Appendix B: Projecting Future Costs

In projecting future costs, financial best practices should be used. The task of projecting future costs is always subject to assumptions and selected methods. Cost estimates should clearly state whether they are *real* or *nominal*. Real costs are adjusted for inflation, whereby the costs of a project in future years can be directly compared to the cost in a current year. Nominal costs, on the other hand, are not adjusted for inflation and are reported as the amount that must be spent in that year, which can be useful when comparing to revenues. Both are valid methods of reporting financial projections, but detailed descriptions of assumptions are necessary to incorporate into asset management.

Costs of future projects may be reported as total capital costs and/or as unit values. Total costs are the full amount to be spent on a project, which must often be provided to builders up front and is subsidized by revenue from an investment or bond. However, to compare the financial feasibility of various options, total costs are often converted to unit costs as well, which can allow for comparing various new options, along with benchmarking to existing infrastructure costs. Unit costs can be reported as:

1) *Capital costs per projected capacity*, which is the total design and construction cost divided by a projected numerical output, such as volume of water captured or volume of water treated. This helps gauge the efficiency and viability of the actual construction process.
2) *Long-term performance costs*, which account for the projected returns that a project will yield. This allows decision-makers to understand the expected long-term returns for a project that must be paid for now but financed over the long-term.

While project costs for infrastructure occur up front, such investments yield long-term returns. These are captured by annualizing costs over a long period of time that is equal to the estimated lifetime of the new project. The lifetime unit costs would be the total costs (construction and long-term maintenance) divided by the total lifetime expected capacity or output. The unit costs can also be annualized based on an assumed discount rate to account for the changes in the value of money over time. The EFC has provided guidance to communities in standardizing estimates for current and future costs.

Notably, estimates of future costs should be for new infrastructure that 1) meets water quality and flood control/drainage goals and 2) is under municipal control. Costs to municipalities for future build outs on private lands, which are directly covered by private development fees, would not be included in the assessment through this approach.

The unit cost metrics help in comparing options in terms of benefits and value, but cost estimates and accounting can become even more detailed. For instance, the costs of a given project can be estimated in terms of output variability. Each project will have some mix of both *fixed* costs, which do not change with size or operational parameters, and *variable* costs, which do change with operational modifications. These combine to yield a cost-curve that relates size or output with unit costs. When building a new water project, the size is often a critical design decision. Larger projects, while more expensive, often yield lower unit costs.

Other even more advanced and data-intensive accounting methods exist. *Life-cycle cost accounting* includes costs for building, operating, and maintaining a piece of infrastructure over time that incorporates the multitude of operational considerations and monetized benefits over the expected timeframe of the infrastructure. Such accounting can be expanded even further to include *multiple*

benefits that are not necessarily monetary. For stormwater, such life-cycle and multi-benefit assessments are just starting to be used by municipal and county governments in project planning. The EFC tools support cost estimates that include life-cycle costs, but at this time do not directly help accumulate multi-benefit quantifications, which can often be highly-project specific.