

HUMAN BEHAVIOR, BUILT ENVIRONMENTS, AND RESILIENCY: A PRESENTATION BY CAROL ROSS BARNEY



The Seeds of Research in Design Process

I am a Chicagoan. I used to think that growing up in Chicago, an architectural mecca, had some connection to my becoming an architect. My practice has always been based on understanding existing spaces and attitudes, and Chicago is a phenomenal classroom.

One of the drawbacks of practicing in the city where you were born is you may know it too well. I think, at least when you start out...that there's a habit amongst architects and designers to rely on what is familiar. I find that in my practice..that's not good enough...we have to get out of our known existence and out of what we expect. New, valid ideas depend on research...a real research: predictive research. The topic of your conference is human behavior, built environments, and resiliency: These are the new demands that design must answer today. And that type of predictive design requires a deeper understanding of existing conditions and attitudes. And in our design process, we rely heavily on research and the original collection of design data. And we didn't do that originally, I'm showing you this picture because this is the place where we realized how important that was (Figure 2).

This section is a transcribed script of an exclusive talk highlighting the importance of research in practice by Carol Ross Barney at the 2020 PhD symposium.

Carol Ross Barney, FAIA, HASLA, has been in the vanguard of civic space design since founding Ross Barney Architects in 1981. With a career that spans more than 40 years, Carol has made significant contributions to the built environment, the profession, and architectural education. As an architect, urbanist, mentor, and educator, she has relentlessly advocated that excellent design is a right, not a privilege. Her body of work occupies a unique place within the panorama of contemporary architecture, being composed of work in the public realm. Carol's projects vary in type and scale yet uphold a deep commitment to the role architecture plays in life quality. This has manifested itself in the design of spaces that enrich the metropolitan experience; to buildings that are environmental stewards, showcasing sustainability in an overtly compelling way; to spaces that inspire young children and the brightest minds of tomorrow to learn, invent, and break boundaries.

Ross Barney is a graduate of the University of Illinois. Following graduation, she served as a U.S. Peace Corps volunteer in Costa Rica planning national parks. She teaches an advanced Design Studio at IIT and serves on their College Board of Overseers. Carol's work has been honored with more than 100 major design awards, including six national American Institute of Architects Honor Awards, more than 40 AIA Chicago Awards, two AIA Committee on the Environment (COTE) Top Ten Project Awards, the AIA Chicago Lifetime Achievement Award, the AIA Thomas Jefferson Award for Public Architecture, and the AIA Illinois Gold Medal, all for a distinguished body of work. She was named as a *Gamechanger* by "Metropolis" magazine in 2018. For nearly two decades, Carol's studio has been working along Chicago's rivers. These efforts include the design of the Chicago Riverwalk and studies on 150 miles of riverfront across the city. The goal: Reconnect people with the dynamic and changing life of the city's natural resources. In recognition of her dedication to bring people back to Chicago's rivers, the national American Society of Landscape Architects bestowed honorary membership to Carol in 2018, one of its highest honors bestowed upon non-landscape architects.



Figure 1: Professor Carol Ross Barney at the 2020 PhD Symposium. (Source: Michelangelo Sabatino.)

This structure is the Murrah building, and in 1997, two years after the bombing, we were hired to design a replacement for that building. Looking back, what is remarkable about it is I had spent my entire life relying on what I knew as a Chicagoan and the history of the city. And here I was in a city where I knew nothing. I didn't know the history. I didn't know the people, and it threw me into a panic as a designer of this important building. And I spent the first three weeks of the assignment just traveling around. I became a real Oklahoma wonk. I actually knew more about Oklahoma than I think most Oklahomans did. But beyond history and data, there is this other, more qualitative part to understanding a city. And we decided that we wanted to try to methodize that also. It is the very first time that we collected opinion and data by public engagement. And it was pretty remarkable.

Our client, the General Services Administration, agreed with us that this was a good thing to do and they sponsored our efforts. One of the first things we did was create a questionnaire which was so primitive. And the answers that we got back were almost unusable. One of the things we asked was: What's the most important thing about this building? And the first-choice answer was that there would be no parking in this building because, if you remember, the Oklahoma City disaster was caused by a truck bomb that was parked next to the building. And the second most important thing according to our questionnaire answers was that parking would be really convenient. Well, it seems that those are diametrically opposed. What we learned is sometimes we have to be able to recognize and design for the intersection of these data points.

Development of Research Methods for Data Collection

So, since that time, collecting data and conducting research has been a part of our Studio process and that's actually whether we get paid to do it as a scope of services or not. And we had some really interesting experiences. This is the opening day on the Bloomingdale Trail 606. We worked on this with MVVA, the landscape architects (Figure 3). And the city was very concerned about this neighborhood—Logan Square. Most of you know where the Bloomingdale Trail is. It goes through from a really affluent neighborhood in the East to a less affluent neighborhood on the West. And the city was really concerned about the neighborhood change and gentrification, and the opinions of the residents about repurposing the elevated rail line as a linear park. So, for the City of Chicago...this is the first time we were asked to design...a public engagement process. It started out with public meetings.

This is the very first public meeting. It's at the Congress Theater that many of you know (Figure 4). It was just before it was closed for renovation and was being used mainly for rave-style rock concerts. I had never seen it with the lights on. So, it was quite revealing both that it was so unbelievably gorgeous and also quite decrepit. The whole process was a multi-faceted, multi-phase process. In Phase 2 we dedicated an entire weekend to hands-on charrette (Figure 4). We also started developing a tool chest of games that would produce the responses that we needed to analyze and bring our design forward. This is one of the really popular 'Post-it exercises.' In this case, we mounted a massive aerial map of the Bloomingdale Trail site...it's the length of the gym...and we asked people to post their ideas and thoughts on the map.



Figure 2: Oklahoma City Federal Building, Oklahoma City. Research on parking spaces.
(Source: Ross Barney Architects; photo courtesy of Steve Hall, Hedrich Blessing Photographers.)



Figure 3: Aerial view of the Bloomingdale Trail 606. (Source: Ross Barney Architects.)



Figure 5: A rendered image of the Railyard in Rogers, Arkansas. (Source: Ross Barney Architects.)



Figure 4: First public meeting at Congress Theater (left). Design guidelines charrette at YMCA (right).
(Source: Ross Barney Architects; photos courtesy of Kate Joyce Studios.)

We recreated the Bloomingdale Trail outline to scale inside a handball court to make it easier to understand the scale of the project during the charrette. Other activities included idea exchange and generation: break down into small groups and then report back. I'm sure you're familiar with these techniques. But for us, it was really exciting to be able to develop this type of information to use in our design. And since then, we've tried to make this an integral part of our services. We conduct some of this research regardless of whether a client makes it a part of the scope or not. But we are finding that especially public agencies are becoming more and more interested in including their communities in design.

This is the railyard in Rogers, Arkansas. It's under construction right now (Figure 5). This park is in the historical center of the town and has actually always been a working railroad. The project, which is funded by the Walton Family Foundation, will create a downtown center. By the way, Walton Family Foundation has started a program dedicated to design excellence in the public realm. Design fees and sometimes the construction money are paid by WFF. One requirement of the program is that the designer must be from a group curated by the WFF, so we competed for this design against nationwide architects and landscape architects. And the interesting thing about it is we were selected because of our attitude and our insistence on a public-engagement process.

And we used some of those same tools that we developed working on the 606, but one thing we're finding is that our toolbox is expanding rapidly. And I have to confess to you that we don't have all the tools we need now. One of the problems on the Bloomingdale Trail 606 was an inability to get meaningful engagement from Spanish-speaking communities along the trail. I won't say that we failed entirely but I know that we didn't get the depth of response we wanted. And, ironically, that we had that same issue in Rogers, Arkansas: About 30% of the population is Spanish speaking. It's a big changeover in the last few years, and that community is not really integrated into the rest of Rogers.

So, we did an outreach beginning with Spanish-language surveys. And at this point we also changed and updated our survey technique, which is something really wonderful that's happened with digital communication and engagement. And we were able to use digital platforms. These were really the simple ones: Survey Monkey. And by leaving paper forms with strategic Rogers businesses and leaving QR codes in vital places, we were able to get a participation that we never really thought we would get.

The town is about 70,000 people. Out of those 70,000 people, we had a thousand responses. 75% of them were complete. So, we were able to discover an interest in this project that wasn't really known to the community before. And these are just some samples of some of the answers (Figure 6). The feedback was interesting and instantly usable. First of all, we instantaneously developed a following of people who were interested in the completion of this project. The second thing that happened, you see here through questions 18, 19, and 20, and to a certain extent even earlier in question 17, was by soliciting public input for the park's program elements, we made the citizens owners of the activities in the park. By the way, this is the park under construction (Figure 5). It is going to open on January 1, 2021. And you can see we still have rail lines running through the middle of the town. But it's certainly going to have a different feel than what it had before.

Research in an Integrated Design Process: Community / Interdisciplinary Engagement in Chicago Riverwalk Project

We have learned that different types of communities demand different engagement processes. For the Bloomingdale Trail, which was quite clearly a geographic community, it was pretty easy, at least relatively easy, to get the right people in the room. On a project like the Chicago Riverwalk, that wasn't true. For us, the Chicago Riverwalk project was a 15-year project (Figure 7). And we found that our methods changed actually during the design. The most successful method we had for gathering data input was to create a series of interest groups that met on a scheduled basis. In fact, as phases of the projects completed, new interest groups were created. By the end of the project, we were meeting monthly with a Kayak Commuters Club. The design created communities that lasted enough to become a part of the research.

The other thing that we learned to rely on, besides talking to user communities, is a large stable of specialty consultants. Interdisciplinary consultation is essential, especially for projects like the Chicago Riverwalk. The Chicago Riverwalk had probably two dozen consultants ranging from marine engineering to water traffic. And one of the ones that I found most interesting to work with were the marine biologists that we worked with to create a "fish hotel" (Figure 8). Earlier, a few blocks east of here, the Friends of the Chicago River maintained an experimental fish hotel for quite a few years. Based on that research along with consultant advice, we were able to develop a uniquely supportive fish

environment. One of the problems with having fish in the main stem of the Chicago River is it's channelized and that there is really no natural environment. But by adding architectural features below the deck structure, we could create needed habitat. Floating marine plantings in the hotel provide fish food restaurants.

Resilient Architecture Through Transformable Design Features

One of the things that Zahida and I talked about before we started this...is that post-occupancy research is equally important especially when designing for resilience. I think you see this today when you look at parks, how we can use them, how we can't use them, and how we need to change after COVID. And one of the things we've done since COVID is engage in at least a modest form of reverse research, to see how our buildings work with new, unanticipated restrictions.

Some of them have had really interesting new lives. This is a building, we completed in 2019. It's a visitor center at Lincoln Park Zoo (Figure 9). For a few years now, we've been really fascinated by buildings that are literally transformable. They adapt to different conditions. In this case, this visitor center for Lincoln Park Zoo is free, so you don't have to stop and pay for admission, but you can pick up information about the exhibits and membership. But because it's in Chicago with 24/7 operation, it doesn't need to be enclosed. But we were really intrigued by the idea of what we could make transform in the building, then most of this would be a pavilion. And then what would need to be enclosed?

It was really sad after we opened the building, we found out that the building management wasn't really keen on opening up our NanaWall because it took 20 minutes a day. And it was a pretty much forgotten feature of the building. But since the zoo reopened after March 2020, after the first COVID wave, they have been opening the NanaWall because the 'transformability' has created a safer environment. We had done it because we wanted to save that energy, we wanted to make the building more welcoming. But what we are learning is the important connection between health and sustainability, often the things that make buildings healthy are the same things that make them sustainable.

Data in Design and Operation of High-Performance Buildings

So, the last thing I want to talk to you about...The more precise are buildings' demand to be, the more we rely on an in-depth data gathering. And that is particularly true for this project, which just opened in July 2020. This is the McDonald's Flagship in Disney Orlando (Figure 10). And it will be after one year, we hope, a certified NetZero building. And if any building needs a lot of research on a net zero building because the key to charting at the NetZero building is to first of all reduce as much of the energy as you possibly can, before you can start building back on renewables. So, this column here shows our last building that occupies the site. And this is our design building or concept building here.

And what I want you to take away from it is where we found the biggest energy savings: light and power. But the biggest after that is equipment and surprisingly comfort things like cooling aren't as much as you think. So, our attitude toward this building was to first reduce the power load, which included things like you may not have thought about it at

first...For example, McDonald's has three grill lines and then McDonald's ordinary methods to keep all their grills hot in case they have a rush order. And for this project one of the developments that their kitchen supplier did was a standby grill, so they don't have energy to maintain grill lines when they're not being fully in use. But then the method we used was off-balance and even there we found that there are different values to photovoltaics.

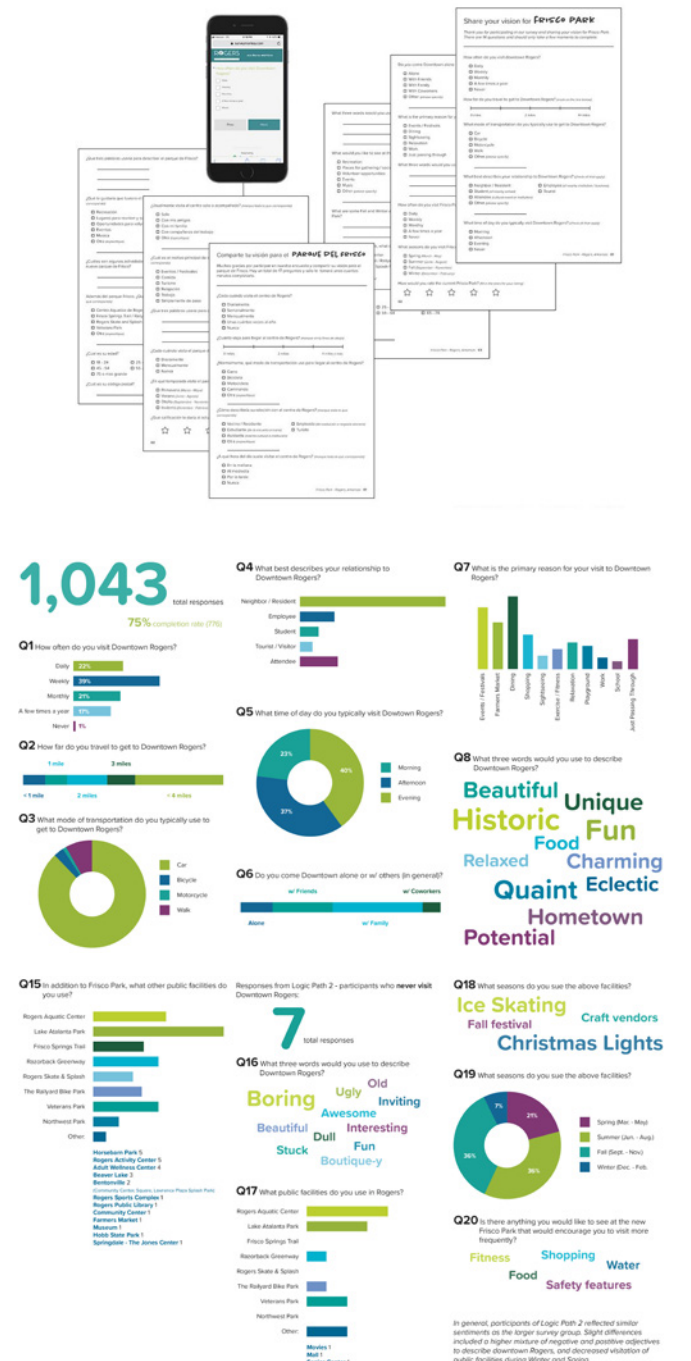


Figure 6: Data collection methods for Rogers, Arkansas / Bloomingdale Trail 606. (Source: Ross Barney Architects.)

I do want to show you what I am most excited about because it combines a few things that are both research oriented. Entrance with the idea that buildings can change. And on the upper chart this is comfort in Florida. So red is very uncomfortable hot, and blue is uncomfortable cold. And the hours of the day are charted on this side and the bumps on this side, just as you expect to see in a tropical climate. This part is pretty miserable most of the time. But we found out and this is not original research so if you ask me questions

about it probably, I can't answer. If you ventilate and shade, you can reduce that uncomfortable spree of the day to what's shown on this lower chart.



Figure 7: Chicago Riverwalk. (Source: Ross Barney Architects; photo courtesy of Kate Joyce Studios.)

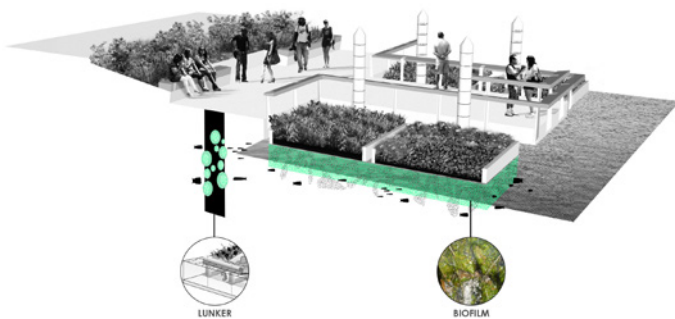


Figure 8: Interdisciplinary involvement (marine life, biologists, etc.). (Source: Ross Barney Architects.)



Figure 9: Retractable NanaWall, a connection between health and sustainability, at Searle Visitor Center, Lincoln Park Zoo. An example of resilient architecture. (Source: Ross Barney Architects; photo courtesy of Kendall McCaugherty, Hall+Merrick Photographers.)

So, what that inspired us to do was to create a building that ventilates naturally. And in the end this building uses a product that's manufactured by a window company called Colts. And it kind of looks like an old jalousie window you see in Florida. The jalousies are controlled by the building automation system. So, when the conditions are right, when we have the right humidity and the right outdoor temperature, the building opens up and is naturally ventilated. And then likewise it closes itself down. So, either way it's a breathing building in its own way. And that's allowed us to create a space of a dining room that actually is barely usable during COVID, but one that uses very little energy.

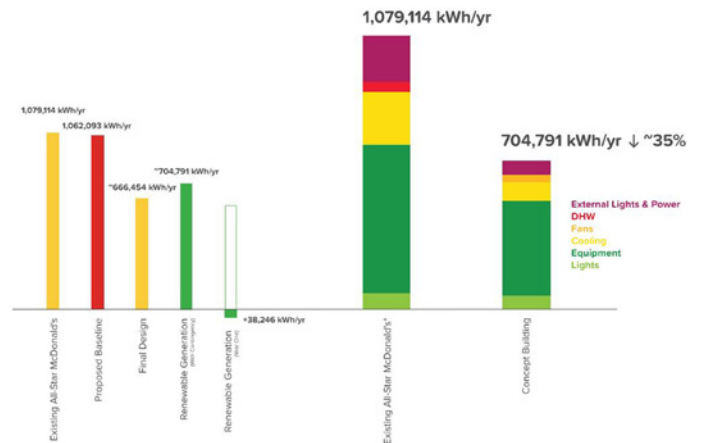
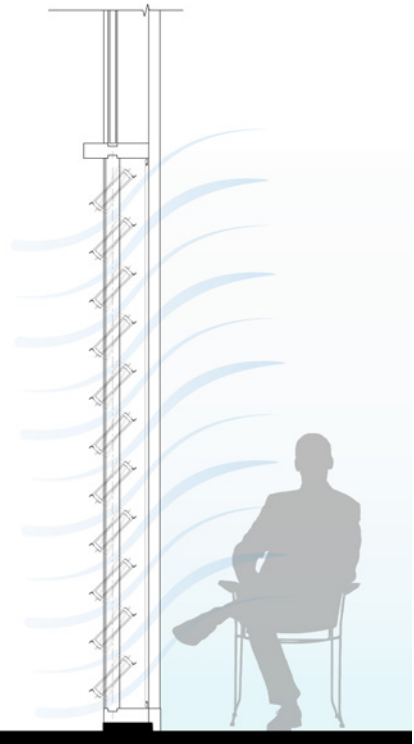


Figure 10: Jalousie window detail for natural ventilation at McDonald's Flagship at Walt Disney World Resort, Orlando (top). Charting for energy consumption, an example of NetZero building (middle). (Source: Ross Barney Architects; photo courtesy of Kate Joyce Studios.)

And I'm really excited about **the combination of the input of data into architectural design**. I'm really excited about making **buildings that respond to their conditions, and I really think that those are the most important features**, the most important qualities in creating a building or a part of an urban environment that is enjoyable in its own.