

# ST3 COST ESTIMATES

SOUND TRANSIT 3

DECEMBER 2015

## How does Sound Transit develop cost estimates?

To develop Sound Transit 3 cost estimates, Sound Transit drew on its proven experience planning and building major capital projects. ST3 cost estimates were developed with the methods that have kept the Sound Transit 2 measure on track. They include ample contingency and reserve funds that take into account the very early stage of design they are based on. The cost estimates will be independently reviewed by an Expert Review Panel appointed by the state of Washington.

## What is Sound Transit’s cost estimating track record from its last ballot measure?

Sound Transit is approximately halfway through the 15-year period of delivering the major light rail expansions that regional voters approved in 2008 as part of Sound Transit 2. The below chart shows the cost estimates for the major light rail extensions that were included. It demonstrates that the 2008 estimates, which relied on approaches now being used for ST3, are proving to have been prudent and effective.

Project	Current project phase, \$ year of comparison *	Current estimate	ST2 high-range estimate from 2008, including contingency and reserve	Current estimate % of ST2 estimate
South 200th Link light rail	In construction, 2011\$	\$343,770,000	\$367,450,000	94%
Northgate Link light rail extension	In construction, 2012\$	\$1,601,214,040	\$1,620,290,000	99%
East Link light rail	In construction, 2014\$	\$ 3,079,087,698	\$3,185,348,000	97%
Lynnwood Link light rail	Final design, 2014\$	\$1,453,980,000	\$1,614,198,000	90%
Link O&M Maintenance Satellite Facility	Final design, 2015\$	\$381,130,000	\$298,615,000	128%
Tacoma Link	Final design, 2015\$	\$153,170,000	\$188,300,000	81%
Link to Kent/Des Moines	Preliminary engineering, 2014\$	\$485,960,000	\$474,331,000	102%
* For comparative purposes costs are presented in the listed constant dollar year				<b>Average: 97%</b>

## Representative alignments: the basis for cost estimates

Developing the base cost estimate for each project involves studying a representative alignment. The term “representative” refers to the fact that a final alignment cannot be selected until after the major environmental studies and public involvement that follow voter approval. The representative alignment allows cost estimates to be developed using initial assumptions for the project’s route, length, mix of at-grade, elevated and/or underground profiles. Other representative assumptions include the types of investments to enable passengers to access the project, such as facilities for parking, bus-rail transfers, bicycling and walking. Sound Transit breaks down the project into different elements and applies estimates

of unit costs for each of its many components. These costs are estimated in today's dollars and become part of a spreadsheet for calculating the project's base cost. It is important to note that these estimates need to be inflated to year of expenditure (YOE) dollars once the period in which a project will be delivered is known. In 15 years a project will cost around 60 percent more than today with compounded inflation.

### **Evaluating risks**

Planners work to identify all major foreseeable risks to a project that could increase its costs. These uncertainties range from soil conditions and structural challenges to legal, property acquisition and permitting risks. Sound Transit uses risk assessments to support and inform contingency levels for its capital projects. Agency procedures stipulate that cost estimates including contingencies be established or baselined at 80% confidence level or higher, meaning there is an 80% probability that the project will be completed at or lower than the estimated cost.

### **Building in appropriate contingencies**

Contingencies are budget allowances to address uncertainty and risk associated with the delivery of a given scope of work such as unexpected conditions (e.g., ground conditions) and market fluctuation (e.g., unusual material price escalation). It provides the mechanism to manage the variance between estimates and actual project costs. Successful planning depends on including a level of contingency funding that is appropriate for the conceptual and representative nature of project designs, and for a project's identified risk, providing confidence and credibility in the cost estimate. Four different types of contingency are used, consistent with best practices identified by the Federal Transit Administration (FTA), Association for the Advancement of Cost Engineering International (AACEI) and American Society of Professional Estimators (ASPE).

- 1. Design allowance:** Construction cost estimates consist of a "base cost estimate" and a corresponding "design allowance." The sum of the base cost estimate and the design allowance represent an estimate of the expected contract award amount. The design allowance addresses uncertainty regarding the final configuration of construction scope elements. It accounts for the fact that defining and quantifying a project's scope is an incremental process that grows greater in certainty as projects move toward completed designs and construction. Therefore, design allowance is reduced in parallel with the advancement of scope definition and design. It moves from around 30% in the early stages to zero by the time the project is put out to bid.
- 2. Allocated contingency:** An allocated contingency addresses risks and unknowns that could come up during the execution of the project. In the earliest stages of project development, the allocated contingency is 10% to 20%, depending on the project's complexity and risks. In most cases, allocated contingency for ST3 candidate projects will be 15%. By the time a voter-approved project goes out to bid, depending on the project/contract delivery method, the allocated contingency may be reduced to as low as 8%.
- 3. Unallocated contingency:** Cost estimates also include unallocated contingency (UAC) that is available to address cost risks and uncertainties that could come into play at different phases of the project. During the initial stage of project development, unallocated contingencies are typically set between 10% and 15%. The candidate project summaries have established the amount at 10%. By the time a project goes to bid it may be dropped to as low as 5% depending on the level of risk.
- 4. Project reserve:** The project reserve is used to address general project-wide cost risks and uncertainties. Assignment and allocation of project reserve requires approval by two-thirds majority of the Sound Transit Board. Project reserves for ST3 projects have been set at 7%.