

Chapter 8
INCORPORATING THE NATURAL WATERSCAPE INTO BERKELEY PARKS:
AN ECONOMIC APPRAISAL
Laura Richard

Introduction

While the many benefits of recreational facilities are easily described, they are not readily measured in economic terms. For this reason it has been argued that no attempt to measure the economic benefit of recreation should be made, as even the most optimistic estimates are likely to understate its true value. Expenditures of public funds for these facilities must thus be made and justified on other than purely economic grounds. As recreational funding must compete with other demands for public funds, however, it seems desirable to attempt to place at least an approximate monetary value on it (San Mateo Planning Commission, 1961). The objective of this paper is to assess the additional cost or savings of including elements of the natural waterscape into parks. To this end, two different Berkeley parks--Strawberry Creek Park and North Waterfront Park (see map, p. viii)--are examined.

Strawberry Creek Park is designed to offer many of the same facilities as several other city parks, including a large grassy area, a creek, a picnic area, plus recreational courts. The significance of this park is that it is presently under development, and that it involves the restoration of Strawberry Creek.

Even though North Waterfront Park is a littoral community, the design of the park was originally based on the same principles as Strawberry Creek Park. A newly adopted plan, however, requires the replacement of exotic plants with species native to California. This two-year project, undertaken by DAWN (Design Associates Working with Nature), will incorporate a large variety of native species into an integrated plant community. Each plant has a function in a low-maintenance design that is both aesthetically pleasing and fully compatible with human use.

Cost Structure

The most important constraint in park planning is economics. Money must be available for initial planning, for the actual construction, and for the continued maintenance of a park. It is therefore necessary to understand how the whole park cost-structure is financed. In Berkeley, there are two

sets of funds involved in financing parks. Measure Y is a tax override that was approved by the voters to acquire and develop land exclusively for parks. It placed a twenty cents per one hundred dollar assessment on the City of Berkeley (Chuck Roberts, pers. comm., 1983). Funds allocated through Measure Y are used for parks in the uptown region. Shoreline parks, on the other hand, are financed by fees collected from boat owners who rent slip space at the Berkeley Marina.

The development of Strawberry Creek Park, formerly known as SUDS-Flatland Park, is an approved Measure Y project. Half of the current total funding of \$500,000 for the park is from a Federal Land and Conservation Grant which matches the amount allocated from Measure Y. The \$500,000 is only for the planning and construction of Strawberry Creek Park and not for maintenance. Once the park is completed, the maintenance costs are absorbed in the city budget, which is reviewed and revised when needed to accommodate new parks.

The financial structure of the North Waterfront Park is based on a different principle than that of Strawberry Creek Park. Usually enough revenue is received from boat owners to expand the park to the desired degree; it has been necessary, however, to go to the State Coastal Conservancy (SCC) for additional funding. The SCC has authority to award grants to local non-profit organizations and public agencies acting in their behalf for the acquisition and development of coastal resource enhancements, coastal protection, and public access projects. It is through such a grant that the development of the North Waterfront Park is made possible.

The total grant request was \$49,472 for two years, but the SCC only matched the \$18,800 that the City of Berkeley was willing to allocate. During the two-year project, the park will be maintained by DAWN. When the park is completed, however, it will become the city's responsibility to maintain the area.

Construction Cost - Strawberry Creek Park

Originally the area designated for Strawberry Creek Park was a two-block-long Santa Fe Railroad right-of-way. As shown in the final design plan, the 3.7 acre area has been transformed into a large neighborhood park. A unique feature in the plan is the creek that is being unculverted and returned to an approximation of its natural state. Rising from the picnic ground adjacent to the creekside is a small lawn area, and a bowl-shaped children's playground with equipment. Due to the closure of a portion of Allston Way, a broad path for pedestrians and bicyclists is provided. Traversing the park north to south is a rolling turf field (see paper by Bakonyvari, this report).

The most expensive element of the proposed Strawberry Creek Park is the restoration of approximately 150 feet of Strawberry Creek and the closure of Allston Way. To accommodate these costs, an attempt has been made to reduce spending in other areas. These attempts include the implementation of drip irrigation in some planting beds, and the construction of a self-draining, rolling turf field

that will replace necessary subsurface drainage structures. Even though the design of Strawberry Creek Park is not excessive or elaborate, the City Planning Department is still over its existing budget of \$500,000. It is estimated that to develop the project as presented in the final design plan, another \$25,000-\$40,000 will be needed (Action Minutes, City of Berkeley, September 22, 1981).

Figure 1 is a cost breakdown of each component involved in the planning and construction of Strawberry Creek Park (Doug Wolfe, pers. comm., 1983). Assuming an allocated park budget of \$500,000, it can be calculated that development of Strawberry Creek Park costs \$3.10 per square foot. This figure is somewhat higher than that required to develop a park that does not include a creek. Two items of special interest in the estimate are (1) site preparation and demolition; and (2) rough grading, creek bank stabilization and drainage. These are important because they represent the construction costs of including a creek into the park. The low-bid cost of site preparation and demolition is \$41,150 (Doug Wolfe, pers. comm., 1983). This includes the cost of unculverting the creek and removal of the concrete, plus demolition of Allston Way on the site. An exact estimate of the creek cost is impossible to determine. It is not unrealistic, however, to assume that approximately fifty percent of the \$41,150-- that is, \$20,575, is directly related to opening the creek. The estimate for rough grading, drainage and creek bank stabilization can be broken down further to distinguish how each component contributes. Rough grading is \$8,740 and drainage is estimated to cost \$15,430, but these costs represent the whole site, and therefore are not significant in determining the approximate construction cost of a creek. Creek bank stabilization, however, is an important component, and is estimated to be \$4,290 (Doug Wolfe, pers. comm., 1983). This number is lower than originally anticipated because the contractor plans to use the concrete from the removal of the street to stabilize the creek banks, alleviating the need to haul the concrete a long distance for disposal. An additional cost of \$6,840 is incurred for including a footbridge (Doug Wolfe, pers. comm., 1983).

The additional construction cost contributed by the inclusion of the creek, then, is:

\$20,575	Site preparation and demolition
4,290	Creek bank stabilization
6,840	Footbridge
<hr/>	
\$30,705	TOTAL

If this figure were broken down to represent the construction cost of the creek, it would be found to be approximately \$205 per foot of creek. Certain factors, however, need to be considered in evaluating this figure. For instance, if the creek had not originally been culverted, there would have been a significant decrease in the cost attributable to site preparation and demolition. Intensive creek bank stabilization might not have been necessary either, had the creek been unculverted, since basic erosion control measures would most likely have already been in practice. For this particular park,

FIGURE 1

PARKS DESIGN SECTION COST ESTIMATE

<u>ITEMS</u>	<u>COST</u>	<u>TOTAL</u>
<u>Base Bid Items</u>		
Site Preparation & Demolition	\$35,000	
Rough Grading, Creek Bank Stabilization & Drainage	46,000	
Irrigation	38,000	
Electrical Work	18,000	
Paving, Curb & Gutters	81,000	
Fencing and Bollards	54,000	
Sports and Play Equipment	62,000	
Furniture, Carpentry & Bridge	36,000	
Soil Preparation, Planting, Seeding & Mulching	<u>55,000</u>	
Base Bid Items		\$425,000
Contingencies		60,000
Design, Engineering & Inspection		<u>40,000</u>
TOTAL PROJECT COST <u>WITHOUT</u> ALTERNATE ITEMS		<u>\$525,000</u>
<u>Alternate Bid Items</u>		
Minimal Restrooms	\$20,000	
Color Surfacing for Game Courts	13,000	
Game Court Lighting	42,000	
Alternate Bid Items		<u>\$ 75,000</u>
TOTAL PROJECT COST WITH ALTERNATE ITEMS		<u>\$600,000</u>

then, the stated amount of \$205 per foot of creek is relevant; each park and creek, however, must be examined in view of its own particularities.

Construction Cost - North Waterfront Park

The Berkeley North Waterfront Park Project involves the creation of a 2.7 acre native plant community. The area was originally designed using exotic plants; this proved to be too fragile and expensive to maintain in the park's coastal climate, however. A total of about \$37,600 has been funded for the two-year project, and it has been estimated that the total project cost, including volunteer labor and donated materials, is \$78,722. A summary of the project budget is shown in Figure 2 (DAWN's application for funding by the Coastal Conservancy's Nonprofit Organization Assistance Program, January 12, 1983):

FIGURE 2--PROJECT BUDGET

TOTAL <u>GRANT</u> REQUEST	\$49,472	(\$24,736/yr)
Labor Costs	41,472	(\$20,736/yr)
Material Costs	8,000	(\$ 4,000/yr)
TOTAL <u>PROJECT</u> COST	\$78,772	(\$39,386/yr)
Value of Volunteer Labor	6,000	(\$ 3,000/yr)
Value of Donated Materials	3,000	(\$ 1,500/yr)
ADDITIONAL SOURCES OF FUNDING		
City of Berkeley	\$18,800	(\$ 9,400/yr)
Donations	1,500	(\$ 750/yr)

The initial construction began with site preparation. This consisted of removing weeds and undesirable plants from the area, as well as making a seedbed in preparation for seeded plots. The plants used for the project were originally collected by the members of DAWN as seeds and cuttings for propagation. Plants were selected to survive under severe conditions such as wind and salt spray. They are then raised at the Living Laboratory (see paper by Bakonyvari, this report), located at the Berkeley Landfill. Instead of simply using a large number of gallon-sized container plants at 75 cents each wholesale, the organization is experimenting with small seedlings in two-inch pots (10 cents each wholesale) to compare their effectiveness. The following table outlines the amounts estimated by DAWN for planting materials (DAWN's application for funding under the Coastal Conservancy's Assistance Program, January 12, 1983):

<u>MATERIALS</u>	<u>1983</u>	<u>1984</u>
Plant material	\$1000	\$1000
Soil dressings	2000	2000

Originally a \$60,000 drip-irrigation system on a 10' x 10' grid was established at the park; due to slope instability, however, the system no longer works. DAWN's plan does not require repairing the present system, since drought-resistant native plants do not need irrigation once they are established; a simple portable irrigation system is all that is required. The smaller irrigation system means a considerable savings in capital investment.

Maintenance Costs - Strawberry Creek Park

Once a park is completed it is the responsibility of the city's Park Maintenance Crew to maintain the park at the level that the Park Designers originally intended. It is impossible to determine in advance the projected total yearly maintenance costs for a new park, because it is not known exactly the extent of the required tasks to maintain the park. It is through experience that this is determined. The number of clean-up hours required is related to how extensively the park will be used. Weather is an important factor here, since it influences indirectly the amount of usage. Also involved is the amount of time that it takes for the shrubbery and herbs to become established. As it matures, the groundcover requires less time to maintain.

The annual maintenance cost estimate for Strawberry Creek Park is presented in Figure 3. These figures were introduced to the City of Berkeley in September 1981, when the final design plans of the park were approved (Action Minutes, City of Berkeley, September 22, 1981). There is not a direct method to evaluate the actual maintenance cost of the creek, but it may be assumed for the sake of discussion that one-third of the clean-up time is associated with the creek. This works out to be:

	<u>Hours</u>	<u>Salary</u>	<u>Total</u>
Creek Clean-up	260	@ \$12.50	\$3,250

The actual maintenance of Strawberry Creek Park by the City of Berkeley does not begin until 90 days after the completion of the park. Within that period of time it is the responsibility of the contractor to maintain the park, and assure that all is going as anticipated. The 90-day maintenance charge is included in the planning and construction cost estimate. For Strawberry Creek Park, the low bid was \$1,000 (Doug Wolfe, pers. comm., 1983).

FIGURE 3

ANNUAL MAINTENANCE IMPACT ESTIMATE

<u>PARKS MAINTENANCE TASKS REQUIRED</u>	<u>HOURS</u>	<u>SALARY</u>	<u>TOTAL</u>
Clean-up	780 hrs.	\$12.50	\$9750
Turf	140	12.50	1750
Shrub Beds	40	12.50	500
Supplies (allow)			1000
Utility Bills (allow)			3000
<u>TOTAL</u>			\$16500
<u>PUBLIC WORKS MAINTENANCE TASKS</u>	<u>HOURS</u>	<u>SALARY</u>	<u>TOTAL</u>
Irrigation Supplies	80 hrs	\$14.60	\$1168
Miscellaneous Repairs	80	14.60	1168
Supplies (allow)			1164
<u>TOTAL</u>			\$ 3500
<u>PROJECTED TOTAL YEARLY MAINTENANCE COST</u>		<u>\$20,000</u>	

Maintenance Costs - North Waterfront Park

The North Waterfront Park requires a completely different method of maintenance. The method used is one that is similar to range maintenance methods, since the landscape is completely vegetated through the use of herbaceous plants and perennial grasses. Range maintenance entails the mowing of the perennial grasses in the fall and spring, although other tasks such as "clean up" will still be required to maintain the park. This lowers weed control costs since the weeds will be limited and gradually excluded from the site. The number of actual maintenance hours required for the site are lower than that necessary at Strawberry Creek Park.

During the two-year development period DAWN will be responsible for maintenance, and then will release the job to Berkeley's city gardeners. Since this is the first time that range maintenance methods have been practiced, the city gardeners will be instructed by the members of DAWN. The training period will begin in March, 1983, and will continue until the program ends in February, 1985 (DAWN's application for funding under the Coastal Conservancy's Assistance Program, January 12, 1983). Once trained, the gardeners will be able to care for the native plant landscape. It is assumed that this knowledge will also improve management in other city parks.

While the new vegetation is becoming established, DAWN will remove weeds, reseed areas and work with irrigation techniques. New species of plants will be introduced, and plants that die will be replaced. Records will be kept on the success or failure of the different plantings. Prior to the DAWN project, maintenance costs at the North Waterfront Park averaged \$2,000 per year per acre; this

works out to be \$5,400 per year (Chuck Roberts, pers. comm., 1983). These costs, over the two-year development span, have been absorbed into the budget as volunteer labor, but it appears that the anticipated maintenance cost for the North Waterfront Park, upon its completion, will be less than in the past.

Conclusion

Strawberry Creek Park and North Waterfront Park are two different parks within the City of Berkeley that have been examined to determine the additional cost or savings of including elements of the natural waterscape into parks. It has been estimated that a creek increases the cost of a park by about 10% (Doug Wolf, pers. comm., 1983). By incorporating the stream into the design of Strawberry Creek Park, approximately \$30,705 has been required for construction, and an extra \$3,250 has been necessary for maintenance. In evaluating North Waterfront Park project it is more important to look at the savings incurred by using natural landscaping than to look at the costs involved. Although it is not possible to state an exact figure that represents the savings incurred through natural landscaping, the estimates presented for development of the park show that savings will occur. In evaluating the figures presented here for Strawberry Creek Park and North Waterfront Park it is not realistically possible to compare one to the other, for each represents a different aspect of including elements of the natural waterscape into parks.

REFERENCES CITED

1. Berkeley, City of Berkeley Action Minutes, September 21, 1981.
2. DAWN, January 12, 1983. Application for Funding Under the Coastal Conservancy's Non Profit Organization Assistance Program.
3. Haeg, Frank, Recreations Program Director. Personal communication, February 1983.
4. Kaplow, Dave, Vice President of DAWN. Personal communication, April 1983.
5. Roberts, Chuck, Senior Administrative Analyst, Parks Marina Division. Personal Communication, February 1983.
6. San Mateo, San Mateo Planning Commission, 1961.
7. Wolfe, Doug, Landscape Architect, City of Berkeley. Personal communication, January-April 1983.