

- 800.01 Introduction
- 800.02 Estimate Content
- 800.03 Estimate Preparation

### **800.01 Introduction**

A detailed cost estimate shall be prepared for a project in order to obligate funds for the construction activity and to determine a fair price for the work and a basis for evaluating contractors' bids. Estimates are comprised of various bid items arranged in a logical order, with a variety of payment options (see [Division 7](#) for special considerations). A complete estimate lists all work to be done by the contractor, showing quantity, unit of measure, unit cost, and total cost for each item. Cost estimates are prepared using one of two basic approaches, or a combination thereof, and each method has advantages and limitations. Bid-based estimating is usually easier and faster. Items without an adequate historical base must be estimated using the cost-based method. See Cost Estimating Manual for WSDOT Projects for more information.

#### **(1) Bid-Based Estimating**

Bid-based estimating utilizes historical bid prices. The procedures are typically based on the concept of comparable work—that is, choosing a price by finding similar projects in the same locality with a similar quantity as the item involved. The Washington State Department of Transportation (WSDOT) maintains historical bid data broken down by bid item, region, contract number, plan quantity, and the bid prices of the three low bidders. Bid Tabs Professional works with the Estimate Bid Analysis System (EBASE) and gives the designer the ability to use current bid history to produce and update project estimates. Numerous analysis scenarios can be generated. For information and a User's Guide for this new program, go to:

☞ [www.wsdot.wa.gov/Design/SAEO/](http://www.wsdot.wa.gov/Design/SAEO/) and ☞ [www.wsdot.wa.gov/Design/projectdev/](http://www.wsdot.wa.gov/Design/projectdev/)

#### **(2) Cost-Based Estimating**

Cost-based (scratch) estimating utilizes labor, equipment, and material cost information. Cost-based estimating directly incorporates cost and productivity factors relevant to the project into the estimation process.

**Note: Other than the estimate range included in the advertisement for bids, estimate information is to be kept confidential until bids have been received and opened.**

### **800.02 Estimate Content**

The contract estimate shall include the following:

1. A list of all bid items in correct order, showing contract item number, standard bid item number (if applicable), unit of measurement, estimated unit price, estimated quantity, and total estimated cost for each. The total amount of all items is designated the "Contract Total."
2. Washington State sales tax (if applicable).
3. Work by others at WSDOT expense.
4. Construction engineering costs.

5. Contingency costs.
6. Work by WSDOT at WSDOT expense – State Force Work (see [Division 7](#)).
7. The value of materials furnished by WSDOT (see [Division 7](#)).
8. Calculated amortization of materials sites and stockpile sites, even though the costs may not be known at the time the estimate is prepared.
9. Estimated amount for royalty payments.

**800.03 Estimate Preparation**

The region enters contract estimates into EBASE. A job number unique to each project identifies the estimate for each contract. The same job number used to identify the Contract Provisions should be used to identify the estimate.

The following elements should be considered in preparation of the estimate, as appropriate:

1. Previous unit bid prices. To develop base prices for estimating the value of the work, upcoming projects should be matched to the most recent projects for which bids have been received, according to type, size, and location.
2. An adjustment to the base prices based upon the ages, quantities, and individual conditions of the similar projects.
3. Inflation rates may be considered to update past information, but past inflation rates should not be projected into the future unless based on circumstances that can be reasonably expected to occur, such as anticipated changes in the cost of labor, equipment, and materials.
4. Surveys of local market prices for labor, equipment, and materials for unusual items of work or those with fluctuating prices.

**(1) Mobilization**

Mobilization is a contract pay item used to cover a contractor’s preconstruction expenses and the costs of preparatory work and operations. Since there is no clear list defining this work effort and since contractors have the ability to adjust their bids as needed to cover these expenses, there are no true rules as to what percentage should be used per contract. Figure 800-1 is a suggested percentage guide:

Project Amount	Mob Range
Less than \$100,000	8% – 12%
\$100,000 – \$250,000	6% – 10%
\$250,000 – \$500,000	6% – 9%
\$500,000 – \$1,000,000	5% – 9%
\$1,000,000 – \$2,000,000	6% – 9%
\$2,000,000 – \$5,000,000	7% – 9%
\$5,000,000 – \$10,000,000	8% – 10%
\$10,000,000 – \$20,000,000	8% – 11%
Over \$20,000,000	7% – 10%

**Mobilization Table**  
*Figure 800-1*

When determining mobilization for a project, consideration should be given to location; complexity; the need for specialized equipment; the type of work; and the working season if it extends over more than one construction season. Projects that would probably require a higher mobilization percentage include rural vs. urban; projects with multiple work sites; projects with numerous preparatory removal items; projects with large quantities of excavation; or projects extending over two seasons where the contractor would be expected to shut down operations and move out.

For complete instructions on developing estimates in the EBASE system, see the EBASE User's Guide. It may be accessed directly from EBASE by selecting HELP or through the following website: [www.wsdot.wa.gov/Design/projectdev/](http://www.wsdot.wa.gov/Design/projectdev/)

## (2) Engineering and Contingencies

“Contingency percentages” are set up to handle unforeseen changes in a project during construction, including additional work, quantity over-runs, and additional items. Contingencies are currently limited to 4% of the total contract amount for all WSDOT contracts. For local agency projects administered by WSDOT off the state highway system, no contingency percentage will be set up.

“Engineering percentages” are the monies set up in each contract for WSDOT’s operating costs to administer that project. These percentages will vary by type of work and total dollar amount of the contract. On average, the department has been running around 15% engineering on all projects in the Improvement and Preservation programs. Therefore, when starting an estimate for a project, enter 15% as a beginning point for construction engineering and adjust it up or down, using the tables in [Figures 800-2](#) and [800-3](#), before final PS&E submittal.

The Region Program Development/Management staff can, based on appropriate justification, approve any changes in the construction engineering percentages for a project different from the rates listed.

Copies of the approved justification letter shall be submitted with the final PS&E submittal for advertisement.

To use the tables in [Figures 800-2](#) and [800-3](#), once the Program and Subprograms have been identified, enter the appropriate construction cost. (Construction costs include any below-the-line items that have Engineering and Contingencies applied to them, such as utility agreements and work by state forces other than WSDOT.) Record that percentage in your estimate. When a project has multiple programmed sources (for example, P-1 paver with some I-2 safety collision reduction work), break out the construction costs associated with each program and use a weighted average, as shown the following example:

**\$3,750,000** Total Project Construction Cost, with:

**\$2,225,000** under Preservation P-1 paving (PA) and  
**\$1,525,000** under Improvement I-2 collision reduction (ID)

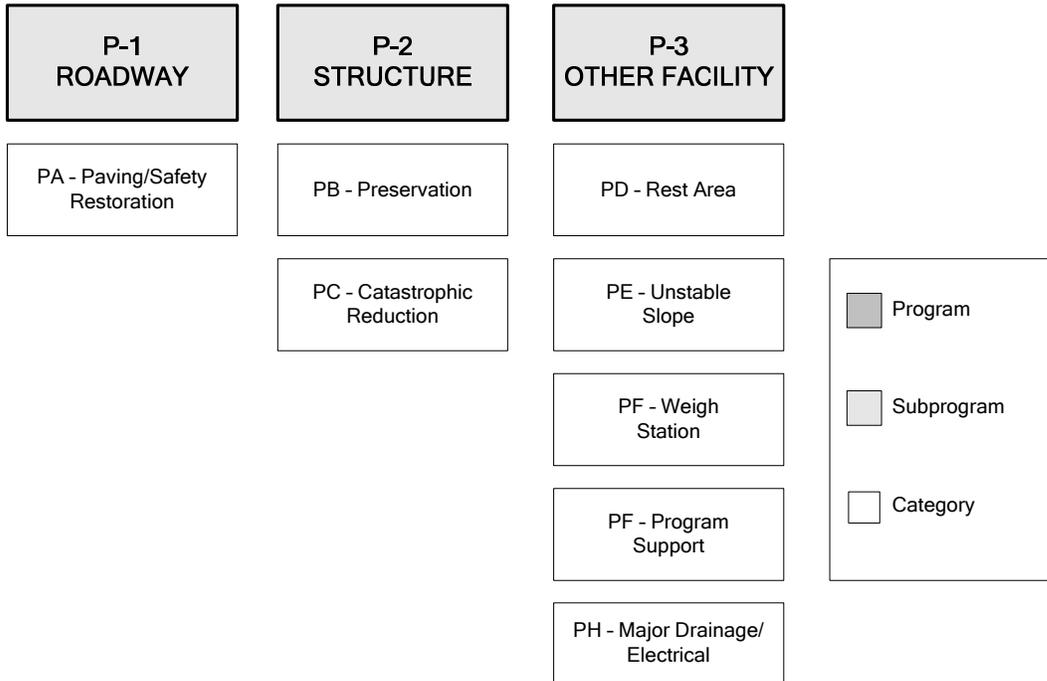
From the Highway Preservation and Improvement tables:

P-1–PA = 12%

I-2–ID = 18%

$$\frac{(2225000)(.12) + (1525000)(.18)}{3750000} = 14\%$$

## Program P - Highway Preservation



Preservation Projects Cost Range Table*										
Project Construction Cost	P-1			P-2			P-3			
	PA	PB	PC	PD	PE	PF	PG	PH		
\$0 – \$250,000	20%	20%	24%	18%	18%	23%	14%	21%		
\$250,000 – \$500,000	18%	18%	24%	16%	16%	20%	12%	18%		
\$500,000 – \$1,000,000	16%	16%	22%	16%	12%	18%	10%	16%		
\$1,000,000 – \$2,000,000	14%	14%	20%	14%	10%	16%	10%	16%		
\$2,000,000 – \$5,000,000	12%	12%	20%	14%	8%	14%	8%	14%		
\$5,000,000 – \$10,000,000	10%	10%	18%	14%	6%	14%	8%	14%		
\$10,000,000 – +	8%	8%	18%	14%	6%	14%	8%	14%		

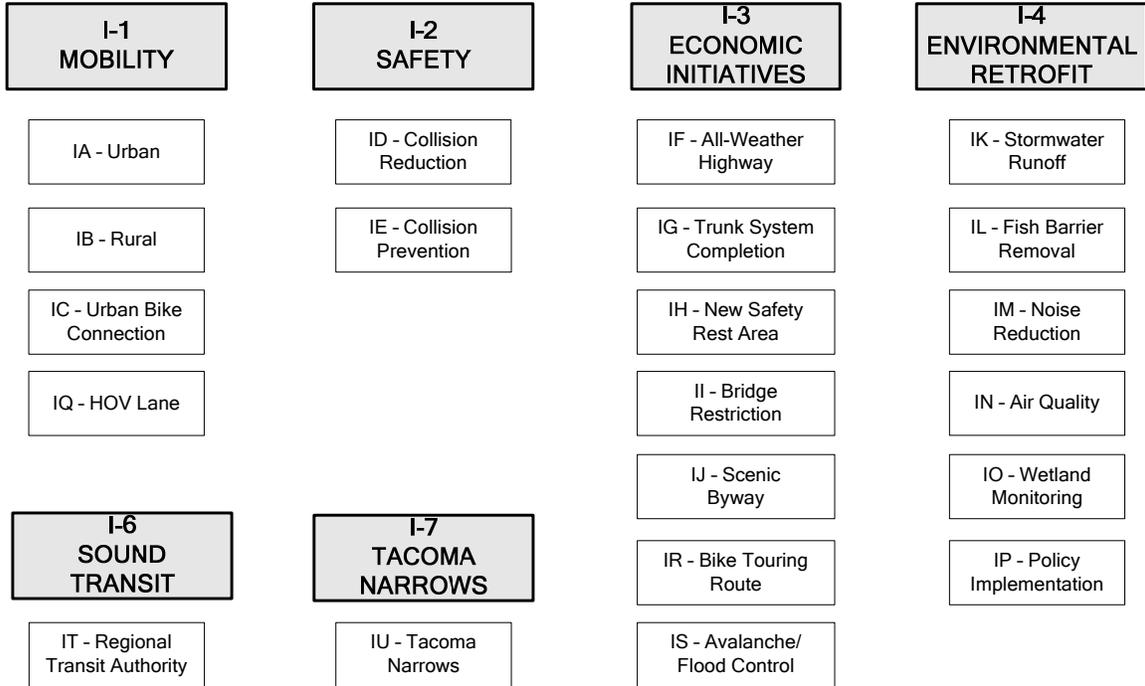
\* Highlighted percentages indicate there were not enough projects for an accurate sample.

**Program P – Highway Improvement**  
Figure 800-2

<b>P – Preservation Program</b>	
Preserve the highway infrastructure cost-effectively to protect the public investment.	
<b>P-1 – Roadway</b>	
Paving Projects	<b>PA</b>
<b>P-2 – Structures</b>	
New construction, update existing structures projects	<b>PB</b>
Seismic retrofits	<b>PC</b>
<b>P-3 – Other Facilities</b>	
Refurbish existing rest areas to extend service life and improve safety	<b>PD</b>
Construct weigh facilities	<b>PF</b>
Major refurbishments of electrical systems, electronics, mechanical systems and major drainage rehabilitation or replacement projects	<b>PH</b>
Slope stabilization projects	<b>PE</b>
All other items: RA discretionary funds	<b>PG</b>

**Program P – Highway Improvement**  
*Figure 800-2 (continued)*

**Program I - Highway Improvement**



Improvement Projects Cost Range Table*													
Project Construction Cost	I-1				I-2		I-3				I-4		
	IA	IB	IC	IQ	ID	IE	IF	IG	IH	II	IK	IL	
\$0 – \$250,000	26%	18%	22%	22%	24%	22%	22%	20%	12%	12%	18%	22%	
\$250,000 – \$500,000	23%	17%	22%	20%	22%	20%	20%	20%	12%	12%	18%	22%	
\$500,000 – \$1,000,000	20%	16%	20%	20%	20%	18%	20%	18%	12%	12%	18%	22%	
\$1,000,000 – \$2,000,000	17%	15%	20%	18%	18%	16%	18%	16%	12%	12%	18%	22%	
\$2,000,000 – \$5,000,000	14%	14%	18%	16%	15%	14%	16%	14%	12%	12%	18%	22%	
\$5,000,000 – \$10,000,000	13%	13%	16%	14%	13%	12%	14%	12%	12%	12%	18%	22%	
\$10,000,000 – +	10%	10%	14%	12%	10%	10%	14%	10%	12%	12%	18%	22%	

\* Highlighted percentages indicate there were not enough projects for an accurate sample.

**Program I – Highway Improvement**  
Figure 800-3

<b>I – Improvement Program</b>	
<b>I-1 Mobility</b> – Improve mobility within congested highway corridors.	
Congestion relief projects: Urban	<b>IA</b>
Congestion relief projects: Rural	<b>IB</b>
Bicycle projects	<b>IC</b>
High Occupancy Vehicle projects	<b>IQ</b>
<b>I-2 Safety</b> – Provide the safest possible highways within available resources.	
Accident reduction projects	<b>ID</b>
Projects that improve roadway geometrics, eliminate at-grade intersections, install signals/channelization at intersections	<b>IE</b>
<b>I-3 Economic Initiatives</b> – Support efficient and reliable freight movement on state highways. Support tourism development and other Washington industries.	
Freight and Goods improvement to all-weather surfaces	<b>IF</b>
Projects providing four-lane limited access facilities on a trunk system	<b>IG</b>
Constructing Rest Areas	<b>IH</b>
Replacing or modifying structures on the Interstate System with restricted vertical clearances and limited overload capacities	<b>II</b>
Scenic Byway projects	<b>IJ</b>
Bicycle rural road shoulder-widening projects	<b>IR</b>
<b>I-4 Environmental Retrofit</b> – Retrofit state highway facilities as appropriate to reduce existing environmental impacts.	
Reconstruct stormwater discharge facilities	<b>IK</b>
Projects removing fish passage barriers	<b>IL</b>
Projects including noise walls, berms, and noise mitigation measures	<b>IM</b>
Projects for air quality	<b>IN</b>

**Program I – Highway Improvement**  
*Figure 800-3 (continued)*

