

Framework for a 21st Century City
Sustainability Made Tangible Through The Arts

CITY
AS
LIVING
LABORATORY
BROADWAY:
1000 STEPS

BROADWAY: 1000 STEPS

BROADWAY: 1000 STEPS is an initiative to establish Broadway as the new 'green corridor' of New York City where current and planned sustainability initiatives, such as those outlined in the city's PlaNYC, will be made tangible and encourage citizen action.

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Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.





Mary Miss / City as Living Laboratory: Sustainability Made Tangible Through the Arts (MM/CaLL) provides a framework for how the arts and sustainability can be linked in innovative ways to create cities that help us redefine how we live our lives, use our resources, how we communicate, educate, work, and collaborate.

MM/CaLL conceives of the city as a laboratory where artists and designers collaborate with scientists, policy makers and other experts to create immediate experiential impact derived from long term research and planning initiatives.

The goal is to make sustainability personal, visceral, and tangible so that city residents are empowered to take positive action.

Background:

The roots of **Mary Miss/City as Living Laboratory** can be found in the groundbreaking projects of Mary Miss, stretching back to the early 1970s. Her work has been consistently focused on decoding the environment in public spaces. More recently however, her collaborations with scientists, urban planners, community constituents, and other visual thinkers, such as designers and architects, have inspired her to create an organizational infrastructure in MM/CaLL that can plan, administer and raise funds to support and emphasize the potent capacities that artists along with visual and creative professionals offer to address the important environmental challenges that society faces today.



In addition to building on Miss' long career developing collaborative arts projects, BROADWAY: 1000 STEPS also benefits from important MM/CaLL precedent projects. In 2007 in Boulder, Colorado, Miss worked with climate scientists to map the "500 year" flood that has been predicted to occur in the heart of the city. With a great economy of means – 300 simple blue metal discs installed on trees, fences, sides of buildings and other structures – Miss illustrated the predicted high water levels. It was the first time that the public could experience the potential threat of the waters on a visceral level. The scientists were awakened to the power of art. For years the data they had been presenting to the public and civic leaders fell on deaf ears; but armed with the skills of an environmental artist, their data was made visible, palpable, and compelling.



BROADWAY: 1000 STEPS also builds on the recently completed precedent project along the White River corridor through Indianapolis entitled FLOW: (Can you See the River)?, made possible via the collaboration of over 20 organizations, including the Indianapolis Museum of Art (IMA) which commissioned the work, and with major funding support from the National Oceanographic and Atmospheric Administration, the National Endowment for the Arts, and others. FLOW includes the installation of over 100 markers and mirrors along a six mile stretch of the White River, with corresponding dial-up narrations, a smart phone app, and an interactive website (www.flowcanyouseetheriver.org). FLOW's multi-platform approach reached viewers utilizing visual cues, technological communication, and direct personal experiences to convey the multiple layers of interconnection between this Indiana waterway with the actions and lives of Indiana residents as well as its industries, agriculture, and businesses.

Encouraged by public officials to bring this type of work to New York City, Miss came up with the concept to use Broadway as a demonstration project for the MM/CaLL framework, turning the City's oldest and most celebrated avenue into a "green corridor." The "framework" is a working process/feedback system, that relies on collaboration and input from the most advanced scientific research in tandem with community-based inquiry and involvement. Its educational underpinnings are represented and activated by Mary Miss' "Toolkit" (described later in more detail). Site-specific and human-scale, the Toolkit literally and symbolically reflects the viewer and decodes the immediate surroundings.

Concept:

BROADWAY: 1000 STEPS is a project to establish Broadway as the “green corridor” of New York City.

Up to twenty “hubs” dispersed along the length of Broadway will serve as sites for collaboration between MM/CaLL, research scientists, municipal policy makers, and local community groups. Installations that are small in scale but which aggregate to reveal the vast network of systems vital to a sustainable city, are designed to make sustainability tangible to citizens at street level and catalyze future projects by artists and environmental designers. The sense of incremental transformation—of many individual instances working together to create a powerful cumulative effect—is the over arching idea for the project and the basis of its title “1000 Steps”. The central message to be communicated – generated out of a year-long collaboration with a prestigious scientific and community advisory board – is that **nature is everywhere and in action at all times**, that the city is an urban ecosystem, that an innumerable number of small decisions over time have shaped the environment to be the one we inhabit today, and that our decisions (behavioral choices) impact the future of all of nature.

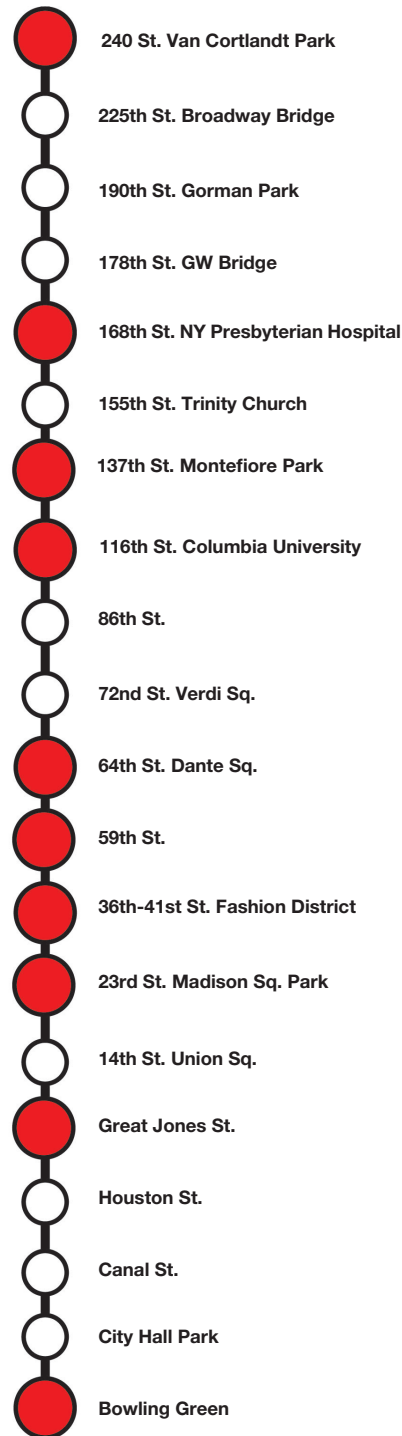
To ensure the quality of information being communicated, MM/CaLL has formed partnerships with senior personnel at the Center for Research on Environmental Decisions at the Earth Institute of Columbia University, the CUNY Environmental Crossroads Initiative, the Institute for Sustainable Cities at CUNY, NASA Goddard Institute for Space Studies, the Wallerstein Collaborative for Environmental Education at NYU, and the Wildlife Conservation Society.

The partners have met regularly to develop learning goals, shape the information gathering framework that informs the deployment of art markings, and curate the specific information that will be included at each hub. In order to secure municipal partnerships, permits, and permissions, there is an ongoing dialogue with the NYC Department of Planning, Department of Parks and Recreation, Department of Transportation, and the Mayor’s Office of Long Term Planning and Sustainability.



Mapping hubs along Broadway:

The 275 block length of Broadway through Manhattan and the Bronx offers a highly visible, symbolic corridor in which to reveal the working ecosystem of New York City and the individual's role within it. Concentrations of ecological, infrastructural, cultural, and social features have led to hub site selection. Detailed investigations are currently underway with the help of over 200 design, architecture, communications, and ecology student participants in the MM/CaLL Academic Partnership. Students are mapping, documenting, and conducting research through direct engagement with community constituents to discover what issues are most pressing.



Developing hubs along Broadway:

Approximately 20 hubs along Broadway are in preliminary stages of development. The bold red hubs will be the sites of more intensive interventions with intermediate hubs marked by minimal, acupuncture-like means to carry the links along Broadway's 15-mile length.

Topics:

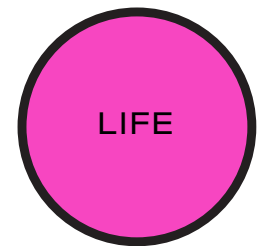
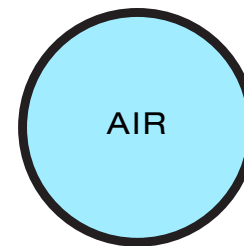
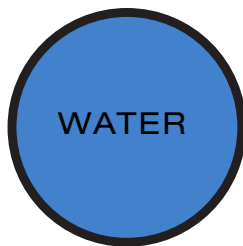
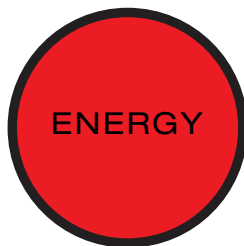
BROADWAY: 1000 STEPS addresses the challenge of engaging individuals with long-term sustainability initiatives like the Mayor's 'PlaNYC – a Greener, Greater New York by 2030' by highlighting ecological, infrastructural, and cultural features in the streetscape at eye-level.

The urban environment is full of street hardware like hydrants, stormdrains, and trash cans, each of which belongs to a larger urban system, illustrated below and listed at right. The BROADWAY: 1000 STEPS strategy is to reveal these systems through decoding and color-coding the “working parts” of NYC’s iconic streetscape.

The topics below, **Land, Energy, Water, Waste, Air, Life** are drawn, in part, from PlaNYC.

Other pertinent issues are:

**Food,
Transportation,
Public Health,
History / Preservation,
Biodiversity / Life,
Climate Change / Urban Heat Island**



Prototype Elements

Existing street features will be repurposed to communicate about sustainability where it happens. Common, everyday elements are revealed as local expressions of larger systems on which our urban lifestyle depends.

The elements being developed include the following:

- **Green vertical poles**
- **Convex mirrors with text or diagrams**
- **Pavement markings**
- **Walkable maps**
- **Media platform:**
 - **Narrative audio tour**
 - **Smartphone app**
 - **Digital + real world game**
- **Events**

Each element will be supplemented with additional information available over the web.

Element: Convex Mirrors

This is an example of how a mirror can be used to focus on a particular piece of street hardware. By color-coding the street hardware, and catching its reflection in a convex mirror, explanatory text or diagrams can be provided in an attached color-coded disc. This strategy engages the viewer by reflecting their image in the context of the decoded built environment.



Convex Mirrors with diagrams



Element: Field of Green Verticals

Brightly colored lime-green posts and fences will call attention to the hub as pedestrians approach, defining a force field within which curiosity will be aroused and awareness augmented.



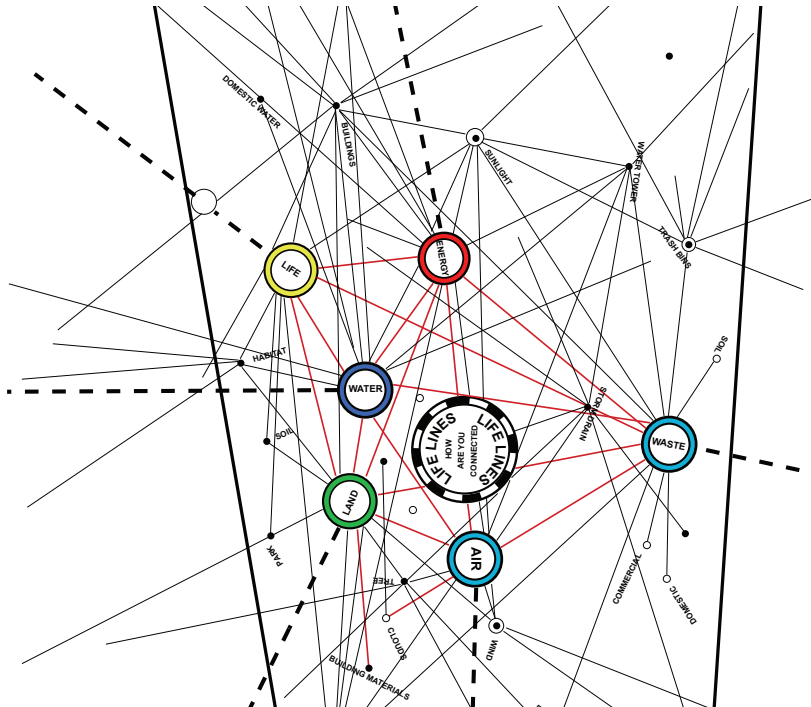
Field of Green Verticals



Element: Pavement Markings

Large scale graphics draw on the city at full scale -- this element is coordinated with the Convex Mirrors element. Pavement markings are used to highlight features such as street hardware or plantings with color-coded outlines or multi-lingual text.

23rd St | Madison Square Park Markings



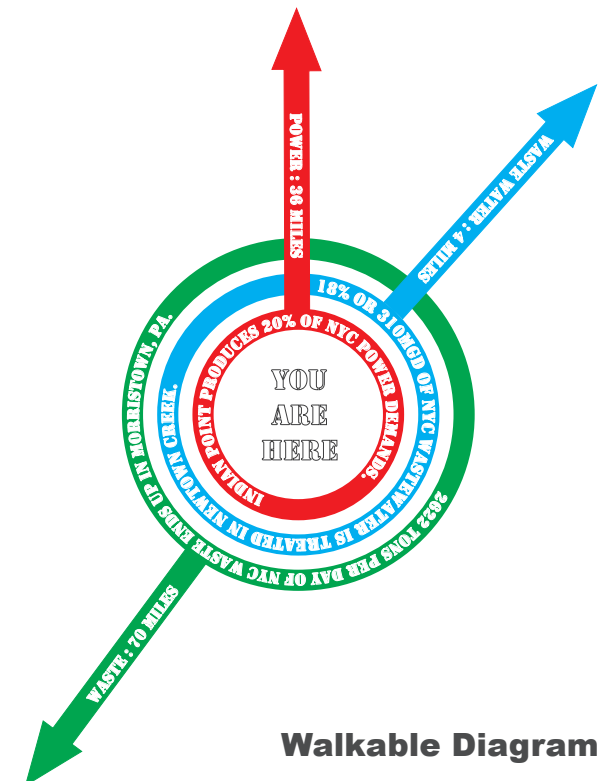
Pavement markings highlight street features



Element: Walkable Maps and Diagrams

Walkable maps and diagrams easily convey information about the surrounding neighborhood, not only geographic but also distances to sources of drinking water and electricity or distances for disposing of waste.

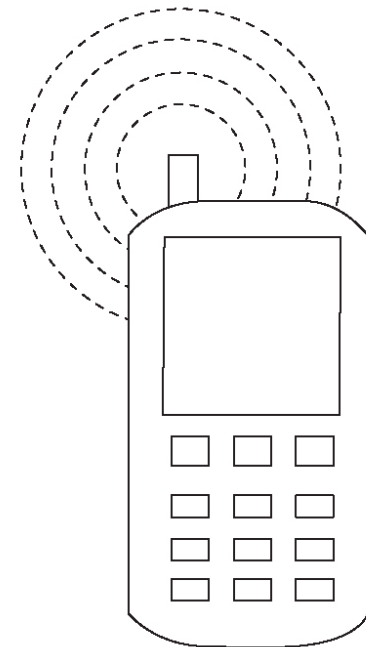
Diagrams can point out regional connections to sources of drinking water, remote power plants, or air pollution coming from other parts of the country.



Walkable Diagram

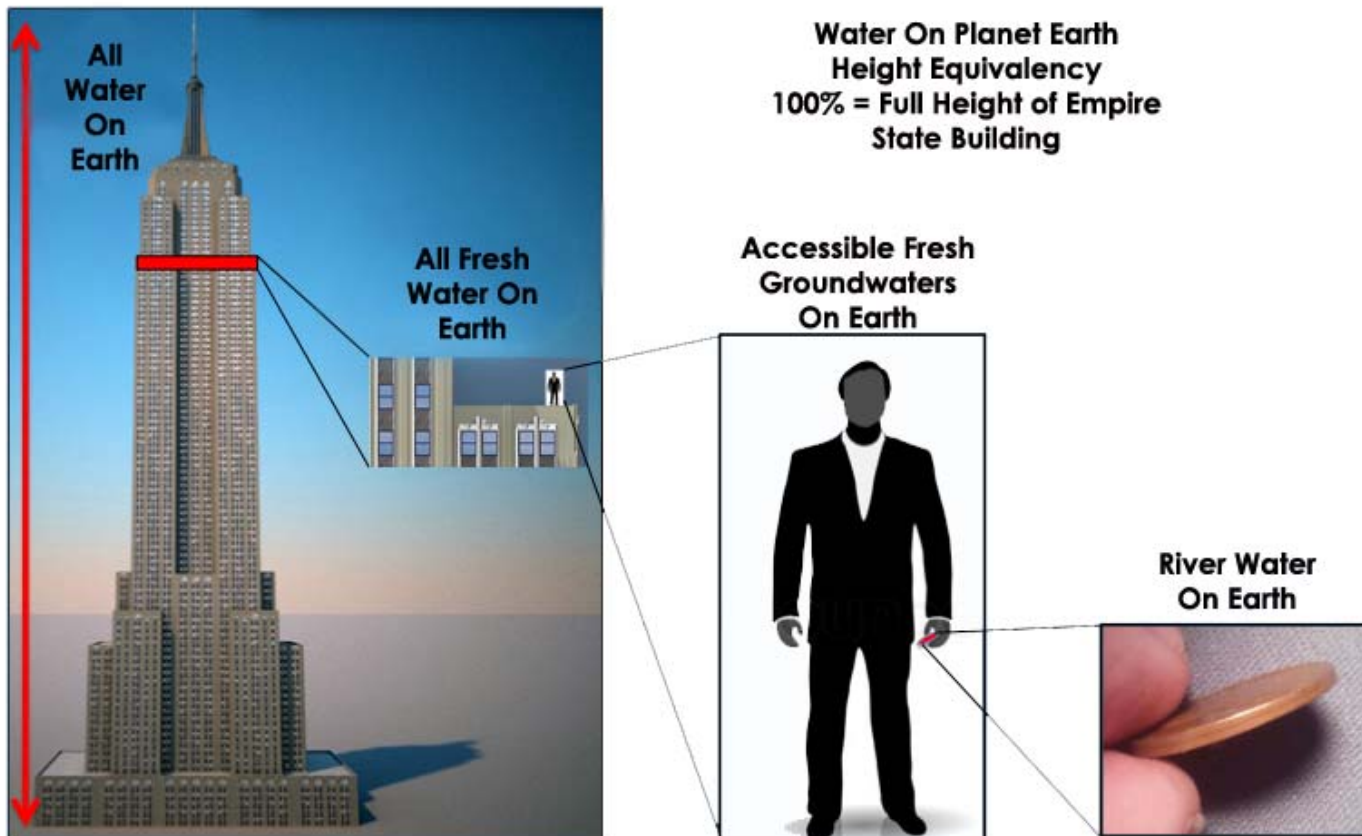
Element: Media Platform - Narrative / Audio Tour

Audio recordings in the voice of expert scientists will describe a particular aspect of the subject/site and link participants to further inquiry via mobile phone or project website.



Element: Media Platform - Lifeline/Equivalency App (LEAPP)

Through an interactive Smartphone app viewers will be offered equivalencies that translate abstract phenomena into more tangible language. For instance, within view of the Shake Shack, the app will ask: "How much water does it take to produce one hamburger?" Answer: "635 gallons."



Element: Media Platform - Digital + Real World Game

BROADWAY: 1000 Points is an interactive game that facilitates play along Broadway and its surrounding streets. In conjunction with the other Toolkit components, it will encourage participants to explore the full length of Broadway. *1000 Points* is being designed by **Joshua DeBonis**, founder and creative director of **SortaSoft**, a studio dedicated to creating games that feature unique and original gameplay and creativity. DeBonis teaches game design and development at Parsons the New School for Design.



Subway Stations

In up to 20 MTA stops along the length of Broadway there will be graphics that introduce viewers to the project and its themes, and prime them to observe the illustrations and explore the corridor.



Element: Events (Artist Projects and Related Programming)



At each site works by independent artists working in diverse disciplines, from visual artists and writers, to performers and designers (architects, graphic, and industrial designers, etc.) will be commissioned to create parallel interventions that emphasize direct viewer engagement.

Additionally, public programs with guest experts will be held throughout the installation period at the respective hub sites and established forums such as the World Science Festival, the Graduate Center, and New York City museums.



Workshops led by engineer Franco Montalto with designers, artists, community constituents, and students will look at comparative sustainability solutions around several significant and disparate hub sites such as the Flatiron District and 240th Street (in the Bronx at Van Cortlandt Park). Teams of artists/designers, scientists, and community representatives will be invited to propose solutions to the CaLL challenge to move BROADWAY: 1000 Steps into its next phase.

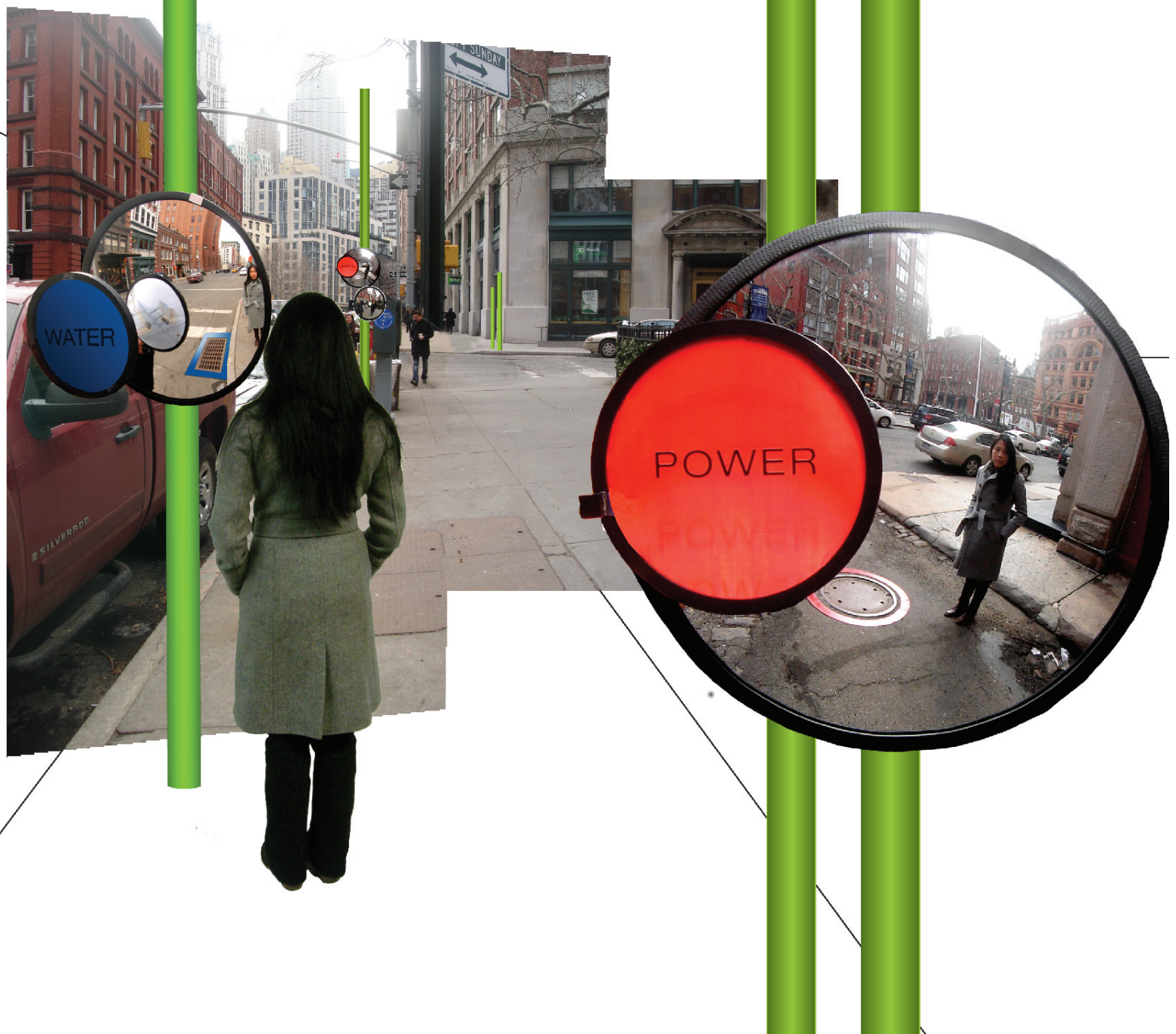
Network

An array of civic and advocacy organizations are serving as advisors and partners in the development and implementation of B/CaLL. Over 25 organizations and institutions have participated to date. A long-range goal of CaLL is to maintain and advance cooperative initiatives around sustainability practices with this partner network:

Broadway Association, Broadway Green Alliance, Chinatown Partnership, NYC Council on the Environment, Center Urban for Pedagogy, Center for Research on Environmental Decisions at the Earth Institute, CUNY Environmental Crossroads Initiative, CUNY Graduate Center, CUNY Institute for Sustainable Cities, Flatiron/23rd Street Partnership, General Services Administration, Hunter College, Lincoln Square BID, Lower Manhattan Cultural Council, Mayor's Office of Long-term Planning and Sustainability, Municipal Art Society, NYC Department of Planning, Museum of Art and Design, Museum of the American Indian, NASA Goddard Institute for Space Studies, Poets House, Solar One, Time Square Alliance, Van Alen Institute, Community Board 1, Community Board 5, Community Board 9, Montefiore Park Neighborhood Association, Urban Assembly, and Wave Hill.

FOR MORE INFO CALL 1.800.123.4567

Panorama of Hub





With private and public support, largely consisting of a **National Science Foundation EARly-concept Grant for Exploratory Research (EAGER) award for Informal Science Education (ISE)**, which supports exploratory work in its early stages on untested, but potentially transformative, research ideas or approaches, MM/Call designed its first test hub site at 137th Street and Broadway.

The installation was implemented in concert with the **Institute for Urban Design (IFUD) 2010 Urban Design Week**. Its content and public programs were developed with the assistance of faculty and students at the **City College Academy for Professional Preparation (CCAPP) Division of Science**, the **Montefiore Park Neighborhood Association**, **Community Board 9**, and the **City College Department of Urban Design**.

This temporary installation was evaluated by **John Fraser, Ph.D. AIA**, formerly of the **Institute for Learning Innovation (ILI)** and currently President and CEO of the **New Knowledge Organization**.

Data from Fraser's research was collected through on-line surveys, facilitated forums, and on-the-street interviews in English and Spanish.

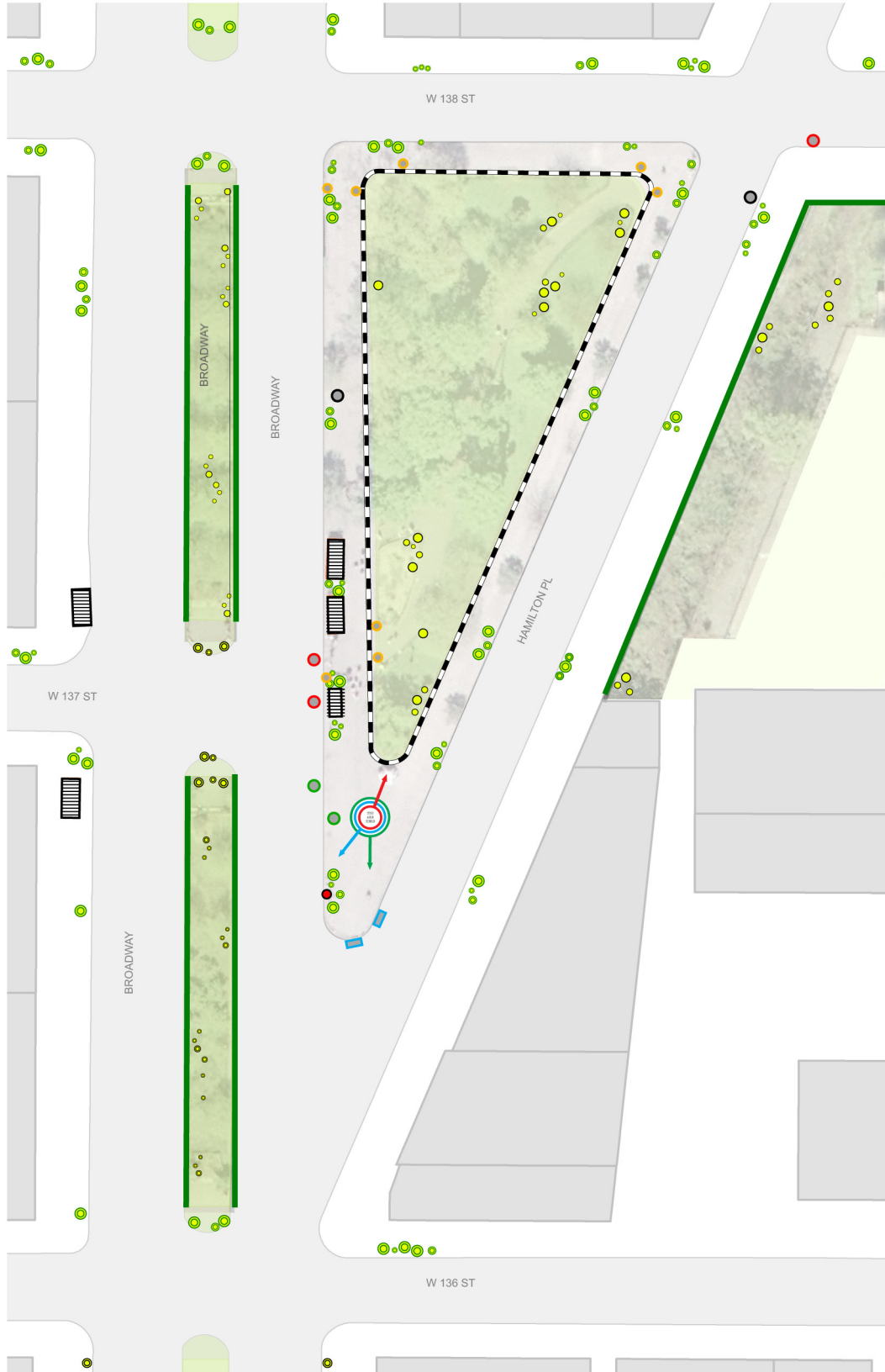
Observations of the test installation have helped refine the project tactics: from how to deepen the viewer experience through a focus on more site-specific content, fabricator/contractor vetting, ergonomic considerations, to a better awareness of regulatory issues, and greater community partner participation.

Fraser's assessment of the 137th test installation focused on viewer engagement and research on the viability of public art to support informal science learning at the service of planning, urban design, and public policy. A key finding of Fraser's research was that "... that there are rich opportunities for artists and scientists to explore collaboration to encourage science inquiry in public spaces."

Plan: 137th Street Test Hub

This aerial plan shows sites where markings were placed around Montefiore Park.

The primary topics at 137th Street included **air, water, waste, life, energy, and food.**



LEGEND EXISTING:

Subway Entrance or Bus Shelter	
Stormdrain	
ConEd manhole	
Sewer Manhole	
Unmarked manhole	
Trash can	
Fire Hydrant	

LEGEND PROPOSED:

Visual Quantification	
Pavement, Median, & Wall Markings	
Green Poles in medians and Parks	
Green Poles With Mirrors on existing verticals	
Walkable Diagram	







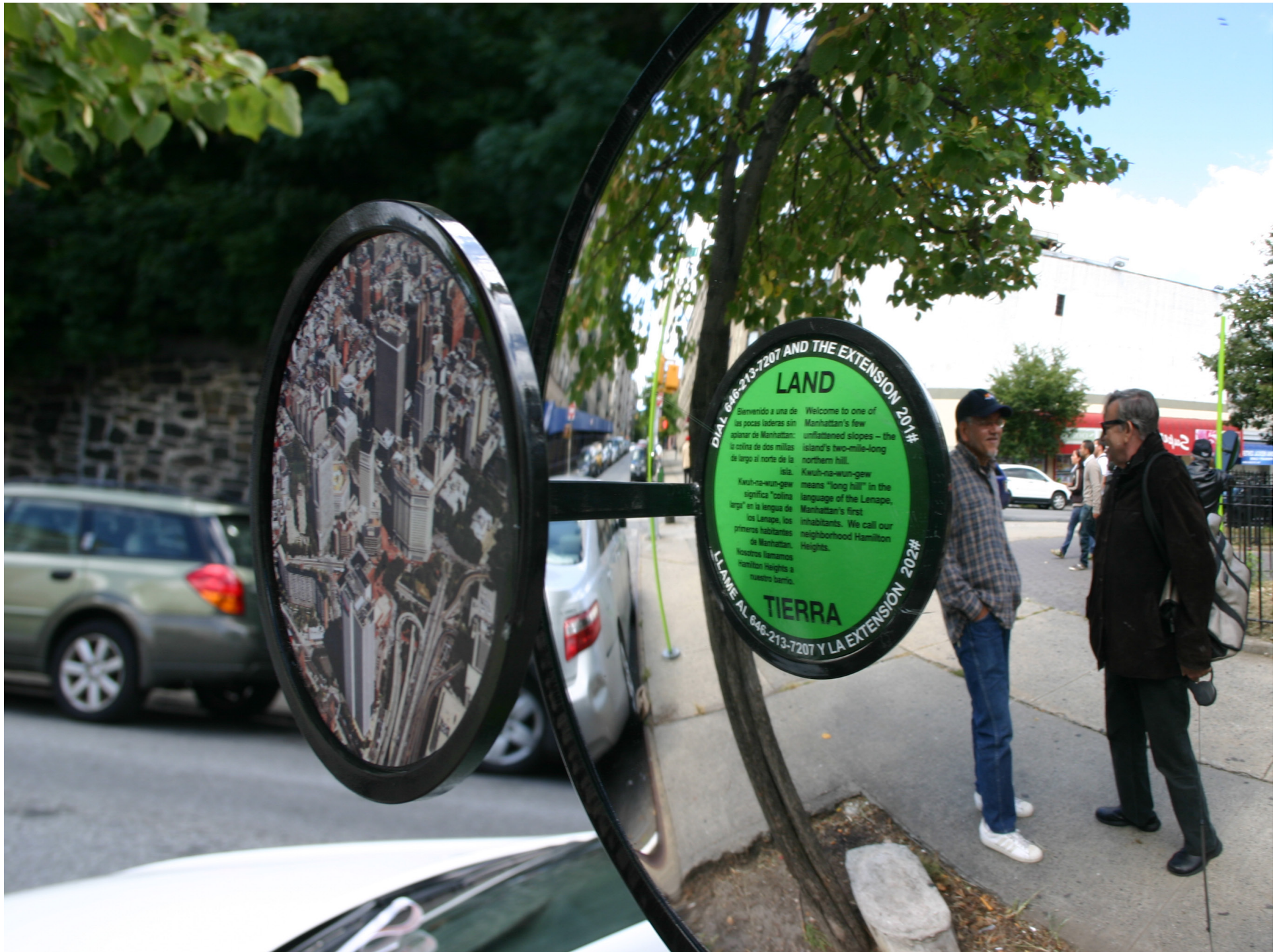




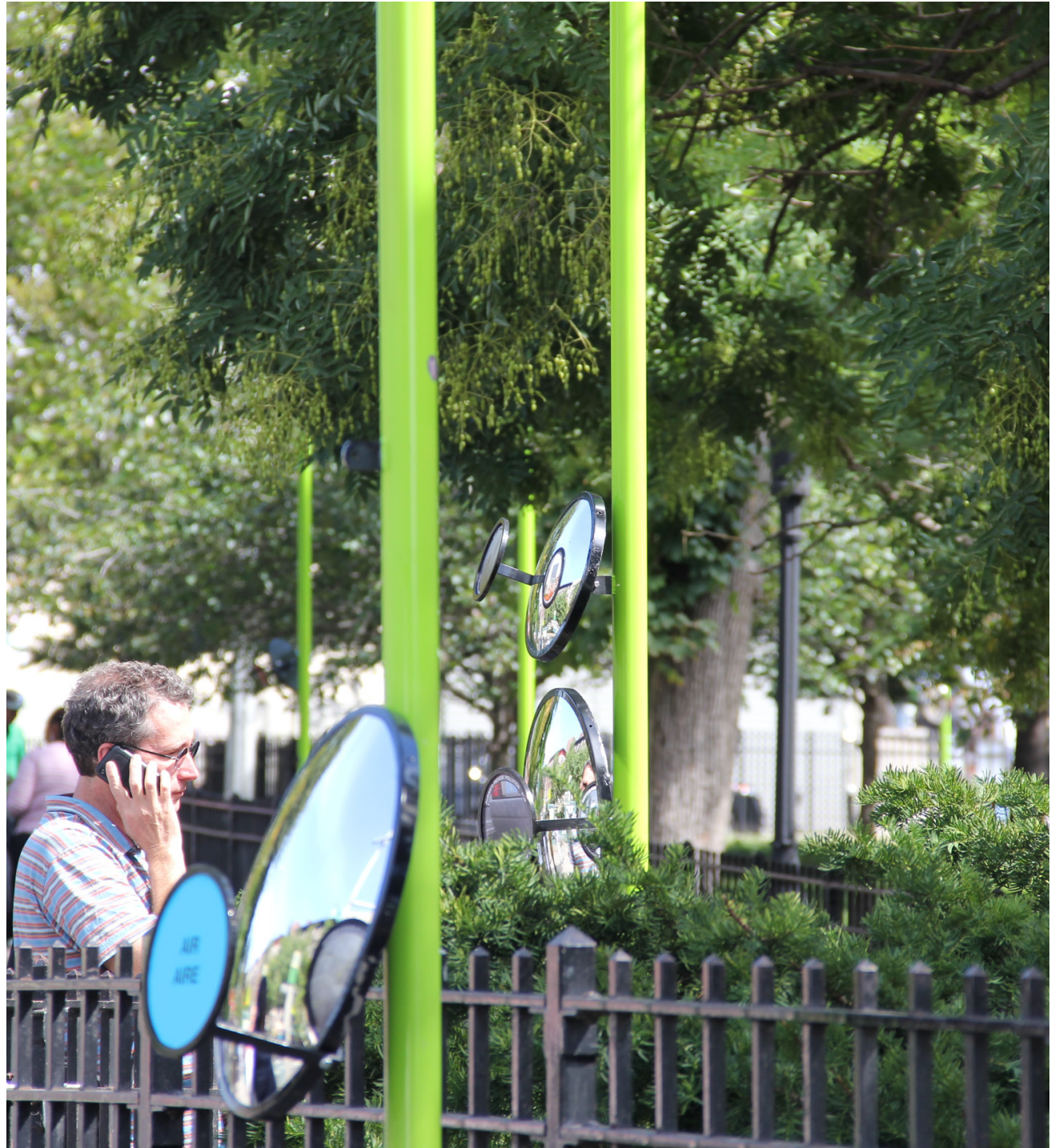






















Evaluation + Impact

The impact of this project will be measured most particularly in terms of public awareness, and in its effectiveness in seeding the city with examples that inspire actual implementation of best practices for urban environmental resilience.

The short-term installations of BROADWAY: 1000 STEPS will be augmented with curriculum, school and community events, and a number of art-science-gov-local collaborative projects to advance the MM/CaLL framework. The project is meant to be a catalyst benefiting other artists and environmental designers who will formulate the next layer of temporary or permanent installations, paving the way for more sustainability interventions in public and private spaces, for instance roof modifications such as white paint to reflect solar radiation and keep buildings cool (see next page).

The BROADWAY project will maximize its impact through the Art + Science Learning Collaborative participants, who are comprised of representatives from seven cities from across the US (see list on page 45).

The Art + Science Collaborative, through observation of the project planning and development along with workshops surrounding its implementation will:

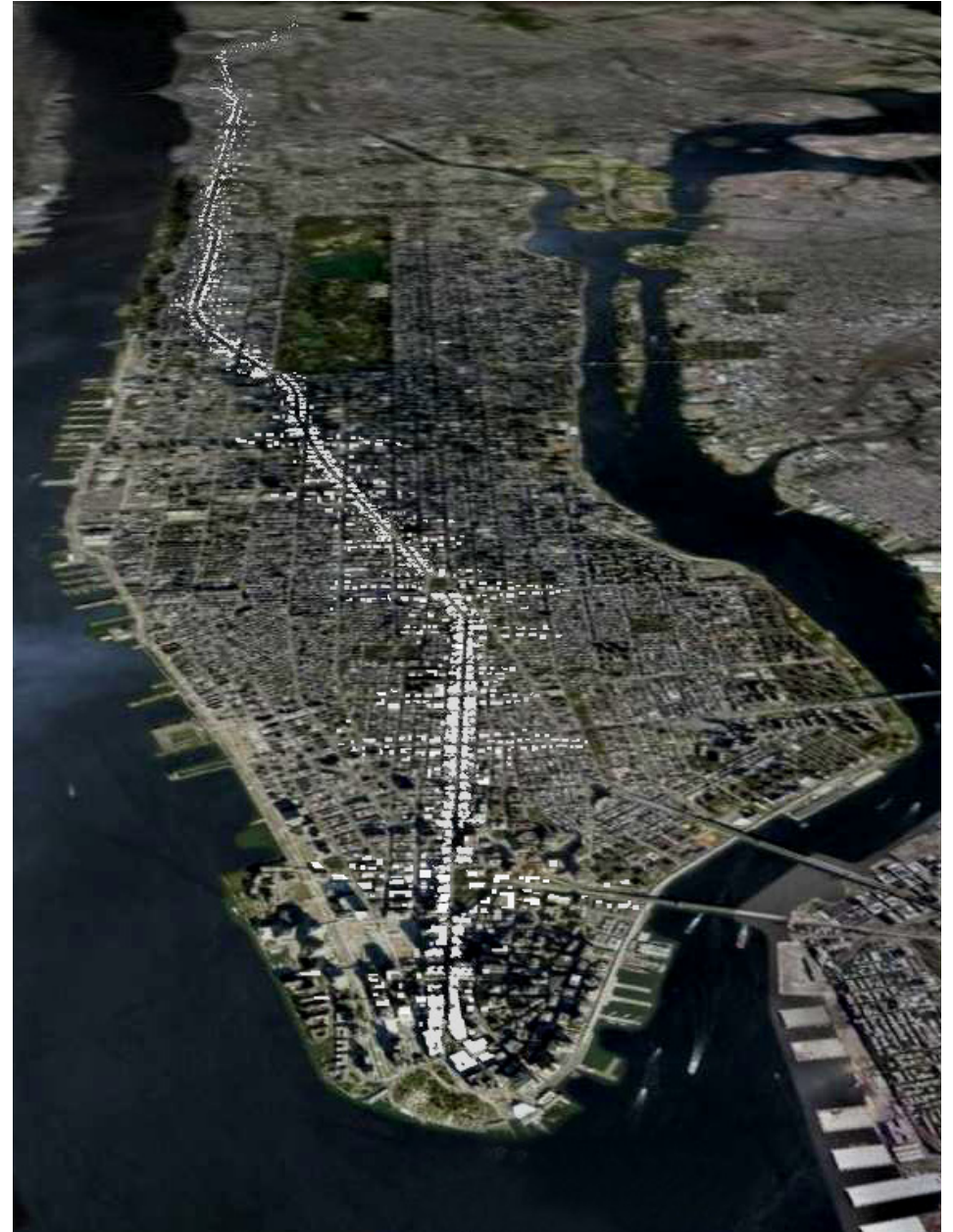
- Increase the interest of city policy makers to use artists and visual thinkers to advance sustainability education
- Strengthen the capacity of cities to use artists and visual thinkers to communicate sustainability challenges
- Strengthen the capacity of scientists and artists to use cities to advance environmental science education.

Another important impact of this project is recognition that visual thinkers and people in the arts are a resource to assist in connecting citizens with the issues that are so important to the city as it begins to transform itself to a 21st century city.

A vision for Broadway:

Ongoing Initiative - MM Studio

White roofs are one possible long-term outcome that communicates that New York City is in the process of transformation.



Advisory Committee

Steven Barshov	<i>Partner, Sive, Paget & Riesel*</i>
Amanda Burden	<i>Chair, New York City Planning Commission; Director, Department of City Planning</i>
Gabriella De Ferrari	<i>Art Historian and Writer*</i>
Ray Gastil	<i>Visiting Professor and Chair in Design Innovation for the Stuckeman School of Architecture and Landscape Architecture, The Pennsylvania State University*</i>
Olivia Georgia	<i>Executive Director, Mary Miss/City as Living Laboratory (MM/CaLL)*</i>
Agnes Gund	<i>President Emerita, MoMA*</i>
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Wendy Evans Joseph FAIA	<i>Partner, Cooper Joseph Studio*</i>
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Laurie Kerr	<i>Joint Project Director, Institute for Market Transformation, Natural Resources Defense Council (NRDC)</i>
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Sabine Marx	<i>Managing Director, Center for Research on Environmental Decisions, Columbia University</i>
Charles McKinney	<i>Principal Urban Designer, Parks & Recreation, City of New York*</i>
Mary Miss	<i>Artistic Director, Mary Miss/City as Living Laboratory (MM/CaLL)*</i>
Dr. Franco Montalto, PE	<i>Assistant Professor, Drexel University; President, eDesign Dynamics LLC</i>
Richard M. Olcott FAIA	<i>Partner, Ennead Architects LLP*</i>
Emily R. Pulitzer	<i>Founder & Chairman, Pulitzer Foundation for the Arts</i>
Cynthia Rosenzweig	<i>Senior Research Scientist, NASA Goddard Institute for Space Studies</i>
Linda R. Safran	<i>Art Appraiser</i>
Eric Sanderson	<i>Senior Conservation Ecologist, Wildlife Conservation Society*</i>
Laurence Shopmaker	<i>Principal, Senior & Shopmaker Gallery*</i>
Patterson Sims	<i>Independent Curator, Writer, and Consultant*</i>
William Solecki	<i>Director, CUNY Institute of Sustainable Cities, Hunter College</i>
Byron Stigge	<i>Director, Level Agency for Infrastructure*</i>
Karen Van Lengen	<i>Professor, University of Virginia School of Architecture*</i>
John Woldenberg	<i>Film, Television, and Digital Media Producer*</i>

*Board Member, City As Living Laboratory

Academic Partners

Boston Architectural College
City College of New York (CCNY)
Columbia University
CUNY Graduate Center
Marymount Manhattan College
Massachusetts Institute of Technology
Parsons The New School of Design
The Pennsylvania State University
Pratt Institute
University of Virginia

Art + Science Learning Collaborative City Representatives

Boulder, CO

David Driskell	<i>Executive Director, City of Boulder Department of Community Planning & Sustainability</i>
David Dadone	<i>Executive Director, Boulder Museum of Contemporary Art</i>

Charlottesville, VA

Karen Van Lengen	<i>Kenan Professor of Architecture, University of Virginia</i>
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Hartford, CT

Sherry Buckberrough	<i>Chair of Art History, University of Hartford</i>
Mary Rickel Pelletier	<i>Director, Park River Watershed Revitalization Initiative</i>

Indianapolis, IN

Timothy Carter	<i>Director, Center for Urban Ecology, Butler University</i>
John Hazlett	<i>Director, Indianapolis Office of Sustainability</i>
Michael Kaufmann	<i>Director, Special Projects and Civic Investment for Health and Hospital Corporation of Marion County</i>

Phoenix, AZ

Anne Reichman	<i>Program Manager, Sustainable Cities Network, Arizona State University</i>
Heather Sealy Lineberry	<i>Associate Director/Senior Curator, Arizona State University Art Museum</i>
Katja Brundiers	<i>Community-University Liaison, School of Sustainability, Arizona State University</i>
Ginger Spencer	<i>Acting Arts and Culture Director, City of Phoenix Office of Arts and Culture</i>

Salt Lake City, UT

Nan Ellin, Ph.D.	<i>Professor and Chair, Department of City and Metropolitan Planning, University of Utah</i>
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Founder and Artistic Director: **Mary Miss** is an artist who conceives, prototypes, and installs large-scale public art projects which emphasize a site's history, its ecology, or aspects of the environment that have gone unnoticed.

CaLL Framework: The concept for City as Living Laboratory: Sustainability Made Tangible through the Arts was developed in partnership with **Marda Kirn** of **Eco Arts Connection**, Boulder, CO. The CaLL vision and framework of emerged from Miss's previous work and methodology. With Kirn the CaLL framework has set out to advance art + science expertise + government/community collaboration grounded in local partnerships and particularities of site and constituents.

The CaLL framework has guided the last four years of work at MM/CaLL. Precedent project has been completed in Boulder (2007), New Delhi (2008), Indianapolis (2011), along with the before described test hub at 137th Street & Broadway (2011).

Key Collaborators and Team Members: Miss has worked closely with experts in the field of sustainability including environmental scientists: **Stuart Gaffin**, Research Scientist, NASA Goddard Institute for Space Studies; **Sabine Marx**, Research Scientist and Managing Director of the Center for Research on Environmental Decisions at Columbia University; **Franco Montalto**, Assistant Professor, Department of Civil, Architectural, and Environmental Engineering, Drexel University and President of eDesign Dynamics; **Cynthia Rosenzweig**, Senior Research Scientist, NASA Goddard Institute for Space Studies; **Eric Sanderson**, Senior Conservation Ecologist, Wildlife Conservation Society; **William Solecki**, Director of the CUNY Institute for Sustainable Cities; and **Charles Vörösmarty**, Director of the CUNY Environmental Cross-Roads Initiative. **Ennead Lab** has provided architectural services.

The texts and Guide by Cell narratives for the 137th Street test hub site were written by **Tony Hiss** in collaboration with educator **Philip Silva**. Tony Hiss, author of *The Experience of Place* and *In Motion: The Experience of Travel*, is a writer deeply interested in increasing both the where and the when of our lives -- expanding the sense of "here" and lengthening the sense of "now" that surround us, and in this way reconnecting us and the things we think about to larger territories and longer time spans.

Olivia Georgia, Executive Director, MM/CaLL has served as Advisory Committee Chair since its founding in 2009 and took on the position of Executive Director in 2011. Prior to her involvement at MM/CaLL she served as Executive Director of The House Foundation for the Arts, the Bronx Museum and the New House Center for Contemporary Art.

Major Funders

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