



Practice-Based Research: Operationalizing Landscape Performance



Presentation 1: Research at SmithGroupJJR

Presenter: Deb Mitchell, FASLA, PLA, SmithGroupJJR

Recorded: March 20, 2014

In this first presentation from LAF's Practice-Based Research: Operationalizing Landscape Performance webinar, Deb Mitchell talks about the evolution of performance research at SmithGroupJJR and discusses the firm's development of its WaterScore metric to get to net zero water.

[00:10] Thanks Heather, that was a terrific intro. I'm going to talk a bit first on a thumbnail overview about SmithGroupJJR. We represent an 820 multi-disciplinary design firm. We are in nine US locations, and more recently plus Shanghai. We have 343 LEED accredited professionals, and we have over 100 LEED certified projects. So we've been at this for a while. The graphic before you doesn't represent us flying on planes everywhere as much as it does the amount of video conferencing that goes on between our offices. And this just really enriches the expertise as well as the sharing that goes on between all of our locations.

[01:00] SmithGroup was established in 1972 as one firm with two brands. It really represents our upper mid-west roots of SH&G's architectural practice in Detroit and JJR's practice in Ann Arbor. And over time we've gone on to grow. JJR has in four locations, and in 1985 we added two disciplines -- the disciplines of civil engineering and environmental science -- to our suite of services. And it really was the environmental scientists who were at the forefront of monitoring ecological performance relative to wetlands creation and mitigation. So they were really at the forefront of looking at things through the ecological aspect.

[01:46] One of our seminal projects was Crosswinds Marsh Interpretive Preserve in Wayne County, Michigan. And this was a result of the Detroit, Wayne County Airport expansion that occurred in the early 1990s. And our strategy, JJR's strategy, was to create a wetland mitigation bank converting 1,000 acres of farmland back to a pre-settlement wetland condition. At the time we did this, it was one of the largest wetland mitigation banks in the country. At the time, wetlands compensatory mitigation under the Clean Water Act required the use of science-based assessment as well as measurable and enforceable ecological performance standards to evaluate project success. This policy mandated post-construction monitoring for three years. So for Crosswinds Marsh, as we monitored bird species for three years, after that you can see the growth slowly but surely. And it was a big day when a pair of nesting bald eagles was spotted out at Crosswinds Marsh.

[02:54] Fortunately, this was also the subject of a LAF case study so were able to update from the late 90s to what was going on in 2012. And you can see the number of bird species that have been observed are now over 200, which is fabulous. But we've also been monitoring invertebrates and amphibians and everybody else, so you get this very rich picture of diversity that occurred as a result of this project, which was recognized by ASLA with the 1999 President's Award of Honor, which we are very proud of.

[03:30] If you take a snapshot of SmithGroup, our architectural component, in 2000, they had expanded to multiple offices and also enhanced their suite of services that they were offering. We had a group in Washington DC that was very passionate about sustainable design and specifically at that time being an early adapter to LEED certification and really getting in front of that trend. And we were able to advance...and that was recognized in 2000 with the Phillip Merrill

Environmental Center for the Chesapeake Bay Foundation, which received the first LEED Platinum certification in the country in 2000. So we were really out there architecturally, really pushing that LEED envelope.

[04:27] SmithGroupJJR, the JJR portion we certainly look very closely at a more integrated approach to sustainable design. You know, as wonderful as our environmental scientists were in pushing us, we realized that we were really very deeply vested in the ecology bucket, but the Venn diagram other attributes we were not measuring as well, such as the economy, society, and human spirit attributes. So to truly have an integrative approach, we needed to address all four elements, which we continue to do through projects such as Portage Lakefront State Park in Portage, Indiana. It got LEED Gold, but we also benefited from an LAF Case Study and it did fit all four of the Venn attributes, which is terrific.

[05:17] And then we also continued with -- this is George 'Doc' Cavalliere Park in Scottsdale, Arizona, which was our first SITES application that we had prepared. And we got a 3-Star rating in 2013 and it will be an LAF Case Study in 2014 so it will be interesting to look comparatively at these two things side by side, and see what we are going to learn from those two.

[05:44] Since 2013, SmithGroupJJr has been one firm and one brand. And so out of that and as we've looked kind of from the ecological roots that JJR had and with the LEED group that the architects were advancing, we really have an embedded firm culture of sustainability. And this has proved for us to be a distinct market differentiator as we go after our various projects competitively.

[06:14] We also are seeing a number of trends which are impacting our performance currently. We are seeing much more stringent stormwater requirements. We have a project in Tysons Corner, Virginia, and their stormwater requirements were to hold at a minimum the first inch of rainfall and retain it on-site through infiltration, evapotranspiration, and/or reuse. And as you look on down this list of what they are requiring that you do and including Low Impact Development on your street design. So this is, Tysons Corner was an edge city and is really becoming much more urbanized. They really want a live work play environment, and so this is their strong steps that they're taking. The thing that's really interesting is how tough Tysons has been. When you have multiple parcels that you are developing, each parcel needs to meet that goal of holding that inch of rainwater. So if you have an under-performing parcel, it can't contribute to over-performing parcel. So you have to be pretty close to 100% before the commissioners give you a pass. So you can say, "I've got 99% or 98% -- that's the best I can possibly do," and they usually will let you go. But if you come in at 90%, they aren't going to accept that you've really tried hard enough. So certainly this is responsive to climate change and, kind of, the more stronger storm events that we're all seeing, and it's great when you see communities step up and really take this on. But it was also...what we learned from this, for the very first time we found out that we as landscape architects could not solve the stormwater issues ourselves, try as we might with infiltration basins on the streets, green roofs and so on. We really had to interact with the building for the first time and so we had to integrate the cooling towers for the mechanical MEP for the building in order to succeed in reaching the goals that were required. So we're really forcing ourselves to really take a very integrated approach, not only to just the site, but the site and the building together to solve these more stringent requirements.

[08:30] Another major trend is the Living Building Challenge, which is a 2030 imperative to hit net zero. They describe themselves as having seven petals, which are the seven diagrams you see across the top of the slide. For the first time they've included things such as health and social equity and beauty, along with net zero energy and net zero water use. It's interesting in contrast to LEED that although there are only two rules, all imperatives are mandatory within each typology and the fact that the certification is based on actual rather than modeled or anticipated performance. So we're really seeing the bar moving from modeling to you're going to have to deliver what you've actually done by proof.

[09:23] So the next step... So in answer to that... We came up with the idea of developing a WaterScore as a result of these trends that we see coming. And the idea that you're using only water that falls or flows through the site and using it at the highest level of quality and that you cascade the water through the building as it decreases in quality so again, incorporating architecture into the calculations. And then you return the water to the biosphere safe, ready for reuse and at natural rates.

[10:06] So the next step we did in creating the tool to be able to do this was the WaterScore tool for net zero... So what we came up with, as you see on the right-hand side of your slide, a rating system where green is good and the project meets the pre-settlement condition in regards to WaterScore, the goal range is kind of in the middle around 63, and if you're not doing a very good job (your project meets your existing conditions) you're in the red zone. And we felt that we needed two ways in order to get to net zero. One is based upon volume and the other is based on quantity.

[10:54] And we'll go on to the tool which is on your screen, and rather than get into the weeds here on the details... The two red boxes represent the volume and the quantity rating. What we're looking at is rainfall data. We're looking at the hydrologic soil group using the Soil Conservation Service classifications. We're looking at the pre-settlement coverage and the drainage areas. Those are the factors that go into this tool.

[11:25] And what we found after doing this, using case studies from our very own projects -- there's about seven of them -- that we were not doing as good a job as we had thought. The volume WaterScores, we didn't get anything in the green. The quantity WaterScores, we... the Ann Arbor City Apartments that we managed to get to a hundred, which was great. And the Dearborn Intermodal Passenger Rail Facility also got into the green zone and above the goal, but we're just finding out that business as usual does not cut it. So meeting LEED or local code doesn't produce a good WaterScore. Increasing pervious surfaces certainly helps. Infiltration helps, but we know we all across the country our soils are different and the perviousness of those soils are radically different and depends if it's not pervious it could end up in the storm sewer system. And then the other lesson, which we talked about in the Tyson's Corner project, is that you must include water reuse either through building mechanical systems or through irrigation, is becoming more and more the way it has to be to meet this.

[12:31] And at the same time our mechanical engineers are getting a lot more conscious about the details of every single piece, whether it's the toilet choice and how this uses. And of course there's a lot of regulations that govern city water use, what you can use it for, what you can use rainwater or greywater for, as well as composting toilets and greywater re-use. So this is how we're getting more finely tuned to achieving our ultimate Living Building Challenge commitment of net zero water.

[13:07] So with that we're underway on the Brock Environmental Center for the Chesapeake Bay Foundation down in Virginia Beach and we are targeted for net zero energy and water. It's our first one that we will have, which is great and we're looking forward to getting that under construction and measuring the results at the end.

[13:25] And as I started with -- I talked about the amount of video conferencing that we do, just to show you how serious we are about communicating across the company -- we have a GreenSmith series. So we took on the net zero and the Living Building Challenge and our two -- this was our 2013 series. And so quarterly we have major events which people can join via video conference, so that we all can become more educated as we move forward. So with that I'll pass the baton back to Heather.