



INDIANAPOLIS
METROPOLITAN PLANNING
ORGANIZATION



Tech Memo III-AA1

Alternatives Analysis Work Program

Indianapolis Metropolitan Area Rapid Transit Study



Prepared By:



Schimpeler/American
Jacobs Civil, Inc.

Paul I. Cripe, Inc. – Shrewsbury & Associates
Infinite, Inc. – Manuel Padron & Associates
Jakes Associates, Inc. – Barnes & Thornburg

TABLE OF CONTENTS

TASK 1.0: PREPARE DETAILED WORK PLAN, BUDGET, AND SCHEDULE 1
TASK 2.0: REFINE *DRAFT PURPOSE AND NEED STATEMENT*..... 1
TASK 3.0: PUBLIC OUTREACH PROGRAM..... 2
TASK 4.0: ESTABLISHMENT OF EVALUATION CRITERIA..... 2
TASK 5.0: IDENTIFICATION AND DEFINITION OF ALTERNATIVES 4
TASK 6.0: EVALUATION OF ALTERNATIVES 5
TASK 7.0: IDENTIFICATION OF LOCALLY PREFERRED ALTERNATIVE 7

The Alternatives Analysis (AA) phase of the Indianapolis Regional Rapid Transit Study (DiRecTionS) will further evaluate the Northeast Corridor (the locally preferred corridor) carried forward from Phase III - Alternatives Analysis Transitional Analysis (AATA) of the Study. This task will result in the recommendation of a single, locally preferred alternative to be carried forward into a Draft Environmental Impact Statement (DEIS) and a Federal Transit Administration (FTA) Section 5309 New Starts Report. This draft scope of work is for Phase IV - Alternatives Analysis (AA) of the Indianapolis Regional Rapid Transit Study. All work will be conducted in a manner consistent with the National Environmental Policy Act (NEPA) and the Federal Transit Administration's New Starts requirements. A preliminary Work Plan approach for performing the AA activities is summarized below.

Task 1.0: PREPARE DETAILED WORK PLAN, BUDGET, AND SCHEDULE

PURPOSE

The purpose of this task is to develop a well-defined and coordinated work plan, budget, and schedule for the AA work program. It is the intent of this task to take the project through the AA process in a timely and cost-effective manner; undertaking the necessary tasks to produce defensible products that will lead into the DEIS phase.

APPROACH

Based on the discussions in initial project meetings with the Federal Transit Administration (FTA) and the Indianapolis Metropolitan Planning Organization (MPO), the Indianapolis Transit Consultants (ITC) shall develop a detailed work plan, budget and schedule. This detailed work plan, budget and schedule shall identify the following:

- Work activities, including:
 - Task products
 - Project Milestones
- Work task flow and interaction (Project Schedule), including:
 - Review points and comment periods
 - Regular management and coordination meetings
 - Meetings with the Indianapolis Regional Transportation Council (IRTC) Technical Committee, Citizen Advisory Committee (CAC), Policy Committee
- Budget

A draft of the detailed work plan, budget and schedule shall be presented to the FTA and MPO for review and comment. The draft work plan and schedule shall be revised to reflect FTA and MPO comments.

PRODUCT Tech Memo IV-1.0: Detailed Work Plan, Budget, and Schedule

Task 2.0: REFINE *DRAFT PURPOSE AND NEED STATEMENT*

PURPOSE

The purpose of this task is to refine the *Draft Purpose and Need Statement* to correlate with the purpose for the proposed action and the needs of the locally preferred corridor from the AATA phase.

APPROACH

The development of a refined *Draft Purpose and Need Statement* will begin with a review of the project's overall *Purpose and Need Statement*, last updated during Phase II of the study, to ensure consistency through the previously stated goals and objectives. The refined document will focus on the specific characteristics of the locally

preferred corridor (Northeast corridor), demonstrating problems that exist (i.e. the *need* for the proposed action) and how rapid transit can effectively overcome those problems (i.e. the *purpose* for the proposed action.)

PRODUCT Tech Memo IV-2.0: Refined *Draft Purpose and Need Statement*

Task 3.0: **PUBLIC OUTREACH PROGRAM**

PURPOSE

The purpose of this task is to carry forward the public outreach program from previous phases of the study and to continue to work towards the selection of a publicly supported Locally Preferred Alternative (LPA).

APPROACH

The approach to this task will be to undertake a continuation of the previous phases public interactive meetings/presentations that were conducted throughout the region as new and relevant information becomes available. In addition, meetings will be continued with affected business and governmental stakeholders and/or neighborhoods and a full range of interest groups.

It is anticipated that two rounds of public meetings will be held during the AA. The first round of meetings will be to make the public aware of the study's intent and to gather information relative to community concerns, issues, and questions. The second round of public meetings will focus on disseminating study findings and recommendations and to solicit feedback concerning those recommendations. ITC will develop all necessary graphics, presentations, and literature and provide to the MPO in advance of any meetings for review.

PRODUCT Tech Memo IV-3.0: Summary of Public Outreach Program Activities

Task 4.0: **ESTABLISHMENT OF EVALUATION CRITERIA**

PURPOSE

The purpose of this task is to identify the criteria to be used to assess and compare the preliminary and final alternatives defined in the Alternative Analysis, and the overall evaluation methodology that will utilize these criteria. As it is anticipated that Federal funding from the Section 5309 New Starts program will be sought for a locally preferred alternative (LPA), FTA's standard criteria for evaluating transit alternatives will be utilized, in conjunction with criteria developed during Phases I, II and III of the Study. The New Starts criteria assess the effects on the region and the transit system by evaluating changes in mobility and air quality, land use policies, and transit system cost-effectiveness.

APPROACH

4.1 **Patronage Modeling**

A service and patronage impacts assessment methodology report will be developed that addresses the following:

4.1.1 **Ridership Forecasting Model Procedures**

- a. Model Zone System
- b. Highway Network Processing
- c. Transit Network Processing
- d. Socioeconomic Data

- e. Trip Generation
- f. Trip Distribution
- g. Mode Choice
- h. Assignment

4.1.2 Model Validation

- a. Highway Assignment
- b. Transit Assignment
- c. District Level Linked Trips

4.1.3 Model Application for Analysis of No-build and Build Alternatives

- a. Highway Networks
- b. Transit Networks
- c. Socioeconomic Assumptions
- d. Horizon Year Forecast (No-build, Baseline, and Build Alternatives)

4.2 Capital, Operations and Maintenance (O&M) Costing

ITC will prepare realistic and comparative conceptual capital cost estimates for each of the proposed RTS “Build” alternatives and the associated background feeder bus systems for the region. Order of magnitude cost estimates for implementing each transit system alternative shall be estimated for the purposes of performing a comparative cost-effectiveness analysis. ITC shall use an approach to the estimation of capital and operating costs that follow generally accepted methods for costing alternatives during conceptual engineering. The capital cost estimation items will include: facilities; systems and equipment; right-of-way costs; engineering and construction management; and owner’s cost, as well as the cost of the regional feeder and background bus system, which will be developed in an integrated fashion within the RTS through a separate Comprehensive Operational Analysis (COA) to be performed by ITC for the IndyGo bus system.

In addition to capital cost estimates, operating and maintenance (O&M) costs associated with each of the alternatives estimates will be prepared. Data and informational outputs from preliminary travel demand forecasts will be used to develop preliminary O&M costs. The preliminary O&M costs will be estimated for each alternative by using the appropriate operating statistics (peak vehicles, annual vehicle miles, etc.) and system characteristics of the alternative. A methodology report will be developed consisting of two sections: Capital Costs, Operating & Maintenance Costs.

4.2.1 Capital Costs

Cost data will be identified by a review of available source. Taxes and fees will be considered in the capital cost estimate. The capital cost estimate will be calculated in constant and YOE expenditure dollars - - escalated to the Year of Expenditure (YOE).

Each capital cost item will be estimated according to its category. The following capital cost categories will be used: (a) Guideway Elements; (b) Roadway and Bridge Repair; (c) Trackwork; (d) Civil Elements for Systems; (e) Passenger Stations/Stops; (f) Yard and Shop; (g) Special Conditions; (h) Systems; (i) Vehicles; (j) Property Acquisition; (k) Project Soft Costs; and (l) Feeder and Background Buses.

4.2.2 Operations and Maintenance Costs

Operations and maintenance costs will be estimated using two different methodologies. One is for a Regional Rapid Transit System financial analysis procedure, and the other is for all background and feeder buses except for BRT (which will use the Regional Rapid Transit System financial analysis procedure adapted for BRT vehicles). Both methods will follow the same six-step process, which is as follows: (1) Model Development; (2) Identification of Data Sources, (3) Cost Model Summary; (4) Operating Statistics, (5) O&M Cost Estimate; and, (6) Model Validation.

4.3 Alternatives Evaluation

An alternatives evaluation methodology report will be developed that addresses the following:

4.3.1 Screening Evaluation Guidelines

- A. Consider Build Alternatives
- B. Focus on Alternatives to be eliminated
- C. Use Criteria that are critical to the decision at hand
- D. Set target number of alternatives for the screening process

4.3.2 Screening Evaluation Criteria

- A. Technical Evaluation
 - i. Feasibility
 - ii. Accessibility
 - iii. Ridership (if available)
 - iv. Costs
- B. Goals and Objectives
 - i. Maximize Engineering Feasibility and Public Safety.
 - ii. Maximize Community Benefits and Personal Safety.
 - iii. Minimize Environmental Impacts.
 - iv. Maximize Operational Efficiency.
 - v. Minimize Costs

PRODUCT Tech Memo IV-4.1: Service and Patronage Impact Assessment Methodology Report
 Tech Memo IV-4.2: Capital, Operating & Maintenance Cost Estimating Methodology Report
 Tech Memo IV-4.3: Evaluation of Alternatives Methodology Report

Task 5.0: IDENTIFICATION AND DEFINITION OF ALTERNATIVES

PURPOSE

The purpose of this task is to identify and define possible alternatives (both mode and alignment) to provide the best transit solutions for the Northeast Corridor. The identification and definition of "Build" alternatives will be based on the refined *Purpose and Need Statement* developed in Task 2.0.

APPROACH

ITC will design and conduct a series of work sessions with the members of the MPO and the Transportation Committee, other local/state agencies, and representatives of the general public to define the most reasonable alternatives to be examined. The alternatives will be identified with critical variations in horizontal alignment, vertical alignment, and extent of initial construction.

In defining the initial group of alternatives to be evaluated, the basic principles that have been identified by the Federal Transit Administration (FTA) and the Federal Highway Administration (FHWA) will be employed.

Transit will be the major transportation service variable associated with the Horizon Year transportation system alternatives. Options to be considered will include the following:

- Automated Guideway Transit (AGT)

- Light Rail Transit (LRT); including Diesel Multiple Units (DMU)
- Bus Rapid Transit (BRT)

Each alternative will include a fully integrated transit feeder bus system. The information obtained during the preparation of the study's *Purpose and Need Statement* will be utilized to the maximum extent possible in the alternative development process. For each of the "Build" alternatives defined, conceptual level engineering shall be conducted in sufficient detail so as to permit a determination of the engineering feasibility and generalized estimation of the capital costs associated with each alternative. The development process and description of the alternatives will be documented in a Detailed Definition of Alternatives Report. Based on comments received on that document, ITC will prepare a Final Definition of Alternatives Report.

PRODUCT **Tech Memo IV-5.0: Identification and Definition of Alternatives Report**

Task 6.0: EVALUATION OF ALTERNATIVES

PURPOSE

This purpose of this task is to employ a public involvement based evaluation of alternatives in order to determine a Locally Preferred Alternative (LPA).

APPROACH

6.1 Two-tiered Evaluation Process

A two-stage evaluation process will be used. Level 1 criterion will focus primarily on the "fatal flaw" level of analysis and will be used when the alternatives are numerous in the beginning of the Alternatives Analysis process. These criteria will be used to evaluate a group of preliminary alternatives and to eliminate from further consideration those that are not reasonable for the Northeast corridor. The more detailed Level 2 criteria will incorporate and extend the Level 1 criteria to an appropriate level of detail and provide metrics for comparing the surviving Level 1 "Build" alternatives. For each of the Levels 1 and 2 criteria, a brief explanation of why the criteria were established for use during the alternatives screening process will be developed.

The two-level screening criteria will be developed based on the refinement and expansion of criteria used in Phase III, the refined *Purpose and Need Statement*, the requirements of FTA's New Starts process, NEPA's environmental process, and working sessions with local agency staff and the regional Transportation Committee. Based on the requirements of the New Starts process, these screening criteria will likely include, but not be limited to the following: mobility impacts, environmental benefits, operating efficiencies, cost effectiveness, transit supportive land use, and socioeconomic impacts. Evaluation criteria will also utilize criteria established by federal metropolitan planning requirements in TEA-21.

Economic and transportation impacts will be measured independently. Transportation impact measures will most likely be those closely tied to the outputs of the travel demand simulation models. Level 1 and 2 criteria will be organized to permit a coherent discussion and understanding for comparison of, and the choices among, alternatives through clear definition of a criterion's measures of effectiveness. The criteria will be organized to cover a spectrum of "order of magnitude" macro-measures that will contain a mix of qualitative and quantitative measures of effectiveness. ITC will present an initial draft to MPO staff and the Transportation Committee of the proposed approach for the screening and evaluation of alternatives. This approach may include such techniques as fatal flaw analysis, dominance comparison, and weighted-ranking methods. The draft evaluation approach will be discussed and reviewed with the MPO and the Transportation Committee. Consensus will be sought on the evaluation process and criteria prior to the initiation of evaluation of alternatives activities.

The evaluation of alternatives will include extensive involvement of the MPO staff and Transportation Committee, and will include, but not be limited to, the following activities:

6.1.2 Capital, Operating, and Life Cycle Cost Estimates

The capital costs and the cost of continuing operation of the integrated regional rapid transit system and bus system (O&M costs) will follow the methodology created in task 4.2.

6.1.3 Transportation Impact Assessment

Analysis of current and projected ridership and traffic statistics for alternatives considered will be performed. The analysis will address how the alternatives affect transit service, ridership, revenue, highway congestion, level of service, parking, and access to transit stations. Using outputs from the regional travel model and GIS information, the degree and location of transportation impacts associated with each alternative will be defined.

6.1.4 Financial Capacity Analysis

The financial capacity analysis will consider both capital costs and the cost of continuing operation of the integrated regional rapid transit and bus system (O&M costs).

- Comprehensive identification and evaluation of existing, local, state, and federal funding sources
- Identification and evaluation of potential revenue streams possible from each source
- Comparison of potential revenue streams with the estimated alternative costs
- Evaluation of other local revenue sources, such as private financing and joint development opportunities
- Identification of any funding short fall from existing sources
- Development of a preliminary financial plan for the alternative to be carried forward

The financial capacity analysis will examine the current financial conditions, provide a summary of regional economic forecast, provide a financial strategy, identify local funding sources, present multiple funding scenarios, present innovative financing opportunities, and incorporate capital and O&M costs in a 20-year cash flow analysis.

IndyGo's Current Financial Condition Analysis will include: the potential for borrowing; the current debt levels and limits; and the IndyGo's financial rating. ITC will be performing an economic impact analysis and regional economic summary under a separate work order. These results will be incorporated into the financial plan.

Multiple financing strategies will be considered for the short-term and long-term integrated rail/bus system. Contingencies and strategies to deal with federal funding short falls will be developed. Local funding sources identified in Phase III will be further explored for legal and political issues culminating in a funding scenario to build and operate a regional rapid transit system and its associated background and feeder bus network. Consideration will be given in the financial plan to innovative financing opportunities.

The capital and O&M plans will utilize results previously estimated incorporating any agency-wide plans for capital and operations, as well as the bus and rail fleet management plan developed in the COA. The culmination of the financial capacity analysis is the twenty-year cash flow projection, which incorporates all costs and revenues estimates for both bus and rail.

6.1.5 Summary Evaluation

The purpose of this task is to use the technical analyses in the previous tasks to identify and select a locally preferred “Build” alternative to be carried forward. Utilizing the information developed in the Level 1 and 2 screening process described above will permit a determination of both the relative ranking of alternatives and the overall desirability of each. The evaluation criteria to be developed will explicitly include a variety of criteria and measures of effectiveness designed to allow for meaningful comparisons between the alternatives with regard to their anticipated mobility improvements for the residents of the region.

The alternative evaluation comparison and summary process will focus on allowing local, state and federal decision-makers to determine which alternatives represent the most cost-effective investment and will provide the necessary analysis to inform the general public of the merits, costs, and potential impacts of each alternative. An important step in the evaluation and comparison process will be the sifting and organizing of information for discussion and deliberation. ITC will develop a clear and concise means to compare the alternatives using a format that highlights the differences among alternatives. The evaluation methodology will be directed toward providing sufficient information to make decisions on refining and narrowing the range of alternatives based on the following criteria: effectiveness, efficiency, equity, and significant tradeoffs.

PRODUCT **Tech Memo IV-6.0: Final Definition of Alternatives Report**

Task 7.0: **IDENTIFICATION OF LOCALLY PREFERRED ALTERNATIVE**

PURPOSE

The purpose of this task is to present all of the findings from the work accomplished in this phase of the work program, and provide support to the IRTC in selecting a locally preferred “Build” alternative (LPA) that will be carried forward into a Draft Environmental Impact Statement (DEIS) and a Federal Transit Administration

APPROACH

A Phase IV Milestone Report will be prepared, including: a description of the Locally Preferred Alternative, as well as, a description of the transit mode, alignment, operational plan, capital costs, cash-flow plan, and the rationale for selection of the LPA.

PRODUCT **Tech Memo IV-7.0: Phase IV Milestone Report, The Locally Preferred Alternative**