Appendix 2:
Cost Estimates Worksheets

Development of Conceptual Construction Costs

The conceptual construction cost templates were established utilizing the following items and/or information:

- Discussions with GDOT personnel
- Discussions with Local Government DOT and Public Works personnel in City of Roswell and Alpharetta, Cobb, Gwinnett, Paulding, Newton and DeKalb Counties
- Review of over 50 bid tabulations on similar type projects which were supplied by the local governments and GDOT online database from late 2005 through May 2006
- GDOT's latest Item Mean Summary
- Discussions with various transportation contractors, suppliers and design professionals

Methodology

PBS&J engineering staff familiar with major local government transportation improvement programs in Forsyth, Fulton, Cobb, Gwinnett and DeKalb Counties identified representative roadway and bridge construction projects from these counties to use as a basis for historical cost data. Actual bid tabulations for these projects, where available, were obtained and reviewed.

GDOT's online construction bid database was used to obtain representative recent project cost information. Bid tabulations were reviewed for a number of projects located in major urban areas of Georgia, including the metro Atlanta area.

The projects were sorted by type, i.e. roadway widenings – by number of lanes, urban/rural section, new location roadways, intersection improvements, and bridges. Transportation engineers experienced in roadway and bridge cost estimating compiled the bid tabulations and developed roadway costs on a per mile basis for various types of widenings and new construction. The costs for local government projects were compared with GDOT project costs to develop the recommended cost. Many of the type projects needed for estimation were not let in the desired time period. These projects were "built" from per mile quantity estimates in the estimating spreadsheet using recent unit cost data.

Roadway Widenings, New Roadways & Intersections

Construction costs were based on review of bid tabulations of projects similar in nature to the different classifications shown on the construction cost listing. The bid tabs were searched for "non-standard" line items which typically included bridge widenings or replacements, retaining walls, ITS and ATMS elements, and traffic signal installations. These items were subtracted from the low bid total price. The sub-total was subsequently divided by the length of the project to establish a baseline cost-per-mile figure for each contract.

Roadways on new location were not found to be let during the desired time period. In these cases, the per mile cost estimate is built from other projects using per mile cost of major elements such as erosion control, earthwork, base & paving, signing & marking, etc. Representative quantities were generated for the type roadway to be estimated and recent unit costs were applied.

The bid tabs represented projects from late 2005 through May 2006. All baseline contract costs are set to 2006 dollars.

HOV Lanes & C-D Frontage Roads

Costs were established by approximating quantities for a one mile segment of roadway and establishing the cost utilizing the recent unit cost data from bid tabulations. In addition, the conceptual cost estimates for the I-75 HOV Cobb County project were analyzed and broken down to baseline per-mile costs for barrier-separated, independent-alignment HOV facilities. The I-85 concurrent HOV project in Gwinnett County was used as a basis for costs also.

Interchanges & Grade Separations

Costs were based on previous bid tabulations of similar projects. Costs for the compressed diamond and single-point interchanges were based on discussions with PBS&J personnel throughout the firm who have extensive knowledge and experience in the planning and design of each type. The costs shown are generic in nature and are to be used for a concept estimate. A system-to-system interchange can not be easily estimated, even for planning purposes, because there is no generic or "baseline" system-to-system interchange. Each is concept-dependent.

Bridge

Costs were derived assuming a standard length and width for different roadway classifications, which allows the number of square feet necessary for widening or replacement to be calculated. Costs per square foot for varying type bridges were supplied by GDOT's Bridge Design office and an average square foot price was derived from those.

Retaining Walls

Costs were established from previous experience and bid tabulations.

Sound Barrier Walls

Costs were established utilizing the GDOT's recent bid tabulations.

Non-Vehicular

Costs were established from discussions with local DOT's in Cobb and Gwinnett Counties in conjunction with bid tabulations from similar type projects.

Using the Cost Templates

The project sponsor should evaluate the need and purpose of the project in order to determine the appropriate section and the logical termini of the project. Then, looking at the cost-per-mile template for the appropriate typical section, multiply the cost/mile figure by the proposed project length. This will provide an approximate baseline cost for this project for the standard and customary elements that are necessary in any road-building undertaking.

Then determine what "non-standard" items are to be included in the project, and they must also determine, as necessary, what type or form they will be. For example, if an interchange is to be added as part of an arterial widening, the type of interchange (single point, diamond, etc.) must be determined. All major non-standard items are listed above and are included on the cost template. As appropriate, non-standard items are estimated on either a per-mile or a per-each basis. The analyst should use the template to find the non-standard items' costs and add those to the baseline cost previously calculated. The resulting figure should give officials a planning level estimate (in 2006 dollars) of the project's overall construction cost.

Table A-1 | Roadway Construction Costs - Cost per Lane Mile (x000)

Project Type	Urban		Rural	
	With Median	Without Median	With Median	Without Median
Surface Street Widening	$2,640	$2,640	$2,000	$2,000
Surface Street Upgrade		$1,390		
Surface Street New Construction	$2,710	$2,440	$2,760	$2,490
Freeway Widening	$2,840	$2,840	$2,340	$2,340
Freeway New Construction			$2,100	

Source: NSAS/GA 400 Sub-Area Study Conceptual Construction Costs

Table A-2 | Additional Roadway Construction Costs

HOV & TOL Lanes	Cost per Lane Mile (x000)
Barrier Separated	$4,250
CD Frontage Roads	Cost per Lane Mile (x000)
Urban	$2,880
Interchanges and Grade Separations	Cost per Each (x000)
Compressed Diamond Interchange	$12,000
Single Point Urban Interchange	$20,500
Diamond Interchange	$10,400
Half Diamond	$ 6,200
Grade Separation – 4 lanes	$ 7,400
Grade Separation – 2 lanes	$ 4,800
Intersections	Cost per Each (x000)
Arterial to Arterial	$2,380
Arterial to Collector	$1,890
Collector to Local	$1,390
Traffic Signalization/Upgrade	$ 160
Bridges	Cost per Lane Mile (x000)
Bridge (Assume 450′ length)	$ 500
Railroad Bridge	$ 1,125
Non-Vehicular Elements	Cost per Lane Mile (x000)
Multi-Use Trail	$ 590
Sidewalk	$ 190
	Cost per Space (x000)
Park/Ride Lot	$ 1,000

Source: NSAS/GA 400 Sub-Area Study Conceptual Construction Costs

Table A-3 | Miscellaneous Roadway Costs

						Cost per Sq Foot		Cost per lane mile (x000)
Sound Barrier Walls								
Assume 15' high as default (allow user to over if necessary)								
15	x	5280	=	79,200	x	22	=	$ 1,740
Retaining Walls								
Assume 12' high as default (allow user to change if necessary)								
12	x	5280	=	63,360	x	60	=	$ 3,800

Source: NSAS/GA 400 Sub-Area Study Conceptual Construction Costs

PROJECT NAME: Highway 92 Streetscape

GJ PROJECT NO.: xxxxx

DATE: December 14, 2007

PROJECT PHASE: Concept Design/Vision Plan - 100' Section

STATEMENT OF PROBABLE COST

Item No.	Item	Quantity	Unit	Price	Subtotal	Description
	Hardscape					
1.	Concrete Sidewalk	2,000	SF	$4.50	$9,000.00	4' Thickness
2.	Benches	2	EA	$1,500.00	$3,000.00	
3.	Trash Receptacles	2	EA	$1,200.00	$2,400.00	
3.	Concrete Curb	200	LF	$25.00	$5,000.00	6" Height (median in center turn lane)
4.	Street Lights	4	EA	$3,600.00	$14,400.00	Does not include conduit, circuitry, etc.
	Subtotal				**$33,800.00**	
B.	**Landscape**					
1.	Canopy Trees	12	EA	$1,800.00	$21,600.00	200 Gallon
2.	Shrubs and Groundcover	1,000	SF	$2.50	$2,500.00	
3.	Sod	4,000	SF	$0.38	$1,520.00	
4.	Irrigation	2,200	SF	$0.75	$1,650.00	Full System
	Subtotal				**$27,270.00**	
	Total				**$61,070.00**	
	General Conditions and Mobilization at 15%				**$9,160.50**	
	Contingency at 20%				**$12,214.00**	
	Design and Permitting at 12%				**$7,328.40**	
	Grand Total				**$89,772.90**	