FEHR PEERS

MEMORANDUM

Date: September 3, 2015

To: Matt Bomberg, Alameda CTC

From: Carrie Nielson and Ryan McClain, Fehr & Peers

Subject: Alameda CTC ATP Network Cost Estimating Tool User Guide

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This memorandum serves as companion user guide to the Alameda County Transportation Commission (Alameda CTC) Active Transportation Plan (ATP) Network Cost Estimating Tool. Alameda CTC developed the ATP Network Cost Estimating Tool (the Tool) to provide countywide consistency in how costs for bicycle and pedestrian projects are estimated at the network planning scale. The primary use of this tool is by local jurisdictions during the development and review of active transportation plans, bicycle master plans, pedestrian master plans, and specific plans. The tool can also be used in a sketch-planning capacity to provide conceptual cost estimates for a given bicycle and/or pedestrian project.

This memorandum provides a step-by-step guide of how to use the tool and is organized into six sections:

1. Overview of Tool
2. Inputting Projects
3. Revising and Deleting Projects
4. Project List
5. Modifying Assumptions
6. Additional Information

1. OVERVIEW OF TOOL

The Tool is a Microsoft-Excel based tool that allows for user input regarding project details. Based on bicycle and/or pedestrian facility type, mileage, number and type of intersection, and design elements, a cost is automatically calculated. The Tool is organized into three tabs in Excel:

Cost Calculator: This is the primary area of user input. This is where users should enter the basic information such as project description, segment information, mileage, number and type of intersections, and design elements. Cost per segment and per project is calculated on-the-fly in this tab as inputs are entered and adjusted.

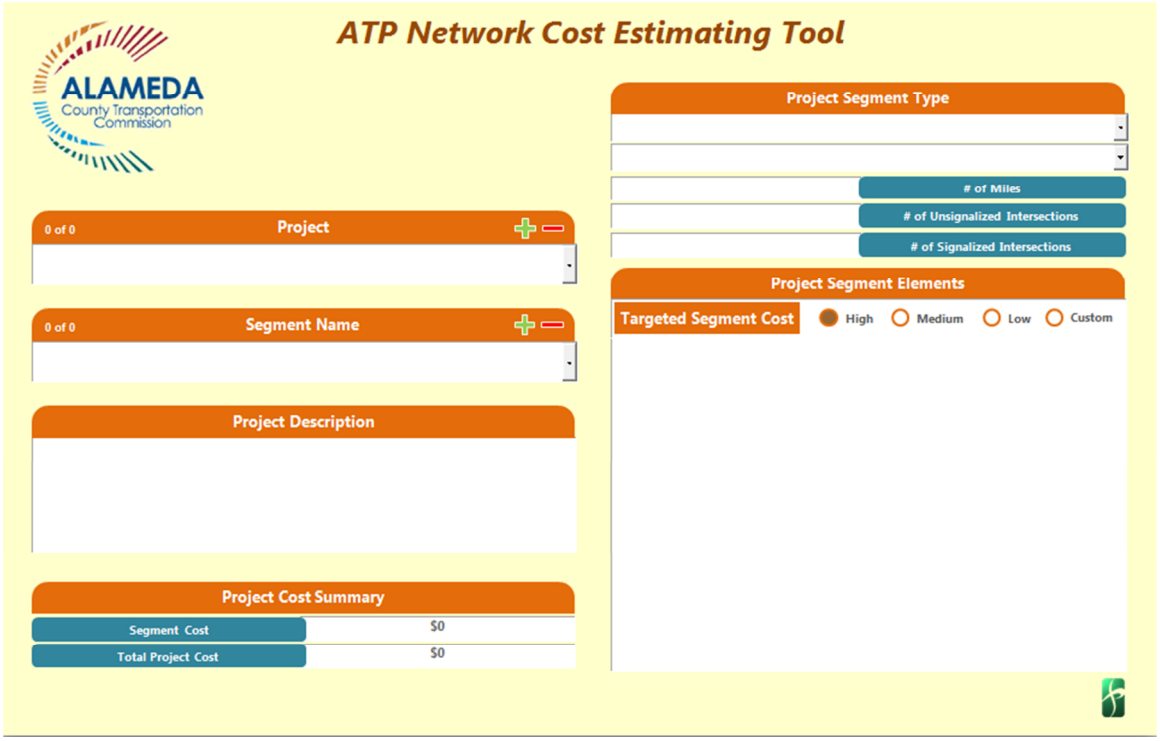
Report: This is the primary output of the tool. The Report Tab automatically saves all information entered on the Cost Calculator and reflects all data stored in the database. This can be used as a comprehensive project list for Active Transportation Plans. Each project and segment is listed as a row.

Cost Assumptions: This allows for direct input of assumptions of soft costs, unit costs, and design parameters for each of the design elements and is used to calculate project costs. This is organized into four areas: (1) Assumptions & Soft Costs, (2) Unit Costs, (3) Composite Unit Costs, and (4) Corridor Unit Costs. These are further outlined in the Cost Assumptions section of this memo.

2. ENTERING PROJECTS (COST CALCULATOR TAB)

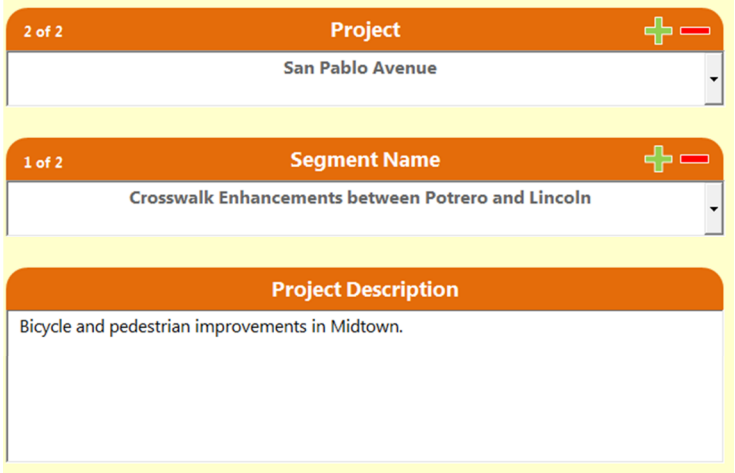
To enter a project, the Cost Calculator Tab should be selected. Selecting the green " + " sign will enter a new Project. The Cost Calculator is organized into several areas of input:

- **Project Information** ("Project" and "Project Description")
- **Segment Information** ("Segment", "Project Segment Type", and "Project Segment Elements")
- **Cost Information** ("Segment Cost" and "Total Project Cost")



Project Information ("Project" and "Project Description")

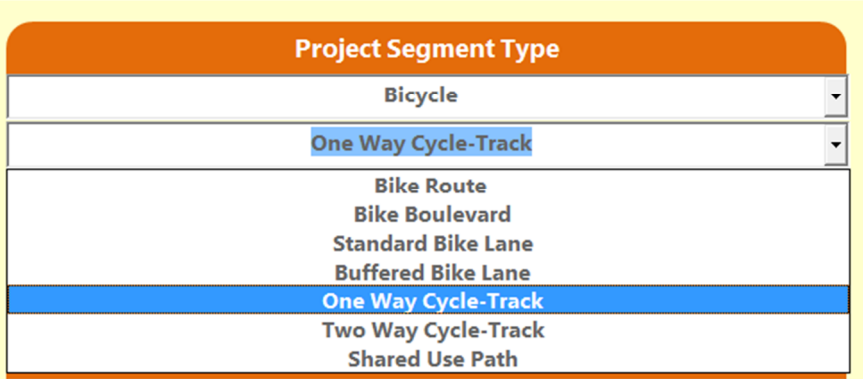
First, Project information should be entered. The Project is considered to be an overall umbrella for individual segments. For example, "San Pablo Avenue Complete Streets Improvements" might be a project name. Under that umbrella, several distinct segments may exist: "Cycle Track between Potrero and Lincoln Avenues", "Crosswalk Enhancements between Potrero and Lincoln Avenues", and "Enhanced Bicycle Route between Lincoln Avenue and Southern City Limit." Similarly, the Project Description applies to all segments under the project. The Project Name should be entered first, after which the Tool will prompt the user to input a Segment Name. After that, the Project Description should be entered.

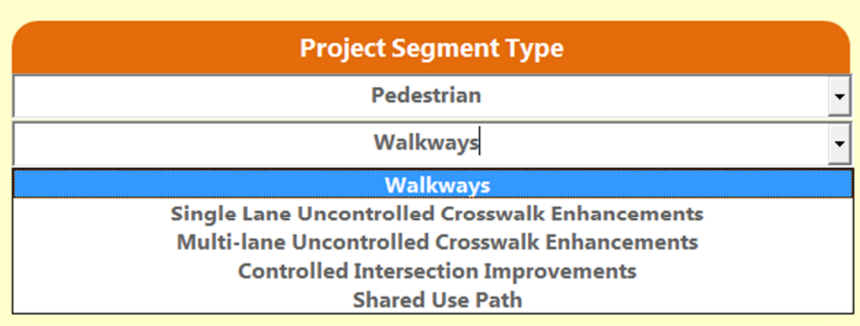


Segment Information ("Segment", "Project Segment Type", and "Project Segment Elements")

Segment Name and Type

Once the Project is identified, the Tool will prompt the user to enter a Segment Name, which should be descriptive both in terms of project extents (e.g. "Potrero to Lincoln Avenues" or "Intersections at Potrero Avenue, Stockton Avenue, and Lincoln Avenue") and facility type (e.g. "Uncontrolled Crosswalk Enhancements" or "Bicycle Boulevard"). Once the Segment Name is identified, the Segment Type should be identified. For simplicity, these have been divided into either Bicycle or Pedestrian Projects. A Project may have both Bicycle and Pedestrian links, but a Segment must be one or the other. Based on the selection of Bicycle or Pedestrian Segment Type, a list of potential project types is generated in the next drop down list.

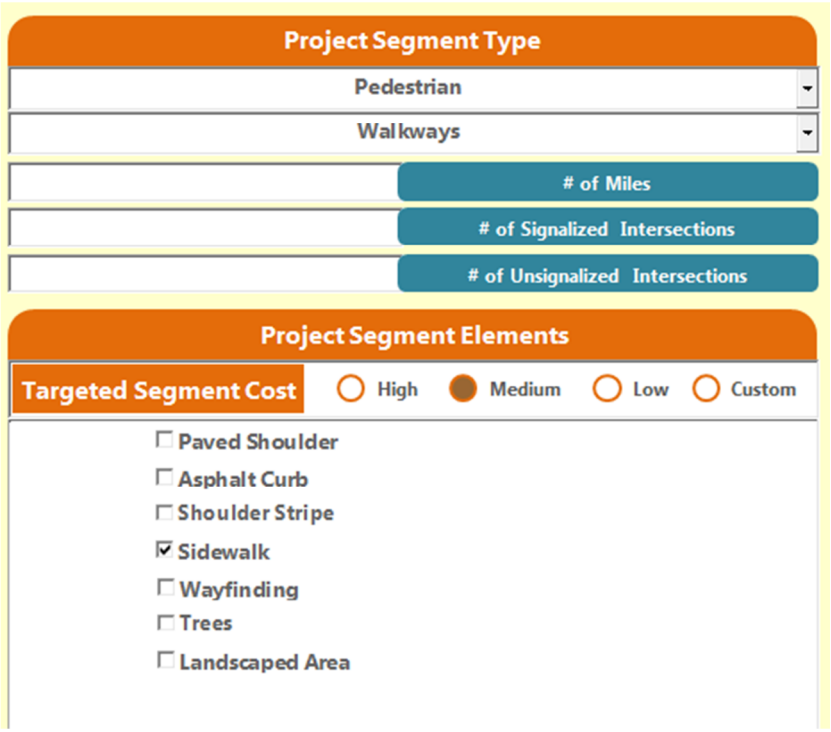




With the facility type selected, users are then asked to input the mileage of the facility as well as the number of signalized and unsignalized intersection. The mileage information is used where a "link" type improvement is selected, such as a walkway (e.g. sidewalk, path, or shoulder) or bikeway (e.g. bicycle lane, path, cycle track, bicycle boulevard, etc). The intersection information is used as a multiplier for intersection improvements. For example, when curb extensions is selected for Uncontrolled Crosswalk Enhancements, the cost for curb extensions at a crosswalk will be multiplied by the number of unsignalized intersections.

Segment Elements and Targeted Segment Cost

Once the facility type, mileage, and number and type of intersection have been input, the Tool will automatically generate the relevant design elements. Each Project Segment Element has a checkbox next to it that can be selected or deselected to address the design elements of the given project. If the user is less familiar with the specific design elements, there is an opportunity to select a Targeted Segment Cost of high, medium, or low. If design elements are selected and unselected beyond the defaults, the Targeted Segment Cost switches to "Custom."

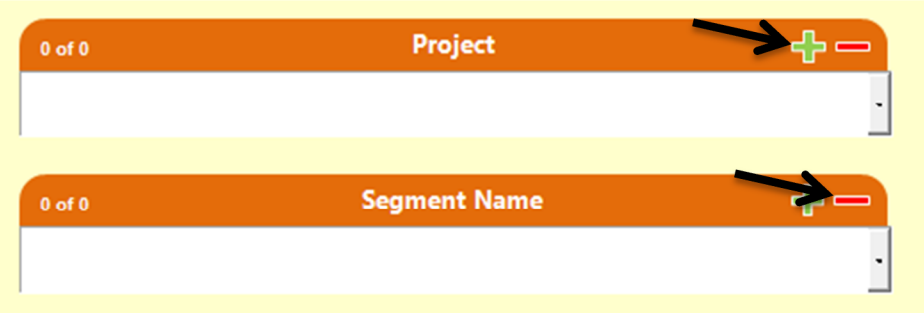


Cost Information ("Segment Cost" and "Total Project Cost")

As design elements are selected and deselected, the Segment Cost will automatically calculate. The Total Project Cost will sum the costs of all other Segments in the Project. If more detailed cost estimates are available for a project, it is possible to override the Segment Cost. This can be done by double-clicking into the Segment Cost area, which will prompt the user to manually input a cost. This will then be saved for that Segment and will be reported in the Report along with all other Segments and Projects.

3. REVISING AND DELETING PROJECTS (COST CALCULATOR TAB)

Projects and Segments can be revised by navigating to the relevant Project or Segment, double-clicking into the text box, and editing the text. The Project and Segment Name sections both have drop-down menus that allow users to navigate between Projects and Segments, respectively.



Projects and Segments can be deleted by selecting the red " – " sign next to Project and Segment, respectively. The user will be prompted with a screen confirming the deletion of that Project or Segment.

4. PROJECT LIST (REPORT TAB)

As projects are entered, revised, and deleted, the Report Tab creates a running list of inputs. The report is organized by Project and then by Segment, with each receiving a respective row. Segment Type, Facility, and Project Elements (e.g. the checkboxes of design elements) are listed along with the Segment Cost.

ACTIVE TRANSPORTATION PLANNING
PROJECT LIST AND COST ESTIMATES

Project Name / Segment Name	Detailed Description / Type	Facility	Project Elements	Cost
San Pablo Avenue	**Bicycle and pedestrian improvements in Midtown.**			
Crosswalk Enhancements between Potrero and Lincoln	Pedestrian	Multi-lane Uncontrolled Crosswalk Enhancements 4 signalized intersections	Rectangular Rapid Flashing Beacon, High Visibility Ladder Crosswalk, Curb Extension - Raised	$716,408
Cycle Track between Potrero and Lincoln	Bicycle	Bike Route 1 miles	Bike Route with Signage Only, Wayfinding Signage	$108,240
			Total	**$824,648**

Date : 5-20-2015

5. MODIFYING ASSUMPTIONS (COST ASSUMPTIONS TAB)

The Cost Assumptions tab houses all of the assumptions used to calculate the cost estimates. The inputs in this tab apply to all Projects and Segment in the network. Therefore, when a user changes something on this tab, the change will apply to all projects in the network. If assumptions need to be adjusted for a specific project, it is recommended that users do a "Save As" to isolate those adjustments to the assumptions. Areas that allow user input are shown in light green.

This tab is divided into four main areas, each of which build on each other to create the final costs used to calculate the Project Segment Elements and Segment Costs:

- **Assumptions & Soft Costs**: This section houses basic assumptions, such as block length, in addition to soft cost and contingency assumptions.
- **1. Unit Costs**: Recent unit costs contextualized for the San Francisco Bay Area are listed under Base Cost. The Base Costs are then multiplied by the soft cost assumptions to derive the Adjusted Costs, which includes all soft costs and contingencies.
- **2. Composite Unit Costs**: The Adjusted Costs are then multiplied across the Quantities and Units of design parameters for each design element to create a Composite Unit Cost. Design assumptions regarding, for example, width of a sidewalk or median refuge can be made in this area.
- **3. Corridor Costs**: Corridor costs multiply the Composite Unit Cost against the number of design elements present per mile or intersection. For example, the curb extension cost derived in 2. Composite Unit Costs is then multiplied against a Quantity of four curb extensions per intersection. Similarly, the raised landscape buffer calculation is then multiplied by a Quantity of two to estimate the cost on both sides of the street, as in one-way cycle tracks with landscaped buffers.

6. ADDITIONAL INFORMATION

Unit Cost Sources

The unit costs included in the Cost Estimating Tool represent an up-to-date database of prevailing construction costs per unit typically observed in Alameda County, as validated by information from local jurisdictions and through the results of recent of bid documents. The unit costs should continue to be validated moving forward as Alameda CTC maintains the Cost Estimating Tool and/or as local jurisdictions modify the tool for their local purposes.

Maintenance

Maintenance costs can vary considerably for the various types of pedestrian and bicycle improvements included in this Tool. As such, maintenance is not specifically accounted for the costs derived from the Tool. For Class 2 and 3 bikeways, as examples, pavement markings will be replaced when the roadway is resurfaced. The additional cost to the overall pavement project would be similar to the cost for new striping and pavement marking. For cycle tracks, maintenance can vary depending on if the separation is striped or if it is a raised island with landscaping. Maintenance of landscaping should be considered relative to other landscaping maintenance performed by the local agency and incorporated into that program.

Pedestrian facilities such as sidewalks and curb extensions can have a life span of 50 years or more assuming they are constructed correctly. However, tree roots or base failures can cause premature failure.

Shared-use paths require regular maintenance to maximize their life span. It is recommended that paths be included in the local agencies pavement management program. Maintenance costs can be calculated using the following assumptions:

- Slurry seal at 5 and 10 years at $1 per square foot
- Overlay at 15 years at $4 per square foot