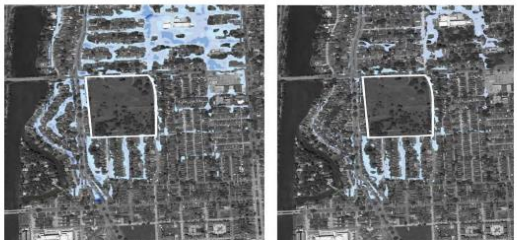
Autocase SITES

Ecosystem Goods and Service Value of Resilient New Orleans Park
The Mirabeau Water Garden vision is based on innovative site design and stormwater management features. The ecosystem value is calculated by Autocase for Sites

Challenge: Demonstrate how ecosystem goods and services value can be added to a Triple Bottom Line Analysis in the design to transform a 25-acre empty site into a recreational and educational urban amenity.

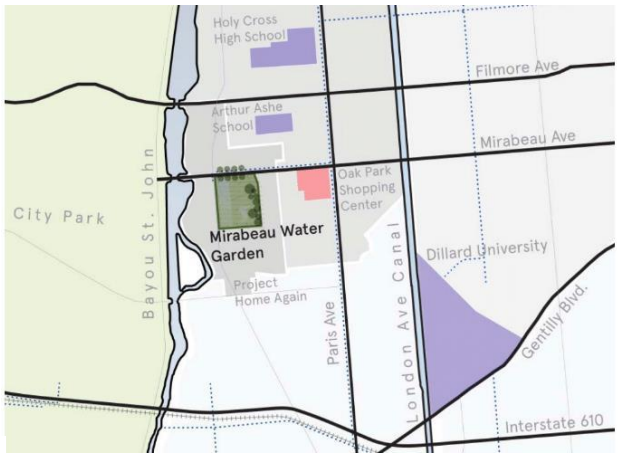
Mirabeau Water Garden, view from above during a 2-year storm event from Gentilly Resilience District - Mirabeau Water Garden, Fact Sheet, March 2018

The proposed Mirabeau Water Garden, a 25-acre urban stormwater park in the City of New Orleans was selected as the ideal project on which to build and test Autocase's enhanced ecosystem valuation capability via a 100RC Green Infrastructure Challenge. The Mirabeau project is part of a suite of green infrastructure projects in New Orleans seeking to reduce flooding and subsidence, while providing environmental, social, health, educational, and economic co-benefits to communities.



Flood Reduction from Mirabeau Water Garden Stormwater Management & Flood Mitigation 90% Design Report. Waggonner & Ball, 30th June 2017

The Rockefeller Foundation's 100 Resilient Cities (100RC) chose New Orleans from several North American cities to pilot Autocase for Sites, analyze a wide range of green infrastructure costs and benefits, and produce a Triple Bottom Line Cost Benefit Analysis (TBL-CBA). Autocase for Sites incorporated comprehensive ecosystem service benefits valuation from Earth Economics as part of this effort.



Project Location - Triple Bottom Line Cost Benefit Analysis of Mirabeau Water Garden, Final Report, October 13, 2017

Solution: To see how the design met the objectives, Autocase valued the water quality and avoided flood risk as well as the avoided subsidence and the educational benefits of the project.

Also included in the TBL-CBA analysis were the value of: air quality, carbon emissions, urban heat island, recreational values, property value uplift and the public health benefits of the project.

The design has four objectives:

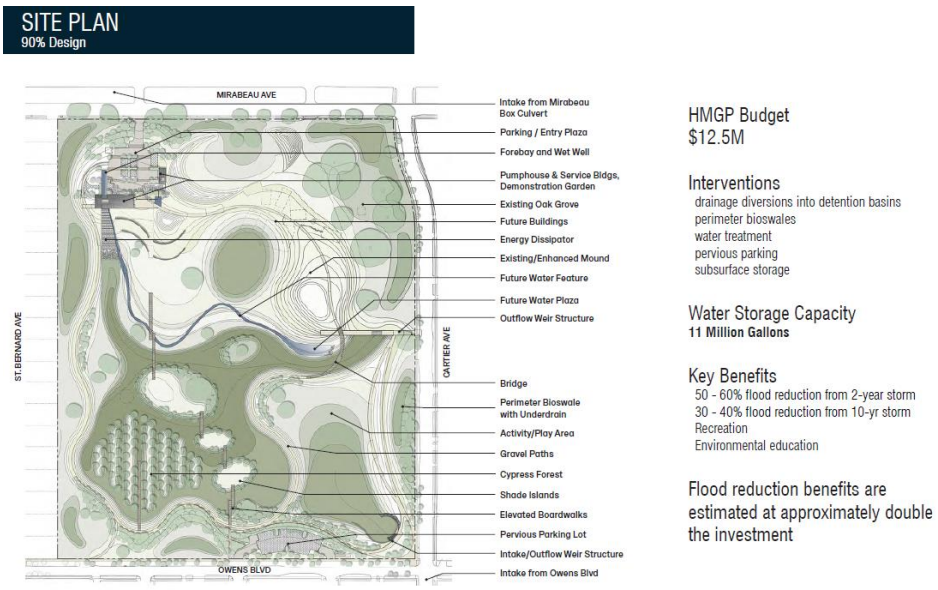
- divert and temporarily store up to 10 million gallons of water to reduce flooding
- infiltrate water to allow organic soils to stabilize and limit subsidence
- clean the water of pollutants through a series of constructed filtration wetlands
- educate by demonstrating how natural processes can be utilized for more sustainable water management and local ecology

The Mirabeau Water Garden is a key component of the city's resiliency. In addition to flood and subsidence the design is intended to beautify the neighborhood, improve health, and provide opportunities for recreation. How can the multiple benefits best be communicated to project stakeholders?

Autocase for Sites measured the design's objectives and other environmental and community benefits.

New Orleans coordinated with Architects Waggonner & Ball to input the specifications of the features, such as the size of swales, detention capacity, and number of trees into Autocase's TBL-CBA cloud-based platform.

The results for the Water Garden are impressive with a value of $79 million over 50 years and a cost-benefit ratio of 5.7 – representing an excellent return on public spending. The bulk of this value comes from the park's primary function of flood risk mitigation ($90m), but significant value is also created from property value uplift ($2.6m), recreational value ($1.3m), and public health benefits ($0.7m).



Site Plan with Highlighted Benefits - Mirabeau Water Garden Community Outreach Presentation

Results: Ecosystem and other benefits outweigh the costs six-to-one

Impact Type	Cost/Benefit	Median Value	95% Confidence Interval		
Financial	Capital Expenditures	**-$12,141,029**	-$12,576,950	to	-$11,739,432
Financial	Operations and Maintenance	**-$2,622,715**	-$3,290,368	to	-$2,139,443
Financial	Replacement Costs	**-$2,774,896**	-$6,437,983	to	-$1,443,802
Financial	Residual Value of Assets	**$827,631**	$147,289	to	$1,993,376
Social	Heat Island Effect	**$79,612**	$111,616	to	$30,748
Social	Recreational Value	**$1,309,576**	$1,014,965	to	$1,602,333
Social	Flood Risk	**$90,250,751**	$23,588,468	to	$278,011,070
Social	Subsidence Risk	**$232,436**	$116,722	to	$368,578
Social	Education	**$480,097**	$318,422	to	$651,232
Social	Public Health	**$742,323**	$324,566	to	$1,304,393
Social	Property Value Uplift	**$2,604,632**	$1,531,101	to	$3,998, 568
Environmental	Water Quality	**$31,599**	$31,599	to	$31,599
Environmental	Carbon Emissions from Concrete	**-$144,877**	-$257,507	to	-$63,189
Environmental	Air Pollution Reduced by Vegetation	**$90,082**	$53,622	to	$133,687
Environmental	Carbon Reduction by Vegetation	**$12,579**	$5,498	to	$21,598
Triple Bottom Line Net Present Value		**$79.1 M**	$4.6 M	to	$269 M

Typically, it takes months to ascertain the size of these co-benefits, and it is only cost effective to do the analysis once a project is approved and is in the later stages of design. Now that Autocase's platform has been enhanced to include Education, Public Health, and Property Value Uplift benefits, it takes just minutes to get these types of results with minimal information about a potential project.

Cities seeking to become more resilient now have a powerful tool that enables them to prioritize projects on an apples-to-apples basis. Autocase's platform helps illustrate that designing with – and designing for – nature can be the right thing to do both in terms of a resiliency standpoint, but also in terms of a budgetary standpoint.

With Autocase, the City of New Orleans:

- valued the resiliency benefits quickly
- was able to show how the local community and the environment benefitted
- put a dollar figure of the educational and ecosystem attributes
- justified a $12 million capital outlay with public benefits of $96 million.

Autocase: Making the business case for resilient green infrastructure

Autocase SITES

Autocase for Sites from Impact Infrastructure, Inc.

Autocase for Sites is a software tool that models the environmental and social dollar values of green infrastructure 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 so doing, contribute to the future economic, social, and environmental success of every project.

For more information about how TBL-CBA would assist your resilience project, go to www.autocase.com