

Design and Development of Facilities

When the greenway or trail ROW has been acquired, the process of designing the planned improvements for the property can proceed to final stages. Improvements to a greenway could be limited to installing signs, but may involve more elaborate activities, such as habitat restoration. Because development of a trail involves construction of facilities and installation of equipment, the paragraphs below provide advice on implementation procedures and recommendations for common features, materials, and equipment.

Establishing a phasing plan is the first step in breaking the total project down to fit the funds committed to the project. To develop a phasing plan, fairly accurate costs for proposed improvements must be determined. While general costs and quantities were sufficient to determine feasibility, develop the master plan, and apply for grants, greater accuracy and detail will be needed at this point to

Ways to reduce construction costs

1. **Seek donated materials from suppliers in exchange for recognition.**
2. **Use recycled or surplus materials from contractors in the area.**
3. **Use waste materials, such as wood chips, fly ash, and demolition debris.**
4. **Well organized volunteers can provide labor for some tasks.**
5. **Involve scout and other youth groups.**
6. **Community service ordered by the courts may be applicable to a trail project.**
7. **Contractors may donate equipment and expertise.**
8. **Inmate labor from area correctional units.**
9. **Youth Conservation Corps.**

ensure that a usable facility is available when construction funds have been expended.

Those who work in the construction industry have methods and data that can help identify probable costs of materials and labor for various types of improvements, but considerable experience and judgment is needed to make accurate interpretations. Your organization can engage the services of professionals familiar with estimating construction, or you can develop your own estimates based on contacting other trail groups which have had recent construction experience in your area. Some cost data that can be used for general guidance is included in Appendix IX. The most time-consuming method of predicting costs is to contact three contractors or suppliers for each step of the construction process (e.g. grading, paving, signs) to get a feel for how they price their work or deliveries.

With current prices for the various items and the master plan, you can calculate the total cost for each item for a convenient increment of the trail, such as per foot or per 100 feet. Based on the combined unit costs for all of the elements to be included you can work out how much of the trail can be built with the available funds. These unit prices can also be used for fundraising. The organization can “sell” segments of the trail to donors who receive recognition for the segment through a sign or plaque. Care must be taken to include everything that will be required. If, when planning for the trail, contractors and suppliers have agreed to donate services and materials, those items can be omitted from these estimates. When the probable cost has been estimated for a usable segment of the trail, the phasing plan can be completed to show the sequencing, timing, and budgets for the first and subsequent segments.

Construction plans and specifications can be prepared next, using the funding immediately available for implementation. Using unit prices from the phasing plan

and the list of improvements to be made, drawings can be prepared that show the length, width, and elevations of the trail and the specific locations, sizes, and quality of all the materials and equipment. These detailed drawings and specifications can be distributed to interested general contractors for competitive bidding. If funding for the project comes from state or federal sources, the funding agency will supply the specific requirements for procedures to be followed in bidding. If the local government is involved in the project, personnel from the public works or purchasing departments will likely be involved to assist with the bidding process. If funding is all from private sources, the procedures are less prescribed and more like the course of action an individual would take when seeking a contractor for improving private property.

Construction permits will be required before building most significant elements such as parking lots, entrance driveways, drainage structures, and maybe even signs and the trail itself. What is required will be determined by the local government with jurisdiction over the real estate involved. If streams or wetlands are to be crossed or disturbed in anyway, state and federal agencies must be contacted to determine what permit applications will be required, in addition to those submitted to the local government. Normally, a complete set of plans and specifications include temporary measures and permanent fixtures needed to mitigate the effects of construction and long-term use of the facility. Erosion and sediment control and traffic control plans prescribe specific actions that must be performed during construction. With those plans, the contractor will apply to the local government for a grading permit and permission to interrupt traffic when needed. Plans for detaining and treating stormwater runoff leaving parking lots and paved surfaces will be required in all Tidewater localities and other localities which have implemented stormwater management regulations under the Chesapeake Bay Act and/or the federal Clean Water

Act. A local building permit may also be required for some or all of the work and the contractor will use the plans to apply for the permit.

State and federal permits may be required for alterations to streams, wetlands, or beaches. Because the measures needed to protect these resources are site specific, there are few standard solutions that can be included in the contractors' bid materials. Therefore, an application must be submitted to the relevant agencies during the development of the plans and specifications so that the measures that will be required can be included in the work. If a project comes in contact with any body of water, other than a very small privately owned pond, the Virginia Marine Resources Commission should be contacted to initiate the Joint Permit Application process. This process will inform the appropriate regulatory agencies of the project and they will determine whether they have jurisdiction over the proposal. With the Joint Permit Application, you will need to include fairly detailed plans of your proposed construction and any mitigation measures proposed. Representatives from one or more state or federal agencies may need to visit the site prior to making a jurisdictional determination.

Inspection of construction provides quality control over the final product. An individual familiar with the intent and specifics of the project should observe the work of contractors on a frequent and regular schedule. Deviations from the plans and specifications should be brought to the attention of the general contractor. One individual should be designated as the construction representative of the trail organization so the general contractor has a ready point of contact. It is essential that contractor questions be answered quickly and with certainty, and that unacceptable deviations from the plans and specifications be corrected.

Payments to the general contractor should be made promptly, but only for work completed minus approximately 10 per cent of each bill submitted. The amounts held back, called retainage, are reserved until the final inspection has confirmed that all work is finished in a satisfactory manner. A letter of acceptance from the organization should be provided to the general contractor along with payment of the retainage.