

# ST. LOUIS BLUES: WATER WATER EVERYWHERE

BY GAIL GREET HANNAH



## The history, economy and ecology of St. Louis are defined by water.

The Illinois, Missouri and Mississippi Rivers provided an important system of waterways for indigenous peoples as early as 700 AD. In the 19th century, the city's strategic location on the Mississippi established it as the "gateway to the west." While vulnerability to river rise has historically posed a threat, climate change is now worsening the situation. For decades precipitation that normally discharges into the Mississippi River has backed up during large-scale rain events into the existing sewer system and overflowed into streets, parks and residential basements. As in many places around the world, inundation in St. Louis occurs in low-lying areas primarily occupied by underserved and poor communities, making it both an environmental justice issue and an ecological urbanism challenge.



On November 6 - 8 2017, Landscape Forms, North America's leading designer and manufacturer of high-design site furniture and advanced LED lighting, sponsored its ninth Xtreme Landscape Architecture (Xtreme LA) event at Washington University in St. Louis. As in previous Xtreme LA events, the challenge for this fast-paced charrette focused on an issue in landscape and the built environment critical to the local community. Xtreme LA was funded by Landscape Forms and co-hosted by Kirt Martin, Landscape Forms Vice President of Design and Marketing; Rod Barnett, Chair, Landscape Architecture at Sam Fox School of Design & Visual Arts, Washington University; and Barbara Deutsch, Executive Director of the Landscape Architecture Foundation. The 36-hour event included fifteen young design professionals identified by their firms as potential leaders and a like number of students from Washington University's landscape architecture master's program. The group was guided by two distinguished landscape architects: Chip Crawford, Senior Principal, Forum Studio; and Keith Bowers, Founder and President, Biohabitats.

“We invited young professionals from around the country and put them together with some of our brightest and best students in an old building in the middle of St. Louis for about a day and a half and asked them to solve one of the most pressing problems facing cities today. Which, in a nutshell, is ‘How do you transition to a green, just city?’”

**Rod Barnett**

Chair, Landscape Architecture at Sam Fox School of Design & Visual Arts  
Washington University

Projected water overflows in St. Louis based on sea level rise are 2" today, 5" in 20 years, and 7" in 100 years. The city has an outdated storm sewer system with insufficient capacity to handle current flooding, let alone more extreme future inundations. In response to an EPA-mandated plan for dealing with floods, the Metropolitan St. Louis Sewer District (MSD) has identified vulnerable neighborhoods throughout the city where it can install large detention basins to carry surplus water and has developed a property demolition plan for removing at least a thousand buildings over the next few years. Up to \$13.5 million has been allocated for building demolition, sodding, and other green infrastructure within the northern and eastern portions of St. Louis, where neighborhoods that struggle most with abandoned property are located. Washington University is committed to sharing knowledge, expertise and the efforts of outstanding student scholars with the MSD in order to develop ecologically appropriate designs that do the job *and* offer a vision for constructive transformation. Xtreme LA was designed to contribute to the effort.

The Green City Coalition, as well as local and city government representatives are part of the initiative.

## The Challenge

Xtreme LA participants were charged with developing visionary designs and an actionable plan for a resilient green infrastructure system that meets Metropolitan St. Louis Sewer District (MSD) mandates for flood mitigation; addresses biodiversity, habitat, public health, and quality of life for residents; and engages the community in the process.



**Above:** Xtreme LA participants guided by activists from Green City Coalition and a local historian walked the streets of Goodfellow and talked to residents about their hopes for the community.

The event began with an overview by Rebecca Weaver, Coordinator for the Green City Coalition (GCC), which focuses on providing green spaces for underserved residents, of GCC's vacancy demolition prioritization model and projections for the social, health, environmental and economic benefits of green development. Then, in the company of local activists, political representatives and a city historian, charrette participants toured Wells Goodfellow, a neighborhood within the flood-affected 22nd ward. They walked on blocks lined with brick homes, many in need of repair but still sturdy and intact, set side-by-side with abandoned buildings and vacant lots where structures once stood. They walked on cracked and buckled sidewalks slicked with a sheen of silt, along wide streets with few

cars and fewer people, past a multi-story school building, now closed and boarded, and a liquor store, one of the few businesses in the area. Their walk took them down sloping streets and terminated where the ground levels, at a barren detention basin surrounded by chain link fence. Along the way they met two long-term residents in front of their carefully tended homes, both holding on in the hope that their neighborhood will again see better days.

The following morning, the group divided into two teams and set to work researching, assembling maps and other materials, developing and refining ideas, and creating power point presentations of their designs and plans.



## The Creative Response

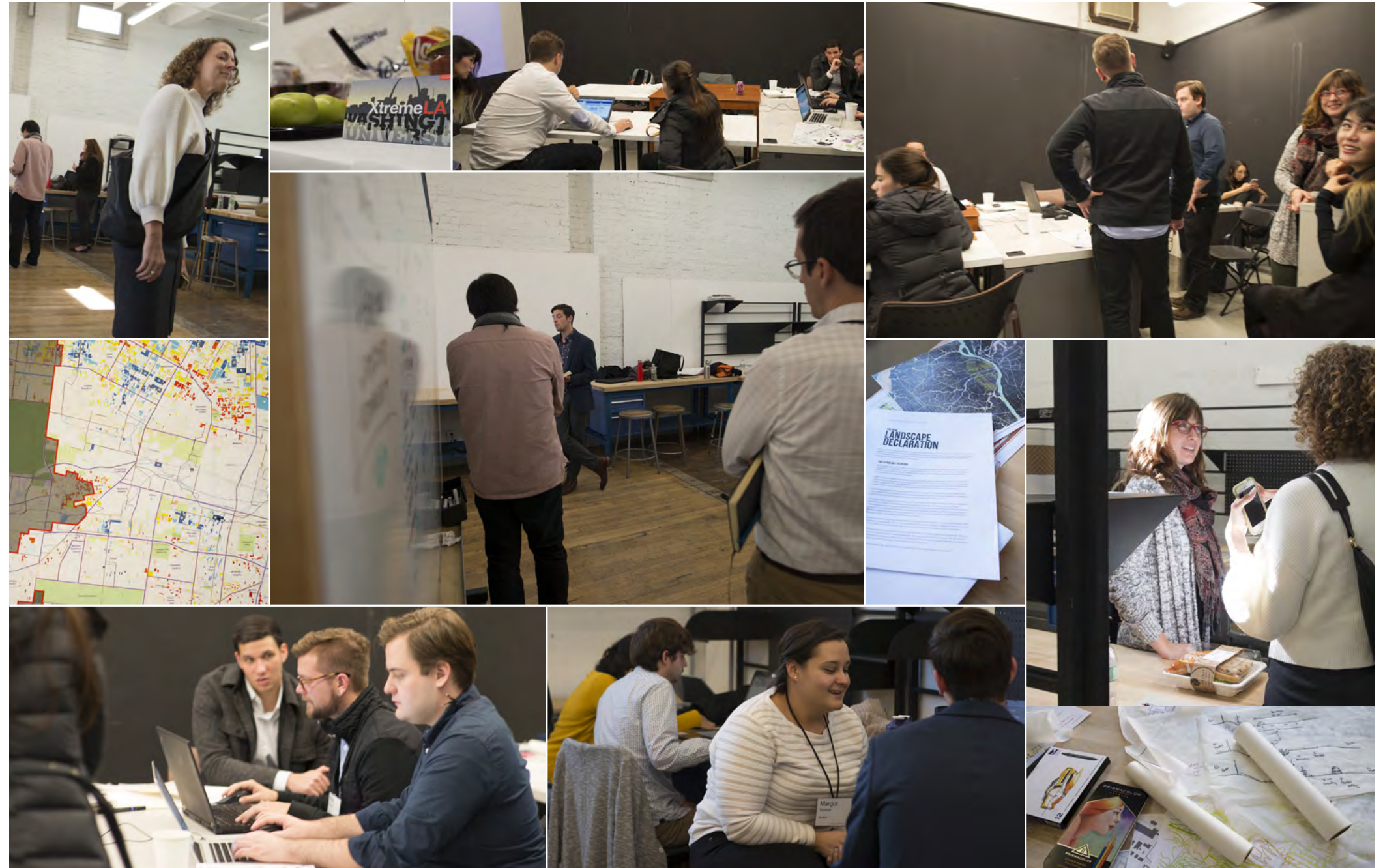
### A THEME WITH VARIATIONS

The teams independently arrived at a common approach. Both teams identified the watershed, rather than artificially-defined politically boundaries, as their sphere of action. Following the science showing that the first inch of overflow contains most of the contaminants after which water quality improves, they addressed water quality at decentralized locations before it travels to holding basins. They thought long term, not just today but 20, 50 and 100 years into the future. And they acted on shared goals: to discharge less water into the storm sewer system, eliminate discharge of waste water into the Mississippi River, and create a resilient, performing watershed that integrates human and natural systems.

**The teams also adopted common strategies for achieving their goals:**

- **Create a comprehensive landscape infrastructure system - not a green landscape overlay**
- **Develop an armature, not a master plan, to allow interventions to be adopted incrementally in response to changes in the community over time**
- **Provide a “kit of parts,” not prescriptive solutions, to allow interventions that are varied, interesting, flexible and adaptable to individual site conditions, community preferences, and future development**

The teams worked long, hard and late into the night. On the morning of the third day, they offered narrated power point presentations to a full audience of students and faculty, community residents, environmental activists and municipal government representatives.



**Above:** Xtreme LA teams brainstormed, generated concepts, and set strategies. Team members worked individually and in small groups researching, developing plans and proposals, and creating final presentations.



### Team A: Imagine Wells Goodfellow

Imagine the re-emergence of a thriving neighborhood as a vibrant, healthful place. Imagine untangling the complex systems within the neighborhood, integrating best practices to improve services and eliminate critical storm water issues. Imagine revitalizing the urban fabric with an adaptable green infrastructure. Imagine strengthening connections within the neighborhood, providing walkability, circulation and better transit options. Imagine creating a resilient community that provides habitat and recreation through a low-maintenance, self-sustaining system. Imagine a generous solution that gives back more than it takes.

**Top:** Proposed road interventions include infiltration within the right of way, at intersections, and in front of vacant parcels where “bump-out” planted water collection points replace unused parking spaces.

**Right:** A toolbox of proposed solutions, to be used individually and in combination, addresses the mitigation of groundwater flooding and basement inundation at building, street and site levels.

**Far Right:** Proposed placemaking strategies include three typologies for the creation and use of open space that would over time provide a mosaic of welcoming green spaces within the community.

### ELEMENTS (SMALL) green conditions

Image 1

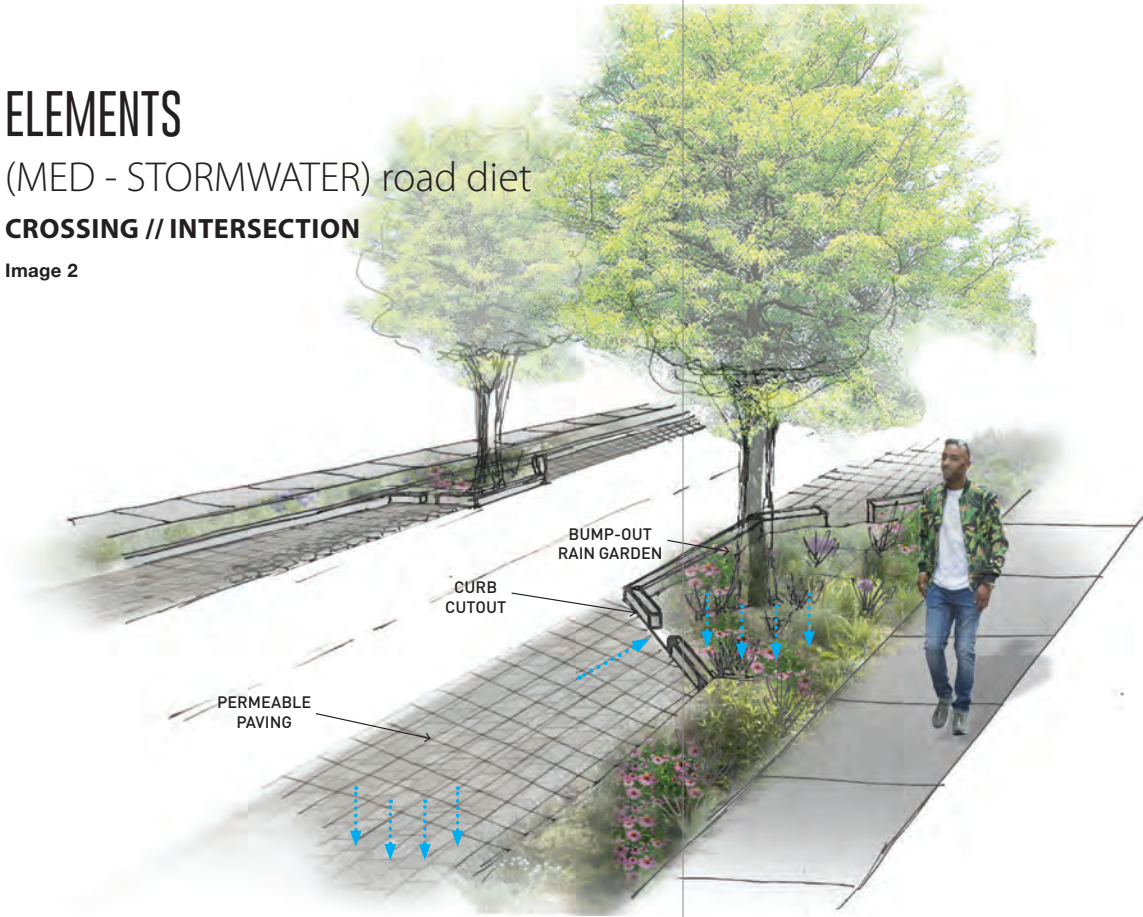


### ELEMENTS

(MED - STORMWATER) road diet

### CROSSING // INTERSECTION

Image 2



### ELEMENTS

(MED - PLACEMAKING) openspace program

Image 3



RECREATION

ECOLOGY

URBAN AGRICULTURE

Team A approached its ambitious agenda at three scales. Small scale, (Image 1) it addressed the groundwater flooding roads and basements with blue roofs/green roofs, bioswales, rain gardens, permeable paving, groundwater retention areas and sloping wetlands.

Medium scale, it proposed road and placemaking interventions. It scaled down over-large roadways, employing a variety of green mitigations to provide groundwater infiltration and filtration within the right of way, at intersections, and in front of vacant parcels by removing unused parking spaces and creating “bump-out” green-planted water collection points. (Image 2) Its placemaking strategy addressed vacant parcels, proposing three typologies for the creation and use of open space: recreation, ecology and urban agriculture. (Image 3)

Large scale, the team proposed a plan for a comprehensive network that would expand on bioswale and storm water systems by creating a storm water corridor leading to the existing MSD basin and future basins, forming “detention parks” and completing a loop of green infrastructure that could continue to drive development and infill for people living in the area now and in coming decades. The team projected that, over an extended timeframe, such a system could be incorporated into other municipal systems with expansion of greenways into the greater St. Louis system.



Team A envisioned these conditions developing organically in response to a changing context, and its presentation envisioned variations of how this “mosaic” might work. (Image 4) Starting with current conditions marked by vacant lots and adjacent abandoned buildings, it showed initial implementation of permeable surfaces in open spaces with lawn and native plantings to provide infiltration on the site and over time, removal of adjacent buildings and creation of new program areas. Eventually, more native plantings might be added, with paths and bioswales weaving through the open spaces. Acting on community comments citing the lack of local sources for healthy food and the need for job creation, it proposed the development of urban agriculture with local residents acting as stewards.

Within the watershed the team proposed breaking down the larger site into mini watersheds in which each area would have its own wetland feature to hold water and allow it to slowly release, in time creating a corridor that would provide water management and also support public space and social programming. (Image 5) The team expressed its hope that this incremental approach and framework of typologies for storm water management layered with social programs might eventually propagate from Wells Goodfellow throughout the 22nd ward and St. Louis as a whole.

## A FUTURE OPENSOURCE CORRIDOR

Image 5



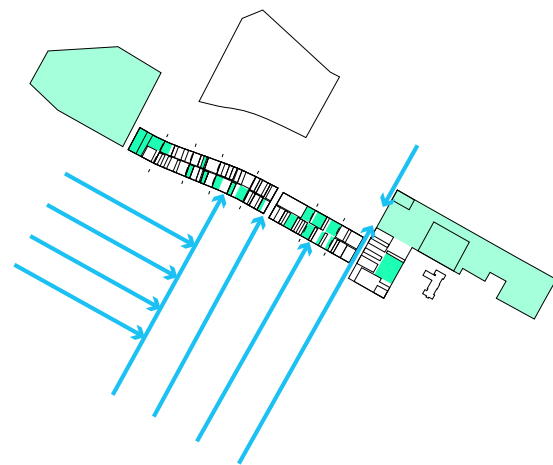
**Top:** An envisioned green corridor provides shade, ground plantings and a walkway for pedestrian movement through the neighborhood with access to houses and open spaces along the way.

**Below:** Over time, mini-watersheds designed as wetland features in local areas would hold water and slow its release, eventually creating a water management corridor within the larger watershed.

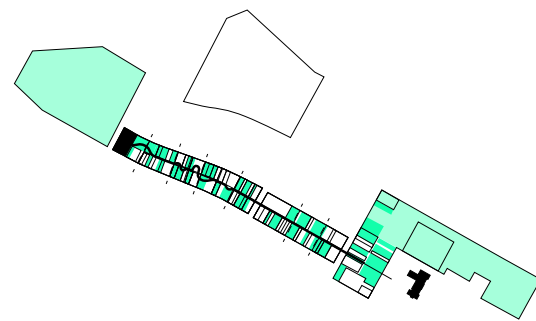
## AN INCREMENTAL STRATEGY

Image 4

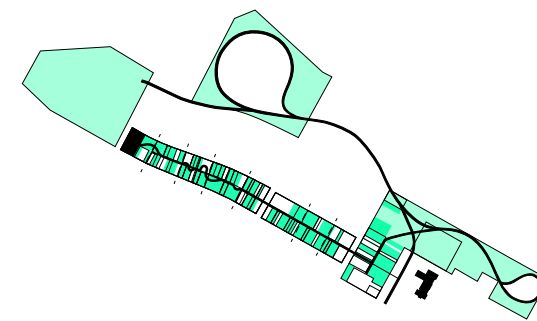
**PHASE 1**  
2yr



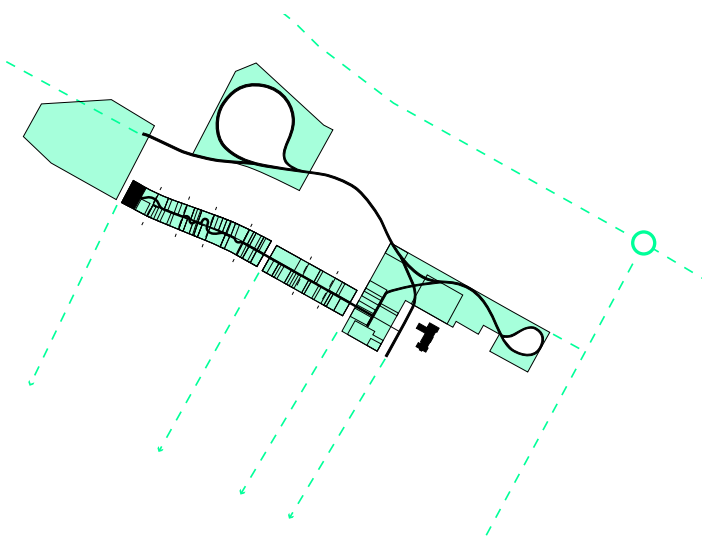
**PHASE 2**  
5yr



**PHASE 3**  
10yr



**PHASE 4**  
20yr





**Team B: The Goodfellow Project**

“We propose three big moves that we think are most important for Wells Goodfellow: expanding water management systems, enhancing community/public space, and encouraging residents to engage more in their community. These moves are based on three factors that we believe can drive a healthier community: access, safety and identity.”



**Right:** The graphic shows proposed landscape and programmatic interventions for improving access, safety and identity – three key attributes of a healthy community.

**Far Right:** A map of existing zoning within the Harlem watershed provides context for the relationships between multiple uses and the movement of water throughout its boundaries.

Team B’s proposals aimed at increasing access to jobs, food, recreation and outdoor space. They focused on increasing safety through improved water management, better water quality, and traffic calming that makes streets part of the solution. And they proposed to foster identity through education, signage and engagement to build sense of place and pride.

The team looked at the context of the site in relation to the layered whole within the Harlem watershed to understand how water moved through the site pre-development, how it moves through today, and the infrastructure that has been

implemented to contain and re-direct it. It used zoning maps to identify the relationships between multiple uses within a residential area that abuts an industrial corridor in decline. (Image 6) It considered ways to increase pervious surfaces and support ground water penetration, treating water where it lies; to engage with community members and metropolitan authorities to enable the expansion of its armature framework to other sites; and to leverage the ecological whole by, for example, drawing on the Mississippi River as a center for avian migration to advance renewed and regenerative solutions.

**EXISTING ZONING**

Image 6



<span style="display:inline-block; width:10px; height:10px; background-color:grey; border:1px solid black;"></span> Residential	<span style="display:inline-block; width:10px; height:10px; background-color:darkgreen; border:1px solid black;"></span> Barrett Brother's Park
<span style="display:inline-block; width:10px; height:10px; background-color:lightblue; border:1px solid black;"></span> Commercial	<span style="display:inline-block; width:10px; height:10px; background-color:lightgrey; border:1px solid black;"></span> Industrial



**PHASE 1 The Immediate Future:** Team B's plan proposed storm water treatment in at-grade locations already owned by the MSD or the city that it called "community nodes," that would collect water locally and from surrounding areas and could grow and change over time to accommodate immediate adjacencies. It developed a kit of parts, including rain gardens and other small-scale infiltration and retention systems, to repurpose vacant lots as amenities. It proposed working landscapes to foster resident involvement in community gardening, soil creation through composting, and tree production, in which trees are grown for the immediate site or for relocation elsewhere in a wetland park. And it advocated abundant native plantings to create a low-maintenance system that could be used to infill all remaining vacant lots and provide soil stabilization along steeper property edges. (Image 7) Lot types could be mixed and matched to meet the needs of adjacent homeowners and the aspirations of local residents. Aware that some people find the appearance of natural landscapes unkempt, the team identified a palette of pleasing and colorful plants that could act in wet and dry scenarios and provide both ecological services and be inspiring to residents.

## NATIVE PLANTINGS

Image 7



*Aster novae-angliae*



*Asclepias incarnata*



*Vernonia fasciculata*



*Carex vulpinoidea*



*Scirpus cyperinus*



*Mimulus ringens*



*Eupatorium perfoliatum*



*Liatris pycnostachya*



*Spartina pectinata*



*Panicum virgatum*



*Eupatorium maculatum*



*Lobelia cardinalis*



*Rudbeckia hirta*

## FORBS

## SEDGES, GRASSES, and RUSHES



**PHASE 2 Evolving Conditions:** In the second phase, the team proposed a typology for urban storm-water management in which the parcels of landscape space planted as urban meadows and rain gardens are used to gather the water already filtered and held at collection nodes and bring it down to the street and to the basins. They re-imagined the basins as storm-water wetland parks with amenities such as boardwalks that, unlike toxic fenced no-man’s lands, would become places for people to gather after storm water events and provide ecological landscapes for migrating birds, pollinators and small mammals. (Image 8) The team tied these water quality measures together by interventions in the street system, reducing widths of driving and parking lanes to create an additional 10 feet or so of space on either side; implementing vegetative swales along the adjacencies; and providing a 5 to 6-foot sidewalk along the edges. Removing parking spaces in front of vacant lots and expanding vegetative swale in those areas provides even more landscape amenity and water treatment capacity. (Image 9) In addition, the team proposed adding traffic calming, such as curvatures and speed bumps, to control the excessive speed at which cars travel through the site.

**PHASE 3 A Comprehensive System:** As the system of wetland parks evolves, the team envisioned a corridor in which the original MSD basins are connected into a more comprehensive system from Barrett Brothers Park to the southern boundaries of the current basin. This linear wetland corridor would perform water management functions, give people access to the water and natural surroundings, expand native plant corridors for bees and other pollinators, enable creation of bike paths and pedestrian networks, and better connect residents with transit. Like Team A, Team B envisions its system as a model for the entire region, with a network of wetland corridors extending from Goodfellow in the west all the way to the Mississippi River: a new green infrastructure system in which the street network transects from the far north to the far south, providing storm water mitigation and retention, community amenities, calm streets and native habitat.

## WETLAND PARKS

Image 8

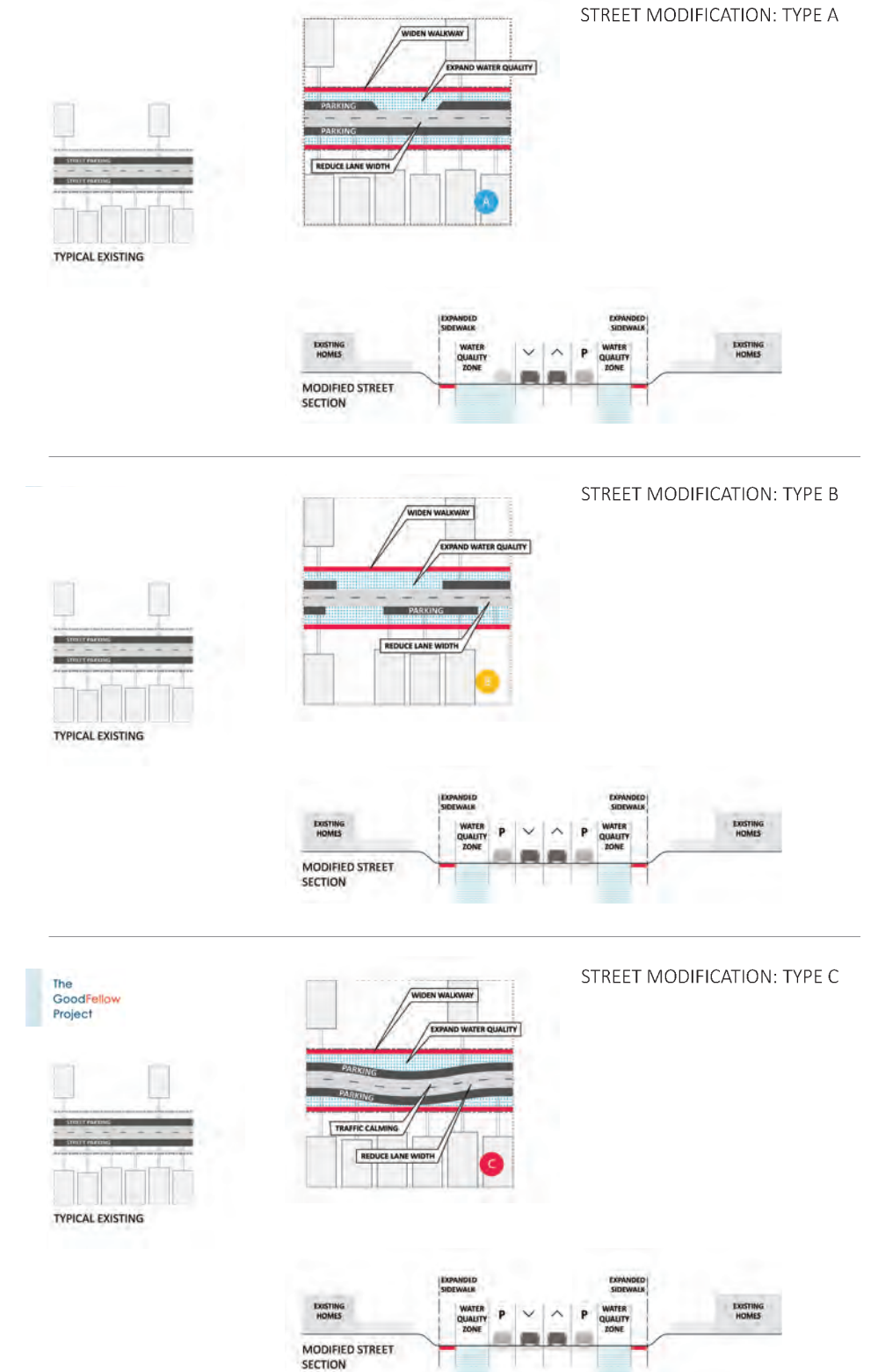


**Right:** Proposed wetland parks provide water retention with grasses and trees, walkways and lookouts: ecological landscapes for people, migrating birds and small mammals.

**Far Right:** Three variations on street modifications that reduce street widths to provide vegetative swales and wider sidewalks, eliminate unused parking spaces to increase landscape amenity and water treatment capacity, and create traffic calming measures to promote safety.

## STREET MODIFICATIONS

Image 9



The GoodFellow Project





## Public Comment

Audience members were invited to ask questions and offer comments. Many did and the dialog focused around three areas: how to transform plans into reality, how to revitalize the economy, and how to engage the community in the process.

The difficulty of building an effective support base was acknowledged. “It takes a lot of stake holders working together to make something this large work,” one participant explained. “Especially if we are talking about doing this not just on a site level but as a framework for the entire county or city.” And another observed, “In order for the incremental approach to work it takes specific partnerships along the way – whether it’s the organizations mentioned and involved here or government institutions or new people with connections in the

community who come along. The good thing about an incremental approach is that the community can continue to accrue those partnerships as they come along.”

In response to a question about economic revitalization, a participant explained, “We did not have time to delve into what the long-term economic engines are. But we did think about some short-term things related to the landscape that could be done. The city currently hauls away uprooted trees and vegetation illegally dumped on site and brings in clean fill for the holes where rubble from demolished homes has been removed. But it could be using that vegetation to make soil on site and using it to fill the holes. Creating local tree nurseries would make it possible to grow the trees used for streetscapes right here. All these could create jobs for local people.” A second participant added: “We were told that the neighborhood is a food desert, which led us to think about urban agriculture and food trucks, which we understand are popular in this city. Providing a place for food trucks to park could bring people and awareness into the

neighborhood, creating an amenity here, even if on a small retail scale. We also discussed using the vacant school building as a community center that might house a theater, host community events, and provide a youth program – things that could engage community members, build community participation, raise some revenue and make this community known to the rest of St. Louis.”

Participants regretted not having sufficient time to develop detailed strategies for engaging with the community, but acknowledged the necessity for engagement. Several mentioned reaching out to local organizations and churches, to which a community member replied, “The disenfranchised don’t go church. You need to go where they are.” And that remains a local and global imperative if meaningful solutions are to be realized.

In closing, Team A leader Chip Crawford thanked Landscape Forms and applauded the “great product and great work.” He noted, “We didn’t get to the public engagement, which is part of every public project. But

I want to assure you that we debated late into the night about our ideas and solutions. There was a lot of give and take representative of what happens during the process of community engagement.” Team B leader Keith Bowers spoke to participants. “It’s been great working with you all – everybody worked so hard. I’d like to thank all of you for the time and energy you put into this.” And to the audience. “You wouldn’t believe how hard they worked through the night. The discussions we had, the ideas that came up and went back and forth, what they put together was really enriching and engaging.”

St. Louis Alderman Jeffrey Boyd delivered his take on the effort. “I’m very impressed, especially with the trails and the boardwalk bridge and the idea of not doing something that hinders change or progress in the future,” he said. “You affirmed that we are on the right track in the way we are thinking about this. Thank you.”





## Xtreme LA: A Ripple Effect

Washington University reports positive outcomes from Xtreme LA on four fronts. Representatives from two local design firms engaged in a three-day conference, in collaboration with the Green City Coalition to develop a master plan for the area, had attended the Xtreme LA presentation. Impressed by what they saw, they invited students from the university to discuss the Xtreme LA proposals and students are looking forward to seeing their Xtreme LA work reflected in the master plan.

Separately, Rod Barnett was invited to meet with representatives from the City of St. Louis, who revealed that prior to Xtreme LA they were unaware of the skills and expertise

that landscape architecture in general and the landscape architecture program at Washington University in particular could bring to St. Louis's water management and property vacancy challenges. As a result, Barnett explains, the landscape architecture department at the university will become increasingly involved in these issues. "Basically, we have become more of a player."

Since the Xtreme LA event, Barnett has met with the Nature Conservancy's newly appointed St. Louis Manager for Urban Ecology to discuss how the department can contribute to developing local strategies. And Washington University has started a new urban bio-diversity focused research center within the school of science and the landscape architecture department has been invited to participate.

As part of its commitment to the growth and success of the landscape architecture profession, Landscape Forms will provide opportunities for Xtreme LA participants to build on relationships formed in St. Louis, broaden professional networks, and continue the collaborative work and learning at the heart of landscape architecture practice.

### Xtreme LA Co-Host

**Rod Barnett**  
Chair, Landscape Architecture,  
Sam Fox School of Design & Visual Arts  
*Washington University*

**Barbara Deutsch**  
Chief Executive Officer  
*Landscape Architecture Foundation*

**Kirt Martin**  
Vice President Design + Marketing  
*Landscape Forms*

### Xtreme LA Team Leaders

**Keith Bowers**  
Founder and President  
*Biohabitats*

**Chip Crawford**  
Senior Principal  
*Forum Studio*

### Professional Participation

<b>Jarred Beall</b>	HGOR
<b>Jason Brill</b>	Confluence
<b>Sara Davids</b>	RDG Planning
<b>Clare Drummond</b>	Studio DWG
<b>Aaron Elswick</b>	Terry Guen Design Associates
<b>Alex Kelley</b>	Reed Hilderbrand Landscape
<b>Matt Perotto</b>	Hargreaves
<b>Veronika Ortega</b>	Arquitectonica GEO
<b>Katie Rudowsky</b>	Kiser + Vogrin Design
<b>Kelli Schwab</b>	Wenk Associates
<b>Darren Sharkey</b>	SWA
<b>Paul Toenjes</b>	SWT Design
<b>Gaylan Williams</b>	Dana Brown & Associates
<b>Paula Lawrence</b>	Progressive AE

### Washington University Student Participants

**Briana Coleman**  
**Nona Davitaia**  
**David Eslahi**  
**Rui Guo**  
**Tom Klein**  
**PiuPiu Huang**  
**Eric Kobal**  
**Micah Macaulay**  
**Margot Shafran**  
**Shelbey Sill**  
**Rory Thibault**  
**Kelsey Vitullo**  
**Jason Wu**  
**Shuying Wu**  
**Simba Wu**



# WELLS GOODFELLOW IN CONTEXT

