.5}$ | CO | $NO_x$ | VOC | $PM_{2.5}$ | CO | $NO_x$ | VOC | $PM_{2.5}$ |
| **Automobile** | 16.77 | 0.91 | 0.60 | 0.010 | 11.46 | 0.28 | 0.27 | 0.010 | 10.26 | 0.20 | 0.21 | 0.010 |
| **Bus - Diesel** | 5.83 | 8.67 | 0.73 | 0.48 | 3.26 | 2.08 | 0.24 | 0.09 | 2.89 | 1.14 | 0.16 | 0.03 |
| **Bus - Hybrid** | 5.83 | 8.67 | 0.73 | 0.480 | 3.26 | 2.08 | 0.24 | 0.09 | 2.89 | 1.14 | 0.16 | 0.03 |
| **Bus - CNG** | 39.62 | 3.84 | 1.46 | 0.010 | 20.30 | 3.41 | 1.15 | 0.010 | 17.16 | 3.35 | 1.11 | 0.010 |
| **Bus - Electric** | 6.45 | 5.83 | 0.12 | 0.378 | 5.39 | 4.39 | 0.10 | 0.313 | 5.04 | 3.98 | 0.10 | 0.299 |
| **Heavy Rail** | 7.06 | 6.38 | 0.13 | 0.413 | 6.85 | 5.58 | 0.13 | 0.398 | 6.73 | 5.32 | 0.13 | 0.399 |
| **Light Rail and Streetcar** | 10.51 | 9.50 | 0.19 | 0.615 | 10.20 | 8.31 | 0.19 | 0.593 | 10.01 | 7.91 | 0.20 | 0.593 |
| **Commuter Rail - Diesel locomotive (new) and DMU** | 16.80 | 13.20 | 0.55 | 0.190 | 16.80 | 13.20 | 0.55 | 0.190 | 16.80 | 13.20 | 0.55 | 0.190 |
| **Commuter Rail - Diesel locomotive (used) and DMU** | 16.80 | 93.00 | 4.36 | 4.600 | 16.80 | 43.00 | 1.26 | 1.330 | 16.80 | 20.90 | 0.44 | 0.470 |
| **Commuter Rail – Electric and EMU** | 12.81 | 11.57 | 0.24 | 0.750 | 12.43 | 10.12 | 0.23 | 0.722 | 12.19 | 9.64 | 0.24 | 0.723 |

## Change in Air Quality Monetization Factors

| | Year | CO | NOx - Mobile | NOx – EGU | VOC | PM2.5 - Mobile | PM2.5 - EGU |
|---|---|---|---|---|---|---|---|
| | | | | $ / KG | | | |
| **Attainment** | Current Year | $0.08 | $12.96 | $18.36 | $3.02 | $680.40 | $561.60 |
| | 10-Year Horizon | $0.08 | $15.66 | $22.95 | $3.75 | $861.30 | $688.50 |
| | 20-Year Horizon | $0.08 | $16.20 | $23.76 | $3.89 | $896.40 | $712.80 |
| **Nonattainment** 1.5 times value of attainment | Current Year | $0.12 | $19.44 | $27.54 | $4.53 | $1,020.60 | $842.40 |
| | 10-Year Horizon | $0.12 | $23.49 | $34.43 | $5.63 | $1,291.95 | $1,032.75 |
| | 20-Year Horizon | $0.12 | $24.30 | $35.64 | $5.84 | $1,344.60 | $1,069.20 |
| **Maintenance area** 1.25 times value of attainment | Current Year | $0.10 | $16.20 | $22.95 | $3.78 | $850.50 | $702.00 |
| | 10-Year Horizon | $0.10 | $19.58 | $28.69 | $4.69 | $1,076.63 | $860.63 |
| | 20-Year Horizon | $0.10 | $20.25 | $29.70 | $4.86 | $1,120.50 | $891.00 |

Change in Energy Use

A significant part of the benefits that come from reducing energy use is already accounted for by the resulting reduction in pollutant and greenhouse gas emissions. In this measure, FTA is attempting to capture the benefit coming from reduced reliance on foreign fuels. Thus, the change in energy use is only computed for modes that use petroleum fuel. The measure estimates the change in energy consumption rates for transit and automobile modes based on the change in VMT.

**Change in Energy Use Factors**

| MODE | Current Year | 10-year Horizon | 20-year Horizon |
|---|---|---|---|
| | | Btu/VMT | |
| Automobile | 7,559 | 6,167 | 5,633 |
| Bus – Diesel | 41,436 | 35,635 | 33,978 |
| Bus – Hybrid | 33,149 | 28,508 | 27,182 |
| Commuter Rail - Diesel (new) and DMU | 96,138 | 96,138 | 96,138 |
| Commuter Rail - Diesel (used) | 96,138 | 96,138 | 96,138 |

FTA then monetizes the change in energy use based on the economic cost of dependence on imported petroleum for fuels. FTA uses a value of $0.20 per gallon of petroleum fuel (Leiby/ORNL 2012). To convert from Btu to gallons of petroleum fuel, FTA uses conversion factors (from the GREET model) of 116,090 Btu per gallon of gasoline and 128,450 Btu per gallon of diesel fuel. Therefore, the monetization factors are $1.72 per million Btu for gasoline and $1.56 per million Btu for diesel fuel. Gasoline is assumed to be the sole fuel for changes in automobile VMT for simplicity in the computation.

Change in Greenhouse Gas Emissions

The calculation of the proposed unit rates for GHG emissions includes the application of emissions factors by fuel type.

**Change in Greenhouse Gas (CO2e) Emissions Factors**

| Mode | Current Year | 10-year Horizon | 20-year Horizon |
|---|---|---|---|
| | | (g CO2e/VMT) | |
| Automobile | 532 | 434 | 397 |
| Bus – Diesel | 3319 | 2854 | 2721 |
| Bus – Hybrid | 2655 | 2283 | 2177 |
| Bus – CNG | 2935 | 2524 | 2406 |
| Bus - Electric | 2934 | 2441 | 2303 |
| Heavy Rail | 3211 | 3106 | 3073 |
| Light Rail and Streetcar | 4779 | 4623 | 4574 |
| Commuter Rail - Diesel (new) and DMU | 7970 | 7970 | 7970 |
| Commuter Rail - Diesel (used) | 7970 | 7970 | 7970 |
| Commuter Rail - Electric and EMU | 5821 | 5632 | 5572 |

NOTE: The factor is CO2 equivalents (CO2e). This means that other greenhouse gas emissions (other than CO2) that have different rates of affecting global warming are converted into CO2 terms because that is the most prevalent greenhouse gas emission.

To capture the monetary value of change in GHG emissions, FTA uses the $38 midrange estimate of the social cost of carbon obtained from the *Technical Update of the Social Cost of Carbon for Regulatory Impact Analysis under Executive Order 12866 (May 2013)*, which is a document developed and updated periodically by an Interagency Working Group comprised of a number of Federal agencies. The $38 value is the 2015 midrange estimate based on a 3 percent discount rate. FTA will update the value based on the latest information available from the Interagency Working Group or other Federal government sources, as appropriate.

Change in Safety

To measure change in safety, FTA uses the change in VMT to estimate changes in disabling injuries and fatalities for automobiles and transit. FTA does not attempt to capture the changes in pedestrian or bicyclist accidents or injuries resulting from changes in VMT because of the difficulty in accounting for such changes using readily available national data.

**Change in Safety Factor**

| | Current Year | | 10-year Horizon | | 20-year Horizon | |
|---|---|---|---|---|---|---|
| **Mode** | *Fatalities* | *Injuries* | Fatalities | Injuries | Fatalities | Injuries |
| | | | *(per million VMT)* | | | |
| Automobile | 0.013 | 0.195 | 0.013 | 0.195 | 0.013 | 0.195 |
| Bus – Diesel | 0.004 | 1.824 | 0.004 | 1.824 | 0.004 | 1.824 |
| Bus – Hybrid | 0.004 | 1.824 | 0.004 | 1.824 | 0.004 | 1.824 |
| Bus – CNG | 0.004 | 1.824 | 0.004 | 1.824 | 0.004 | 1.824 |
| Bus - Electric | 0.004 | 1.458 | 0.004 | 1.458 | 0.004 | 1.458 |
| Heavy Rail | 0.007 | 0.155 | 0.007 | 0.155 | 0.007 | 0.155 |
| Light Rail and Streetcar | 0.009 | 1.696 | 0.009 | 1.696 | 0.009 | 1.696 |
| Commuter Rail - Diesel (new) and DMU | 0.012 | 1.746 | 0.012 | 1.746 | 0.012 | 1.746 |
| Commuter Rail - Diesel (used) | 0.012 | 1.746 | 0.012 | 1.746 | 0.012 | 1.746 |
| Commuter Rail - Electric and EMU | 0.012 | 1.746 | 0.012 | 1.746 | 0.012 | 1.746 |

To monetize the estimated changes in safety, FTA uses U.S. DOT guidance on the value of a statistical life and injuries. According to the most recent guidance, published in 2013, the current U.S. DOT value of a statistical life is $9.1 million. The value FTA uses for a disabling injury for both transit and automobiles is $490,000, which is 5.39 percent of the U.S. DOT value of a statistical life, based on the KABCO scale in the 2009 Highway Safety Manual published by the American Association of State Highway and Transportation Officials in coordination with the Federal Highway Administration. FTA plans to update these figures whenever U.S. DOT publishes revised values.

**Environmental Benefits Breakpoints**

The environmental benefits measure for New Starts projects is the sum of the monetized value of the benefits resulting from the changes in air quality and GHG emissions, energy use, and safety divided by the same annualized capital and operating cost of the project as used in the cost effectiveness measure. FTA multiplies the resulting ratio by 100 and expresses the environmental benefit measure as a percentage.

The environmental benefits measure for Small Starts projects is the sum of the monetized value of the benefits resulting from the changes in air quality and GHG emissions, energy use, and safety divided by the same annualized capital federal share of the project as used in the cost effectiveness measure. FTA multiplies the resulting ratio by 100 and expresses the environmental benefit measure as a percentage.

Below are the environmental benefits breakpoints for both New and Small Starts projects

| **Rating** | **Range** |
|---|---|
| High | > 10% |
| Medium-High | 5 to 10% |
| Medium | 0 to 5% |
| Low-Medium | 0 to -10% |
| Low | < -10% |

## COST EFFECTIVENESS

**Measures:**
The cost effectiveness measure for New Starts projects is the annual capital and operating and maintenance (O&M) cost per trip on the project. For Small Starts projects, the cost effectiveness measure is the annualized capital federal share of the project per trip on the project. The number of trips on the project is not an incremental measure but simply total estimated trips on the project.

The cost part of the New Starts cost-effectiveness calculation is an incremental measure requiring a point of comparison. For estimates based on current year data, the annualized capital and O&M cost for the proposed project is compared to the existing transit system. If a project sponsor also chooses to estimate the measure based on 10-year horizon data, the annualized capital and O&M cost of the proposed project is compared to the no-build transit system (which includes the existing transportation system as well as those transportation investments committed in the Transportation Improvement Plan (TIP) pursuant to 23 CFR Part 450.) If a project sponsor chooses to estimate the measure based on 20-year horizon data, the annual capital and O&M cost of the proposed project is compared to the annual capital and O&M cost of the projects identified in the Metropolitan Planning Organization's fiscally constrained long range plan (excluding the proposed build alternative.)

**Calculation:**
For New Starts projects, the cost-effectiveness measure is computed as the annualized capital cost plus annual O&M cost of the project divided by the annual number of estimated trips on the project. For calculation of this measure, the capital costs of scope elements considered "enrichments" are either reduced by an FTA defined percentage or eliminated entirely from the annualized capital cost calculation. "Enrichments" are improvements to the transit project that are desired by the project sponsor but are non-integral to the planned functioning of the project, and whose benefits are not captured in whole by the criteria. "Enrichments" are allowable expenses for reimbursement under a future New Starts construction grant.

"Enrichments" are based on costs associated with certain Activity Line Items (ALIs) in the FTA Standard Cost Category worksheets. FTA, through its Project Management Oversight Contractors verifies "enrichments" claimed by project sponsors. FTA allows only the following "enrichments" to be excluded from the New Starts cost effectiveness calculation. This is a finite list that may be revisited through future proposed policy guidance:

- **ALIs 20.01 through 20.04 and 30.01 through 30.04 Sustainable Building Design Features --** Up to 2.5 percent of the cost of facilities designed to achieve U.S. Green Building Council Leadership in Energy and Environmental Design (LEED) or a comparable third-party certification (i.e., ENERGY STAR, BREEAM) may be removed from the cost effectiveness calculation. Projects that include buildings optimized to use less energy, consume less water and reduce greenhouse gas emissions may also claim the credit, even if the improvements do not lead directly to an official certification. Examples of eligible improvements include landscape and exterior site designs that improve water efficiency and management, and renewable and alternative energy technologies that support greenhouse gas emissions reduction. The 2.5 percent factor is based on studies completed in 2003 and 2004 by the General Services Administration (GSA) and State of

California that estimated the average incremental construction cost associated with achieving LEED certification. FTA does not propose to credit the professional services cost of sustainable building design because the studies indicated that this is a very small fraction of a capital project's cost (0.1 to 0.3 percent).

- **ALI 20.05 Joint Development** – This ALI identifies items eligible for Federal participation per Section 5302(3)(A)(G) of Chapter 49 USC and FTA's Proposed Joint Development Circular found on the FTA website. All costs on this line item may be removed from the cost effectiveness calculation. Per FTA's Joint Development Guidance, "Joint development is any income-producing activity with a transit nexus related to a real estate asset in which FTA has an interest. Joint development projects are commercial, residential, industrial, or mixed-use developments that are induced by or enhance the effectiveness of transit projects. . ." FTA hopes that the credit will encourage sponsors to undertake joint development efforts as part of New Starts projects; few to date have included joint development-related costs.
- **ALI 40.06 Artwork, Landscaping, and Bicycle and Pedestrian Improvements** – All costs of this line item may be removed from the New Starts cost effectiveness calculation. All proposed bicycle and pedestrian improvements must be consistent with FTA's Bicycle and Pedestrian policy.
- **ALI 70.04 Alternative Energy Bus Vehicles**. Fifty percent of the purchase cost of "green" buses may be removed from the cost effectiveness calculation. Any type of clean fuel bus is eligible for the credit, including buses with compressed natural gas (CNG), hybrid, electric, or fuel cell propulsion. This allowance is based on a 2007 TCRP report, *Assessing and Comparing Environmental Performance of Major Transit Investment*, that found the average cost difference between a conventional diesel bus and a CNG or hybrid bus is approximately 50 percent.

For Small Starts projects the cost-effectiveness measure will be computed as the annualized capital federal share of the project divided by the annual number of trips using the project. The total capital cost of the project and any associated "enrichments" are not part of the cost-effectiveness calculation for Small Starts projects.

If the project sponsor chooses to develop estimates based on horizon year data in addition to developing estimates based on current year data, the overall measure of cost effectiveness is a weighted average that considers both years. FTA weights each 50 percent for the reasons described earlier in this guidance.

**Sources of Information:**
Annualized capital costs for New Starts projects are taken directly from the FTA Standard Cost Categories (SCC) workbook, specifically the "Build Annualized" worksheet.

- Capital costs are expressed in the current year's dollar value.
- The annualization worksheet of the SCC workbook converts the capital cost of individual scope items into their equivalent annual capital cost based on their economic lifetimes and a 2.0 percent discount rate. Enrichments are deducted from the annualized cost calculation automatically in the SCC "Build Annualized" sheet once the project sponsor indicates through simple yes or no answers the enrichments that are applicable and the amount of eligible base cost for each.

Annual operating and maintenance (O&M) costs for New Starts projects are taken directly from the O&M cost model(s) of current and proposed transit facilities and services.

- O&M costs from the model(s) for the current system in the current year are required to match the current O&M budget and reflect any changes anticipated in the existing transit system to integrate the project into the system, as documented in the transit service plan for the project.
- If the project sponsor chooses to calculate the measure in a horizon year as well, the O&M cost estimates are required to reflect the transit service plans for both the point of comparison and the project, including changes made to the point of comparison service plan needed to integrate the project into the system. Horizon-year O&M costs are expressed in the current year's dollars.

Annualized capital Federal share for Small Starts projects is calculated in a manner similar to the way annualized capital cost is calculated for New Starts projects within the SCC workbook.

- Capital costs are expressed in the current year's dollar value.
- The "Build Annualized" worksheet of the SCC workbook converts the capital cost of individual scope items into their equivalent Federal share based on the overall capital Federal share for the project. The Federal share for each individual scope item is converted into its equivalent annualized Federal share based on the item's economic lifetime and a 2.0 percent discount rate.

For the cost-effectiveness criterion, trips on the project are the number of linked trips using the project, with no extra weight given to trips by transit dependent persons. Trips may be calculated using either the FTA developed simplified national model (STOPS) or the local travel model at the project sponsor's option.

**Breakpoints**

FTA examined data from projects currently in the New and Small Starts process and developed the proposed breakpoints below based on that information. FTA further compared the proposed New Starts breakpoints below to data contained on average annual capital and operating cost per trip of various modes in the National Transit Database and determined them to be reasonable and in line with expectations. Because of the different measures used for cost-effectiveness for New Starts versus Small Starts projects, separate breakpoints are shown below.

Cost Effectiveness Breakpoints
New Starts - Annualized Capital and Operating Cost per Trip
Small Starts – Annualized Federal Share per Trip

| Rating | New Starts Range | Small Starts |
|---|---|---|
| High | < $4.00 | < $1.00 |
| Medium-High | Between $4.00 and $5.99 | Between $1.01 and $1.99 |
| Medium | Between $6.00 and $9.99 | Between $2.00 and $3.99 |
| Medium-Low | Between $10.00 and $14.99 | Between $4.00 and $5.00 |
| Low | > $15.00 | > $5.00 |

## LAND USE

**Measures:**
The land use measure for both New and Small Starts projects includes an examination of existing corridor and station area development; existing corridor and station area development character; existing station area pedestrian facilities, including access for persons with disabilities; existing corridor and station area parking supply; and the proportion of existing "legally binding affordability restricted" housing within ½ mile of station areas to the proportion of "legally binding affordability restricted" housing in the counties through which the project travels.

A legally binding affordability restriction is a lien, deed of trust or other legal instrument attached to a property and/or housing structure that restricts the cost of housing units to be affordable to households at specified income levels for a defined period of time and requires that households at these income levels occupy these units. This definition, includes, but is not limited to, state or federally supported public housing, and housing owned by organizations dedicated to providing affordable housing. For the land use measure looking at existing affordable housing, FTA is seeking legally binding affordability restricted units to renters with incomes below 60 percent of the area median income and/or owners with incomes below the area median that are within ½ mile of station areas and in the counties through which the project travels.

One reason FTA chose to include affordable housing in the land use criterion was to ensure that neighborhoods surrounding proposed transit stations have the fundamentals in place to ensure that as service is improved over time there is a mix of housing options for existing and future residents. One measure of the readiness of a community to accept a new transit investment and avoid significant gentrification that can occur over time is the presence of "legally binding affordability restricted" units. These units have protections in place to ensure that they will continue to be available to low and moderate income households as changes in the corridor occur.

In this context FTA believes this to be a first step in developing a worthwhile measure that encourages project sponsors to locate projects where a higher share of "legally binding affordability restricted" housing exists in their area. The metric selected evaluates the proportional share of existing "legally binding affordability restricted" housing in the corridor compared to the share in the surrounding county or counties.

Note that this metric is not intended in any way to serve as a "federally endorsed" definition of acceptable levels of legally binding affordability restricted or other types of affordable housing, and is unique to this process. Further, FTA acknowledges that this measure has not been tested and aims to improve and refine this measure as data are gathered on its application from project sponsors and its impacts are examined. As noted in the calculation section below, FTA will consider additional information provided by project sponsors that captures the benefits of the proposed project to low-income families.

Below FTA provides a set of breakpoints for evaluating the proportion of existing "legally binding affordability restricted" units in the study area compared to the proportion of "legally binding affordability restricted" units in the counties through which the project travels.

**Calculation:**
FTA bases the rating primarily on quantitative measures, including station area population densities, total employment served by the project, and the proportion of "legally binding affordability restricted" housing within ½ mile of stations areas to the proportion of "legally binding affordability restricted" housing in the counties through which the project travels. Poor pedestrian accessibility may reduce the rating, as it reduces the effective amount of population and employment directly served by the system. Otherwise, the presence of high trip generators, a pedestrian-accessible and friendly station area environment, and limited availability of parking all serve to support the rating.

Project sponsors will obtain population and employment information from census data.

A station area encompasses a ½ mile radius of the station.

To develop information on "legally binding affordability restricted" housing located in the proposed corridor and the counties through which the project travels, project sponsors should consult with area housing agencies. For this purpose, FTA is seeking legally binding affordability restricted units to renters with incomes below 60 percent of the area median income and/or owners with incomes below the area median. Project sponsors should also obtain a signed certification by the head(s) of the housing agency(ies) from the relevant jurisdictions attesting to the accuracy of the numbers provided.

While FTA believes contacting area housing authorities will provide the best and most comprehensive data on "legally binding affordability restricted housing", some statistics on affordable housing can be found in the National Housing Preservation Database (http://www.preservationdatabase.org/). This database includes an address-level inventory of federally assisted rental housing. It does not contain information on affordable units supported only by state and local programs. The amount of "legally binding affordability restricted" units in the corridor and the surrounding counties is then compared to total residential housing units in the corridor and the surrounding counties. Total residential housing units should come from the American Community Survey (ACS) five year estimates at the County and Census Tract levels.

FTA assigns a value to this measure by comparing (a) the percent of total units in the transit corridor (defined as 1/2 mile around each proposed station) that are legally binding affordability restricted housing to (b) the percent of total units in the counties in which the stations are located that are legally binding affordability restricted housing.

Given the "first-time" measurement of housing affordability as part of the project evaluation criteria, project sponsors may submit additional information to supplement the calculation described above, that FTA may consider, on a case by case basis, in assigning a final rating for this metric. For instance, project sponsors may voluntarily provide supplemental information if they believe their project would receive an inappropriately low score because the corridor of the proposed project is particularly dense, or because the county through which the project passes has an ample amount of affordable housing. FTA will rate the project higher than the calculation described above would otherwise warrant if the project sponsor demonstrates that the proposed project would provide meaningful benefits to a significant number of low-income persons or families.

**Breakpoints**

The breakpoints for station area population, employment densities, and Central Business District (CBD) parking are shown in the table below. These breakpoints apply to both New and Small Starts projects.

| | Station Area Development | | Parking Supply | |
|---|---|---|---|---|
| **Rating** | **Employment served by system[2]** | **Avg Population density (persons/square mile)[3]** | **CBD typical cost per day[4]** | **CBD spaces per employee[5]** |
| High | > 220,000 | > 15,000 | > $16 | < 0.2 |
| Medium-High | 140,000-219,999 | 9,600 - 15,000 | $12 - $16 | 0.2 – 0.3 |
| Medium | 70,000-139,999 | 5,760 – 9,599 | $8 - $12 | 0.3 – 0.4 |
| Medium-Low | 40,000-69,999 | 2,561 – 5,759 | $4 - $8 | 0.4 – 0.5 |
| Low | <40,000 | < 2,560 | < $4 | > 0.5 |

The breakpoints for the proportion of "legally binding affordability restricted" housing in the corridor compared to the proportion of "legally binding affordability restricted" housing in the counties through which the project travels are shown in the table below. These breakpoints apply to both New and Small Starts projects.

| **Rating** | **Proportion of legally binding affordability restricted housing in the project corridor compared to the proportion in the counties through which the project travels** |
|---|---|
| High | ≥ 2.50 |
| Medium-High | 2.25 – 2.49 |
| Medium | 1.50 - 2.24 |
| Medium-Low | 1.10 - 1.49 |
| Low | < 1.10 |

(For example, a low rating indicates the share of affordable housing units within the project corridor is lower than 110% of the share within the corresponding counties.)

[2] The employment breakpoints are based on the Institute for Transportation Engineer's document entitled "A Toolbox for Alleviating Traffic Congestion," which suggests minimum non-residential development concentrations of 20 million square feet for frequent local bus service and 35 million square feet for light rail service. At 500 square feet per employee, these figures are equivalent to 40,000 and 70,000 employees, respectively. The total employment served includes employment along the entire line on which a no-transfer ride from the proposed project's stations can be reached.

[3] The average population density breakpoints are based on the Institute for Transportation Engineer's document entitled "A Toolbox for Alleviating Traffic Congestion," which suggests light rail and frequent bus service requires a minimum of 9 to 15 dwelling units per acre. This data has been used to inform the medium breakpoint shown.

[4] CBD core (not fringe parking)

[5] Average across CBD

## CONGESTION RELIEF

Until such time as FTA can undertake a subsequent rulemaking process to implement all of the provisions of MAP-21, including development of a measure for the congestion relief resulting from implementation of a proposed New or Small Starts project, FTA will assign a medium rating to this criterion for all projects seeking New or Small Starts funds.

## III. Local Financial Commitment

**Measures:**
The law requires that proposed New and Small Starts projects 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 or extension, and maintain and operate the entire public transportation system without requiring a reduction in existing services.

Project sponsors must prepare a financial plan and 20-year cash flow statement in accordance with *FTA's Guidance for Transit Financial Plans* found on our website unless they are proposing a Small Starts project that qualifies for the simplified financial review as discussed below.

The measures FTA uses for the evaluation of the local financial commitment for proposed New and Small Starts projects are:

- The proposed share of total project capital costs from sources other than the Section 5309 capital investment grant program;
- The current financial condition, both capital and operating, of the project sponsor and/or relevant project partners when more than one entity is involved in construction or operations;
- The commitment of funds for both the capital cost of the proposed project and the ongoing transit system operation and maintenance, including consideration of whether there is significant private participation;
- The reasonableness of the financial plan, including planning assumptions, cost estimates, and the capacity to withstand funding shortfalls or cost overruns.

Small Starts projects can qualify for a highly simplified financial evaluation if the project sponsor can demonstrate the following:

- A reasonable plan to secure funding for the local share of capital costs or sufficient available funds for the local share;
- The additional operating and maintenance cost to the agency of the proposed Small Starts project is less than five percent of the project sponsor's operating budget from the most recently audited financial statements; and
- The project sponsor is in reasonably good financial condition, as demonstrated by the past three years' audited financial statements indicating a positive cash flow over the period, a reasonable current ratio, and no material findings.

Proposed Small Starts projects that meet the items above and request greater than 50 percent Small Starts funding will receive a local financial commitment rating of *Medium*. Proposed Small Starts projects that meet the items above and request 50 percent or less in Small Starts funding will receive a *High* rating for local financial commitment. Small Starts projects that cannot qualify for the simplified financial evaluation will be evaluated and rated in the same manner as New Starts projects.

**Calculation:**
Individual ratings will be given to each of the following measures:

1. The rating for the current capital and operating condition will be based upon the average fleet age, bond ratings if given within the last two years, the current ratio as shown in the project sponsor's most recent audited financial statement (ratio of current assets to current liabilities), and recent service history including whether there have been significant cuts in service. In arriving at a current condition rating, the majority of the emphasis will be placed on the fleet age and current ratio. The bond rating and service history will have less emphasis. Temporary aberrations in any of these measures would have less of an effect than ongoing systemic concerns.
2. The rating for commitment of funds will be based on the percentage of funds (both capital and operating) that are committed or budgeted versus those considered only planned or unspecified. If there are significant private contributions, such involvement would increase the commitment of funds rating one level. FTA will determine on a case by case basis whether private contributions are significant based on the unique arrangements that may be presented. Private contributions can include outside investments that result in cost-effective project delivery, financial partnering, and other public-private partnership strategies.
3. The rating for the reasonableness of the financial plan will be based upon whether capital and operating planning assumptions are comparable to historical experience, the reasonableness of the capital cost estimate of the project, adequacy of meeting state of good repair needs, and the project sponsor's financial capacity to withstand cost increases or funding shortfalls.

The summary local financial commitment rating will also take into consideration the share of Section 5309 major capital investment funding requested. If the summary local financial commitment rating is rated at least Medium and the Section 5309 share is less than 50 percent of the project's capital cost (i.e., the project sponsor is providing significant overmatch), then the summary local financial commitment rating will be raised one level.

| | High | Medium-High | Medium | Medium-Low | Low |
|---|---|---|---|---|---|
| **Current Capital and Operating Condition (25% of local financial commitment rating)** | • Average bus fleet age under 6 years.<br>• Current ratio exceeding 2.0<br>• Bond ratings less than 2 years old (if any) of AAA (Fitch/S&P) or Aaa (Moody's)<br>• Historical positive cash flow. No cash flow shortfalls.<br>• No service cutbacks in recent years. | • Average bus fleet age under 6 years.<br>• Current ratio exceeding 1.5<br>• Bond ratings less than 2 years old (if any) of AA (Fitch/S&P) or Aa3 (Moody's) or better<br>• Historical positive cash flow. No cash flow shortfalls.<br>• No service cutbacks in recent years. | • Average bus fleet age under 8 years.<br>• Current ratio exceeding 1.2<br>• Bond ratings less than 2 years old (if any) of A (Fitch/S&P) or A3 (Moody's) or better<br>• Historical positive cash flow. No cash flow shortfalls.<br>• Only minor service adjustments in recent years | • Average bus fleet age under 12 years.<br>• Current ratio exceeding 1.0<br>• Bond ratings less than 2 years old (if any) of BBB+ (Fitch/S&P) or Baa (Moody's) or better<br>• Historical positive cash flow. No cash flow shortfalls.<br>• Major service cutbacks in recent years. | • Average bus fleet age of 12 years or more.<br>• Current ratio less than1.0<br>• Bond ratings less than 2 years old (if any) of BBB (Fitch/S&P) or Baa3 (Moody's) or below<br>• Recent historical cash flow problems.<br>• Major service cutbacks in recent years. |
| **Commitment of capital and operating funds (25% of local financial commitment rating)** | • At least 75% of the Non-Section 5309 capital funds are committed or budgeted.<br>• At least 75% of the funds needed to operate and maintain the proposed transit system in the opening year of the project are committed or budgeted. | • At least 50% of the Non-Section 5309 capital funds are committed or budgeted.<br>• At least 50% of the funds needed to operate and maintain the proposed transit system in the opening year of the project are committed or budgeted. | • At least 30% of the Non-Section 5309 capital funds are committed or budgeted.<br>• At least 30% of the funds needed to operate and maintain the proposed transit system in the opening year of the project are committed or budgeted. | • At least 10% of the Non-Section 5309 capital funds are committed or budgeted.<br>• While no additional operating and maintenance funding has been committed, a reasonable plan to secure funding commitments has been presented. | • Less than 10% of the Non-Section 5309 capital funds are committed or budgeted.<br>• The applicant does not have a reasonable plan to secure operating and maintenance funding. |
| **Reasonableness of capital and operating cost estimates and planning assumptions/capital funding capacity (50% of local financial commitment rating)** | • Financial plan contains very conservative planning assumptions and cost estimates when compared with recent historical experience.<br>• The applicant has access to funds via additional debt capacity, cash reserves, or other committed funds to cover cost increases or funding shortfalls equal to at least 50% of estimated project cost and 50% (6 months) of annual system wide operating expenses. | • Financial plan contains conservative planning assumptions and cost estimates when compared with recent historical experience.<br>• The applicant has access to funds via additional debt capacity, cash reserves, or other committed funds to cover cost increases or funding shortfalls equal to at least 25% of estimated project cost and 25% (3 months) of annual system wide operating expenses. | • Financial plan contains planning assumptions and cost estimates that are consistent with recent historical experience.<br>• The applicant has access to funds via additional debt capacity, cash reserves, or other committed funds to cover cost increases or funding shortfalls equal to at least 15% of estimated project cost and 12% (1.5 months) of annual system wide operating expenses. | • Financial plan contains optimistic planning assumptions and cost estimates when compared to recent historical experience.<br>• The applicant has access to funds via additional debt capacity, cash reserves, or other committed funds to cover cost increases or funding shortfalls equal to at least 10% of estimated project cost and 8% (1 month) of annual system wide operating expenses. | • Financial plan contains planning assumptions and cost estimates that are far more optimistic than recent history suggests.<br>• The applicant has a reasonable plan to cover only minor (< 10%) capital cost increases or funding shortfalls.<br>• Projected operating cash balances are insufficient to maintain balanced budgets. |

# Appendix

Data Sources

## Change in Air Quality Factors Data Sources and Assumptions

| Factor | Data Source or Assumption |
|---|---|
| Emission rates – automobiles, diesel and CNG transit buses | MOVES2010a – runs using national default inputs for 2013, 2025, 2035 |
| Emission rates – commuter rail (diesel) and DMU | New locomotives: U.S. EPA Tier 4 emissions standards (U.S. EPA 2009)<br>Reused locomotives: Average emission factor for U.S. passenger locomotives by year from U.S. EPA |
| Emission rates – electric modes | $NO_x$ emissions forecasts based U.S. Department of Energy (DOE) Annual Energy Outlook (AEO) 2012 Reference Scenario<br>PM, VOC, and CO forecasts based on current emission levels Argonne National Laboratory Greenhouse Gases, Regulated Emissions, and Energy Use in Transportation Model (GREET) and forecast generating mix from AEO |
| Value of change in emissions | U.S. EPA (2012) health damage using PM2.5 and precursor (VOC and NOx) costs by source type – adjusted for horizon year estimates based on EPA estimates for 2015, 2020, 2030<br>Delucchi (2004) midpoint value for urban areas for CO<br>Adjusted 50% upwards for nonattainment areas and 25% upwards for maintenance areas to account for the higher value of a change in emissions in an area with worse air quality, based on FTA judgment. |

## Change in Energy Use Data Sources and Assumptions

| Factor | Data Source or Assumption |
|---|---|
| Assumed fuel blends for gasoline and diesel | Gasoline: 10% ethanol<br>Diesel: 10% biodiesel |
| Full fuel-cycle energy factors (measure of energy consumed by the transportation vehicle and energy associated with the extraction, transmission, and processing of fuels) | GREET model for 2020 |
| Automobile fuel economy | Projections from AEO 2012 (including Model Year 2012-2016 standards) |
| Transit vehicle energy intensity (Btu per mile) – (2010) | NTD averages by mode for diesel bus and commuter rail<br>Hybrid bus = 20% improvement vs. diesel<br>DMU = commuter rail diesel |
| Transit vehicle energy intensity – improvement factors (current year, 10-year horizon, 20-year horizon) | Buses - AEO average efficiency improvement for heavy duty vehicles (HDV) (18% by 2035)<br>Diesel rail - AEO average efficiency improvement for freight rail (3% by 2035) |

## Change in Greenhouse Gas Emissions Data Sources and Assumptions

| Factor | Data Source or Assumption |
|---|---|
| $CO_2$ emission factors by fuel type – liquid fuels and natural gas (kg/gal) | U.S. Energy Information Administration (EIA), Voluntary Reporting of Greenhouse Gases Program |
| GHG emission factors for electricity generation (kg/kWh) | AEO Reference Case (11% improvement by 2035) |
| $CO_2$equivelant to $CO_2$ scale factors by fuel type | GREET model |
| Full fuel-cycle GHG factors (ratio of fuel-cycle to operating GHG emissions) | GREET model for 2020 |

## Change in Safety Data Sources and Assumptions

| Factor | Data Source or Assumption |
|---|---|
| Fatality rates – automobiles | National Highway Traffic Safety Administration (NHTSA) - Fatal Accident Reporting System, 2000 – 2009 |
| Injury rates – automobiles | Bureau of Transportation Statistics (BTS) reported motor vehicle safety data, 2000 - 2009 |
| Fatality rates – transit (except commuter rail) | National Transit Database (NTD) 2000-2011 for bus, light rail, and heavy rail<br>Electric bus, streetcar, DMU and EMU rates based on most similar corresponding mode from NTD |
| Injury rates – transit (except commuter rail) | NTD 2000-2011 for all reporting modes<br>Streetcar, DMU, and EMU based on most similar corresponding mode from NTD |
| Fatality and injury rates – transit (commuter rail) | BTS reporting for passenger rail, 2000 – 2010 |
| Value of a statistical life | 2013 U.S. DOT memorandum on Value of a Statistical Life |
| Value of an injury by severity level | Federal Highway Administration (FHWA) Highway Safety Manual (2009), based on KABCO scale |
| Distribution of injuries by severity level – automobile | NHTSA General Estimates System 2010 crash data, disabling injuries only to match what is available through NTD reporting requirements |
| Distribution of injuries by severity level – transit | Disabling injuries only, based on NTD reporting requirements |

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