APPENDIX D
Conceptual Alternatives Cost Estimation Methodology

CONCEPTUAL ALTERNATIVES COST ESTIMATION METHODOLOGY

I. Introduction

Partial capital cost estimates were developed for thirteen I-69 Section 6 Conceptual Alternatives and the Tier 1 selected Alternative C as part of the evaluation and screening process. The cost estimates for the alternatives are intended to capture the cost of major project elements at a planning level of detail and allow for comparison of the alternatives. Too many uncertainties exist at this stage of project development to develop reliable absolute cost estimates. Major cost items accounted for in the estimates include roadway pavement, drainage, earthwork, interchanges, overpasses, land acquisition, major utility relocations and rest areas. Costs of items such as local access changes, environmental mitigation and damages payments to property owners are not included in the estimates at this time.

Because of the very preliminary nature of the cost estimates calculated for the Conceptual Alternatives, absolute cost values are not provided at this time. Instead, a cost rating on a scale of 1 to 5 was assigned to each Conceptual Alternative to indicate how its estimated cost compares to other Conceptual Alternatives. A rating of 1 indicates the lowest cost alternative, and a rating of 5 represents the highest cost alternative. The ratings are represented by dollar symbols in the Conceptual Alternatives evaluation summary table (Appendix A).

II. Methodology and Assumptions

Conceptual Alternative alignments were developed on digital aerial photography using Microstation CAD software. Quantities for roadway items associated with each alternative were estimated on a per-mile basis using the CAD alignments and assumed typical roadway sections. The quantities of other items, such as bridges, interchanges and roadway overpasses were estimated by identifying their potential locations and sizes from the alignment and aerial photography. Land acquisition was estimated based on the footprint of each alternative.

Unit costs for most items were developed from average unit prices for INDOT pay items of projects bid within the last three (3) years. Costs from projects of similar size, such as I-69 Section 4, were used to the extent possible. Unit costs for structures and some additional items were derived from recent INDOT projects and HNTB engineer experience. More detailed information on the methodology and assumptions for the various cost items is provided below.

A. Roadway

Roadway costs were estimated using INDOT average pay items to estimate the per-mile unit cost for a typical 4-lane freeway section. Typical sections developed for I-69 Section 4 were used to estimate the quantities. The freeway unit cost accounted for pavement, underdrain and earthwork quantities. Earthwork quantities account for clear zone width, underdrain freeboard and full median width. The typical section per-mile unit cost was checked against recent construction pricing information from I-69 Section 5. Per-mile costs for 6-lane typical freeway

sections were estimated by factoring up the 4-lane section cost. The lengths of 4 lane and 6 lane freeway segments required for each alternative were estimated based on traffic forecasts developed with the interim I-69 Section 6 travel demand model.

B. Structures

Structures estimated for each alternative included bridges, mechanically stabilized earth (MSE) walls and small structures. Bridges were identified wherever an alternative crosses a body of water, railroad or roadway. Quantities for bridges were estimated using the I-69 roadway typical sections and estimated lengths based on floodways, floodplains and clear zone requirements. MSE wall quantities were only estimated for locations with proposed bridges. Small structures were quantified when an alternative crossed an existing small structure that would require replacement. Unit costs, based on prior design experience, were assigned to each structure type.

C. Interchanges and Overpasses

Potential interchange and local road overpass locations for each alternative were identify during initial layout of alternatives based on roadway functional classifications, network connectivity and interchange spacing principles. The cost of system interchanges and service interchanges were identified on a per-each basis based on recent INDOT projects. Overpass costs were estimated on a per-each basis with the assumption of a 4-lane road passing over I-69.

D. Right-of-Way Acquisition

Average per-acre values for real estate were obtained by an Indiana licensed appraiser from records of recent real estate transactions. Average values for residential and agricultural land were identified by county and township. Average values for commercial and industrial land were identified for the specific areas impacted by alternatives. The per-acre values include the value of both land and improvements. In northwest Johnson County, the average price of agricultural land approaches that of residential land due to the demand for developable land. The unit values for right-of-way acquisition were applied to land within the footprint of each conceptual alternative footprint based on how that land is zoned. Actual existing land use information is not available at this time. Relocation and damages payments to property owners are not included at this time.

E. Professional Services

The cost of professional services for project survey, design, land acquisition and construction management were estimated at 10% of the construction cost.

F. Contingencies

Due to the very early stage of alternative development, a 30% contingency was added to project costs to account for unknown and excluded items. This was not done with the intent of providing an accurate absolute cost estimate for each alternative but rather to provide a more realistic estimate of the cost differences among the alternatives.

G. Cost Escalation

Cost estimates are assumed to be in current year dollars. No cost escalation has been applied.

H. Excluded Costs

The following items are not specifically included in the cost estimates developed for Conceptual Alternatives. They are assumed to be included in contingencies:

- Local access road changes
- Widening of existing freeways to accommodate added traffic
- Rest areas
- Environmental mitigation
- Relocation payments and damage payments to property owners
- Cost escalation to the year of construction
- Costs of project financing

Potential cost savings due to the reuse of pavement or other existing infrastructure along SR 37 or SR 67 were not evaluated either. These costs and costs savings will be considered as remaining alternatives are developed and evaluated in more detail.