

Using an Auction Mechanism to Encourage Private Investment in Green Infrastructure Retrofits

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Natural resources provide various functions that translate into measureable value

Wetlands collect stormwater during rain events and treat and release it into groundwater or surface water



Naturalized shorelines reduce flood impacts and help prevent them from happening



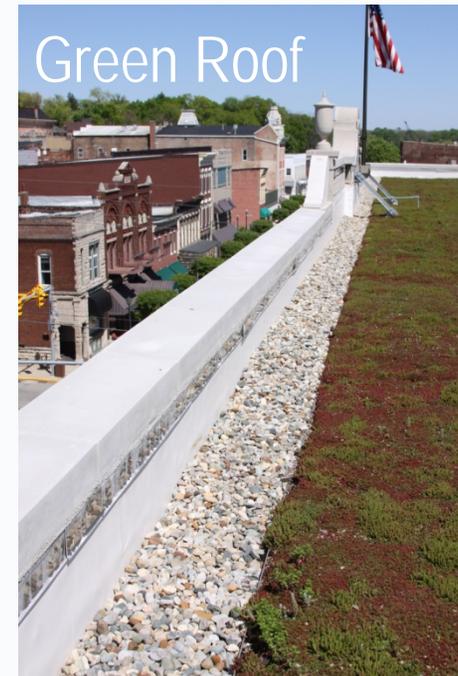
Trees manage microclimate and air quality, reducing "heat island" impacts



Examples of “ecosystem services.”



Specific type of ecosystem service: stormwater green infrastructure





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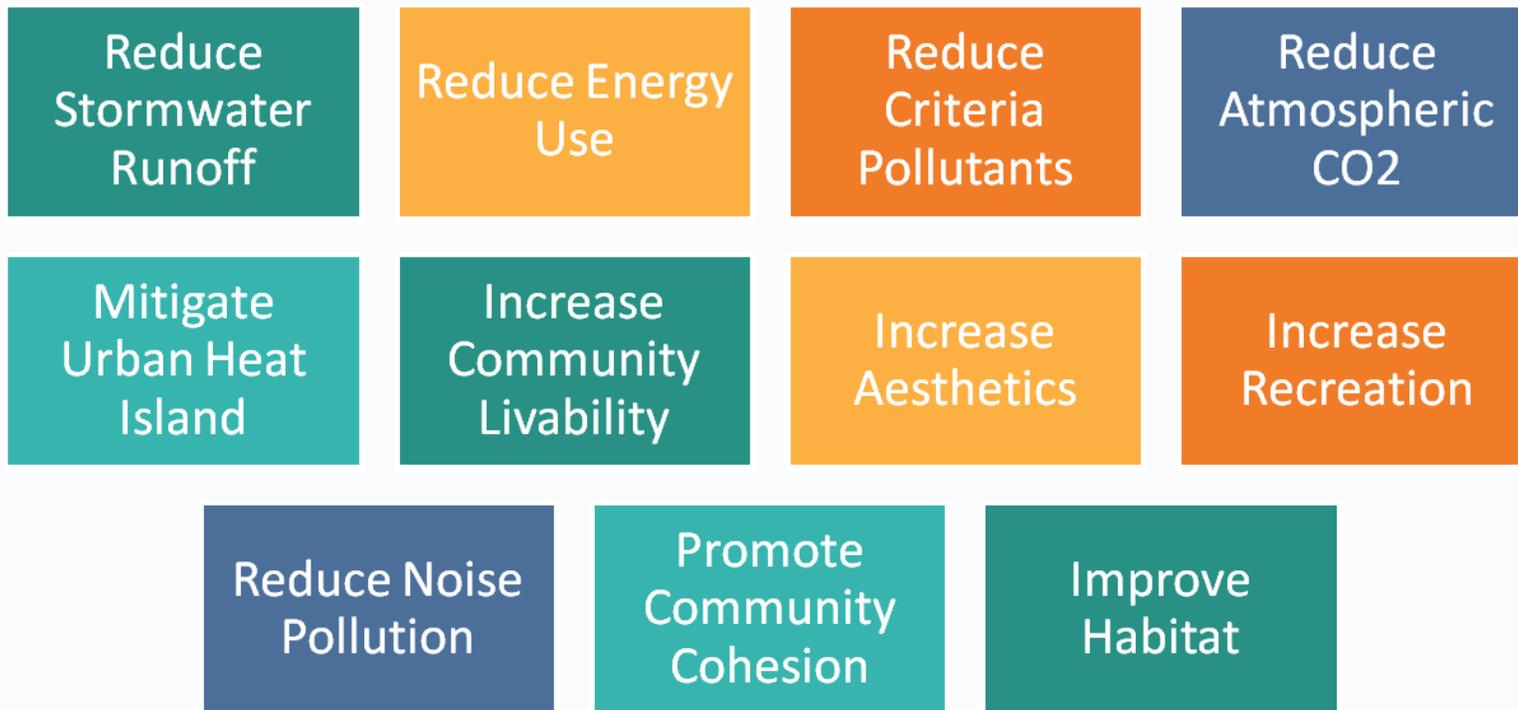
What green infrastructure does

- Captures rainwater close to where it falls
- Holds or filters it to prevent it from carrying sediment and nutrients to lakes and streams
- Replaces rainfall capture and filtering services of lost natural areas, such as wetlands

Green infrastructure can help reduce demand for hard stormwater infrastructure



Studies have demonstrated that green infrastructure provides many benefits



Source: *The Value of Green Infrastructure*, Center for Neighborhood Technology,

<http://www.cnt.org/repository/gi-values-guide.pdf>



So while we might want to do:



We may still end up doing



Why?



Barriers to Green Infrastructure

Technical and Physical

Legal and Regulatory

Community and Institutional

Financial

Source: *Barriers and Gateways to Green Infrastructure*,
Clean Water America Alliance, <http://bit.ly/gireport>.



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To overcome barriers to green infrastructure in our communities, planners need to know...

How can the value of green infrastructure be captured and factored into planning and decision-making processes?

One potential mechanism is to find out what dollar value people place on green infrastructure



Economics uses an “auction” to capture this information

Stakeholders “bid” what they are willing to pay, given full information



Municipalities use this and other information to prioritize decisions

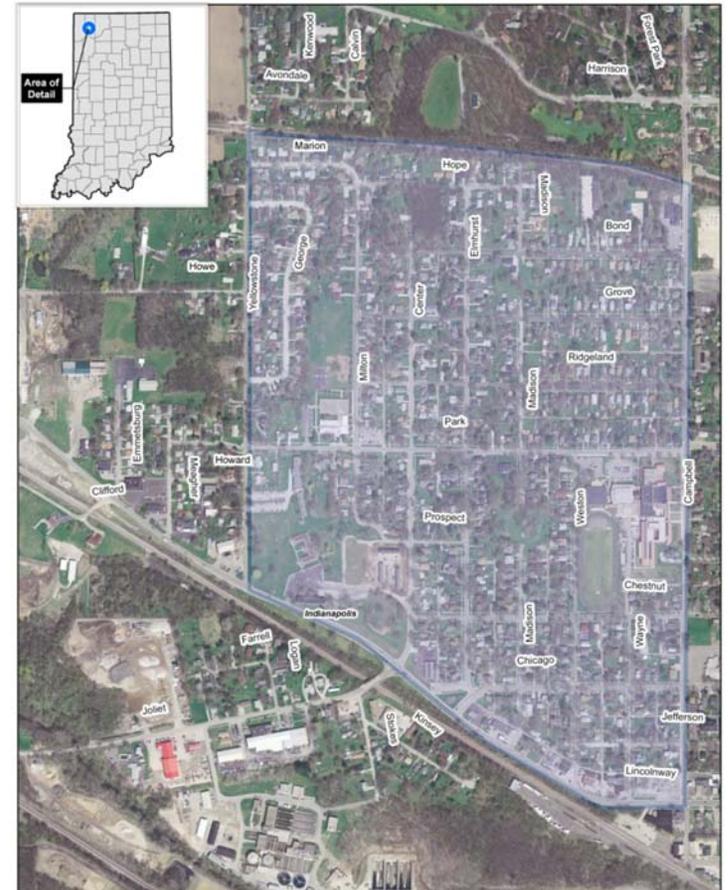


Result is a mechanism to take actionable steps to advance green infrastructure



City of Valparaiso Green Infrastructure Retrofit

- Stormwater causing CSO issues
- Impairment to area watershed
- Public funds dedicated to hard infrastructure investment
- Private landowner involvement in reducing stormwater problem



Challenge: How can green infrastructure be installed on private property?



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Key questions that needed to be addressed:

- What should the green infrastructure options be?
- How can we engage stakeholders in the process?
- How do we determine what should go where?



Green infrastructure options





Engage stakeholders in the process

Develop and run an auction for the public to bid on green infrastructure

Stakeholders "bid" what they are willing to pay, given full information



Municipalities use this and other information to prioritize decisions



Result is a mechanism to take actionable steps to advance green infrastructure



Auction Motivation

- Better stormwater management involves both publicly and privately owned land
- Private landowners may have some willingness to pay for green infrastructure but perhaps not as much as desired by the community
- Private landowners can provide community stormwater benefits if the right incentives are in place

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Auction Process

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Auction Process



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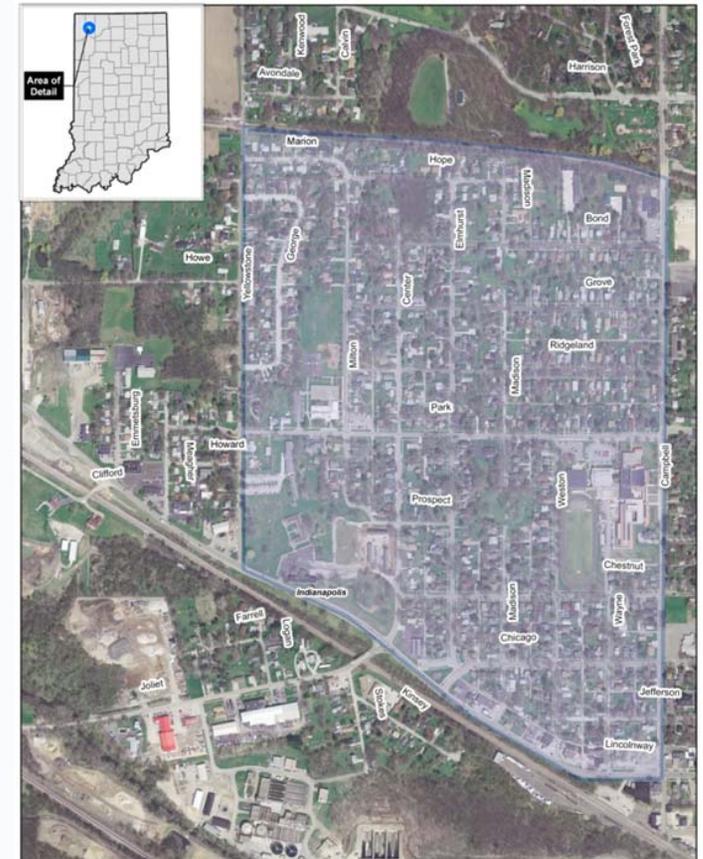


Memorial Neighborhood

- Stormwater causing CSO issues
- Impairment to area watershed
- Public funds dedicated to hard infrastructure investment
- Private landowner involvement in reducing stormwater problem

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Auction Process



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Memorial Neighborhood Focus Group

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stormwater improvements in your neighborhood

Sponsored by:



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Regional Development Authority

- Have you experienced flooding in your basement or yard?
- Have you had problems with large puddles in your yard or street that won't drain?
- Would you like to know what the City is doing to address these problems?
- Want to know how you can help?

Stormwater issues in the Memorial Neighborhood are the top priority for the City of Valparaiso and their project partners. The City has teamed up with regional experts to look at ways homeowners can help capture rainwater before it becomes a problem.

Memorial Neighborhood Meeting and Focus Group

Tuesday, February 22

6:30 pm to 8 pm

Memorial Elementary School

City staff will provide you with an update on new stormwater projects for your neighborhood and introduce a pilot program that offers incentives for homeowners to help capture rainwater. More details on reverse side.





Information Flier

Information on Rain Barrels and Rain Gardens

Rain barrels and rain gardens capture rainwater close to where it falls and helps prevent it from carrying sediments and pollutants to our streams and lakes.

What's In It for Property Owners?

- Customized and professionally installed rain barrel(s) or rain garden at reduced cost.
- Rain barrels may potentially lower your water bill. Stored water can be used to water lawn, garden, or other plants, wash cars or windows.
- Rain gardens can improve landscape appearance and provide habitat for wildlife and pollinators.

Community Stormwater benefits:

- Helps reduce speed of stormwater runoff and reduce erosion, nutrients and sediments flowing to local streams.
- Helps reduce the likelihood of neighborhood flood events by reducing peak flows if enough projects are installed.

Rain Barrels

- Rain barrels capture and store rainwater from each downspout.
- Stored water can be used for watering plants or yard, or washing cars.
- Screens on barrels prevent mosquitoes.

Typical Cost
\$250 including barrel, delivery and installation.

Maintenance
Use rain water between rain events, drain and bypass in winter months; follow manufacturer recommendations for cleaning and maintenance.

Algreen Products' *Cascata* model rain barrels are shown below and will be offered in the auction.
(available in a variety of colors)



Rain Gardens

- Rain gardens are planted low areas designed to store and filter rainwater.
- Amended soils with high sand and organic content are often recommended
- Can be planted with a variety of attractive, water-loving plants.



Typical Cost
\$2,500 including design and installation.

Maintenance
Rain gardens should be weeded and cleaned of trash on a regular basis, roughly 3 times per year. Regular watering is required during first year.

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Auction Design

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- Auction was designed by consultants with feedback from partners
- Mailing and letter was sent from the City of Valparaiso
- Design was based on focus group feedback and results of test auction
- Respondents asked to bid their amounts for professionally-installed rain barrels worth \$250 and rain gardens worth \$2500
- Additional information was requested about household and property characteristics



Auction Process

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Conduct Auction

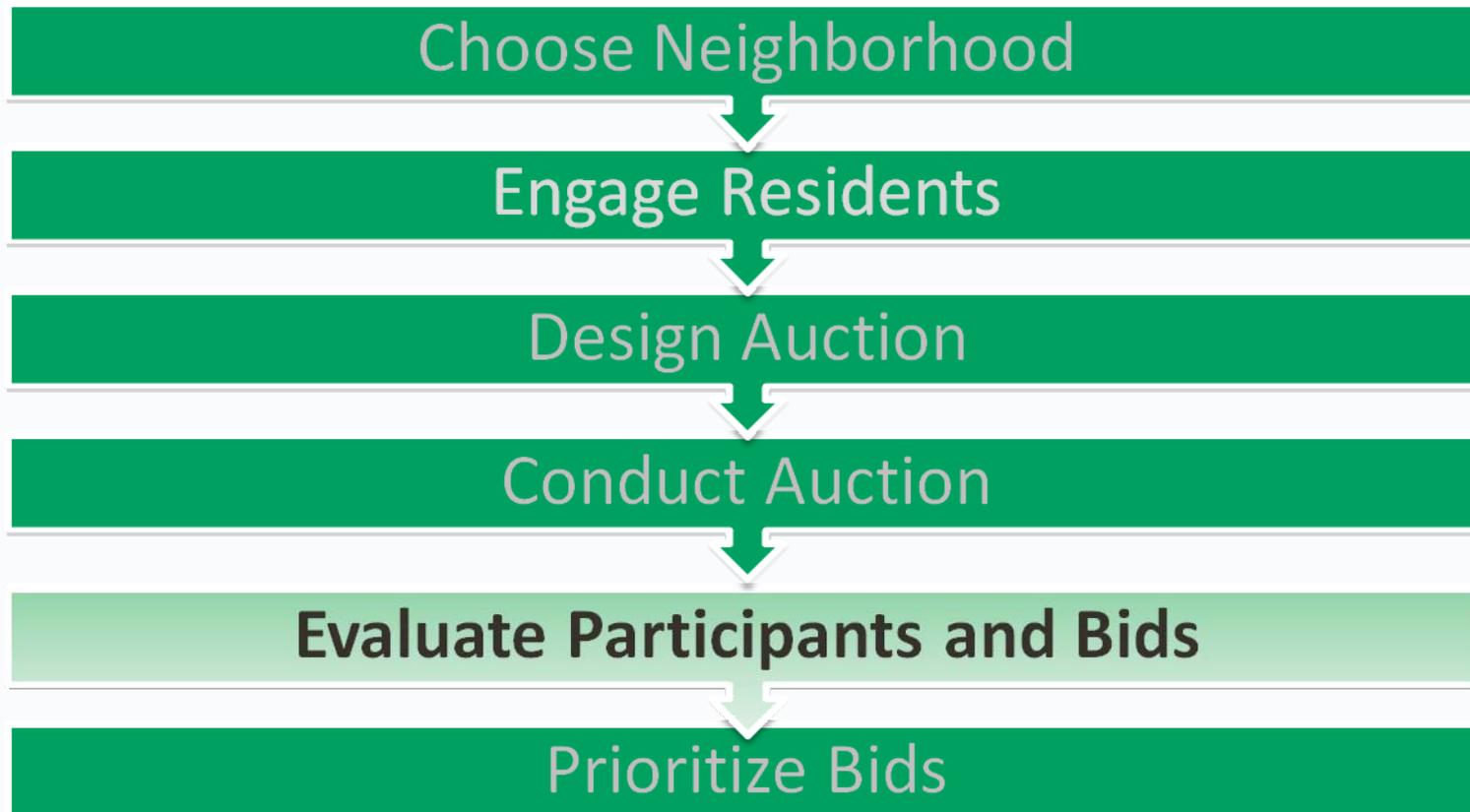
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- Auction questionnaire sent to 567 property owners on April 29, 2011
- Respondents could bid on either type of BMP but winners would only receive one or the other
- Bids selected based on ranking of bid amount and property suitability for rain water capture



Auction Process





Evaluate Participants and Bids

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- About 10% of the property owners participated in the auction
- Twice as many rain barrel bids as rain garden bids
- Approximately half participated online and half through the mail
- Online bidders generally bid more and chose more rain gardens than the mail bidders



Evaluate Participants and Bids

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- There were 38 total rain barrel bids and 19 rain garden bids
- The average rain barrel bid was \$59 for the first barrel and an average of \$48 for all rain barrels.
- The maximum rain barrel bid was the market price of \$250
- The average rain garden bid was \$393 with a maximum of \$1,850



Evaluate Participants and Bids

- Most bidders had experience planting gardens, trees and shrubs on their properties
- Just under half had previously paid for professional landscaping services
- About half had experienced outdoor flooding and 2/3 had indoor flooding
- Approximately 1 in 6 already had an existing rain garden or rain barrel on their property



Evaluate Participants and Bids

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- The majority of participants were long-time property owners in the neighborhood.
- The majority had a technical school or college degree and a 1/3 had a post-graduate degree
- The majority had visited Great Lakes beaches more than 3 times in the past year and more than 1/3 were donors to environmental organizations
- Bid amounts increased with both income and education



Auction Process



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How do we determine what should go where?

Use a Decision Support System to:

- Manage property owner data
- Manage submitted questionnaire and ballot data
- Store site assessment information
- Develop rankings of bids
- Analyze auction results and compare rankings
- Track installed BMPs



FUTURITY



Project Outcomes: Rain Barrels

- To encourage participation, any bid greater than \$0 received a rain barrel
- 59 rain barrels installed at 29 locations for 27 property owners as of 11/1/2011.
- Bid payments of \$3,408.00 were collected
- Grant funds used to cover installation costs
- Rain barrel maintenance flier given to each property owner.





Project Outcomes: Rain Gardens

- 11 rain gardens bids approved based on estimates of cost per gallon captured (\$3.80/gallon, from rain barrel calculations)
- Bid payments of \$4,537.00 were collected.
- 5 rain gardens have been constructed as of 11/23/11
- Remainder will be complete by the end of 2011, weather permitting.





How an Auction Can Help Overcome Barriers to Green Infrastructure

Technical and Physical

Legal and Regulatory

Community and Institutional

Financial



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Engaging the public in an auction can have actual impact in advancing green infrastructure within municipalities.



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