



## Reaping the Greatest Benefit from Engineering Design

Barr Engineering optimizes the value of a redevelopment site for the City of Saint Paul and the Capitol Region Watershed District

**Challenge: How can Barr Engineering quantify the benefits of green stormwater design alternatives to redevelop a former industrial site into a “21st century community”?**



City planners for St. Paul sought the green infrastructure services of Barr Engineering to redevelop a vacant Ford Motor Co. campus comprising 135 acres in Highland Park, a riverfront area abutting a natural resource, the Hidden Falls Regional Park, but lacking the storm water and transit structure that would allow for a more connected, livable and green community. To guide the redevelopment of the river bluff into one of St Paul’s most desirable neighborhoods, Mayor Chris Coleman had led a delegation of planners and civic partners to as far away as Europe to study best practices for a “21st century community”.

The final design would incorporate a central stormwater feature running from north to south culminating in a pond at the south end that would be used for winter skating and a connection to Hidden Falls Regional Park, with a series of interesting and attractive spaces along the way. With a high level of community involvement in requirements and financing, including a 25-member community task force and 34 community meetings, how could Barr effectively communicate how their incremental designs would optimize the community benefits overall.

**Solution: Autocase provides the cost analysis tool to quantify incremental value in present value terms.**

Barr engineering used Autocase software from Impact Infrastructure, to provide automated “triple bottom line (TBL) cost benefit analysis (CBA)”, including life cycle cost analysis, of the greener design against a baseline. For each design, Autocase helped Barr quantify the full lifecycle costs, the social and environmental impacts, and the dollar value of those impacts in the areas of...

Water Quality • Water Quantity • Flood Risk Reduction  
• Recreation Value

Property Value Uplift • Heat Island Mitigation • Health and Safety • Criteria Air Contaminant Green House Gases • Value of Time

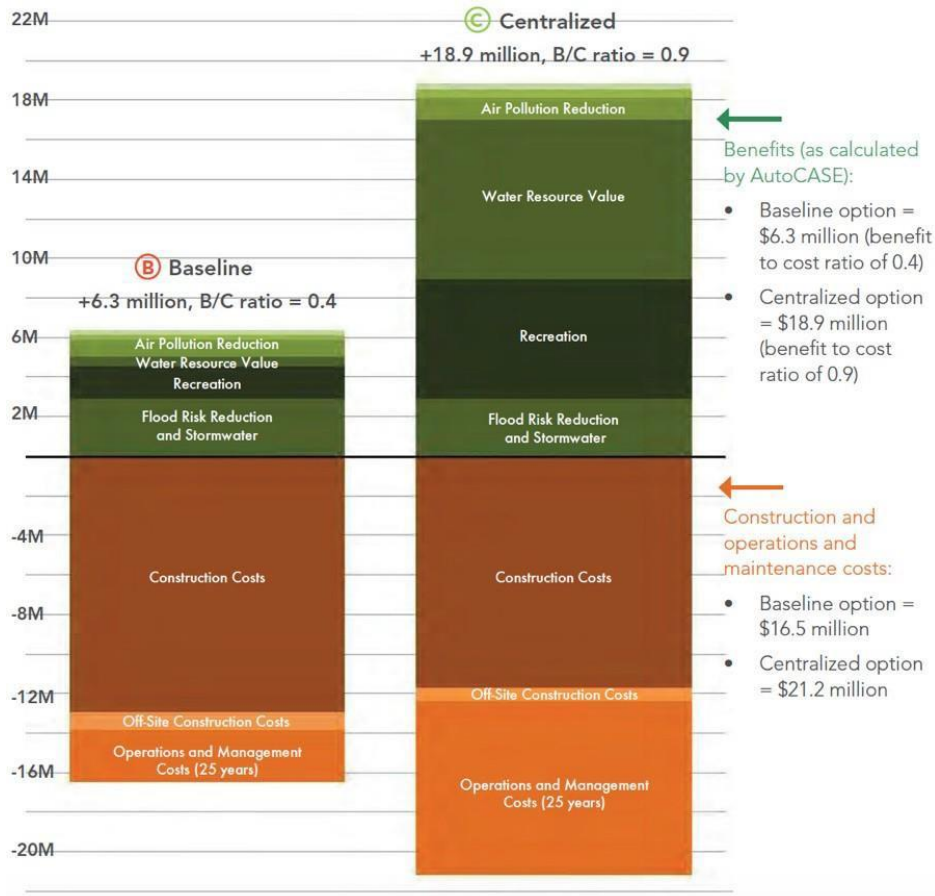
... as well as other location-specific considerations.

*“Increasingly, our clients are interested in comparing the relative sustainable value of alternatives to prioritize their capital improvement plans. Autocase of Sites gives us the flexibility to cost-effectively apply triple bottom line cost-benefit analysis to these different scenarios, almost like a custom business case framework for each customer. We are already seeing clients requesting Autocase analyses as the need grows for rigorous economic analysis in green infrastructure.”*

Matthew Metzger, ENV SP, PE —  
Senior Civil Engineer, Barr Engineering

**Results: Barr's designs deliver double the benefits per dollar of cost.**

The comprehensive green infrastructure design (below labeled "Centralized") exceeded the benefits of the Baseline design by \$12.6 million while increasing the costs by only \$4.7 million, more than doubling the benefit-to-cost ratio.



With Autocase, Barr Engineering benefitted from:

- value analysis at a significantly lower cost
- reduced pushback and costly delays by addressing community concerns
- confidence in a business case backed by credible data
- flexibility to prioritize design elements based on overall benefit

**Autocase: Making the business case for high performing and sustainable buildings.**



Autocase for Sites from Impact Infrastructure, Inc.

Autocase for Buildings is a software tool that models the environmental and social dollar values of building designs and, together with financial costs, evaluates their net, triple bottom line (TBL) benefit over the life of a project using a rigorous cost-benefit analysis (CBA) framework. With Autocase, the cost and time required to compare design alternatives at any stage of a project is a fraction of today's custom studies. As a result, design firms can easily evaluate and justify different approaches and, in doing so, can contribute to the future economic, social, and environmental success of every project.

For more information about how TBL-CBA would assist your project, go to [www.autocase.com](http://www.autocase.com)