2. Definitions of Alternatives

2.1 Introduction

"We must learn to explore all the options and possibilities that confront us is a complex and rapidly changing world."

- Senator James W. Fulbright, Speech in Senate, March 27, 1964

The selection of the alternatives to be considered in project planning is perhaps the most important activity in the entire effort. Without a set of alternatives that is structured to isolate the differences between options and to 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 decision-makers.

This guidance gives careful consideration to the development of alternatives to be studied during corridor planning. FTA does not require any specific set of alternatives. Rather, this guidance outlines the steps to be taken (1) in the development of a set of alternatives that respond to the local transportation problem, and (2) in the definition of each alternative to optimize its performance within the limits of its technology and operating characteristics. Following this guidance will help to ensure the development of an appropriate set of transportation alternatives to develop, refine, and evaluate during alternatives analysis. It will also ensure that the alternatives analysis produces an alternative that can serve as the New Starts baseline alternative during project development, if a major transit investment becomes the locally preferred alternative. The guidance further suggests milestones for local and FTA review of the alternatives as they are identified, refined and evaluated.

2.2 Development of Alternatives through a Narrowing of Options

Throughout the planning and project development process – from system planning, through corridor planning and preliminary engineering – the primary nature of the decisions to be made is a narrowing of options toward selection of a specific project. In many cases, decision-makers face initial questions on priority corridors, then proceed through the selection of a mode and general alignment, and finally select a set of design standards and a specific alignment.

The planning and project development process is designed around these decisions. It is structured so that the alternatives and the technical work can be focused only on the decision at hand, avoiding unnecessary grappling with issues that are relevant only at later stages. A key part of the planning process is the definition of alternatives only in the detail needed to support decision-making. For decisions on corridor priorities, it is unlikely that the specific location of each station on a guideway alternative is necessary to judge the relative need and potential for improvement in alternative corridors. However, selecting a particular alternative for a corridor requires the evaluation of the cost and the environmental impacts of various station and park/ride options, and consequently, that the stations be defined more specifically.

The technical analysis proceeds from system planning. During system planning, local officials develop and update regional objectives, collect data on regional travel patterns, and project future demographics, land use and travel demand. This effort leads to the identification of current and future transportation problems. Basic planning tools such as regional travel demand forecasting models are developed, revised and refined as part of ongoing system planning. The availability of financial resources is assessed and a range of alternative solutions to the regions problems are examined.

The system planning effort should give adequate consideration to system-wide and regional issues, including:

1. The interdependence of corridors in terms of travel demand, system design, and operations;
2. The feasibility of various mode and alignment combinations in each corridor in terms of engineering, cost, operations, and environmental impacts; and
3. The region-wide financial implications of various investment levels in each corridor.

The system planning effort should recognize the difference between the foregoing of precision and the sacrifice of accuracy in the technical work, so that estimates of costs and impacts, while coarse, are at least approximate indicators of the potential merits of the alternatives. The level of effort must be designed so that additional effort would not result in the choice of a different preferred alternative.

A rigorous system planning effort provides a set of priority corridors and the basis for selecting a small set of alternatives to consider during corridor planning. Without such an effort, the initial phases of alternatives analysis may revert to a reappraisal of system planning issues, redoing much of the technical work and delaying the start of corridor planning. Where regional systems are contemplated, a sound system planning effort will have identified considerations beyond the priority corridor and enable the local officials and project staff to avoid alignment and design decisions that preclude future options.

The transition from system planning to project planning does not always proceed along this ideal course. When the system planning effort has dealt with a large number of possible corridors and options, there may have been only limited screening of the mode and alignment possibilities in the corridor ultimately selected for initial project planning efforts. If the remaining screening effort is complex, it may be desirable to do a "transitional" study for the specific purpose of narrowing the range of alternatives for a particular corridor. Where the screening effort is less difficult, it may be carried out as an initial step in project planning. Another situation leading to a sub-optimal sequence is where an alternative is generated outside of the normal planning process. Where a right-of-way becomes available, for example, the idea of reserving it for a transit guideway may be a real but unforeseen option. A transitional study is usually needed in this situation to identify reasonable options for the corridor and get a preliminary indication of the potential merits of investment in a guideway.

The central task in project planning is to identify one or more alternatives that are the most desirable solutions to problems identified in the corridor. Because the analysis will result in the local selection of a preferred alternative, it is necessary to develop reliable information on costs and impacts so that the selection is not affected by errors in the projections. Reasonably detailed analysis of the physical characteristics, operating plans, patronage and revenue implications, and environmental impacts of each option is appropriate.

The alternatives should not be defined in the detail required to advance them into final design and construction, nor to complete the environmental analysis. These tasks are left to preliminary engineering, when detailed specifications for the preferred alternative and the Final EIS are typically developed. Such issues as the specific alignment through downtown (2nd Street versus 3rd Street, for example), may well be resolved in preliminary engineering if they have only minor differences in cost and environmental impact. Unnecessary work may be avoided in project planning with a clear understanding of the difference between issues germane to the selection of an alternative and issues related to its ultimate construction.

In system planning, alternatives are defined only to the level of detail necessary to explore the potential merits of the alternatives in addressing the problems in a corridor. In alternatives analysis, alternatives are defined to the level of detail necessary to support a sufficiently reliable analysis of costs and impacts to support the selection of mode and alignment and a financing plan. In preliminary engineering, alternatives are defined in the detail required to select the design specifications and operating plan, and to accurately estimate costs in order to obtain the funding commitments required to carry the project into final design and complete the federal environmental process.

2.3 Identifying the Set of Promising Alternatives

Several key principles should be considered to ensure a well-structured set of reasonable alternatives is developed to address identified problems in the corridor.

1) The set of alternatives must address the purpose and need for considering a major transportation investment.

The key principal in the identification of alternatives is that they directly address the stated transportation problem in the corridor. The identification of promising alternatives entails an understanding of the underlying causes of the problems in the corridor, and the potential of particular types of transportation investments to solving those problems.

2) The set of alternatives must include the necessary baseline options.

For studies that will produce an EIS, environmental requirements mandate the consideration of a No-Build alternative as the environmental baseline. Further, any study considering major transit investments must also include an option that optimizes transportation facilities and services in the corridor but stops short of major capital expenditures. This option is called the transportation system management (TSM) alternative, which will usually serve as the basis of comparison during the alternatives analysis and serve as the New Starts baseline alternative during preliminary engineering and final design.

3) The alternatives should include all ***reasonable*** *modes and alignments.*

This consideration, founded on Council on Environmental Quality regulations (40 CFR Part 1502.14), addresses both the addition and deletion of alternatives. It requires the addition of alternatives that make technical sense in terms of addressing the corridor's transportation problems, even where those alternatives may not be consistent with pre-existing notions on the desired project. Equally important, it provides a basis for excluding alternatives that are simply not appropriate for the setting. Local officials should avoid carrying clearly uncompetitive options through project planning simply because their elimination might be opposed by a few individuals or groups. The postponement of this decision to the end of project planning is unlikely to make it easier, and will increase the time and cost of the analysis. Where sound technical information indicates, and a majority of technical and policy participants agree that an option is undesirable, every effort should be made to eliminate it.

Financial feasibility should be one of the considerations in assessing the reasonableness of an alternative. Where the resources needed to build and operate an alternative clearly exceed the amount of funding that can realistically be anticipated, that alternative may be eliminated despite its potential transportation or other merits.

4) Alternatives designed to address differing goals and objectives should be included.

The study area is likely to be composed of a variety of groups and individuals with divergent goals, values, and needs. Some may stress the achievement of mobility goals, while others may emphasize the need for environmental quality of fiscal responsibility. By including alternatives that respond to these different goals, the trade-offs inherent in choosing a preferred alternative that responds to these different goals can be made more explicit, and citizens of varying viewpoints can be brought into the process. Similarly, the corridor is likely to contain a variety of travel markets, such as travel by particular population subgroups, travel within or between specific geographic areas, or travel for particular purposes. No one alternative is likely to serve all of these markets well; so different alternatives should be defined for different travel markets. For example, a rail line with closely spaced stations may be included in corridors with a large number of relatively short trips. A second alternative, perhaps using the same technology and alignment, might be developed with fewer stations to better serve longer distance trips.

5) The set of alternatives should include all options that have a reasonable chance of becoming the locally preferred alternative.

A locally preferred alternative emerges from the evaluation of mode and alignment options in project planning. In cases where an alternative is chosen that is significantly different from any option considered during alternatives analysis, it may be necessary to do additional analysis, and possibly prepare a supplemental DEIS, before proceeding to preliminary engineering. The delay associated with these additional analyses might be avoided if the initial set of alternatives is developed with care. This care extends to the service policies within which the alternatives are defined. For example, if all of the alternatives in the DEIS assume a large system-wide service expansion that increases the operating deficit substantially, the selection of one of the guideway options without the service expansion would require additional analysis since the environmental impacts and cost-effectiveness of the selected alternative may be very different from those of any previously considered option.

6) The alternatives should encompass an appropriate range of options without major gaps in the costs of the alternatives.

The set of alternatives should not include several relatively low cost options, several high cost options, and no intermediate cost alternatives. There are several reasons that this outcome is undesirable. First, it is likely that one or more potentially cost-effective options exist within the gap. Omitting them would distort the analysis. Second, the gap limits the flexibility of local decision-makers in choosing an alternative. Third, the exclusion of intermediate-cost options risks a result where no alternative has a significant effect on the problems in the corridor and is financially feasible.

The analysis of shorter (i.e., "minimum operable segment") options is a ready means of including intermediate-cost alternatives. In alternatives analysis and preliminary engineering, FTA urges consideration of one or more minimum operable segments as separate alternatives to provide flexibility in any full funding negotiations that may follow.

7) Where questions remain on feasibility of specific alternatives, other alternatives should provide related fallback options.

While most questions on feasibility should be resolved before the initiation of project planning, there are cases where alternatives may turn out to be infeasible. In these situations, the set of alternatives should include other options that are derived from the potentially infeasible alternatives but include adjustments that address the source of the potential problem. For example, a busway alternative may lead to a significant increase in the number of buses in the downtown during rush hours and the detailed analysis to establish the capacity of downtown streets to handle the buses will be done during project planning. If it is likely that existing streets do not have sufficient capacity, a second alternative that incorporates dedicated transit lanes or other distribution options should be considered. A second example is uncertainty in the future availability of funds for operations, perhaps where a referendum is needed to expand existing sources of funds. In this case, while some of the alternatives may well exceed the financial capacity of current funding sources, the No-Build alternative and a number of the TSM alternatives should be financially feasible with existing sources of funding.

8) The number of alternatives should be manageable so that decision-makers can realistically be expected to understand the implications of each and make a thoughtful choice.

The number of alternatives can easily reach unmanageable levels when there are a variety of physical and operational elements that can be packaged together in many ways. Testing all the possible combinations and permutations will quickly consume available resources, and may overburden decision-makers with more information than they can comprehend. FTA stresses the analysis of a small set of promising alternatives in order to keep the technical and decision-making process manageable. There is no magic number of alternatives, but experience has shown that the process can become unwieldy when the number of alternatives exceeds ten.

One way to reduce the number of alternatives is to include a screening step early in the process. Clearly inferior combinations can be eliminated without detailed analysis. Another way is to perform a series of sensitivity analyses to investigate the impacts of changes that may affect several alternatives. By presenting the results of these analyses as variations on a theme, rather than as entirely new alternatives, the number of alternatives can be kept reasonable while still providing decision-makers with necessary and useful information.

2.4 Defining Individual Alternatives

Several key considerations apply to the definition of each alternative. The following considerations can be used to evaluate the adequacy of the alternatives proposed for analysis.

1) The alternatives must, within the limits of their technology, respond to the transportation problems identified in the corridor.

The single most important consideration in the definition of alternatives is that they must address the goals, objectives, and specific transportation problems identified in the corridor. This linkage can be illustrated by examining the likely configuration of a busway alternative in two corridors with very different transportation problems. In one corridor, a strong focus on travel to downtown together with severe peak-direction highway congestion on highway facilities would suggest that a busway alternative be configured to provide one-way service without intermediate stations. In contrast, a corridor with major activity centers outside of downtown and substantial bi-directional highway congestion throughout the corridor would suggest a more elaborate two-way busway with on-line stations.

A target year for the analysis must be chosen as part of the effort to define transportation problems. If too short a planning horizon is used, the project may not be designed with sufficient capacity to accommodate future growth. As the planning horizon is extended, projection of future demographics and traffic congestion levels become increasingly speculative. There is also the question of whether funds should be directed toward solving existing or future problems. A planning horizon of 20 years is used as the primary basis for all alternatives analysis studies and New Starts ratings. This is supplemented with an opening year forecast and ideally with several intermediate year forecasts, often at five-year increments. At local option, other long-range analysis years (beyond 20 years) may be added to the analysis, particularly where the financing strategies are expected to involve longer maturation periods (e.g., a 30-year bond issue).

2) Each alternative should be defined to optimize its performance.

Since different technologies have different strengths and limitations, optimization may lead to alternatives that have different alignments, lengths, and operating plans. For example, in the first corridor used in the previous example, a rail alternative may use a significantly longer alignment to reach a logical terminus point for transfers to feeder buses. Thus the rail alternative would be longer and provide two-way service with intermediate stations while the busway alternative would be relatively short and provide peak-direction non-stop service, possibly with High Occupancy Vehicles (HOVs) permitted in addition to buses. The differences between these two alternatives are a direct reflection of the different nature of their basic technologies. These differences do not violate any notions of "comparability" of the alternatives. Indeed, to require the busway in that corridor to mimic the physical and operating characteristics of the rail option would risk a resulting busway alternative that would be significantly less cost-effective than the shorter, one-way facility.

3) The policy and land-use setting in which the alternatives are defined and analyzed must be unbiased and consistent across the alternatives.

Since a primary purpose of the project planning analysis is to select a mode and alignment alternative, it is necessary to hold the policy setting constant so that the impacts of the mode and alignment alternatives can be isolated. Service and fare policies should be defined in broad terms and applied consistently across all alternatives. For example, a fare policy that calls for a $.25 transfer fare and a $1.00 fee at park/ride lots means that all alternatives will have these transfer charges and parking fees. If fare policies differed across alternatives, it would be difficult to determine whether an alternative that recovers a higher percentage of costs from the farebox does so because of the operating efficiency and ridership of the alternative, or because it has a different fare structure. Similar considerations exist regarding land use policy. If land use assumptions differ among the alternatives, isolating the effect of the alternatives themselves from the impact of the assumed land use changes would be difficult. Appropriate sensitivity analyses may be included in the study, if desired, to explore the implications of different service, fare, and/or land use policies.

4) The alternative definitions must specify their operating plans, institutional setting, and financing strategy.

In project planning, an alternative is defined in terms of its mode and general alignment as well as its policies, institutions, and financial setting. Table 2-1 identifies these dimensions. Mode is defined to include technology, degree of right-of-way separation, and the operating characteristics of both guideways and feeder services. In addition to the obvious technology differences, alternatives can be different to a very significant extent in their operating policies. Continuing the previous example, the one-way HOV-way would be a distinct alternative from a two-way facility limited to buses only.

General alignment is defined to include the approximate horizontal and vertical alignment, approximate station locations, and length. Thus, major shifts in horizontal alignment, large variations in the lengths of segments with different vertical alignments, significant changes in overall station spacing, and major increments in the length of the facility, would lead to separate alternatives. Some of these variations are less obvious than others, but can lead to substantial differences in the alternatives that have caused past studies to expand the set of alternatives fairly late in the effort.

Table 2-1: Dimensions for Defining Alternatives

Dimension	Characteristics	Options
Mode	1. Technology	• Bus • Rail • Highway • Etc.
	2. Degree of right-of-way separation	• Mixed Traffic • Separation except at intersections • Exclusive right-of-way
	3. Operating characteristics	• Local vs. express • Stations vs. no-stop • Integrated feeders vs. transfers • Number of lanes/tracks • Etc.
General alignment	1. Horizontal	• Streets • Medians • Rights-of-way • Elevated

	2. Vertical 3. Station locations 4. Length	• At-grade • Open cut • Subway • Parking • Intermodal connections • Alternative terminus locations
Policies	1. Operations 2. Fares	• Service standards • Loading standards • Etc. • Flat • Zone • Distance-based • Transfer charges • Parking fees
Institutional arrangements	1. Legislative authorities 2. Labor agreements 3. Private sector participation	• Existing/new agencies • Legislative changes • Existing/new agreements • Design-build arrangements • Contracting out
Financing strategy	1. Capital financing 2. Operating funding	• Pay as you go • Debt • Funding partners • Farebox recovery • Public subsidies

The institutional setting for project implementation and operation also needs to be defined for each mode and alignment alternative. Institutional factors include the roles and responsibilities of public agencies, the need for new legislative authorities, labor agreements, and the role of the private sector. For the purpose of evaluating mode and alignment alternatives, the institutional setting should be unbiased and consistent across all alternatives. However, there may be a need to consider optional institutional arrangements, and one or more additional alternatives may need to be defined to explore these options. The project planning study may include two alternatives that are identical in terms of mode and alignment, but have different public or private entities responsible for project implementation or operation, or that have different assumptions regarding labor agreements.

While financing plans are not settled during planning, the financing strategy should reflect hard thinking about the potential sources of funding available to provide the local share of project costs. Transit alternatives can be financed through a range of strategies including one or a combination of pay-as-you-go, debt, leasing, intergovernmental grants, and private sector participation. The analysis of optional financing strategies must be performed in such a way that it does not bias the analysis of mode and alignment alternatives, or introduce a large number of new alternatives to be carried through the study. The use of carefully designed sensitivity analyses or special studies may be the most practical approach. Once a financing strategy or combination of strategies has been identified, revenue forecasts for each source should be prepared, the steps required to secure funding commitments from each source should be documented, and an assessment of the likelihood that the source will be available for this project should be provided (see Part II Section 8 *Financial Planning for Transit*).

The dimensions noted above are not necessarily independent of one another. In some urban areas, for example, public agencies have been established with the authority to implement only certain transportation technologies. The need to consider new institutions or legislation would depend upon the range of reasonable alternatives in the corridor. There is also a strong linkage between the alignment and financing options. New financial strategies may be needed if one technology or alignment alternative costs more than another. An agency's ability to finance a portion of a project with joint development revenues may depend upon finding a suitable alignment and station locations. These interrelationships should surface during the project planning phase to ensure that a coordinated package, covering all dimensions, emerges from the study.

5) The alternatives should be designed from the start with environmental considerations in mind.

Certain environmental statutes and executive orders mandate the avoidance of parks, historic sites, wetlands, floodplains, etc., except under specific conditions. These requirements must be continually considered and reconsidered as candidate alignments and potential station locations are being identified.

In other cases, proper sensitivity to community concerns may suggest that a particular mode and alignment is unreasonable. For example, a rail alignment should not be drawn through a noise-sensitive neighborhood, such as university campus, if it is known that disruptive levels of noise will result. Similarly, a station oriented for feeder bus and park-and-ride access might be unacceptable in a neighborhood with limited street capacity.

Many environmental concerns cannot be taken into account at the early stage of development of the alternatives. A detailed analysis that quantifies the impacts and the costs of avoidance or mitigation may be needed before the alignment is adjusted or other refinements are made to minimize adverse impacts. Such detailed analysis may not occur until preliminary engineering. Nevertheless, as the alternatives advance from the conceptual stage to the final detailed description in project planning, the relevant environmental issues should be considered in refining the alternatives at a level of detail commensurate with the detail of the alternatives.

6) The mode and alignment alternatives must be significantly different.

Judgment and preliminary analysis are needed to determine whether the possible variations in the definition of an alternative should be treated as separate alternatives.

For example, where two horizontal alignment options are available for a relative short segment of a particular alternative, preliminary cost estimates and an environmental review might be useful in determining how these options should be included in the alternatives. If the alignments are not likely to be significantly different in cost, ridership, or environmental effect, they might be treated as simple design variations that can be resolved in preliminary engineering. Alternatively, significant differences between the alternatives, where the more costly options also appear to have greater benefits would suggest that the two alignments should be treated as separate, major alternatives. Finally, a large difference between alignments, where higher costs or significant environmental impacts are not accompanied by higher benefits, might suggest that the more expensive or intrusive option be eliminated.

2.5 Issues in the Development of Alternatives

Although the definition of alternatives is determined largely by local conditions and local goals and objectives, there are a number of issues commonly encountered in defining and developing the alternatives. These include the nature of the No-Build and Transportation System Management (TSM) alternatives, and the approach to developing operating plans for guideway alternatives that optimize their performance.

2.5.1 The No-Build Alternative

The No-Build alternative provides the baseline for establishing the environmental impacts of the alternatives, the financial condition of the transit operator, and the cost-effectiveness of the TSM alternative. It also establishes much of the information needed for the DEIS Chapter 1 on Purpose and Need since it examines horizon year travel demand and its impact on a largely unimproved transportation system. This alternative is defined to include those transportation facilities and services that are likely to exist in the forecast year. All elements of the No-Build alternative must be part of each of the other alternatives except where an alternative replaces services or facilities inside the corridor.

To provide a basis of comparison in the EIS that preserves the NEPA requirements to evaluate all federal actions with a significant potential impact on the social, economic or physical environment, the No-Build alternative must include the following features:

- The maintenance of existing facilities and services in the study corridor and region;
- The completion and maintenance of committed projects in the study corridor that have successfully completed their environmental review; and
- The continuation of existing transportation policies.

Within these guidelines, there are two possible definitions of the No-Build option outside the study corridor. Choice among these is determined by the local situation, particularly the degree of certainty that other transportation improvements will be made between now and the horizon year. The possible definitions include:

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 may 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. In some metropolitan areas with severe financial constraints,

this definition may involve no improvements to transportation facilities or transit services in the corridor beyond routine maintenance and replacement.

The first definition is the typical definition of the No-Build alternative, but it does entail some risk in that the inclusion of "planned" improvements may lead to a set of alternatives that incorporate projects that may not happen. The second option recognizes whatever improvements are essentially certain to occur because they are simply incremental responses to growth in the corridor and have been programmed by the region.

The No-Build alternative should generally maintain the current transit operating strategy with a growth in service commensurate with forecast population and employment growth. New bus routes may be added and existing bus routes extended, but the underlying strategy should remain the same. For example, if the current bus system is oriented toward providing radial service to the CBD, that same strategy should be assumed in the No-Build alternative. Changing that strategy to a grid pattern might be considered as part of the TSM alternative. The No-Build alternative can then serve as a basis for evaluating the costs and benefits of a revised operating strategy.

2.5.2 The TSM Alternative(s)

Compared with a fixed guideway investment, transportation system management alternatives are relatively low cost approaches to addressing transportation problems in the corridor. The TSM alternatives provide an appropriate baseline against which all of the major investment alternatives are evaluated. The most cost-effective TSM alternative generally serves as the baseline against which the proposed guideway alternative is compared during the New Starts rating and evaluation process that begins when the project applies to enter preliminary engineering continuing through final design.

The TSM alternative represents the best that can be done for mobility without constructing a new transit guideway. Generally, the TSM alternative emphasizes upgrades in transit service through operational and small physical improvements, plus selected highway upgrades through intersection improvements, minor widenings, and other focused traffic engineering actions. A TSM alternative normally includes such features as bus route restructuring, shortened bus headways, expanded use of articulated buses, reserved bus lanes, contra-flow lanes for buses and HOVs on freeways, special bus ramps on freeways, expanded park/ride facilities, express and limited-stop service, signalization improvements, and timed-transfer operations. Outside the study corridor, the TSM should have the same transit network as the no-build alternative. While the scale of these improvements is generally modest, TSM alternatives may cost tens of millions of dollars when guideway alternatives range up to several hundreds of millions or billions of dollars.

Given the crucial role of the TSM alternative as both a realistic near-term package of improvements and a rational baseline for evaluation of the guideway investments, it deserves significant attention in its definition and refinement. In many respects, the TSM alternative is the most difficult alternative to define and develop. The potential components of the alternative are many and varied, and tend to be small in scale and widely distributed in location. The cumulative contribution of the individual actions can be hard to measure and translate into changes in travel patterns. Most importantly, since the TSM alternative is designed to represent the "best" that can be done without major new capacity improvements, a wide variety of possible actions need to be sifted to identify a package that approximates an optimum mix. This sifting often leads to several iterations on the definition of the TSM alternative as components are added and deleted during alternatives analysis. In many cases, this iterative process provides a means of sorting out questions on appropriate region-wide transit service levels and fare structure. The results of this analysis provide a sound basis on which to develop the operating plans for the guideway alternatives.

As TSM alternatives are defined, four issues often arise: the treatment of demand management strategies, the feasibility of some TSM strategies, the assumed highway network, and the number of TSM alternatives that should be studied. These issues are discussed in the following sections.

2.5.2.1 Demand Management

Non-capital actions such as staggered work hours, road pricing, parking management, transportation management organizations, employer-based ridesharing incentives, and so forth may have an impact on the use of all transit alternatives. As such, TSM alternatives may include demand management strategies. The analysis of such strategies might be treated as a special study that looks at the applicability of demand management techniques, their potential benefits, and institutional considerations.

2.5.2.2 Technical vs. Political Feasibility

Technical considerations are the primary determinant of feasibility during alternatives analysis. Technical reasons for judging an option infeasible include operational difficulties, high costs relative to expected benefits, and environmental impacts that exceed standards or guidelines. Where local officials view a technically feasible option as politically unacceptable, it may again be useful to include two TSM alternatives in the analysis: one option that includes only those actions judged to be politically feasible, and a second with all technically feasible options. This approach recognizes local policy positions, provides a fair baseline for comparing projects, and permits the project staff and local decision-makers to consider the merits of the actions thought to be politically infeasible with an eye toward their potential merits.

2.5.2.3 Highway Network Assumption

The technical analyses performed during transit project planning try to isolate the costs and benefits of the various alternatives. To meet this objective, the same background highway network is generally assumed for the TSM and other build alternatives. If the fiscally constrained long-range plan provides a set of projects that may be reasonably expected to be implemented, the adopted long-range plan provides a solid basis for the highway network assumptions outside the study corridor. This may not be realistic if there is a significant risk that the cost of the long-range plan could exceed funding availability.

2.5.2.4 Number of TSM Alternatives

Ideally, a single TSM alternative can be agreed upon that represents a comprehensive program of sound, low-cost actions for addressing identified transportation problems. However, there are situations in which more than one TSM alternative is necessary. Some examples follow:

1) The long-range plan may include a major effort to upgrade highways throughout the region, but the funding schedule for this effort is uncertain. The use of two TSM alternatives that differ in their level of highway improvements can be useful in recognizing the uncertainty, determining the interdependence between transit and highway improvements, and possibly setting priorities for the highway upgrades.

2) The optimal operating plan for the TSM alternative may be unclear. One project planning study, for example, was evaluating extensions to a light rail line that ended just a few miles outside downtown. Two bus operating plans were developed for the TSM alternative: one with buses feeding the light rail terminal, the other with buses running all the way downtown. Two TSM alternatives allow for an explicit recognition of the advantages and disadvantages of each operating plan in terms of costs, transit service levels and ridership.

3) There may be legitimate questions regarding the feasibility – operational, political, or financial – of some elements of the TSM alternative. Analysis to assess the feasibility of contra-flow lanes on a freeway that is presently uncongested in the off-peak direction may be required. An expanded bus fleet may require financial resources that are not presently available. In such cases, advancing two or more TSM alternatives may be the best way to answer legitimate questions and keep the analysis process moving forward.

2.5.3 The Fixed Guideway Transit Alternative(s)

No guidance can substitute for the informed judgment of local analysts in the development of guideway alternatives, but past experience leads to several comments and cautions on the development of realistic alternatives.

2.5.3.1 Relationship to the TSM Operating Plan

The operating plans for the guideway alternatives typically are derived from the optimized plan developed for the TSM option. This approach is the best way to ensure a feeder and background bus system that is compatible with the guideway but is also consistent with the overall operating policies governing all of the alternatives. The approach requires a two-step analysis for each guideway alternative. First, the guideway is overlaid on the TSM operating plan. Second, adjustments are made in bus routings to eliminate unnecessary parallel service and to integrate the bus service for possible headway shortening to meet any anticipated increase in volumes.

2.5.3.2 Parallel Bus Services

A trade-off may exist between the desires to integrate on- and off-guideway services. At higher levels of integration, the operating efficiency in the corridor approaches its maximum, usually accompanied by degradation in service levels for some travel markets. For example, a guideway with fairly long station spacing may not provide good service to short trips. Also, areas on the fringe of the corridor with direct express service to the downtown may be less well served if the bus routes are converted into feeders that require a more circuitous route to downtown. These and other markets facing potentially lower service levels warrant particular attention in the development of the alternative. Careful analysis of the implications for service levels and operating efficiencies should precede final selection of the operating plan.

2.5.3.3 Guideway Operations

One of the most difficult aspects in the development of sound guideway alternatives is the selection of an operating plan that optimizes the performance of the alternative. The wide variety of operating possibilities, plus the range of possible TSM improvements that can be incorporated into the guideway alternatives, present a broad array of options. The challenge in this regard is particularly evident for bus/HOV facilities that have a myriad of operational possibilities: one-way vs. two-way service, on-line stations vs. no stations, HOVs vs. bus-only, integrated collector/line-haul service vs. forced transfers from feeders, and so forth. Compounding the challenge, a mix of operations – some express and some "all-stops" services on the busway – is often the optimal operation.

One useful approach to sorting out the various options is to reserve the analysis of busway alternatives until after the analysis of operating plans for rail alternatives (if rail alternatives are being considered). Examination of the transit trip tables and station volumes for the rail options can help distinguish between high volume travel markets in the corridor that may warrant integrated express service on the busway, and lower volume markets that are more appropriately served by feeder services into stations on the busway. This approach can minimize the number of adjustments to the initial operating plan needed to produce a final plan that serves travel demand in the corridor. Where no rail alternatives are being considered, an initial operating plan can be assumed to provide both an "all-stops" service on the busway and integrated feeder/line-haul service from all residential areas to major activity centers in the corridor. This over-supplied operation can then be scaled back in a subsequent iteration to match supply and demand levels.

2.5.3.4 Park/ride Facilities

The success of transit improvements in a corridor depends, in large part, on the accessibility of new guideways to potential transit riders. The level of feeder bus services and the capacity of park/ride lots are key aspects of the alternatives that must be carefully developed. There is usually a trade-off between the bus- and auto-access opportunities. Existing transit guideways show a wide range in the mix of access modes used by their riders. Some have very little feeder bus service but attract fairly heavy ridership through walk access or park/ride and kiss/ride access. More commonly, large shares of guideway riders use feeder buses to access the guideway service. The potential trade-offs among ridership attraction, the availability of space for park/ride facilities, and the cost of operating feeder bus services require careful attention during project planning, possibly including a sensitivity analysis of ridership and costs with different access strategies.

Many travel demand models used to estimate patronage for guideway facilities have no automated way to recognize capacity constraints on parking at park/ride stations. Thus, one necessary step in the development of the operating plans is to determine whether the predicted (unconstrained) demand for parking at stations allocated to other park/ride lots, to other access modes, and/or to non-transit travel.

2.5.3.5 Guideway Design Standards

There are no widely accepted design standards or specifications upon which to base conceptual engineering project costing. For rail projects, each system ultimately develops its own standards and specifications by drawing upon the work of previous systems and revising it to reflect local conditions. Planning studies assume a set of standards that are representative of operating projects elsewhere in the country and/or the world. These cover such matters as minimum clearances, geometrics, signal systems, and vehicle size and performance (see Exhibit 2-1 and Exhibit 2-2). FTA takes a flexible position on the design standards used in individual studies, provided that the standards proposed for use are proven safe and effective in actual application, and that they are consistent with assumed performance characteristics.

Design standards for busways and HOV lanes have been issued by the American Association of State Highway and Transportation Officials (AASHTO) in the Guide for the Design of High Occupancy Vehicle Facilities (1992). To the extent that the standards proposed for use in a particular situation have been proven safe and effective, FTA will agree to a standard less than that advocated by AASHTO. FTA may even advocate the use of different standards as a cost saving measure. Design standards that have not previously been used may also be acceptable if supported by adequate research.

Exhibit 2-1: Sample Line Items in Busway Design Specification

[Specifications are presented for each environment: at grade, elevated, tunnel, highway median, on-street, busway stations, access ramps, etc.]

1. Cross-sections

- lane width
- shoulder width
- median
- drainage control
- minimum total width (shoulder-to-shoulder/curb-to-curb)

2. Minimum clearances

- vertical clearances for over-crossings and under-crossings
- lateral clearances

3. Geometrics

- design speed
- horizontal curves
  - minimum radius
  - desirable radius
  - curb radius at intersections
- vertical curves
  - sag K value
  - crest K value
- maximum grade

4. Pavement loading standards

5. Vehicles

- dimensions
- performance
  - rates of acceleration and deceleration
  - cruising speed
- passenger capacity: seated plus standing at stated loading standards

6. Fare collection methods

7. Passenger stations

- platforms
- access provisions: bus, park n' ride, kiss n' ride

Exhibit 2-2: Sample Line Items in Rail Design Specification

[Specifications are presented for each environment: at-grade, elevated, tunnel, highway median, on-street, stations, yards etc.]

1. Cross-sections

- track centers
- drainage control
- minimum total width
- trackwork: direct fixation, ballast, rail, ties, fasteners, turnouts, cross-overs

2. Minimum clearances

- vertical clearances for over-crossings and under-crossings
- lateral clearances

3. Geometrics

- design speed
- horizontal curves: minimum and desirable radii (degree of curvature?)
- vertical curves: minimum and desirable radii
- superelevation and spirals
- grades

4. Electrification

- overhead or third rail
- power substations

5. Signals

- unsignaled, way signals or cab signals
- automatic block signaling / centralized train control (commuter rail)
- automatic train control / communications based train control (rapid rail)

- street and highway crossing signals and protection

6. Vehicles

- dimensions
- performance: acceleration, deceleration, cruising speed
- passenger capacity: seated plus standing at stated loading standards

7. Fare collection methods

8. Passenger stations

- platforms
- access provisions: bus, park n' ride, kiss n' ride

2.5.3.6 Vehicle Loading Standards

Project planning studies often entail comparisons between alternatives with different types and sizes of vehicles. To maintain comparability, consistent vehicle loading standards are used for all alternatives. Headways are set such that, during peak periods, all seats are filled at the maximum load point. To the extent that standees are anticipated, each alternative is designed to provide the same amount of space per standee. The loading standard may be expressed in terms of square feet of standing area (floor area of the vehicle less seating area) per standee.

Questions sometimes arise about whether the loading standards might vary with the type of service (such as local and express) or operating environment (reserved lanes or mixed traffic). Some states, for example, require seated loads on express buses operating on freeways. Different loading standards may be appropriate in such situations provided they are expressed in terms of a regional policy that is consistently applied to all alternatives. The analyst should consider the degree of bias this may introduce into the analysis.

2.5.4 Highway Alternatives

Although transit project planning studies are often undertaken with an eye toward various transit solutions, the transportation problems being addressed are frequently highway problems, such as peak hour traffic congestion. Therefore, highway solutions as well transit solutions may warrant analysis. There may or may not be highway projects that are already being contemplated by the responsible highway agencies.

Where major highway alternatives are contemplated in the corridor, highway and transit corridor studies should be merged or, at a minimum, closely coordinated such that the relative merits and interrelationships of highway and transit options can be explored in the analysis using a consistent set of methods and assumptions. Even if highway improvements are not being contemplated, the initial screening of alternatives should consider the potential for highway solutions to identified problems.

Multi-modal corridor studies can be complicated both technically and institutionally. Technical complications arise from the fact that multi-modal studies have two objectives: to compare highway alternatives with each other, and to compare highway alternatives with transit alternatives. A large number of possible combinations may need to be tested to isolate all of the relevant costs, benefits, and interactions between alternatives. Table 2-2 shows how one project planning study structured its set of alternatives to address the possible highway and transit combinations. Note that the alternatives allow for a comparison of the transit alternatives' relative costs and benefits, keeping the highway network constant, as well as comparisons among highway alternatives and between transit and highways.

Table 2-2: Example of Multimodal Set of Alternatives

Alternative	**Key Components**	
	Highway	**Transit**
1. No Build	Current TIP including completion of Interstate System in Salt Lake area	UTA short range plan and financially attainable service plan to 2010
2. TSM (rehab I-15) - Best bus	Minor operational and safety improvements and rehabilitation of I-15	Expand bus routes to optimize corridor transit service to the urban area for 2010
3. One lane - Best bus	Add one general-purpose lane in each direction to I-15 (in median); selected interchange additions and reconstruction; local street improvement; rehabilitation of I-15; improvements to 2100 South interchange.	Same as Alternative 2
4. Two lanes - Best bus	Add two general-purpose lanes in each direction (one in median, one on outside); selected interchange additions and reconstruction; local street improvement; rehabilitation of I-15; improvements to 2100 South interchange.	Same as Alternative 2
5. One lane plus reversible HOV - Best bus	Same as Alternative 4, except median is reversible HOV lane	Same as Alternative 2

6. One lane plus one HOV - Best bus	Same as Alternative 4, except median lanes are HOV lanes	Same as Alternative 2
7. Highway TSM - UPRR LRT loop	Same as Alternative 2	Light rail on UPRR ROW from 10600 South to CBD with CBD loop
8. Highway TSM - State/main LRT loop	Same as Alternative 2	Light rail on State Street from 10600 South to 4500 South, then transition to Main Street to CBD with CBD loop
9. One lane - UPRR LRT Depot	Same as Alternative 3	Light rail on UPRR ROW from 10600 South to CBD with terminus at Union Station Depot
10. One lane - UPRR LRT Main	Same as Alternative 3	Light rail on UPRR ROW from 10600 South to CBD with terminus on Main Street at South Temple
11. One lane - UPRR LRT loop	Same as Alternative 3	Light rail on UPRR ROW from 10600 South to CBD with terminus a one way loop on 400 South, 200 East, South Temple and West Temple
12. One lane - State/Main LRT loop	Same as Alternative 3	Same as Alternative 8
13. Two lanes - UPRR LRT loop	Same as Alternative 4	Same as Alternative 7
14. Two lanes - State/Main LRT loop	Same as Alternative 4	Same as Alternative 8

2.6 Documentation of the Alternatives

Because of the importance of the careful development of alternatives, an iterative approach with three distinct review points should be used to define alternatives. Exhibit 2-3 summarizes the process that begins with a "conceptual" definition of the alternatives, produces a "detailed" definition that forms the basis for the heart of the technical work, and concludes with a "final" definition that may be summarized in the DEIS. Written documentation of the alternatives is developed at each of the three stages during alternatives analysis.

2.6.1.1 Conceptual Definition

The conceptual definitions of the alternatives are ideally produced in system planning and then reviewed in the early scoping activities during project planning. For each alternative, the conceptual definition includes the preliminary identification of candidate alignments and operating strategies. The operating strategies – as distinct from operating plans developed as planning and project development proceeds – give general ideas of overall bus service levels, service standards, and guideway service options. These definitions are sufficient to address such general concerns as ranges of costs, ridership potential, likely cost-effectiveness, and financial feasibility. They also serve in the initial scoping process to identify the range of options to be considered and to shape the technical work scope.

The subsequent preliminary analysis is focused on narrowing the range of alternatives to a manageable number to carry forward in the detailed analysis. The preliminary analysis may be quite brief or very involved, depending on the complexity of the corridor, the variety of options, and the amount of preliminary screening done during system planning. This analysis employs coarse criteria to sort among the various alignment and operating options, and to develop preliminary definitions of alignments, standards, and operations. This preliminary analysis may begin with a screening effort to sort out the broader issues before work begins on the preliminary specifications and operating plans where large numbers of options remain (often because the prior system planning effort left many system-level issues unresolved).

Exhibit 2-3: Steps in the Development of Alternatives (click here to see image)

2.6.1.2 Detailed Definition

The detailed descriptions provide sufficient information for each of the technical disciplines to begin detailed analysis. The engineering and environmental teams are given specific guidance regarding the horizontal and vertical alignments, station locations, typical sections and stations, vehicle loading standards, and initial specifications. At this stage, reference is made to design standards developed by the local transit operator, the State highway agency, AASHTO, APTA, and other sources. Close coordination is necessary between the development of the detailed definition of the alternatives and the capital costing methodology. The definitions provide a description of the standards and design criteria to be used while the capital cost methodology depicts specific cross-sections for segments of the alignment and identify the outlines of the physical items typically covered in the specifications documented in the detailed definition of the alternatives.

The detailed definition of alternatives report describes the transit service currently in the corridor and describes the service levels, operating plans and policies for each alternative in the opening and forecast years. The operating plans describe routing, locations of stations or stops (or average stop spacing), peak and off-peak headways, and peak and off-peak speeds for each bus and/or rail route, including the feeder system. The operating plans should be described in sufficient detail to permit a careful review by participating technical staff and to permit the demand forecasting team to code the transit network for each alternative. Important operating policies include peak and off-peak fares, loading standards, parking charges at park/ride lots in the corridor, and the supply and/or price of CBD parking (if applicable).

Policy options, institutional arrangements, and financial strategies should also be described, providing input to the relevant technical analyses. For example, the detailed definition of alternatives report should identify any travel demand management options to be considered in the service and patronage analysis. Where land-use options are to be evaluated, the report would describe these options in terms of possible differences in the location and scale of new development, to guide the associated ridership, environmental, and financial analyses. As appropriate, the report should also identify the different institutional arrangements and financial strategies to be evaluated in the study. The report should be written in such a way that the reader could appreciate the interrelationships among decisions on the mode, alignment, service and other policies, institutional arrangements, and financing options to be considered.

2.6.1.3 Final Definition

The final definitions of the alternatives consists of the plan and profile drawings, cross-section drawings for various line segments, conceptual drawing of stations and park/ride lots, and proposed specifications developed in the conceptual engineering effort. In addition to the finer detail provided in these materials, the final definitions may also differ from the detailed definitions because of changes made in response to cost, operational and environmental considerations. The design specifications are labeled "proposed" because, while providing the basis for the cost estimates, they are subject to further refinement in preliminary engineering.

The final operating plans are likely to differ from the initial plans provided as part of the detailed definition. The final definition reflects the equilibration of transit service levels with travel demand. To the extent that the initial plans anticipated ridership levels accurately, there may be little revision needed to produce the final operating plans.

To document the equilibration process, the final definition of alternatives report should include, for each alternative, and for both the design year and the opening year, tables showing the following:

- each route’s initial headway assumption;
- the initial peak hour peak direction volume (at peak load point);
- the revised headway assumption;
- the final peak hour peak direction volume;
- the resulting peak hour vehicle loadings;
- weekday vehicle miles and hours for each route; and
- the adopted vehicle loading standards.

The final definition of alternatives report also presents inputs to the capital costing and operating and maintenance (O&M) costing tasks. In addition to the plan and profile drawings, the capital costing inputs include the maintenance facility needs and vehicle requirements for each alternative. Information on the service variables to the used for O&M costing is likely to include vehicle-hours, vehicle-miles, and peak vehicles.

2.7 The New Starts Baseline

If the alternatives analysis results in a the locally preferred alternative that is a fixed guideway transit project and will be seeking federal New Starts funding, the FTA must approve or deny entry into preliminary engineering and final design as well as rate and evaluate the proposed New Starts project for the annual (and supplemental) New Starts report. The rating process is crucial to the recommendation of New Starts projects for funding.

FTA requires that the proposed project be evaluated against a ``baseline alternative.'' The baseline alternative establishes a basis of comparison for project evaluation and provides a consistent framework for estimating the relative merits of proposed projects during project development.

The baseline alternative is drawn from the alternatives defined during alternatives analysis. In almost every case, the best TSM alternative will serve as the New Starts baseline. FTA will approve the choice of a baseline alternative to serve as the basis of comparison for the New Starts project justification measures before a project is allowed to enter preliminary engineering. If alternatives analysis is completed without developing an acceptable New Starts baseline alternative, significant (and avoidable) new work will need to be undertaken before entering preliminary engineering to develop an acceptable New Starts baseline alternative.

2.7.1 Basis of Comparison

A project cannot be evaluated simply by examining the results of a transportation system improvement in isolation. The purpose of the baseline alternative during project development is to provide a basis of comparison to isolate the costs and benefits of the proposed major transit investment relative to what would occur without the investment. Project staff and decision-makers should be interested in the changes brought about by the project. The build alternatives and the baseline alternative are developed to determine these changes.

In response to FTA's legislated responsibilities, a series of project justification measures have been developed to facilitate the national comparison of the relative merits of the proposed New Starts projects. These measures include mobility improvements, cost-effectiveness, environmental benefits, operating efficiencies, transit supportive land use, and other factors and have been explained in detail in other guidance. Aside from the land use measure and other factors, all of the project justification measures are evaluated based on changes relative to the New Starts baseline alternative.

2.7.2 Consistent Treatment of Projects

The intent of the New Starts evaluation and rating process is to provide Congress, the Administration and other interested parties, information about the relative merits of each proposed New Starts project. Toward that end, FTA must have measures that are based on a fair evaluation of the relative merits of each project and do not penalize projects for good planning practices.

In corridors with minimal existing transit service, a project sponsor may be able to achieve most of the benefits of the proposed rail project with relatively low-cost upgrades to the existing bus service. Proposed projects in corridors with extensive existing transit service would be at an unfair disadvantage if the baseline alternative used to develop New Starts evaluation measures were simply the existing service levels. For instance, a corridor with no transit service that implements a rail system will generate more incremental user benefits than if extensive express bus service were already provided in the corridor. In effect, project sponsors who have implemented high quality transit services would be penalized for providing that service when competing for federal funding.

FTA maintains that project sponsors will not be allowed to attribute benefits to a proposed major capital investment that could be achieved with low-cost improvements to the transportation system. By requiring a baseline alternative that includes those low-cost improvements, FTA’s New Starts ratings are based on the benefits that are provided only by the proposed project that could not be derived from other low-cost improvements.

2.7.3 Definition of the New Starts Baseline

The features of an acceptable baseline alternative are the defining characteristics of the TSM alternative developed during alternatives analysis. FTA has long standing procedures that specify that the TSM alternative is the basis of comparison when conducting an alternatives analysis and for calculating project justification measures during the New Starts ratings process. This practice has not changed.

The new Rule for Major Capital Investments (49 CFR Part 611) stipulates that grantees will be required to carry forward one baseline alternative and the build alternative after entering preliminary engineering *for the purpose of reporting New Starts project justification measures*. The baseline alternative will be the TSM alternative developed during the alternatives analysis unless all elements of a solid TSM alternative already exist in the No-Build alternative or the TSM alternative is technically infeasible.

Some projects have no obvious TSM alternative. A prime example would be the double tracking of a single-track rail transit line. There are no obvious lower cost alternatives to that proposed project other than the No-Build alternative. Similarly, projects meant to upgrade, improve or repair existing fixed guideway service will usually use the No-Build alternative as the baseline. These examples highlight the need for alternatives to respond directly to the transportation problem rather than carrying forward alternatives that do not make sense.

Project sponsors in certain metropolitan areas with high quality existing and/or planned transit service may also be able to use the No-Build as the baseline alternative. If all or most of the improvements that would conceivably be contained in a TSM alternative are already constructed or are planned and have completed their FEIS, the No-Build could serve as the baseline alternative. FTA expects that only a small number of project sponsors from areas with well established high quality transit services would find that their No-Build is a suitable baseline alternative. An example would be a fixed guideway project proposed to serve a corridor with an existing dedicated express bus service that simply does not have the capacity to serve the transit demand. Under this scenario, the project sponsor is already doing everything possible to solve the transportation system in the corridor, without the major capital investment. To prove that the TSM is a redundant alternative, the project sponsor must clearly demonstrate, as a result of the alternatives analysis, that the best possible TSM is not materially different from the No-Build alternative. If solid evidence to this effect is presented, the FTA will approve the use of the No-Build alternative as the baseline.

In all other cases, additional cost-effective transit improvements can be made beyond those already on the ground or those to be built in the near future and the baseline will be the TSM alternative developed during alternatives analysis. FTA expects the vast majority of project sponsors will carry the TSM alternative forward as the New Starts baseline.

2.7.3.1 New Starts Baseline vs. NEPA Baseline

The No-Build alternative will continue to serve as the NEPA baseline alternative for the Draft and Final EIS's. A corridor study completed according to accepted planning principles would result in a set of alternatives that can be directly applied during project development. There are two possible scenarios for baseline alternatives used in the environmental planning documents (DEIS/FEIS) and for the New Starts project rating process. These are:

> 1) If a project sponsor completes alternatives analysis and the TSM alternative is accepted by FTA as the baseline for the New Starts rating process, the No-Build alternative must be carried forward as the baseline for the Environmental Impact Statement(s). This scenario results in three alternatives carried forward into preliminary engineering: the No-Build as the NEPA baseline, the TSM as the New Starts baseline, and the build alternative.
>
> 2) If a project sponsor completes alternatives analysis and the No-Build alternative is accepted by FTA as the baseline for the New Starts rating process, the project sponsor may carry forward two alternatives: the No-Build as the NEPA and New Starts baseline and the build alternative.

FTA expects that most project sponsors will fall under scenario 1.