

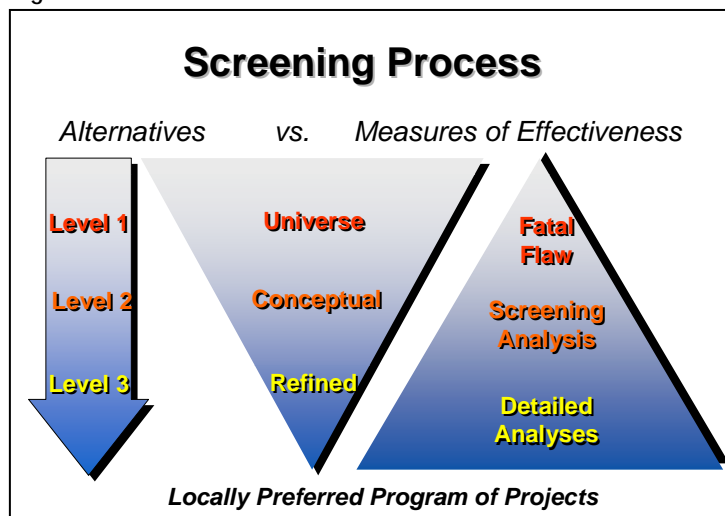
CHAPTER 3 • EVALUATION METHODOLOGY

3.1 Screening Processes & Measure of Effectiveness (MOEs)

This section describes the screening process and measures of effectiveness (MOEs) that were applied to the alternatives developed for the North South Transportation Initiative (Initiative). The purpose of the screening process was to refine the list of possible alternatives from a long list of all possible alternatives to a shorter list (locally preferred program of projects). This screening process was necessary to identify and screen alternatives and assure that the Initiative's Goals and Objectives are met.

A three-level screening process was implemented. Initially, a few pertinent and important details were identified about a broad array of initial alternatives. As the analyses progress, the range and depth of information was widen as the number of alternatives decreased. Figure 3-1 depicts the levels of screening and the depth of information that was developed as the number of alternatives narrowed.

Figure 3-1: Evaluation Process



The preliminary screening involved determining the impacts of various alternatives via a limited number of criteria and the completion of a matrix-based evaluation sheet for each alternative (Figure 3-1). The first phase of analysis, Level I or "Fatal Flaw" screening, was made on a qualitative, rather than quantitative basis.

As the screening process progressed, the development of more detailed information took place. The criteria for the later stages, Levels II and III respectively, gradually became more definitive and require more quantitative rather than qualitative results.

During the initial level of screening some information remained unknown. In this instance,

data related to the evaluation and performance of similar alternatives/systems in other cities was used to provide order-of-magnitude information, expressed as ranges. For example, the performance of an alternative for the Initiative was compared to a similar system in place in a peer city. Based on that experience and the application of local knowledge, we would expect a performance measure, to within a certain range. Likewise, the "Yes" or "No" information developed in Level I was replaced with more refined information, much of it quantitative, and expressed as ranges. Where quantitative data was incomplete or unavailable more qualitative data was substituted.

Finally, Level III screening involved the most detailed analysis of the final set of alternatives. This analysis was based on financial and ridership data, social, economic and built environmental factors and analysis. Since this is the most in-depth screening, it was limited to only those alternatives that offer the best potential to successfully address the Initiative's Goals and Objectives. This level had the most complete and detailed quantitative data of all the analysis phases.

The following sections detail the Three-Level screening processes.

The "Fatal Flaw" analysis seeks to apply limited measures of evaluation to all alternatives to eliminate some from further consideration. Alternatives that did not meet the Goal's and Objectives of the study were eliminated.

This first level analysis relies on qualitative data and judgments of the Initiative's decision makers as applied to a limited number of criteria. The evaluative criteria for Level 1 screening includes:

3.1.1 Level I "Fatal Flaw" Screening

Effectiveness: To what extent does an alternative meet the Initiative's stated goals and objectives and address the issues outlined in the problem statement?

Financial Feasibility: To what extent is sufficient funding available, or likely to be available, to support the alternative?

General Acceptability: Is the alternative acceptable to most stakeholders?

The initial screening involved determining whether or not the alternatives satisfy the above criteria in a minimal fashion. Since limited information was known about each alternative during the "fatal flaw" screening, the performance of similar systems in comparable cities was used to provide a basis for comparison and conclusion.

In some instances where very little quantitative data is known about an alternative, a rudimentary answer of "Yes" or "No" had to suffice. In instances where a bit more detail is known, the qualitative evaluation of the various measures needed to be expressed as "High", "Medium", or "Low". Also, the use of an appropriate graphical scale was appropriate.

The completion of an evaluation sheet for each alternative facilitated the Level I analysis. Each sheet detailed enough information to make choices for the "Fatal Flaw" screening. Information depicted on the evaluation sheets (Figure 3-2) includes:

- Alternative name
- Brief description of alternative
- Photograph, map or other graphic depicting placement of the route or corridor
- Evaluation criteria discussion / results
- Conclusion / recommendation for further consideration or elimination

For a complete set of Level I Screening Sheets see Appendix B.

Figure 3-2 – Level I/“Fatal Flaw” Screening Matrix

Alternative: *Name, description and / or number of alternative*

Description:	Picture / Drawing of Alternative
<i>Description of the alternative – including policies, programs, technology, location and operating characteristics</i>	

Evaluation Criteria:
Effectiveness: <i>Description / evaluation of effectiveness</i>
Financial Feasibility: <i>Description / evaluation of financial feasibility</i>
General Acceptability: <i>Description / evaluation of general acceptability by most stakeholders</i>
Summary: <i>Summary / conclusions of the evaluation</i>
Recommendation: <i>Recommendation to be advanced or to be dropped from further consideration.</i>

3.1.2
Level II
Screening

The Level II evaluation gathered more details about the alternatives that remained. Criteria from Level I was carried through to Level II. Specific measures in each category were developed and refined to quantify and evaluate potential impacts in more detail.

Building on Level I, the criteria for Level II includes:

Transportation System Performance – Mobility and accessibility including: transit ridership, level of service (LOS), average daily traffic (ADT), vehicle miles traveled (VMT), measures of congestion (volume to capacity (V/C) ratios), population % within ¼ mile of transit route/station, number of employers within ¼ mile of transit route/station.

Community Impacts – Compatibility with local and regional plans.

Environmental Impacts – Affects within 1,000 feet: number of historic sites / structures, number of sensitive noise receptors, number of natural resource areas, number of HAZMAT sites / underground storage tanks (USTs).

Economic Development – Employment / investment potential.

Costs – Capital cost for all projects; operating and maintenance (O&M) costs for transit only.

Environmental Justice (EJ) – Identification of disproportional impacts.

This screening analysis produced a more rich and quantitative comparison. At this stage of the project, for some of the criteria, the information collected was combination of quantitative and qualitative data.

When available, quantitative data was stated as ranges, rather than absolute numbers. In this case, the order or magnitude or differences in the ranges was more important than actual numerical differences and was suitable for this level of decision-making. For example, in dealing with environmental impacts, the absolute number of wetland acres impacted by two alignments may not be known until a later stage when a more detailed alignment can be field checked. Obviously, one alignment that impacts between 10 and 15 acres will have a lesser impact than another alignment that impacts between 50 and 75 acres, which in order of magnitude, is a 5 times greater impact.

Substituting qualitative measures like those used for Level I, was employed to make judgments when quantitative data was unavailable or incomplete.

This Level II evaluation involved the selection of alternatives that deserve subsequent and more detailed examination in Level III. A decision on options to advance, and on the appropriate combination of alternatives, was based on the travel data resulting from this initial analysis.

3.1.3
Level III
Refinement

Finally, a third round of screening took place based on the most detailed analysis. This third round of alternative refinement utilized the processes described above to focus detailed analysis on the alternatives that had advanced from the first two rounds. This analysis phase broadened the range of information known about the final alternatives in the above mentioned categories and determined the most refined quantitative and definitive information about each alternative possible. At this point, the volume of technical data about each of the alternatives was at its peak.

The measures of effectiveness for Level III was expanded to include more precise measurement in the various categories to account for all operating details and impacts as possible. A detailed matrix format was developed for each alternative to completely evaluate its performance and impacts.