



Integrated Planning Opportunities Alternatives Analysis – Public Education & Outreach

Springfield, Missouri
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Introduction

The City of Springfield (City), Greene County, and City Utilities of Springfield have developed an approach for integrated planning to best protect local environmental resources in an evolving regulatory landscape. The Integrated Plan (IP), titled "A Citizen Focused Approach," provides a holistic plan designed to prioritize investments based on the most effective solutions to address the most pressing problems that matter most to the community. Implementation of the IP includes a four-phased approach, which is designed to be iterative: 1) Assessment (What is the current status of the environment?), 2) Vision (Where do we want to be?), 3) Tactical (How will we get there?), and 4) Adaptive Management (What adjustments need to be made?).

Identifying and prioritizing the most effective solutions using the Sustainable Return on Investment (SROI) approach is a critical component of the tactical phase. The SROI process is an economic analysis method for analyzing triple bottom-line (i.e., economic, social and environmental) outcomes of investments and policies. This approach provides a comparison between the general cost of a solution to the benefits achieved so that a more informed investment decision can be made.

The SROI process was used here for estimating the sustainability value of public education & outreach, including social and environmental benefits and financial costs. The methodology entailed projecting the value of impacts over a 25-year planning horizon and applying a discount rate to bring future values into today's dollars. A description of this opportunity and details of the SROI analysis are provided below.

Opportunity Description

Public education and outreach is one of the six Minimum Control Measures required under the City's municipal separate storm sewer system (MS4) program. The goal of the City's Public Education & Outreach program is to reduce or eliminate behaviors and practices in ways that prevent pollution and protect natural waters that receive stormwater runoff flow. The City's existing program includes a variety of practices that target property owners, residents, businesses, contractors, city staff, developers, and local organizations. These practices include routine classroom presentations and field trips for local students, media interviews on various water quality topics, public service announcements, conference presentations, facilitating public reporting of illicit discharges, and distribution of brochures and informational flyers. The City also runs the Adopt-A-Stream program and helps fund key programs through the Watershed Committee of the Ozarks (WCO), the James River Basin Partnership (JRBP), and Missouri Project WET (Water Education for Teachers).

The Adopt-A-Stream program enlists local citizens to remove trash and garbage from area streams. Support for the WCO helps fund the Watershed Center, which serves as a destination



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for school field trips to learn about water quality protection. In addition to field trips to the Watershed Center, the WCO are involved in different outreach activities including booths at community events, classroom presentations, and underground tours of Jordan Creek. Funding for the JRBP directly supports the “Right as Rain” rain barrel rebate program and the Lawn Steward soil testing program. JRBP also provides outreach through social media, newsletters, presentations and tabling events. Missouri Project WET, is a water education program that provides curriculum resources and workshops for teachers and other educators working with K-12 children.

Environmental and Social Benefits

The primary benefit of public education and outreach is improved water quality. Water quality improvements were determined using a water quality index (WQI) approach. The WQI is a composite scoring system that evaluates the conditions of a waterbody on a scale of 0 to 10 based on different community priorities and indicators. The economic value of a change in water quality is determined by the number of people that benefit and an individual’s “willingness-to-pay” for that change. A one point change to the WQI is worth about \$40 for a direct user and \$14 for in indirect user.

HDR evaluated the change to the WQI in Springfield urban streams and Lake Springfield from estimated reductions to pollutant loadings associated with the City’s public education and outreach programs (**Table 1**). Public education and outreach programs increase awareness of how certain behaviors impact the environment. It was estimated that such programs, on average, will achieve an 18% change in behavior. Other factors used to estimate overall program effectiveness include:

- Pollutant Removal Potential – Pollutant removal potential from various polluting behaviors were classified as major, moderate, minor, or none, and were assigned values of 90%, 60%, 30%, and 0%, respectively.
- Pollutant Consequence – The consequence or effectiveness of the strategy was classified as entirely, largely, or partially, and were assigned values of 100%, 66%, and 33%, respectively.
- Relative Contribution – The relative contribution or fraction of total pollutant loading addressed by the strategy was estimated between 0 and 100%.

Table 1. Estimated Pollutant Loading Reductions Due to Public Education & Outreach Programs in Area Waterbodies

Indicator	Percent Reduction
Bacteria	1.5%
Metals	0.5%
Organics	2.4%
Sediment	0.7%
Nutrients	3.5%
Trash	4.9%

Estimated reductions to pollutant loadings will positively impact a number of community priorities including aquatic life, waterbody aesthetics, recreation, clean drinking water, and fish consumption. In terms of the WQI, it was estimated that public education and outreach will increase it by 0.071 points in Springfield urban streams and 0.020 points in Lake Springfield (**Figure 1**).

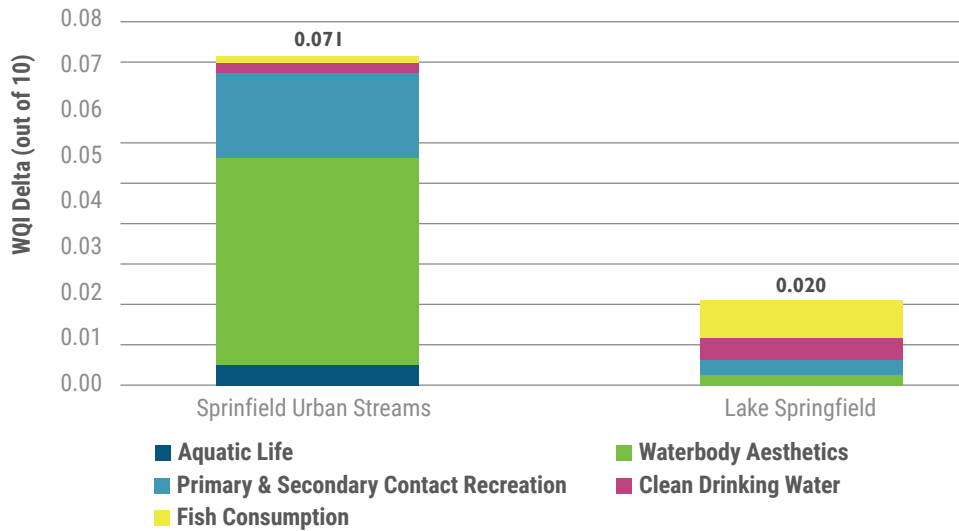


Figure 1. Changes to the Water Quality Index from Public Education and Outreach

Cost Considerations

Costs associated with the City’s Public Education & Outreach program can be broken down into the following four categories: 1) in-house water quality and outreach, 2) WCO, 3) JRBP, and 4) Project WET. City in-house activities were estimated at about \$32,000 per year based on funding for printing materials plus personnel, which includes a Water Quality Compliance Officer (50 hours), Stormwater Technician (56 hours), Stormwater Specialist (12 hours), Education/Outreach Coordinator (27 hours), and an Education/Outreach Specialist (0.5 full-time equivalents). Annual funding for the WCO is about \$52,000 based on funding two full-time equivalents. Annual funding for the JRBP is about \$18,000, which largely supports the rain barrel project and outreach. Annual funding for Project WET is about \$10,000. In total, the cost of the Public Education & Outreach program is about \$112,000 (Table 2). These costs do not include consideration for the numerous interns, volunteers, and other staff that contribute in part to educational activities.

Table 2. Estimated Annual Costs of the City’s Public Education & Outreach Activities

Program	Annual Cost
City In-House Water Quality Education/Outreach	\$32,000
Watershed Committee of the Ozarks	\$52,000
James River Basin Partnership	\$18,000
Project WET (Water Education for Teachers)	\$10,000
Total	\$112,000

SROI Results

Table 3 presents final results of costs and benefits of public education and outreach. The present value operation and maintenance costs amount to about \$1.9 million. However, the monetized water quality benefits are estimated at \$5.6 million resulting in a total value of \$3.7 million and a benefit-cost ratio of 2.9.

Table 3. Summary of Present Value Costs of Public Education & Outreach (\$2018, Millions)

Types of Benefits and Costs	Present Value of Impact
Environmental	
Water Quality Improvements	\$5.6
Social	
(No monetized benefit categories)	—
Costs	
Capital Expenditures	—
Operations & Maintenance Impacts	(\$1.9)
Totals	
Financial Lifecycle Cost	(\$1.9)
Total Social, Environmental Benefits	5.6
Total Value - All Costs and Benefits	3.7
Benefit-Cost Ratio	2.9

Figure 2 provides the best estimate of value created relative to cost by accounting for several uncertainties that can raise or lower the perspective on total value. Taking into account these uncertainties, it is estimated that that the benefit-cost ratio could range from about 1.7 to 5.1 with a 10% chance of it being higher or lower.

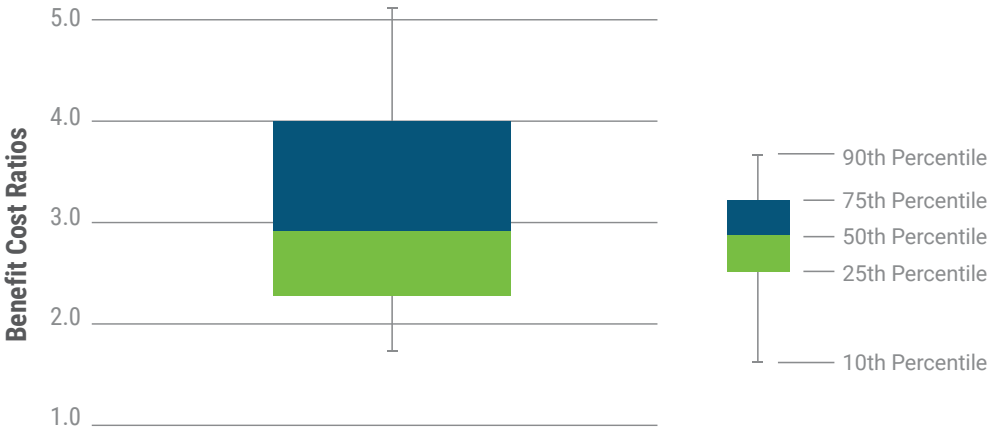


Figure 2. Range of Potential Benefit Cost Ratios for Public Education & Outreach

Summary

Public education and outreach efforts will likely realize benefits that significantly outweigh the costs. The water quality benefits associated with the City’s public education and outreach activities is approximately double that of the estimated costs with a total value of about \$3.7 million. Accounting for uncertainty, the benefit-cost ratio could be as high as 5.1 and is likely no lower than 1.7.