

A Benefit-Cost Analysis of the Proposed Watauga County Recreation Center

The proposed Watauga Country Recreation Center is a 71,000 square foot facility featuring a recreational pool, competition pool, baseball fields, basketball courts, tennis courts, and a new parking area. The estimated cost for the aquatic center is about \$14.5 million and the remaining facilities have an estimated cost of \$11.625 million. The total estimated cost for this facility is \$26.125 million spread over multiple years. These costs cover the renovation of existing parks and the construction of new facilities. Based on a review of the economics literature of similar recreation centers we estimate that benefits that will flow to users of the recreation center in the form of community, economic and health impacts and compare these to the costs.

Considering community benefits, the recreation center will attract daily users who will pay a monthly fee. The difference between what these users are willing and able to pay and what they actually pay as a monthly fee is the consumer surplus. Consumer surplus is the conceptual approach taken for estimating the economic benefits for benefit-cost analysis. In order to estimate consumer surplus we constructed a demand curve using data from a survey conducted for Watauga County Parks and Recreation. Survey participants indicated whether or not they would support a membership if the price were either \$20 or \$30 per month. The first demand curve was based on those who “strongly agreed” that they would pay each fee. Thirty-one percent strongly agreed that they would pay \$20 per month while 19% strongly agreed that they would pay \$30 per month. An estimate of the number of households that would use the recreation center at a fee of \$20 per month is equal to the percentage who responded strongly agree to paying and the number of households in Watauga County. This estimate is 3136 households. From this demand curve we estimate that the average consumer surplus per household is \$12.50 per month. Taking the product of the annual consumer surplus per household and the number of households, we estimate a total annual consumer surplus of \$470,400. We calculate the present discounted value (PDV) over 30 years at a discount rate of 5% and estimate \$7.2 million in community benefits. A higher demand curve for monthly visits includes those who “agreed” (a weaker indicator of preferences) as well as those who “strongly agreed” that they would pay each price. Sixty-eight percent of participants agreed or strongly agreed that they would pay \$20 per month, while 59% agreed or strong agreed that they would pay \$30 per month. Using this we estimate that monthly users could range up 6776. If we add these additional households and conservatively use the \$12.50 consumer surplus estimate, the PDV of consumer surplus would range up to \$15.6 million.

Economic impacts capture the increase of spending in a local economy from visitors to the area. This type of spending in an economy is not a substitute of normal spending from locals but rather an increase in total spending. Economic impact studies also take into account a multiplier effect, which is when \$1 spent creates additional economic spending elsewhere in the local economy. For example, when non-locals stay in hotels, the hotel revenue is paid to hotel employees in the form of wages, who then spend money in the local economy. We estimate the economic impact of a youth

sporting event (e.g., a swim meet) to have an economic impact of \$121,000 based on a previous study done for a soccer tournament hosted by the High Country Soccer Association that used a multiplier of 1.48. We conservatively assume that the Watauga recreation center will host a minimum of 4 events each year with a mixture of volleyball and basketball tournaments and swim meets. We discount each economic impact value by 5% over 30 years and then sum the discounted present values from each year to create a total benefit value of the recreation center. Using these assumptions, the total economic impact of the recreation center would be \$7.4 million. By performing a sensitivity analysis and increasing the number of events to 7 events per year and increasing the per event economic impact by 100% would lead to a present discounted value of \$14.9 million.

We constructed health care savings estimates for two different age groups of recreation center users. For those 65 and older we estimated annual health savings between \$500 and \$750 per person. When aggregated over a 30 year time period, the estimated present discounted value (PDV) of health savings for an individual in this age group ranged from \$7686 to \$11,529 using a 5% discount rate. For those younger than 65 we estimated annual health savings between \$250 and \$375 annually. The estimated PDV of health savings over a 30 year period for an individual in this age group ranged from \$3843 to \$5765. Using data from the U.S. Census, we estimate that 14% of the recreation center users would be 65 or older. We use the estimates of the total number of recreation center users from above and assume that between 10% and 25% would enjoy health care savings. We constructed a range of health care savings estimates from the proposed recreation center over a 30 year period using a 5% discount rate. The most conservative estimate was \$1.3 million, estimating that 10% of the 3136 users would enjoy savings and that use of the facilities saved \$285. When the estimated number of users was raised to 6776, changing the estimated percentage of users with health savings to 25% yielded a present discounted value of total aggregate health savings of \$10.9 million.

In order to determine the discounted present value of aggregate benefits acknowledging the large amount of uncertainty around these assumptions and estimates we conduct a Monte Carlo simulation over the sum of the present value of aggregate benefits in each benefit category. We impose no distributional assumptions over the range of benefit estimates. Instead, we randomly draw a value from the range of the sum of the present values in each benefit category. This is known as the uniform distribution. Community benefits are estimated to range from \$7.2 million to \$15.6 million. Economic impacts are estimated to range from \$7.4 million to \$14.9 million. The health care savings benefits are estimated to range from \$1.3 million to \$10.9 million. The average of 1000 draws from the sum of the uniform distributions is \$36.26 million with a 90% confidence interval of \$26.51 million and \$46.34. Comparing these estimates to the cost of the recreation center the present discounted value of the net benefits is \$10.135 million. Since the lower point of the 90% confidence interval is greater than the cost estimate, we conclude that we can be 90% certain that the benefits exceed the costs given our assumptions and estimates.

This is a project of the Appalachian State University Student Chapter of the National Association for Business Economics. Will Blackwood, Matt Drake, Brittany Ramsey, Ben Sullivan, Evan Truxton and Bobby Weant were the analysts for this report. Contact: John Whitehead, Professor of Economics, (828)262-6121 or whiteheadjc@appstate.edu.