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Technical Memorandum: Capital Cost Estimating Methodology

prepared for
The Regional Planning Commission
of Greater Birmingham

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REGIONAL PLANNING COMMISSION



RPC
OF GREATER BIRMINGHAM

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1. Complete table for BRT alternatives
2. Complete table for LRT alternatives
3. Typical Build cost template from FTA
4. Inflation cost template from FTA

1.0 Summary and Findings

This Technical Memorandum presents the assumptions, methods, background data, and adjustment factors used in the development of capital cost estimates for the Birmingham In-Town Transit Partnership project. This memorandum provides information for stakeholders on the development of cost estimates as required by FTA under the New Starts and Small Starts programs.

The In-Town Transit Partnership project is an Alternatives Analysis and Environmental Assessment of potential enhancements to transit infrastructure and service within downtown Birmingham. The proposed enhancements include Alternatives for BRT or LRT service along a two-mile long north-south corridor combined with east-west links of one to two miles. Each of the Alternatives considered assumes guideway improvements, modern transit vehicles, well-defined station stops, electronic information displays and ticket vending, with Estimates for the BRT and LRT Alternatives are based on the following general assumptions, treated in greater detail in Section 3.0 of this memorandum:

- Proposed transit corridors will typically have two guideways (tracks or BRT bus lanes) running along their full length. Each alignment has been evaluated for transit operation in mixed traffic as well as operation in exclusive lanes.
- Except for stations and systems, construction work in the transit corridors will be limited to guideway lanes only. Guideway costs include an allowance for physical adjustments to traffic signals and new signal priority equipment.
- Station stops include platforms for level boarding, passenger shelters, ticket vending, and real-time passenger information.
- New or expanded vehicle storage and maintenance facilities include infrastructure for vehicle washing, inspection and running repairs. Heavy maintenance is not included.
- For each of the Alternatives presented, corridor lengths, service levels, number of tracks/lanes, station stops, and vehicle fleet sizes required for each alternative corridor are similar for both BRT and LRT modes.
- Allowances are included for relocations of utilities, mitigation of potential environmental issues, and modifications to existing structures.
- No allowance has been made for property acquisition along the alignments, at station stops, or at potential storage and maintenance sites.

Table 1-1 summarizes the estimated capital costs associated with each BRT alternative, while Table 1-2 summarizes the estimated capital costs for each LRT alternative. Note that the primary purpose of the cost estimate at this phase of project development is to compare alternatives and make a general assessment of the capital resources required to implement the alternatives. The estimated costs shown are preliminary and are subject to change based on continuing engineering, design project delivery method, and funding availability.

Table 1-1: Summary of Capital Costs for BRT Alternatives (millions of 2006 dollars)

Cost Category	Alt. A1	Alt. A2	Alt. A3	Alt. B1	Alt. B2
1. Guideway	\$5,657,600	\$4,973,116	\$4,270,400	\$6,106,400	\$4,678,400
2. Station stops, Terminals	\$8,814,064	\$7,554,912	\$6,925,336	\$8,184,488	\$6,925,336
3. Yards, Shops, Support Facilities	\$5,950,000	\$5,950,000	\$5,950,000	\$5,950,000	\$5,950,000
4. Sitework and Special Conditions	\$6,006,310	\$5,845,634	\$4,547,230	\$6,416,334	\$4,948,596
5. Systems	\$4,427,500	\$4,677,500	\$3,177,500	\$4,302,500	\$3,677,500
6. Right-of-Way	\$0	\$0	\$0	\$0	\$0
7. Vehicles	\$3,000,000	\$3,000,000	\$2,500,000	\$3,500,000	\$2,500,000
8. Soft Costs	\$9,256,642	\$8,700,349	\$7,461,140	\$9,287,917	\$7,853,950
9. Finance	\$0	\$0	\$0	\$0	\$0
10. Contingency	\$6,788,204	\$6,380,256	\$5,471,503	\$6,811,139	\$5,759,563
Total Project Cost	\$49,900,321	\$47,081,767	\$40,303,108	\$50,558,778	\$42,293,344

(6) Right-of-way costs are not included in this estimate.

(7) Includes only BRT vehicles associated with the proposed improvements.

(9) Soft Costs include preliminary engineering, final design, construction management, project management, owner administration, FTA and other agency coordination, insurance, and project start-up and testing.

(10) Short-term financing and long-term interest charges are not included.

(10) Contingency costs include allowances for change orders.

Table 1-2: Summary of Capital Costs for LRT Alternatives (millions of 2006 dollars)

Cost Category	Alt. A1	Alt. A2	Alt. A3	Alt. B1	Alt. B2
1. Guideway	\$23,845,600	\$24,037,600	\$17,987,400	\$25,548,400	\$20,130,400
2. Station stops, Terminals	\$6,555,000	\$5,415,000	\$4,560,000	\$5,985,000	\$4,845,000
3. Yards, Shops, Support Facilities	\$9,750,000	\$9,350,000	\$9,750,000	\$9,750,000	\$9,750,000
4. Sitework and Special Conditions	\$60,615,657	\$59,822,653	\$55,344,213	\$62,202,260	\$56,898,379
5. Systems	\$6,528,534	\$6,778,544	\$4,753,281	\$6,928,616	\$5,778,355
6. Right-of-Way	\$0	\$0	\$0	\$0	\$0
7. Vehicles	\$18,000,000	\$18,000,000	\$15,000,000	\$21,000,000	\$15,000,000
8. Soft Costs	\$32,188,437	\$31,621,139	\$27,718,468	\$33,124,283	\$29,220,640
9. Finance	\$0	\$0	\$0	\$0	\$0
10. Contingency	\$23,604,854	\$23,188,835	\$20,326,877	\$24,291,141	\$21,428,470
Total Project Cost	\$181,088,083	\$178,213,771	\$155,440,238	\$188,829,699	\$163,051,244

(6) Right-of-way costs are not included in this estimate.

(7) Includes only LRT vehicles associated with the proposed improvements.

(8) Soft Costs include preliminary engineering, final design, construction management, project management, owner administration, FTA and other agency coordination, insurance, and project start-up and testing.

(9) Short-term financing and long-term interest charges are not included.

(10) Contingency costs include allowances for change orders.

2.0 Methodology and Data Sources

This section of the memorandum explains the Standard Cost Categories and their content, according to FTA guidance. It describes generalized assumptions about the organizational and economic setting of the project which inform the cost estimate, and the generalized procedures, used here, for cost estimating: the “bottom up” and “top down” approaches.

2.1 Cost Categories

FTA guides project sponsors to use a set of Standard Cost Categories for New Starts projects. The Standard Cost Categories (SCC) establish a consistent format for the reporting and estimating of capital costs. With unit costs and basic quantities for standard categories, the SCC make it easier to compare projects and gauge the reasonability of each one, given its unique context. The cost information gathered from projects across the country will generate a database and a cost estimating resource that will be useful to both FTA and the transit industry as a whole.

The SCC are structured to include the ten main categories that typically comprise a transit capital project.

1. Guideway and Track Elements
2. Stations, Stops, Terminals, Intermodals
3. Yards, Shops, Admin/Support Facilities
4. Sitework & Special Conditions
5. Systems
6. ROW (Right-of-Way), Land, Existing Improvements
7. Vehicles
8. Soft Costs
9. Finance Charges
10. Contingency

The latest update of the SCC methodology (June, 2006) includes detailed spreadsheets into which quantities and unit costs for each alternative may be entered. Results are automatically converted to year of expenditure and annualized costs, simplifying comparisons and data entry to New Starts and Small Starts application templates.

For the purposes of this stage of analysis, it was important to be able to prepare abbreviated cost summary tables to compare the range of ten to twenty alternatives and design options. These summary tables are organized according to the major Standard Cost Categories, with selected line items as necessary for comparison of Alternatives. The tables are shown at the end of this document as Attachments 1 and 2.

The project team recognizes that as the project advances toward selection of a Locally Preferred Alternative, the Standard Cost Category templates should be used for project documentation to be reviewed by FTA. Example cost templates from the latest FTA revision of the SCC documentation are included in this memorandum as Attachments 3 and 4. As the ITP

project advances, the number of alternatives will be reduced, and these templates will be completed for the alternatives advanced for NEPA documentation.

2.2 General Assumptions and Limitations

Preparation of cost estimates at this early stage of project development brings with it several challenges, among which are the questions of whether the current economic conditions, construction industry configuration, and building technologies will apply to a project implemented years in the future. In general, the estimating process has assumed that future conditions will be predictably similar to historical trends. Specific assumptions are as follows:

- The estimates are prepared by normalizing all cost items to current, 2006, dollars.
- Construction markets are assumed to be operating at reasonable levels, therefore no premium time on labor costs is included, and adequate experienced contractors and craft labor are assumed available.
- Construction technology is assumed to be similar to that used today, therefore productivity rates are in keeping with those currently seen in the industry.
- Compatible trade agreements exist in the region, and no strike impacts will be experienced by the project.
- Normal Birmingham area weather is assumed, therefore weather conditions will have no major impacts to construction schedule and costs.

A reoccurring issue in the estimation of capital cost during the conceptual phase of a project is the evaluation and treatment of uncertainty. Uncertainty can result in a "difference" between the estimated cost of a project as defined during the concept phase and the actual cost of the project that is ultimately implemented. Four potential sources of uncertainty are generally recognized.

- Changes in Project Scope
- Changes in Design or Operating Standards
- Incorrect Unit Cost / Quantity Assumptions
- Unforeseen Issues in Implementation

Changes in Project Scope

During the NEPA phase, preliminary decisions on project scope are made on such issues as the extent of the proposed alignments, the number and locations of station stops, and other significant issues. As a project progresses through the various stages of implementation many of the original project scope definitions that formed the basis of the cost estimate will be updated or revised.

Changes in Design or Operating Standards

Similar to the broader uncertainties on project scope but generally more specific in nature, changes in transit technology or operating rules during later phases of project development can lead to changes in project cost. Examples of changes in standards would be changes in the designation of exclusive lanes for transit, changing the type of fare collection system, and so forth.

Incorrect Unit Cost/ Quantity Assumptions

A variety of potential problems exist in the assumptions used in selecting unit cost or unit quantities. Issues that can affect the accuracy of unit costs include local demand for construction labor and its impact on wage rates, bid climate during the construction period and fluctuations in basic material prices. Errors in quantity assumptions are often related to changes in design standards as discussed above.

Unforeseen Issues in Implementation

Perhaps one of the largest sources of uncertainty is the difficulty to anticipate issues that will only be uncovered in later stages of project development. Areas that appear to be most susceptible are right-of-way acquisition, utility relocations, hazardous materials, and soil conditions.

2.3 Approach to data sources

A significant and ongoing part of the conceptual planning process has been the development of a common set of design standards, typical cross-sections and other facility elements for the proposed transit improvements. To begin to estimate the costs of these design elements, they are compared to experience from other projects, utilizing a combination of both “bottom up” and “top down” estimating approaches, as described below. Both approaches make use of typical facility costs, where units of consistent dimension and cost may be summed together across the extent of the project, and non-typical facility costs, where sub-elements must be combined to form a quantifiable unit for costing.

Typical Facility Costs

Typical facility costs are developed for items that can be defined by a typical cross-section that is applicable over a given length of alignment. The typical facilities costing procedure begins with a cross section or sketch of a facility such as an at-grade guideway. For elements that can be defined by a typical section, unit quantities (such as cubic yards of excavation, or lineal feet of track) required to construct one route foot of the section are computed and unit costs are applied to determine a base cost for constructing a typical route foot.

Non-typical Facility Costs

Non-typical facility costs are developed based on conceptual design relating to the unique facility under consideration. Costs for those non-typical facilities elements that are necessary for overall system operation, but whose costs cannot be allocated to a specific geographic segment of the system (e.g., vehicles, service and inspection yard, etc.), will be included at the summary level for each alternative.

Bottom Up Approach

The majority of composite unit costs utilized for the Birmingham capital cost estimates are developed based on a “bottom up” approach. In this approach, the cost of major work elements, as generally defined by typical sections, is determined by totaling the cost of their component parts on a per unit basis. Sufficient engineering data is required to reasonably define the scope of work and quantities represented by each typical section. Unit prices are developed and combined with the estimated quantities to determine the costs for each major category of work.

The advantage of this approach is the ability to adjust costs for minor changes of scope, as well as the higher confidence level inherent in a bottom up estimate. The disadvantage is that at the conceptual level of planning, the level of engineering detail available is typically not sufficient to warrant itemizing each feature to the degree desirable for a complete bottom up estimate.

This approach is used here for the following cost categories:

- Guideway and Track Elements
- Stations
- Sitework & Special Conditions (Demolitions and Roadway Modifications)
- Right-of-Way

Top Down Approach

In the “top down” method, an order-of-magnitude cost is determined, usually derived from data from similar projects, and this cost is used directly or converted to some unit of measure (such as route feet) and applied as a unit cost. This method is faster than the bottom up approach; and for conceptual planning purposes it can be sufficiently accurate. The disadvantage is that site-specific elements of the source project may not be identical to elements of the alternative being evaluated.

The top down approach has been used here to estimate costs for the following categories:

- Vehicles
- Vehicle storage and maintenance facilities
- Systems
- Sitework & Special Conditions (Utility Relocations and Environmental Mitigation)

For the cost estimates prepared for the Birmingham ITP project, a blend of bottom-up and top-down approaches has been used, making the best use of available unit cost data and data from completed projects.

2.6 Accuracy of Cost Estimates

The estimating methods described above represent professionally accepted standards for preparing capital cost estimates to a level of accuracy that is consistent with the level of project definition. Accuracy is traditionally expressed as a +/- percentage range around the point estimate that has been produced and is greatest in the early stage of project definition and progressively decreases as project definition increases.

For example, for typical transit projects, the expected accuracy range of an estimate prepared from final design documents is approximately +10/-5 percent. For projects at the General Plan stage (15 percent plus design), which is generally accepted to be at the point where the majority of major construction items can be quantified, the accuracy range could be expected to be about +20/-15 percent.

One of the primary techniques used to address the uncertainties inherent in the estimating process at the NEPA phase of project development is the application of appropriate design allowances or contingencies. As a project progresses through subsequent phases, the level of detail in the design will increase and the design allowances will decrease proportionally.

3.0 Project-Specific Assumptions

This section describes the specific assumptions that inform cost estimates for the alternatives being considered in the Birmingham ITP project. It notes the sources of cost information applied to the project, then describes common features of the BRT and LRT alternatives. Following the Standard Cost Categories established by FTA, the final subsections contain descriptions of the elements of both BRT and LRT alternatives.

3.1 BRT and LRT Unit Costs

For construction line items as well as overall scale of investment envisioned for the District of Columbia, the study team has made use of costs from recent BRT and enhanced bus systems, including Las Vegas "Max" developed in 2002 and the proposed Houston Enhanced Bus Transit Street Improvement Project in 1999, as well as the Silver Line project in Boston.

Unit costs have been adjusted for construction labor, material and equipment differences between Houston and the District of Columbia, using RS Means Building Construction Cost Data, 63rd Annual Edition (2006). The unit costs have also been escalated to \$2006 using cost adjustment data from the same edition of RS Means.

Generally speaking, top-down LRT construction costs were based upon similar recently completed projects. LRT construction costs for the Portland streetcar and Houston light rail line were modified as required for the LRT Alternatives envisioned for the city of Birmingham. Many of the proposed Birmingham improvements were considered similar to the projects in Houston and Portland, in terms of proposed levels of service, scale of track and facilities investment, systems requirements, and the potential for aggressive implementation schedules. Costs from the Tacoma, Washington and Tampa, Florida streetcar lines also informed this estimate.

In these projects, construction costs were deliberately minimized and controlled by limiting the construction to the minimum required for the LRT track and associated systems, and station stops. However, track and systems have been solidly designed and constructed in order to provide trouble-free service for many years to come.

Unit costs have been adjusted for construction labor, material, and equipment differences between others cities and Birmingham, using RS Means Building Construction Cost Data, 63rd Annual Edition (2006). The unit costs have also been escalated to \$2006 using cost adjustment data from the same edition of RS Means.

3.2 System Configuration

For both LRT and BRT modes, operational and service levels are consistent to allow for accurate cross-comparisons. In general, corridor features such as route lengths, track and lane configurations, station stop locations, and number of vehicles to be stored and maintained are similar for each corridor for the LRT and BRT Alternatives.

All corridors are assumed to have two guideways (tracks or BRT bus lanes) for the full length of

each corridor. As far as possible, construction work in the transit corridors would be limited to guideway lanes only. No street reconstruction or other improvements are assumed outside the two guideway lanes in the corridor street, except at station platform locations and for critical transit-supportive facilities such as catenary poles, signal or communications equipment, and traction power substations.

In developing cost estimates, the study team evaluated two different scenarios with respect to the travel lanes—or guideway—that could potentially be available for exclusive use by transit vehicles.

- 1) **Shared use**
In this scenario, guideway lanes would be constructed to allow for shared use of the lane for both transit and general road traffic, and would be paved with a standard concrete paving surface suitable for all vehicles. This is the basic case, from which the other scenarios are adapted.
- 2) **Maximum dedicated guideway**
In this scenario, lanes along the transit corridors were assumed dedicated for transit vehicles along streets that would physically accommodate two lanes of exclusive transit use. Potential impacts to traffic circulation were not taken into account.

In general, station platforms are assumed to be the curb-extension type (bulb-out), constructed in the curb or parking lane of the street. Two platforms, one for each direction of travel, will be constructed on each side of the street at each station location. An exception to this assumption occurs for the LRT alternatives where, to avoid potential effects on private property, platforms are located in the center of the street. Typically, the curb lane of corridor streets will only be reconstructed within the limits of the station platforms, and no curb or sidewalk reconstruction is assumed in the transit corridor streets other than at the platforms.

3.2 Cost Estimate Basis for BRT Alternative

The descriptions below, organized by general cost category, contain specific assumptions pertaining to the cost estimates. A cost table is shown at the end of this document as Attachment 1.

1. Busway Facilities

For the BRT guideway, street reconstruction work is limited to the lane in which BRT vehicles will operate. Work includes minimal removal of existing paving, and placement of a new overlay of asphaltic concrete running way.

Miscellaneous busway facilities require pavement saw cuts, geotextile fabric, reconstruction of street pavement, and required relocation of street lights.

Allowances for minor structural work are included where the proposed transit improvements may require bridge modification, retained fill, or retained cut segments.

2. Station Stops

Typical platforms are 75 feet long and 14 inches high, with 15-foot ramps at one end. Side platforms of the curb-extension type (bulb-out) are constructed in the curb lane of the street and vary in width between 8 and 12 feet. At each stop location there are two platforms, one for each direction of travel. Center platforms constructed in the median of the street, would be of similar dimensions. Construction costs include signage, lighting, and a simple shelter at each platform. No allowance is made for special finishes, custom pavers, or custom-designed shelters, and no curb or sidewalk reconstruction is assumed in the transit corridor streets other than at the platforms.

Fare collection equipment is assumed to include procurement, installation and testing of full service, heavy duty ticket vending machines at all station stops.

3. Shop and Yard Facilities

The estimates take into account storage spaces and lay-down areas appropriate to the overall vehicle fleet size for each alternative.

Unit costs for a typical BRT vehicle storage and maintenance facility assume a vehicle fleet of approximately 6 BRT vehicles being serviced at an existing, expanded bus facility. Maintenance activities are assumed to be the same as those currently performed at the existing facility.

4. Sitework and Special Conditions

Public utilities work include potential adjustments to storm drains, sanitary system, electric power, water, gas, public steam, etc. Private Utilities work includes potential adjustments to communications conduit, television cable conduit, and other private utilities in the street.

A preliminary utilities study identified cost ranges per linear foot, for utility relocation in downtown Birmingham. The range in relocation cost was determined by estimating the impact of placing LRT tracks along the outer lanes of two sample blocks. This estimation produced a high and low value for utility relocation per block.

The estimates include allowances for environmental mitigation, hazmat remediation (soil and/or water), and special noise-control measures. Maintenance of traffic during construction includes temporary signage, electric sign boards, barrels, separation fencing, safety barricades, movable "Jersey barriers", etc. and occasional use of traffic control officers.

5. Systems

Communications equipment includes a simple GPS vehicle location system that provides "next bus" information via a variable message sign (VMS) system at passenger stations. Radio equipment is installed on all vehicles and at a central dispatch center located within the storage/maintenance facility.

A systems and operations testing allowance is added, consisting of 5% of the systems costs.

6. Property Costs

No additional street right-of-way assumed for running way or stations and no allowance has been made for park-and-ride facilities. No allowance for property acquisition has been included in estimates for vehicle storage and maintenance facilities.

7. Vehicles

Irisbus-Matra-Alstom Civis, as supplied for the Las Vegas Max Project in 2002; or Van Hool Low Floor as supplied for the DC Circulator in 2004.

For the purposes of this methodology, the average running speed, headway, capacity and spare quantity is assumed to be the same for both LRT and BRT vehicle.

8. Soft Cost (Owner Costs)

Owner costs were assumed to be similar to current industry experience for planning, environmental assessment, final design, project management, construction management, and administrative costs. Estimates assume that the project will be a conventional design-bid-build project. Typical costs are assumed for liability and accident insurance policy coverage during construction, as well as for agency agreements and utility fees.

The soft costs in the FTA format use six of the SCC sub-categories. These allowances are computed by applying a percentage to the total construction cost estimated for each cost category (excluding right-of-way and vehicles). The following is a list of the percentage multipliers being applied to the total construction costs to cover these items:

Preliminary Engineering & Final Design	10%
Construction: Project Administration/Management	12%
Insurance, Legal, Permits, Review Fees	5%
Training, Startup, Final Testing	3%

9. Finance Costs

No finance charges have been included in this cost estimate. Subsequent financial planning activities will allow conversion of these 2006 estimates to YOE figures and appropriate development of Finance cost estimates.

10. Contingencies

A contractor cost contingency factor has been added to account for special, nonstandard, and unforeseen features and occurrences related to construction. An owner's contingency factor has been added to account for the owner's portion of special, nonstandard, and unforeseen features and occurrences.

3.1 Cost Estimate Basis for LRT Alternative

The descriptions below, organized by Standard Cost Category, contain specific assumptions pertaining to the cost estimates. A cost table is shown at the end of this document as Attachment 2.

1. Guideway Facilities and Track Elements

Construction of standard embedded track consists of sawcutting existing paving, removing existing pavement, and placing 8 inches of aggregate base and a 15-inch reinforced concrete track slab with embedded rails. The estimates account for the relatively higher cost of constructing two single tracks in separate lanes instead of together in adjacent lanes.

One universal crossover is assumed every mile or at the end of each LRT alignment. Special trackwork is of embedded design and flush-mounted, with electrically-powered switch machines, appropriate control and power systems.

Miscellaneous guideway facilities include pavement saw cuts, geotextile fabric, reconstruction of street pavement, and required relocation of street lights. Allowances for minor structural work are included where the proposed transit improvements may require bridge modification, retained fill, or retained cut segments.

Traffic signal modifications include correction of interferences with overhead catenary system wiring, lighting and timing revisions, and signal priority system measures.

2. Station Stops

Typical platforms are 75 feet long and 14 inches high, with 15-foot ramps at one end. Side platforms of the curb-extension type (bulb-out) are constructed in the curb lane of the street and vary in width between 8 and 12 feet. At each stop location there are two platforms, one for each direction of travel. Center platforms constructed in the median of the street, would be of similar dimensions. Construction costs include signage, lighting, and a simple shelter at each platform. No allowance is made for special finishes, custom pavers, or custom-designed shelters, and no curb or sidewalk reconstruction is assumed in the transit corridor streets other than at the platforms.

Fare collection equipment is assumed to include procurement, installation and testing of full service, heavy duty ticket vending machines at all station stops.

3. Vehicle Storage and Maintenance Facilities

In general, the estimates take into account storage tracks and lay-down areas appropriate to the overall vehicle fleet size for each alternative. Yard lead tracks, as well as access drives, employee parking, and employee welfare accommodations are included in the estimate. Maintenance buildings house vehicle inspection, cleaning and routine maintenance capabilities, but heavy maintenance activities such as wheel truing and major body repairs are assumed to

take place off-site. Facilities costs also include power substations and overhead contact systems for all yard track.

This “typical” estimate assumes a vehicle fleet of approximately 6 LRT vehicles on a 2-acre site. The estimate would be modified for each alternative based on the different fleet sizes and different facilities sites assumed. The Technical Memorandum: “Facilities Site Screening” contains an extensive discussion of facilities sites and estimated costs.

4. Sitework and Special Conditions

Public utilities work includes potential adjustments to storm drains, sanitary system, electric power, water, gas, public steam, etc. Private Utilities work includes potential adjustments to communications conduit, television cable conduit, and other private utilities in the street.

A preliminary utilities study identified cost ranges per linear foot, for utility relocation in downtown Birmingham. The range in relocation cost was determined by estimating the impact of placing LRT tracks along the outer lanes of two sample blocks. This estimation produced a high and low value for utility relocation per block.

The estimates include allowances for environmental mitigation, hazmat remediation (soil and/or water), and special noise-control measures. Maintenance of traffic during construction includes temporary signage, electric sign boards, barrels, separation fencing, safety barricades, movable “Jersey barriers”, etc. and occasional use of traffic control officers

5. Systems

Overhead contact system (OCS) includes procurement and placement of the single-wire fixed termination OCS, including pole foundations and poles, catenary system, and feeder system. Wires are typically supported by freestanding poles along each side of the street, not by attachments to existing buildings or structures. One traction power substation is assumed every route mile of double tracked alignment. The overall system is assumed to be designed for 750 Vdc, with switching, protection, rectifier-transformers, feeder, grounding and bonding systems, batteries and chargers, local and/or remote controls, and equipment supervision.

Communications equipment includes a simple GPS vehicle location system that provides “next bus” information via a variable message sign (VMS) system at passenger stations. Radio equipment is installed on all vehicles and at a central dispatch center located within the storage/maintenance facility.

A systems and operations testing allowance is added, consisting of 5% of the systems costs.

6. Property Costs

No additional street right-of-way is assumed for running way or stations. No allowance has been made for park-and-ride facilities, and no allowance for property acquisition has been included in estimates for vehicle storage and maintenance facilities. However, small acquisitions in the range of 20 feet by 50 feet would be required for traction power substations. An allowance for

these small parcels is included in the typical mile estimates.

7. Vehicles

Streetcar vehicles are assumed to be the Skoda-Inekon Astra, as supplied for the Portland Streetcar Project.

8. Soft Costs (Owner Costs)

Owner costs were assumed to be similar to current industry experience for planning, environmental assessment, final design, project management, construction management, and administrative costs. Estimates assume that the project will be a conventional design-bid-build project. Typical costs are assumed for liability and accident insurance policy coverage during construction, as well as for agency agreements and utility fees.

The soft costs in the FTA format use six of the SCC sub-categories. These allowances are computed by applying a percentage to the total construction cost estimated for each cost category (excluding right-of-way and vehicles). The following is a list of the percentage multipliers being applied to the total construction costs to cover these items:

Preliminary Engineering & Final Design	10%
Construction: Project Administration/Management	12%
Insurance, Legal, Permits, Review Fees	5%
Training, Startup, Final Testing	3%

9. Finance Costs

No finance charges have been included in this cost estimate. Subsequent financial planning activities will allow conversion of these 2006 estimates to YOE figures and appropriate development of Finance cost estimates.

10. Contingencies

A contractor cost contingency factor has been added to account for special, nonstandard, and unforeseen features and occurrences related to construction. An owner's contingency factor has been added to account for the owner's portion of special, nonstandard, and unforeseen features and occurrences.

IN-TOWN TRANSIT PARTNERSHIP PROJECT COST ESTIMATE FOR BRT ALTERNATIVES

ITEM	UNIT	UNIT COST	QUANTITY	Alt. A1	QUANTITY	Alt. A2	QUANTITY	Alt. A3	QUANTITY	Alt. B1	QUANTITY	Alt. B2	REMARKS
Alignment Length			20,800		20,550		15,700		22,450		17,200		
Station			14		12		11		13		11		
1.0 Busway Facilities (not incl. utilities)													
1.1 At-Grade Exclusive Lanes	Lane Feet	\$120	41600	4,992,000	41100	\$4,932,000	31400	\$3,768,000	44900	\$5,388,000	34400	\$4,128,000	
1.2 Curbs for Exclusive Lanes	Linear Feet	\$16	41,600	\$665,600	41,100	41,116	31,400	502,400	44,900	718,400	34,400	550,400	
Busway Facilities Subtotal				5,657,600		4,973,116		4,270,400		6,106,400		4,678,400	
2.0 Station Stops													
2.1 Bus Pad Construction 12' x 100'	Sq.Ft.	\$66	33,600	\$2,234,064	28,800	1,914,912	26,400	\$1,755,336	31,200	\$2,074,488	26,400	\$1,755,336	
2.2 At Grade Side Platform 12' x 60'	Lump Sum	\$100,000	28	\$2,800,000	24	2,400,000.00	22	\$2,200,000	26	\$2,600,000	22	\$2,200,000	
2.3 Fare Collection Equipment (per Platform)	Lump Sum	\$90,000	28	\$2,520,000	24	2,160,000.00	22	\$1,980,000	26	\$2,340,000	22	\$1,980,000	
2.4 Variable Message Board Equipment	Lump Sum	\$5,000	28	\$140,000	24	120,000.00	22	\$110,000	26	\$130,000	22	\$110,000	
2.5 Site Furniture, Lighting, Shelters, Bike Facilities, Signage, Fencing.	Allowance	\$30,000	28	\$840,000	24	720,000.00	22	\$660,000	26	\$780,000	22	\$660,000	
2.6 Public Art	Allowance	\$10,000	28	\$280,000	24	240,000.00	22	\$220,000	26	\$260,000	22	\$220,000	
2.7 Typical Bus Stop	Each	\$10,000	0	\$0	0	0	0	\$0	0	\$0	0	\$0	No new bus shelters
2.8 Parking Facilities	Parking Space	\$5,000	0	0	0	0	0	0	0	0	0	0	No new Park & Ride
Station Stops Subtotal				8,814,064		7,554,912		6,925,336		8,184,488		6,925,336	
3.0 Yards Shops, admin/Support Facilities													
3.1 Site Work & Special Conditions	Lump Sum	\$500,000	1	\$500,000	1	\$500,000	1	\$500,000	1	\$500,000	1	\$500,000	
3.2 Shop Buildings, Yard Facil., Util. & Lighting	Sq.Ft.	\$250	19,800	4,950,000	19,800	4,950,000	19,800	4,950,000	19,800	4,950,000	19,800	4,950,000	
3.3 Systems & Equip.	Lump Sum	\$500,000	1	\$500,000	1	\$500,000	1	\$500,000	1	\$500,000	1	\$500,000	
Yards Shops, Admin/Support Facilities Subtotal				5,950,000		5,950,000		5,950,000		5,950,000		5,950,000	
4.0 Site Work & Special Conditions													
4.1 Typical Utilities Adjustments	Lane Feet	\$100	41600	\$4,160,000	41,100	4,110,000.00	31,400	\$3,140,000	44,900	\$4,490,000	34400	\$3,440,000	
4.2 Environ. Mitig. (incl. Hazmat, Noise Reduct., etc.)	Route Mile	\$285,000	3.9	\$1,122,727	3.9	1,109,232.95	3.0	\$847,443	4.3	\$1,211,790	3.3	\$928,409	
4.3 Maintenance of Traffic During Construction (% of guideways and stops)	%	5%	14,471,664	\$723,583	\$12,528,028	\$626,401	\$11,195,736	\$559,787	\$14,290,888	\$714,544	\$11,603,736	\$580,187	
Site work & Special Conditions Subtotal				\$6,006,310		5,845,634		4,547,230		6,416,334		4,948,596	
5.0 Systems													
5.1 Traffic Signal Modifications- Miscellaneous	Intersection	\$100,000	35	3,500,000	37	3,700,000	25	2,500,000	34	3,400,000	29	2,900,000	
5.2 Traffic Signal Priority System Installation	Intersection	\$25,000	35	875,000	37	925,000	25	625,000	34	850,000	29	725,000	
5.3 Communications	Lump Sum	\$50,000	1	\$50,000	1	\$50,000	1	\$50,000	1	\$50,000	1	\$50,000	
5.4 Systems/ Operation and Testing	Lump Sum	5%	1	\$2,500	1	2,500	1	2,500	1	2,500	1	2,500	
Systems Subtotal				\$4,427,500		4,677,500		3,177,500		4,302,500		3,677,500	
SUBTOTAL (NOT INCL. VEH)				\$30,855,474		\$29,001,162		\$24,870,466		\$30,959,722		\$26,179,832	
Miscellaneous Items													
6.0 ROW, Land, Existing Improvements													
6.1 Purchase or lease of real property from Alignment	Per Location	\$0	5	\$0	6	\$0	2	\$0	2	\$0	4	\$0	
6.2 Purchase or lease of real property from Station Location	Per Location	\$0	12	\$0	11	\$0	9	\$0	11	\$0	12	\$0	
6.3 Relocation of existing households and businesses	Allowance	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	
6.4 Street profile adjustment	Allowance	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	
ROW, Land, Existing Improvements Subtotal				\$0		\$0		\$0		\$0		\$0	
7.0 Vehicles													
7.1 BRT	Each	\$500,000	6	\$3,000,000	6	\$3,000,000	5	\$2,500,000	7	\$3,500,000	5	\$2,500,000	
8.0 Soft Cost													
8.1 Preliminary Engineering and Final design	%	10%	\$30,855,474	\$3,085,547	\$29,001,162	\$2,900,116	\$24,870,466	\$2,487,047	\$30,959,722	\$3,095,972	\$26,179,832	\$2,617,983	
8.2 PE, FD, Construction: Project Administration/Management	%	12%	\$30,855,474	\$3,702,657	\$29,001,162	\$3,480,139	\$24,870,466	\$2,984,456	\$30,959,722	\$3,715,167	\$26,179,832	\$3,141,580	
8.3 Insurance, Legal, Permits, Review Fees.	%	5%	\$30,855,474	\$1,542,774	\$29,001,162	\$1,450,058	\$24,870,466	\$1,243,523	\$30,959,722	\$1,547,986	\$26,179,832	\$1,308,992	
8.4 Training, Startup, Final Testing	%	3%	\$30,855,474	\$925,664	\$29,001,162	\$870,035	\$24,870,466	\$746,114	\$30,959,722	\$928,792	\$26,179,832	\$785,395	
Soft Costs Subtotal				\$9,256,642		\$8,700,349		\$7,461,140		\$9,287,917		\$7,853,950	
9.0 Finance Charges													
9.1 (Assumes 2006 Dollars)	%	0%	30,855,474	\$0	29,001,162	\$0	24,870,466	\$0	30,959,722	\$0	26,179,832	\$0	
Finance Charges Subtotal				\$0		\$0		\$0		\$0		\$0	
10.0 Contingency													
10.1 Owner Cost Contingency	%	7%	\$30,855,474	\$2,159,883	\$29,001,162	\$2,030,081	\$24,870,466	\$1,740,933	\$30,959,722	\$2,167,181	\$26,179,832	\$1,832,588	
10.2 Contractor Cost Contingency	%	15%	\$30,855,474	\$4,628,321	\$29,001,162	\$4,350,174	\$24,870,466	\$3,730,570	\$30,959,722	\$4,643,958	\$26,179,832	\$3,926,975	
Contingency Subtotal				\$6,788,204		\$6,380,256		\$5,471,503		\$6,811,139		\$5,759,563	
MISCELLANEOUS COSTS				\$19,044,847		\$18,080,604		\$15,432,642		\$19,599,056		\$16,113,513	
GRAND TOTAL				\$49,900,321		\$47,081,767		\$40,303,108		\$50,558,778		\$42,293,344	2005 \$

IN-TOWN TRANSIT PARTNERSHIP PROJECT COST ESTIMATE FOR LRT ALTERNATIVES

ITEM	UNIT	UNIT COST	QUANTITY	Alt. A1	QUANTITY	Alt. A2	QUANTITY	Alt. A3	QUANTITY	Alt. B1	QUANTITY	Alt. B2	REMARKS
Alignment Length			20,800		21,000		15,700		22,450		17,200		
Stations			14		12		11		13		11		
1.0 Guideway Facilities (not incl. utilities)													
1.1 At-Grade Exclusive (2 Single Tracks)	Route Feet	\$1,000	20,800	\$20,800,000	21,000	\$21,000,000	15,700	\$15,700,000	22,450	22,450,000	17,200	\$17,200,000	
1.2 Special Trackwork: Universal Crossovers	Set	\$595,000	4	\$2,380,000	4	\$2,380,000	3	\$1,785,000	4	2,380,000	4	\$2,380,000	
1.3 Track: Vibration and Noise Dampening	Route Feet	\$0	20,800	\$0	21,000	\$0	15,700	\$0	22,450	0	17,200	\$0	
1.4 Curbs for Exclusive Lanes	Linear Feet	\$16	41,600	\$665,600	41,100	\$657,600	31,400	\$502,400	44,900	718,400	34,400	\$550,400	
Guideway Facilities Subtotal				\$23,845,600		\$24,037,600		\$17,987,400		25,548,400		\$20,130,400	
2.0 Station Stops													
2.1 Typical At Grade Side Platform 12' x 100'	Platform	\$150,000	23	\$3,450,000	19	\$2,850,000	16	\$2,400,000	21	3,150,000	17	\$2,550,000	
2.2 Fare Collection Equipment (per Platform)	Platform	\$90,000	23	\$2,070,000	19	\$1,710,000	16	\$1,440,000	21	1,890,000	17	\$1,530,000	
2.3 Variable Message Board Equipment	Platform	\$5,000	23	\$115,000	19	\$95,000	16	\$80,000	21	105,000	17	\$85,000	
2.4 Site Furniture, Lighting, Shelters, Bike Facilities, Signage, Fencing.	Platform	\$30,000	23	\$690,000	19	\$570,000	16	\$480,000	21	630,000	17	\$510,000	
2.5 Public Art	Allowance	\$10,000	23	\$230,000	19	\$190,000	16	\$160,000	21	210,000	17	\$170,000	
2.6 Typical Bus Stop (Beyond Alignment)	Each	\$10,000	0	\$0	0	\$0	0	\$0	0	0	0	\$0	No new bus shelters
2.7 Parking Facilities (Surface Lot)	Parking Space	\$5,000	0	\$0	0	\$0	0	\$0	0	0	0	\$0	No new Park & Ride
Station Stops Subtotal				\$6,555,000		\$5,415,000		\$4,560,000		\$5,985,000		\$4,845,000	
3.0 Yards Shops, Admin/Support Facilities (Site #11)													
3.1 Site Work	Lump Sum	\$1,000,000	1	\$1,000,000	1	\$1,000,000	1	\$1,000,000	1	\$1,000,000	1	\$1,000,000	
3.2 Shop Buildings, Yard Facil., Util. & Lighting	Sq.Ft.	\$250	19,800	\$4,950,000	19,800	\$4,950,000	19,800	\$4,950,000	19,800	\$4,950,000	19,800	\$4,950,000	
3.3 Systems & Equip	Lump Sum	\$1,000,000	1	\$1,000,000	1	\$1,000,000	1	\$1,000,000	1	\$1,000,000	1	\$1,000,000	
3.4 Yard Lead & Trackwork (includes OCS)	Route Feet	\$800	3,500	\$2,800,000	3,000	\$2,400,000	3,500	\$2,800,000	3,500	\$2,800,000	3,500	\$2,800,000	
Yards Shops, Admin/Support Facilities Subtotal				\$9,750,000		\$9,350,000		\$9,750,000		\$9,750,000		\$9,750,000	
4.0 Site work & Special Conditions													
4.1 High Number of Relocations	Route Feet	\$4,600	10,508	\$48,336,800	10,234	\$47,076,400	10,508	\$48,336,800	10,508	\$48,336,800	10,508	\$48,336,800	
4.2 Moderate Number of Relocations	Route Feet	\$900	10,329	\$9,296,100	10,889	\$9,800,100	5,214	\$4,692,600	11,930	\$10,737,000	6,716	\$6,044,400	
4.3 Low Number of Relocations	Route Feet	\$350	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	
4.4 Agency Agreements and Utility Fees	Allowance	\$340,000	1	\$340,000	1	\$340,000	1	\$340,000	1	\$340,000	1	\$340,000	
4.5 Environ. Mitig. (incl. Hazmat, Noise Reduct., etc.)	Route Mile	\$285,000	3.9	\$1,122,727	4.0	\$1,133,523	3.0	\$847,443	4.3	\$1,211,790	3.3	\$928,409	
4.6 Maintenance of Traffic During Construction (% of guideway and stops)	%	5%	\$30,400,600	\$1,520,030	29,452,600	\$1,472,630	22,547,400	\$1,127,370	31,533,400	\$1,576,670	24,975,400	\$1,248,770	
Site work & Special Conditions Subtotal				\$60,615,657		\$59,822,653		\$55,344,213		\$62,202,260		\$56,898,379	
5.0 Systems													
5.1 Traffic Signal Modifications- Miscellaneous	Intersection	\$100,000	35	\$3,500,000	37	\$3,700,000	25	\$2,500,000	34	3,400,000	29	\$2,900,000	
5.2 Traffic Signal Priority System Installation	Intersection	\$25,000	35	\$875,000	37	\$925,000	25	\$625,000	34	850,000	29	\$725,000	
5.3 Overhead Contact System	Route Miles	\$250	3.9	\$985	4.0	\$994	3.0	\$743	4.3	\$1,063	3.3	\$814	
5.4 Substations (One per mile)	Route Miles	\$500,000	4	\$2,000,000	4	\$2,000,000	3	\$1,500,000	5	\$2,500,000	4	\$2,000,000	
5.5 Communications	Lump Sum	\$50,000	1	\$50,000	1	\$50,000	1	\$50,000	1	\$50,000	1	\$50,000	
5.6 Systems/ Operation and Testing	Lump Sum	5%		\$102,549		\$102,550		\$77,537		\$127,553		\$102,541	
Systems Subtotal				\$6,528,534		\$6,778,544		\$4,753,281		\$6,928,616		\$5,778,355	
SUBTOTAL (NOT INCL. VEH.)				\$107,294,791		\$105,403,797		\$92,394,894		\$110,414,276		\$97,402,134	
Miscellaneous Items													
6.0 ROW, Land, Existing Improvements													
6.1 Purchase or lease of real property from Alignment	Per Location	\$0	7	\$0	9	\$0	3	\$0	3	\$0	4	\$0	
6.2 Purchase or lease of real property from Station Location	Per Location	\$0	12	\$0	9	\$0	9	\$0	12	\$0	16	\$0	
6.3 Relocation of existing households and businesses	Allowance	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	
6.4 Street profile adjustment	Allowance	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	
ROW, Land, Existing Improvements Subtotal				\$0		\$0		\$0		\$0		\$0	
7.0 Vehicles													
7.1 LRT	Each	\$3,000,000	6	\$18,000,000	6	\$18,000,000	5	\$15,000,000	7	\$21,000,000	5	\$15,000,000	
8.0 Soft Cost													
8.1 Preliminary Engineering & Final Design	%	10%	\$107,294,791	\$10,729,479	\$105,403,797	\$10,540,380	\$92,394,894	\$9,239,489	\$110,414,276	\$11,041,428	\$97,402,134	\$9,740,213	
8.2 PE, FD, Construction: Project Administration/Management	%	12%	\$107,294,791	\$12,875,375	\$105,403,797	\$12,648,456	\$92,394,894	\$11,087,387	\$110,414,276	\$13,249,713	\$97,402,134	\$11,688,256	
8.3 Insurance, Legal, Permits, Review Fees.	%	5%	\$107,294,791	\$5,364,740	\$105,403,797	\$5,270,190	\$92,394,894	\$4,619,745	\$110,414,276	\$5,520,714	\$97,402,134	\$4,870,107	
8.4 Training, Startup, Final Testing	%	3%	\$107,294,791	\$3,218,844	\$105,403,797	\$3,162,114	\$92,394,894	\$2,771,847	\$110,414,276	\$3,312,428	\$97,402,134	\$2,922,064	
Soft Costs Subtotal				\$32,188,437		\$31,621,139		\$27,718,468		\$33,124,283		\$29,220,640	
9.0 Finance Charges													
9.1 (Assumes 2006 Dollars)	%	0%	107,294,791	\$0	105,403,797	\$0	\$92,394,894	\$0	\$110,414,276	\$0	\$97,402,134	\$0	
Finance Charges Subtotal				\$0		\$0		\$0		\$0		\$0	
10.0 Contingency													
10.1 Owner Cost Contingency	%	7%	107,294,791	\$7,510,635	\$105,403,797	\$7,378,266	\$92,394,894	\$6,467,643	\$110,414,276	\$7,728,999	\$97,402,134	\$6,818,149	
9.1 Contractor Cost Contingency	%	15%	107,294,791	\$16,094,219	\$105,403,797	\$15,810,570	\$92,394,894	\$13,859,234	\$110,414,276	\$16,562,141	\$97,402,134	\$14,610,320	
Owner Cost Subtotal				\$23,604,854		\$23,188,835		\$20,326,877		\$24,291,141		\$21,428,470	
MISCELLANEOUS COSTS				\$73,793,292		\$72,809,974		\$63,045,345		\$78,415,423		\$65,649,110	
GRAND TOTAL				\$181,088,083		\$178,213,771		\$155,440,238		\$188,829,699		\$163,051,244	2005 \$

INFLATION WORKSHEET

(Rev.8, June 2, 2006)

Project Sponsor Name

Example

Today's Date **5/18/06**

Project Name and Location

Yr of Base Year \$ 2006

Phase

Yr of Revenue Ops 2012

Below, show all project costs in the year in which they occurred or are planned to occur through the completion of the project or the fulfillment of the New Starts funding commitment, whichever is expected to occur later in time.

BASE YEAR DOLLARS (X\$000)	Base Yr Dollars	Double-Check Total	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
10 GUIDEWAY & TRACK ELEMENTS (route miles)	112,000	112,000										22,000	20,000	50,000	20,000		0	0	0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	120,000	120,000											30,000	50,000	40,000	0	0	0	0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	12,000	12,000												6,000	6,000	0	0	0	0
40 SITEWORK & SPECIAL CONDITIONS	19,600	19,600									5,000	10,000	4,000	600		0	0	0	0
50 SYSTEMS	24,000	24,000												14,000	10,000	0	0	0	0
60 ROW, LAND, EXISTING IMPROVEMENTS	21,000	21,000											10,000	9,000	2,000	0	0	0	0
70 VEHICLES (number)	30,000	30,000											12,000	12,000	6,000	0	0	0	0
80 PROFESSIONAL SERVICES	84,500	84,500	1,000	2,000	2,000	2,000	2,000	2,000	2,000	5,000	11,000	15,000	15,000	15,000	10,500	0	0	0	0
90 UNALLOCATED CONTINGENCY	21,155	21,155								2,000	2,000	2,000	2,000	3,000	10,155	0	0	0	0
100 FINANCE CHARGES	440	440	0	0	0	0	0	0	0	94	91	88	85	83	0	0	0	0	0
Total Project Cost (10 - 100)	444,695	444,695	1,000	2,000	2,000	2,000	2,000	2,000	2,000	7,000	18,094	49,091	93,088	159,685	104,738	0	0	0	0

Inflation Rate		0.03000	0.03000	0.03000	0.03000	0.03000	0.03000	0.03000	0.03250	0.03250	0.03250	0.03250	0.03250	0.03250	0.03250	0.03250	0.03250	0.03250	0.03250
Compounded Inflation Factor		0.83546	0.86052	0.88634	0.91293	0.94031	0.96852	1.00000	1.03250	1.06606	1.10070	1.13648	1.17341	1.21155	1.25092	1.29158	1.33355	1.37689	
YEAR OF EXPENDITURE DOLLARS (X\$000)	YOE Dollars	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	
10 GUIDEWAY & TRACK ELEMENTS (route miles)	129,847	0	0	0	0	0	0	0	0	0	24,215	22,730	58,671	24,231	0	0	0	0	0
20 STATIONS, STOPS, TERMINALS, INTERMODAL (number)	141,227	0	0	0	0	0	0	0	0	0	0	34,094	58,671	48,462	0	0	0	0	0
30 SUPPORT FACILITIES: YARDS, SHOPS, ADMIN. BLDGS	14,310	0	0	0	0	0	0	0	0	0	0	0	7,040	7,269	0	0	0	0	0
40 SITEWORK & SPECIAL CONDITIONS	21,587	0	0	0	0	0	0	0	5,330	11,007	4,546	704	0	0	0	0	0	0	0
50 SYSTEMS	28,543	0	0	0	0	0	0	0	0	0	0	16,428	12,115	0	0	0	0	0	0
60 ROW, LAND, EXISTING IMPROVEMENTS	24,349	0	0	0	0	0	0	0	0	0	0	11,365	10,561	2,423	0	0	0	0	0
70 VEHICLES (number)	34,988	0	0	0	0	0	0	0	0	0	0	13,638	14,081	7,269	0	0	0	0	0
80 PROFESSIONAL SERVICES	92,742	835	1,721	1,773	1,826	1,881	1,937	2,000	5,163	11,727	16,511	17,047	17,601	12,721	0	0	0	0	0
90 UNALLOCATED CONTINGENCY	24,495	0	0	0	0	0	0	0	2,065	2,132	2,201	2,273	3,520	12,303	0	0	0	0	0
100 FINANCE CHARGES	500									100	100	100	100	100					
Total Project Cost (10 - 100)	512,587	835	1,721	1,773	1,826	1,881	1,937	2,000	7,228	19,289	54,034	105,792	187,376	126,894	0	0	0	0	0