

PROCESS ACTIVITY - PREPARE BASE ESTIMATE

Activity	Prepare Base Estimate
Description	Preparing a Base Estimate covers the development of estimated costs for all components of a project. These components may be estimated using different techniques depending on the level of scope definition and the size and complexity of the project. The number of components estimated may vary depending on the project development phase. For example, in the scoping phase the cost estimate covers preliminary engineering, ROW, and construction. Later in the design phase only construction related costs are estimated as ROW should be purchased.
Inputs	Completed project file Previous knowledge of site conditions Project Schedule
Technique and Tools	<p>Estimating Techniques</p> <ul style="list-style-type: none"> • Historical Bid Based (line items) • Cost Based Estimating • Previous Projects (similar scope) • Parametric (lane mile) • Historical Percentages <p>Estimating Tools</p> <ul style="list-style-type: none"> • Spreadsheet Templates • Estimate and Bid Analysis System (EBASE) • Planning Level Project Cost Estimation • Transportation Cost Estimator (TRACER) Software System • WSDOT Project Delivery Information System (PDIS) • Unit Bid History • bidTabs Pro • Estimated or Actual Cost Data for a Similar Project • Cost Indices • Standard Item Table • Independent Investigation by Engineer Preparing the Estimate • Project Estimate File Template
Steps	<ol style="list-style-type: none"> 1. Determine Applicable Estimating Technique(s) The estimator has to make a decision regarding which estimating technique or techniques are suitable for preparing the base estimate for a given project type (e.g., Preservation and Improvement). A combination of techniques may be appropriate. 2. Develop Estimate Information The estimator assesses the type of data needed to prepare the base estimate and then determines the specific data to be used. The standard item table serves as a basis for capturing the different elements required for the project. Key data that are estimated would be the quantities of materials required for different work items and

	<p>determining which items are estimated based on percentages.</p> <p>3. Apply Estimate Technique(s) In this step, the estimator selects specific cost data to use to convert project quantities to item costs. These quantities and cost data are input into an estimating tool, such as EBASE or a spreadsheet. When percentages are used to prepare estimates, the appropriate percentage must be selected corresponding to the items being estimated, past history, and policy guidance.</p> <p>4. Document Estimate Basis and Assumptions The estimator must carefully document all calculations, adjustments to historical cost data, and assumptions made when preparing the estimate. The estimate basis must be clearly stipulated (e.g., year of expenditure dollars). This information will facilitate estimate reviews and verification of costs as well as providing traceability.</p> <p>5. Summarize Base Cost Estimate A format should be used that clearly shows all major categories of the estimate and provides a total cost for the project. These cost summaries are combined with the assumptions and the basis to form a cost estimate package.</p>
Products	Base Cost Estimate Estimate Basis and Assumptions
Guidance	<ul style="list-style-type: none"> • A base estimate is an estimate that does not include the cost associated with uncertainties and risks (sometimes referred to as contingency). The base estimate should be the estimator’s best estimate of the cost of the project for a given scope of work, site location, and other project attributes. The base estimate should include all costs associated with the project at that point in the project development process when the project is being estimated. • There are many estimating techniques that can be used to prepare the base estimate. <ul style="list-style-type: none"> ○ The most common estimating technique is historical bid based estimating. The use of this technique varies depending on level of scope definition. It does require identifying line items. ○ Cost based estimating is used for items for which historical unit costs are not available. ○ The previous project approach to cost estimating is used when a past project is almost identical to the project being estimated and little adjustment to costs is required. ○ Parametric estimating is used when quick estimates are needed based on very little scope definition (dollars per lane

mile).

- Percentages are used in combination with the other techniques to estimate certain items (preliminary engineering or construction engineering cost) or estimate costs for items that cannot be specifically quantified at the time of the estimate but are known to be needed.
- The selection of estimating techniques and tools must be congruent with the level of scope definition available, project size, and complexity at the time the estimate is prepared. The time to prepare an estimate may influence the techniques and tools used.
- In most cases, the estimator has to identify line items and calculate quantities. The standard line item table provides a source for line items. The unit of measure is dictated by the standard line items or through the standard specifications. Quantity calculations are influenced by design information available (e.g., known facility geometry, number of items, and so on). Quantity calculations should be documented and will become part of the estimate file.
- When applying historical unit costs, the estimator must select unit costs that reflect the item being estimated, quantity of materials required, the location of the project, the complexity of the project, the time date of the unit cost, market conditions, and the proposed construction schedule. These adjustments are required whether or not the unit price data is from a bid history database or a similar project.
- If cost based estimating is used then the components of the estimate must reflect the specific scope, conditions and characteristics of the project.
- When a lump sum unit is used, the estimator should build up the lump sum unit cost using one of the previous techniques. Items in the lump sum should be clearly identified and documented as should be the quantities and unit costs used to develop total costs for line items that comprise the lump sum cost.
- Costs are generated through the use of EBASE or a spreadsheet developed for specific project applications. Using EBASE as early as possible in the project development process may be useful for tracing changes to the estimate over time.
- The base construction cost estimate should be escalated to year of construction dollars using the appropriate construction cost index and the mid point of construction. Right of way estimates should

use the R/W cost index.

- Traceability is a critical requirement necessary to prepare a credible cost estimate. Traceability allows others to review and validate the estimate. Traceability provides the mechanism to assess cost impact when the scope changes or when other project conditions or characteristics change.
- Traceability is facilitated by clear and concise documentation. Documentation should include estimate basis, assumptions, and calculations. A project estimate file should be created to assemble these items in a single location.
- Estimate bases and assumptions are at two levels: 1) high level basis and assumptions that apply to all parts of the project estimate; and 2) detailed level basis and assumptions that apply to individual item estimates.
- A short cost estimate summary package can be prepared that captures key features of the estimate such as total project costs, key estimate basis and assumptions, project schedule, and other critical items.