

CHAPTER IV

EVALUATION METHODOLOGY AND CRITERIA

A. Introduction

In the Phase I MIS report issued in November 1998, a section was devoted to the evaluation methodology and criteria used in that phase. This section reflects the evaluation methodology and criteria, primarily developed in Phase I, that have been modified to reflect what was used in Phase II. Furthermore, the measures of effectiveness for each criterion have been modified, as appropriate, for this phase.

Phase II of the study focused on transit alternatives only. The objective of this phase was to determine a preferred transit technology and corridor.

B. Goals And Objectives

As stated in the Phase I MIS report, the primary goal of any major transportation investment should be to improve projected travel conditions and transportation efficiency. This should be accomplished in a manner that is cost-effective, financially feasible, environmentally sound, compatible with applicable regional plans, and recognizes both existing land use and the impact of future development and growth.

The particular objectives for Phase I MIS that apply to Phase II are:

- Improve mobility between Durham and Chapel Hill;
- Preserve and use existing transportation facilities, as appropriate for the transit alternatives, efficiently and effectively;
- Manage congestion on the existing transportation facilities that are used for the transit alternatives;
- Provide for and improve access to other modal transportation facilities, as appropriate;
- Support the area's existing and projected land use with travel choices that reduce peak hour auto use;
- Consider alternatives that enhance cost-effective utilization of transit;
- Preserve right-of-way for probable future transportation facilities, to the extent possible;
- Provide and promote modal integration/system linkages;
- Provide transportation solutions that have acceptable impacts on the natural and human environment; and
- Improve accessibility to jobs, goods, and services within the corridor; and
- Reduce reliance strictly on automobile alternatives.

C. Alternative Development and Evaluation Methodology

During the scoping of the Phase II MIS, the alternatives were defined. The transit evaluated were:

- TTA's Phase I technology (i.e., as defined in TTA's design criteria but might not be a Federal Railroad Administration-compliant diesel multiple unit (DMU));
- Busway (i.e., fixed guideway with completely dedicated right-of-way);
- Busway/Mixed Traffic (BMT) (i.e., a hybrid of on-street operation and an exclusive busway); and
- "lighter" rail technology than TTA Phase I, such as light rail or a "lighter" DMU.

The corridors evaluated were:

◆ **From 9th Street area to South Square Mall:**

- ◆ Along NC 147 and US 15-501;
- ◆ Along Phase I Corridor A, Southeast of US 15-501; and
- ◆ Along a Corridor East of Duke's Main Campus.

◆ **South Square Mall to Fordham Blvd.:**

- ◆ Along Phase I Corridor A, Southeast of US 15-501.

◆ **Fordham Blvd. to UNC-Hospitals**

- ◆ Transit corridor per UNC Masterplan or other feasible corridors that result from Phase II's station area planning workshops.

To evaluate the alternatives, engineering concept studies, travel demand projections, overview of environmental issues, cost estimates, and evaluation of input from the public, interested groups and agencies were performed. The alternatives were evaluated using quantitative and qualitative criteria to determine the benefits and disadvantages of implementing each alternative.

While some of the evaluation was qualitative, several items couldn't be quantified. It is important to note that the extent and detail to which each criterion can be measured depended on the resources allocated to the concept development and the evaluation process. The Phase II MIS had been scoped to be cursory in detail, evaluating costs and impacts from available aerial photography and topographic mapping, based on conceptual designs.

As in the Phase I MIS, the same framework of evaluation categories were developed for each phase to differentiate and clarify the trade-offs among alternatives. To facilitate the evaluation process, the evaluation criteria was grouped into several categories:

- 1) Transportation Services/Mobility Issues;
- 2) Community Impacts;
- 3) Environmental Impacts;
- 4) Financial Issues; and
- 5) Regional Considerations.

D. Evaluation Criteria

A listing of the five evaluation criteria groups, potential individual criteria, and their measures of effectiveness, are listed below.

<u>Evaluation Criteria</u>	<u>Measure of Effectiveness</u>
1. Transportation Services/Mobility Issues:	
<ul style="list-style-type: none">• Transit services/coverage;	Transit capacity (seat miles); Percent of population within station service area served by transit.
<ul style="list-style-type: none">• Transit effectiveness;	Transit ridership and load factors, compare the reduction in auto VMT ⁽¹⁾ with the no-build alternative.
<ul style="list-style-type: none">• Traffic/pedestrian safety;	Qualitative judgment.
2. Community Impacts:	
<ul style="list-style-type: none">• Residential and Business displacements;	Count/estimate from conceptual corridors, based on windshield survey.
<ul style="list-style-type: none">• Neighborhoods affected and number of community sensitive land uses affected;	Count/estimate land uses affected; conceptual corridors, based on windshield survey.
<ul style="list-style-type: none">• Visual/aesthetic impacts;	Professional judgment from conceptual corridors.
<ul style="list-style-type: none">• Environmental Justice;	Overlay alternatives with demographic information from census tracts.
3. Environmental Impacts:	
<ul style="list-style-type: none">• Historic sites/structures;	Count/estimate from conceptual corridors, using Phase I MIS historic survey.
<ul style="list-style-type: none">• Wetlands;	Count/estimate from conceptual corridors and professional judgment.
<ul style="list-style-type: none">• Watershed impacts;	Count/estimate from conceptual

- New river/creek crossings;
- Air Quality;

corridors and professional judgment.

Count, based on conceptual corridors.

Provided change in VMT in the corridor from no build by alternative.

4. Financial Issues/Impacts:

- Right-of-Way;
- Construction;
- Vehicles;
- User cost indicators;
- Transit operating and maintenance costs;
- Transit effectiveness;

Confirmed and used Phase I MIS costs where applicable, otherwise used costs per square foot.

Confirmed and used Phase I MIS costs where applicable, otherwise used costs per mile and included capital costs of park and ride facilities.

Used Phase I MIS unit costs, updated as appropriate

Change in VMT and VHT ⁽²⁾ from travel forecasts.

Preliminary computations based on service levels, mode, and system size.

Incremental costs per transit user including incremental cost of expansion.

5. Federal, State, Regional, and Local Considerations:

- Consistency with local land use plans;
- Consistency with relevant regional goals/objectives;

Professional judgment/ coordination with local governments and universities.

Professional judgment/ coordination with local governments, universities, and MPO's long range plan.

(1) VMT = Vehicle Miles of Travel

(2) VHT = Vehicle Hours of Travel