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Yale Environmental Law Clinic

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“Fountains are much more sustainable than plastic bottles that harm the environment with wasted energy, carbon and landfill. Besides, public access to drinking water is essential to a healthy city and street life!”

College Student

“I used to stop and buy a bottle of water at the kiosk for my commute home. Now I just fill up my reusable water bottle at the drinking fountain. Thanks NYC!”

Commuter

“We are actively promoting water for public health. Accessible fountains make it easy to hydrate any time or place with great NYC water.”

Public Health Official

“It’s great having a drinking fountain at the park that works and isn’t gross - I don’t have to buy water anymore. I can save my money for something more fun.”

6th Grade Student
"These drinking fountains are incredible. Most cities seem to have forgotten public water fountains. In NYC they all work, they're beautiful, and they're everywhere!"

Tourist

"I remember the drinking fountains when I was growing up in the New York. This was always a great part of being in the City. Water straight from the Catskills! It's wonderful to see them working again."

Elder New Yorker

"My running route is fountain to fountain... It's liberating not having to carry a water bottle with me now that I know all the fountains are working properly!"

Avid Jogger

"New York has the best bagels because of the water...bakers all over the country want our water for their bakeries."

The Bagel Boss

"It's always rewarding to see your creative work manifest in the world, and even better when art changes the neighborhood around it for the better."

Artist/Designer:

"Our family loves the drinking fountains. NYC has some of the best water in the world, and most bottled water comes in BPA plastic and is unregulated and untested, not to mention the cost!"

Mom
The 100 FOUNTAINS PROJECT aims to revive the public drinking fountain in New York City and start an international revolution in urban drinking water. We'll begin with 100 drinking fountains that become an essential part of the New York City experience.

New York City has some of the best drinking water in the world, yet we consume over a billion bottles of water each year—a huge waste of energy and source of garbage. NYC owes its water to the City’s effort and investment in its water infrastructure. Yet we have no icons that express this in our public urban space. What if being a New Yorker meant drinking from a network of beautiful fountains?

Our goal is to ensure that public drinking fountains are functional, lovable, and accessible to all. We see a great opportunity to create new icons for New York City through these drinking fountains—icons that express sustainability, community, and chic urbanity.

In partnership with NYC, 100 Fountains will lead the way with a global art and design competition and an exhibition of 100 new innovative and fully functional fountains around the city. Beautiful in form and concept, these new drinking fountains will enliven our streets and attract tourists while furthering New York City’s reputation as a global leader in design, innovation, and sustainability.

100 Fountains will:

- Change the culture of urban water consumption in New York City.
- Involve the public in a functional art extravaganza.
- Reduce plastic bottle usage in the city.
- Generate powerful new ideas for drinking fountain designs.
- Raise money and incentives for permanent water infrastructure upgrades.
- Encourage awareness of global water issues.
- Create network among hundreds of water advocacy groups.
- Be an international sensation inspiring cities around the world.
The Problem and the Opportunity

The Eco-Awareness Disconnect

Countless books, films, and research studies (some by fellow New Yorkers) show the global consequences of our country’s curious addiction to single-use plastic water bottles trucked and shipped in by diesel power from places as far away as Fiji. NYC, a city full of eco-minded citizens, is not immune. We continue to consume 1.25 billion water bottles per year, more than enough to create a plastic-bottle chain which would wrap the earth 6 times! One study by the NYC Department of Sanitation reveals that 3% of the waste it collects every day is plastic bottles and jugs, amounting to 140,000 tons of plastic garbage per year that must be trucked to increasingly distant landfill sites.

Show Me the Money

Based on NYC’s $1.25 billion garbage collection and disposal bill (2008) the 3% portion that Sanitation attributes to “plastic bottles and jugs” costs the city about $37 million every year. Even if one quarter of these “bottles and jugs” are water bottles, this amounts to more than $8 million spent disposing of plastic water bottles in one year alone.

NYC, a city full of eco-minded citizens, consumes 1.25 billion water bottles per year, enough to create a plastic-bottle chain which would wrap the earth 6 times!
Our Water Legacy

The consequences of this addiction to bottled water are staggering. But the fact that NYC also provides residents with some of the best municipal water available anywhere makes it all but unforgivable. We have a drinking water infrastructure that is the envy of the world. Gravity-fed from protected natural watersheds, our water requires minimal treatment and energy and is ranked as the best in New York State. New York City is one of only five large cities in the country with a surface drinking water supply of such high quality that filtration is not required. In contrast to this healthy story, one plastic bottle is estimated to require ¼ of its volume in oil to manufacture and deliver. Imagine our annual “chain around the earth” with each bottle ¼ filled with oil: that’s 1.5 million barrels per year.

But people need water that’s convenient, and in NYC the options are rather limited. With over 8 million residents and 50 million annual visitors, NYC has only 1,985 public drinking fountains. Many are in disrepair or only marginally functional--hardly a match for the network of 23,500 restaurants, 11,400 bodegas and 600 coffee shops that put bottled water within easy reach.

This has led to a relatively new (historically speaking) queasiness about the drinking fountain. A recent study by Parsons The New School For Design found that 63% of NYC respondents “hate” and “avoid” public drinking fountains for aesthetic and perceived health reasons. While bottled water is aggressively marketed with sex and dubious health claims, New York’s drinking fountains are often a sad symbol of neglect or distrust in public infrastructure.

What Happens in New York, Does Not Stay in New York

NYC leads the world in style, design, art, fashion, business and public policy ideas. In a very practical sense this means that what we do in NYC—for better or worse—shapes the behavior of millions, if not billions, of people. While New Yorkers love the many symbols of city life, we have yet to love our drinking fountains. But with some of the best tap water in the world and a new breed of NY drinking fountains, maybe a new icon is about to emerge...

The 100 Fountains project is the first step towards iconic drinking fountains becoming an everyday part of NYC life.
We need drinking fountains that are as much a part of the New York experience as yellow cabs, Central Park, subways, sidewalks, skyscrapers and food carts.

Icons and Opportunity

New York City is positioned unlike any city in the world to promote sustainable public water as a “cultural good.” We have the talent, the desire, the knowledge, and the infrastructure. What do we not have (yet) are iconic, lovable, and accessible drinking fountains. We need drinking fountains that are as much a part of the New York experience as yellow cabs, Central Park, subways, sidewalks, skyscrapers and food carts. We need fountains written about by bloggers and poets and photographed by tourists, fountains that children love and are cared for by everyone. These fountains could save NYC millions every year in trash disposal, and relieve a massive strain on our environment.

100 Fountains Project

The 100 Fountains project is the first step towards iconic drinking fountains becoming an everyday part of NYC life. We expect tremendous buzz. Voting on the 100 Fountains will only spur multi-media platform discussions, YouTube videos and fan sites. A glance at comparable public art projects like the Falls, Gates or Cow Parade suggests that the potential revenue to the city in additional tourism could easily top $100 million.

Related advertising revenue could allow NYC to collect significant funds for water infrastructure upgrades. The success of the project could spur the City to expand its commitment to drinking fountains throughout the city, and help dispel the myths and prejudices against drinking fountains.
CALL FOR ENTRIES
100 FOUNTAINS
new york city
CALL FOR ENTRIES

100 Fountains is an international competition to create 100 of the world’s most creative outdoor drinking fountains.

The top 100 applicants will be selected to have their drinking fountains constructed and installed in NYC for a summer-long exhibition. Once these fountains are installed, the public will judge these contestants in several categories and choose a winner. A total of $100,000 in prize money will be distributed to the top ten fountain designers. One fountain will be chosen and mass produced as a permanent drinking fountain.

When the competition is over, all fountains will be auctioned to raise funds for global water charities.

A 100 Fountains mobile app will be developed to provide a virtual guide to the exhibition featuring interactive maps, artist bios, local neighborhood attractions, and other resources.

STEP BY STEP

1. Call for Submissions
2. 100 Fountains Selecting Committee
3. Design Development
4. Fountains Construction & Installation
5. 100 Fountains NYC Exhibition
6. Grand Prizes Awarded
7. Auction of Fountains
8. 100 Fountains Publication

Sept
Nov
Dec
Mar - May
Jun - Sept
Sept
Sept
Oct
100 Fountains Competition
Step by Step:

Call for Submissions [Sept]
• Candidates receive “Competition Handbook” with rules and regulations, safety and technical guidelines, and zoning and site information.
• Candidates select sites from within predefined neighborhood zones.
• Concept drawings and images (with location specifications) are submitted online.

100 Fountains Selecting Committee [Nov]
• Panel of NYC officials and notables select top 100 fountains for installation.
• $5000 stipends awarded to these contestants. A waiting list of 20 alternates will also be selected in case of drop-outs.
• 100 Contestants announced

Design Development [Dec - Feb]
• Contestants will develop their designs to professional specifications in conjunction with guidelines and design officials. These specifications will be used for safety review and manufacturing.
• Plumbing valve kits will be specified with allowance for approved adaptations.

Fountains Construction & Installation [Mar - May]
• Pre-selected NY local manufacturers will work with artists and 100 Fountains design officials to construct fountains.
• City contractors will install the fountains on approved sites. Required adjustments will be accommodated by artists and manufacturers.

100 Fountains NYC Exhibition [June - Sept]
• Drinking water is served up to city residents and visitors.
• Mobile App will act as guide to 100 Fountains with maps, links, schedules, local advertisements and other helpful information.
• Mobile App will serve as conduit for feedback and voting.

Grand Prizes Awarded [Sept]
• Winners will be announced in several categories with a runner up in each.

Auction of Fountains [Sept]
• A public auction will sell each fountain and raise funds for global water charities
• Fountains will be removed by the city and given to auction winners

100 Fountains Publication [Oct]

For the purpose of this section, and our contest, we have defined the four terms here:
1. Applicant: Anyone who has submitted a design for the 100 Fountains contest.
2. Contestant: An individual who’s design is selected for construction in NYC
3. Winner: An individual who’s design is selected by the public voting process in one of several a predetermined categories.
4. The Selection Committee: NYC representatives (DEP, DOT, PlaNYC, etc), notable NYC creatives, the mayor of New York City and Pilot Projects representatives.
Competition Handbook and Guidelines
Sample Table of Contents:

Rights and Intellectual Property
• Legal information regarding the rights and usage of the designs and fountains after they’ve been submitted to the competition.

First Round Judging Process
• Selection committee structure, how the designs will be judged, and what criteria the selection committee will look at in selecting fountains for the competition.
• Designs will be judged on aesthetics and engagement (with the public, the city and the human body), sustainability concepts, technical creativity and craftsmanship, public safety, and maintenance.

Awards and Prizes
• Details regarding the $5,000 stipend, and the prizes for winners and runners-up.

Placement/Site Selection
• Process for site selection including pre-approved zones for fountain placement, and all site restrictions and recommendations.

Safety and Accessibility
• Safety requirements regarding site placement and all minimum standards for delivering water safely and hygienically.
• Minimum standards for accessibility.

Technical Specifications
• Restrictions on fountain size, weight, materials and other design considerations.
• Metrics and standards for fountain functionality. Specifications and construction documents that must be included in the final design package.

Manufacturing Process
• Fountains manufactured by local NY State workshops and factories.
• Communication, contracts and trouble shooting between the contestants, manufacturers and 100 Fountain officials.
• Materials or processes that are being promoted, offered at a discount or restricted.
• Pre-approved plumbing: valves, spigot, drains or other hardware.

Public Voting
• Outline for soliciting and processing votes from the public.
• Restrictions and best practices.
• Specifications of web application to be adapted for voting.

The Future of the Fountains
• What will happen to the fountains after they have been built, from their placement, maintenance and where they will go after the exhibit?
• Fountains Auction process and goals.
• How will the auction money be used?
The fountains will stand as icons for art and design as well as for a new level of access, participation and engagement.

Fountain Locations

Siting the Fountains in NYC

The location of the 100 fountains will be critical to the success of the project. These fountains will stand as icons for art and design as well as for a new level of access, participation and engagement. The siting of the fountains will inevitably say something about the city, ideas about public space, and the experience of diverse people in this space. We hope the artists will fully explore these themes.

The fact that the fountains are temporary will allow contestants to be highly creative in selecting sites. Within the constraints outlined in The 100 Fountain guidelines, contestants will be encouraged to think about siting the fountains in innovative ways. Water and drainage hookups will be part of the technical challenge detailed in the guidebook, but this will also be an area for significant innovation. Do fountains really need drains?

In order to ensure distribution throughout the city the competition area will be divided into 30-40 zones that will each host 2 or 3 fountains. During the first phase of the competition, applicants will be able to see how many other applicants are proposing designs for each zone. This will balance out the effort and the level of competition at the same time.
# 100 FOUNTAINS Project - DRAFT Budget

## 100 Fountains Project - Estimated Total

100 FOUNTAINS Project - DRAFT Budget

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<td>Fountain maintenance (4 months)</td>
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<td>Note: Includes removal of competition fountains and replacement with permanent fountain.</td>
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<td>Contingency</td>
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What is the city left with?

The 100 Fountains Project is both a public awareness campaign and a permanent infrastructure upgrade for NYC. Each of the 100 fountain locations will be left with a new fountain hook-up after the competition event is over. Once the art fountains are removed, locations will have a city approved fountain permanently installed, which may be one of the winning designs.

A Legacy for the City:

- 100 new drinking fountains - paid for by The 100 Fountains Project.
- Educational programs and opportunities for students and adults.
- The evidence is tangible of the strong leadership in critical global environmental issues such as carbon reduction.
- Reduced bottled water usage, reduced waste and millions saved in NYC garbage costs.
- Revenue from advertising and merchandise for water infrastructure upgrades.
- Empirical research and testing for new drinking fountain designs, locations and policies.
- Tourism revenue added to the NYC economy.
- Support of local industry and manufacturing jobs.
- Goodwill in supporting global charity through fountain auction.
- Public art promoting sustainability efforts.
Fundraising and Sponsorship Opportunities

100 Fountains will be a unique fusion of public art and city infrastructure, leading to unprecedented funding opportunities. Our funding model targets five key sources: Corporate sponsorship, Foundation grants, advertising revenue, merchandise sales and NYC funding. Additional funding may come from federal or state funds and private donations.

Funding and Sponsorship

Fundraising will have several phases that parallel the project development and approval process:

- Project Design - start-up capital for feasibility studies and project groundwork
- Competition - call for artists’ submissions and fountain competition selection process
- Competition Drinking Fountains - the manufacturing and installation of the Art Fountains
- Permanent Drinking Fountains - the manufacturing and installation of the Permanent Fountains
- Technology - The 100 Fountains tour application for smart phones
- Advertising - website, cab, subway ads, smart phone app
- NYC Project Management - ongoing project oversight

We anticipate that the city will be interested in contributing to the project start-up in line with its many campaigns towards infrastructure upgrades and sustainability. Examples of the economic benefit past public art projects have created for the City include:

NYC Waterfalls
Cost: $15 Million
Economic Benefit: $69 Million

The Gates
Cost: $23 Million
Economic Benefit: $254 Million

The Cow Parade
Cost: $1 Million
Economic Benefit: $300 Million
Corporate Sponsorship

Key funding of 100 Fountains will come from corporate sponsorship. The project is designed to offer unprecedented exposure on a global stage in association with three unbeatable brands: New York City, Sustainable Design and Free Water. This project fits squarely in the sights of many large international corporations looking for uplifting, creative causes and affiliations. We look to numerous successful public art projects for inspiration. Aspects of our funding model have been successfully implemented in the following urban art projects: The Cow Parade (done here in New York and many other cities), Rochester’s Benches on Parade, and Cincinnati’s Big Pig Gig.

Primary sponsors will receive acknowledgment on the 100 Fountains Project website and on all public advertising of the competition (taxi cab & subway ads, smart-phone fountain tour app, public signage, etc.). Larger brands and businesses may buy ad space directly or have ad space as part of their sponsorship agreement. Other advertising opportunities abound at a regional and international level - print, radio, TV, bus shelters, taxis, film festival sponsorship, and affiliated branding.

100 Fountain Auction
Support for Global Water Charities

At the conclusion of the 100 Fountains Competition the art fountains will be removed and offered for sale at auction. Resulting funds will provide an opportunity to share NYC’s water bounty with less fortunate parts of the world, as well as assist with some of the long term maintenance of NYC’s expanded fountain network. Many charities have been doing great work for decades on global water justice, education and infrastructure. In a show of solidarity, NYC can lend a hand and boost this important work.

Fountains will be auctioned at the discretion of the Committee. We expect a bid range from $1000 to $50,000, with an average value of $10,000). Winning bids would be fully tax deductible. New owners can use the fountains in any way they like: as collectible art, functioning fountains, or private garden sculpture.

100 Fountains will be a unique fusion of public art and city infrastructure, leading to unprecedented funding opportunities.
Partnership

From promoting sustainability and improving city infrastructure, to enhancing tourism and promoting arts education, the 100 Fountains project dovetails perfectly with many of the city’s most important goals. In order to maximize the potential benefits, we need to develop a robust public-private partnership that creates the authorizing environment required for a project of this scale.

Relationships

While our funding will primarily come from corporate sponsorships and foundation grants, we need NYC agencies to dedicate staff time, share key information about city infrastructure and planning, authorize the development of projects on city land, and contribute to the thought leadership of all aspects of this project.

We are forming a city-wide task force to bring stakeholders from various city agencies together to help make this project a reality, and are seeking representatives from each of the following city agencies:

NYC Department of Environmental Protection (DEP)

Of utmost important is our relationship with the Department of Environmental Protection (DEP). DEP oversees all municipal water operations in NYC, and will be the most important authorizing entity for this project. Accordingly, our goal is to ensure that our operations support DEP’s mission, and that the entire project – from the location of the fountains to the proceeds of the auction – will be planned in collaboration with the agency. We also anticipate working with PlaNYC and its public facing arm GreeNYC in meeting our mutual engagement and education goals around the quality and importance of NYC drinking water.

The 100 Fountains project will bring recognition to the high quality public water in NYC, and promote its use, decreasing bottled water consumption, reducing plastic waste, driving forward the city’s sustainability goals, and enhancing the image of the DEP and its physical infrastructure.

“We are seeking a DEP representative who can usher through the 100 Fountains project, share information, make decisions, and authorize actions that will make this project a reality.”
NYC Department of Cultural Affairs (DCA)

We will also work very closely with the NYC Department of Cultural Affairs (DCA) to ensure that the art and design benefits generated by this project are leveraged by the city. We want to make sure this tourism draw is woven into the cultural fabric and institutions of our City.

Several such institutions may want to produce ancillary events. For example, the NYC panorama at the Queens Museum would be an amazing partner to highlight the locations of the fountains, and we could envision an exhibition at the New York Historical Society on the history of the drinking fountain in NYC.

“We are seeking a DCA representative who can connect us with interested cultural organizations and partners, and contribute to the artistic thought leadership on this project.”

NYC Department of Education, Office of the Arts and Special Projects (OASP)

The NYC Department of Education’s Office of the Arts and Special Projects is a natural partner for 100 Fountains. With their goal of promoting access to high quality arts education, we can serve as an arts partner, both developing a curriculum around fountain design and engaging students in learning about the design process more generally.

To that end we will develop: 1) a special curriculum for teachers whose students would like to enter the competition and reserve one fountain to be designed by NYC public school students; 2) a 100 Fountains curriculum to be distributed to the system’s arts teachers and 3) an online professional development module for teachers who would like to use the 100 Fountains curriculum with their students.

“We are seeking a representative from OASP who will help us create an unparalleled arts education experience for all NYC public school students.”

NYC Mayor’s Office

The 100 Fountains project will leave an important legacy for NYC, and we will work with the Mayor’s office to ensure that the importance of the message is shared across the city.

“We are seeking a representative from the Mayor’s Office who will help us position the 100 Fountains as a shining example of multidisciplinary public-private partnerships, and model for public art installations around the world.”
New York City Parks Department

The vast majority of New York City’s outdoor fountains are currently hosted in public spaces operated and maintained by New York City’s Parks Department, making Parks a key partner for the 100 Fountains Project. The project may piggy-back on or upgrade existing fountain infrastructure, install new fountains, and offer new design concepts for future fountains. Additionally, the added foot-traffic, attention, and business for Park vendors should forge a strong symbiotic relationship with the department.

Between the public health and green initiatives the Parks and Recreation department currently directs, the 100 Fountains Project would be a great addition to their program. Initiatives like Shape Up New York City, Walk NYC, or The Youth Sports Program would all benefit from the added hydration made available by 100 Fountains. The many programs Parks & Recreation has in its Greening Initiative are clearly in line with the sensibilities of 100 Fountains. Across the board The 100 Fountains Project and The Parks and Recreation Department are an obvious team.

“We will need to work closely with people from the Park’s public art department, their maintenance crews, and their engineers to help this project reach its fullest potential while fulfilling the mission of the department.”

Public Arts Organizations

NYC’s public arts organizations have an international profile. We hope to collaborate with many of them, including (but not limited to) the Public Art Fund, Design Trust, and Creative Time.

“We recognize the deep expertise these organizations hold in terms of making projects of this scale a reality, and are committed to working in partnership to create the best possible outcomes for all.”

What we need from the City:
• Authorization
• Access to Constituents
• Funding
• Dedicated Staff
NOTES:

1. ALL DRAINAGE PIPING SHALL BE GALV.
2. HANGER ROD AND INSERT SHALL BE GALV.
3. WATER PIPING SHALL BE 1 1/2" DIA CEMENT LINED GALV. STEEL PIPE AND 3/8" DIA TYPE "K" COPPER TUBING.
4. 1'-6" MIN COVER OVER WASTE WATER PIPES.

CAST ALUMINUM BUBBLER HOUSING
3 1/2" X 5" DIA. STAINLESS STEEL ANCHOR RING CAST INTO FOUNTAIN

4-#3 RODS VERTICAL
2" X 2" 12/12 GALV. W. W. FABRIC

2" PVC SLEEVE SCHEDULE 40
3/8" COPPER TUBING

1/2" LIP
3" X 2" GALV. MALLEABLE IRON REDUCER

CONCRETE PAVEMENT

ADJACENT PAVEMENT

GALV. STEEL WEDGE TYPE CONCRETE INSERT
GRINNELL NO. 280-1/2" DIA
1 1/2" CEMENT LINED STEEL PIPE ANCHORED TO WALL

3/4" DRAIN COCK
1 1/2" GATE VALVE

2" X 2" RUNNING TRAP WITH DOUBLE HUB VENTS
BRASS C.O. PLUG

PIPE SLEEVE CAULKED WATER TIGHT
4" DIA. C.I. PIPE

2" X 4" INCREASER

PRECAST CONCRETE OR Poured IN PLACE CONCRETE

BROKEN STONE
Section Two . Research Reports
Yale Environmental Law Clinic

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Research Partnerships

Beginning in the fall of 2011, PILOT PROJECTS has been working with Yale University’s Environmental Law Clinic, as well as students from Parsons The New School For Design.

During this time, student interns completed a series of important studies covering topics from existing infrastructure, policies and laws pertaining to drinking fountains, and conducted primary research on the attitudes towards public drinking fountains in New York City.

The following section contains the summary reports.

This Map of Central Park was constructed to show drinking fountain locations, based on a recent research study by Parsons The New School for Design. According to this research, no such information currently exists in NYC records.
Report 1. NYC Water Infrastructure

New York has some of the best drinking water in the United States.¹ This is not an accident of history but the culmination of a water infrastructure that stretches hundreds of miles, has cost billions of dollars, and has been a primary driver of the City’s ascendency as a cultural and financial center.

NYC Water Quality

New York City has been able to maintain the quality of its water largely through its protection of 2,000 sq. miles of upstate watershed. This water supply system provides more than a billion gallons of safe drinking water each day to residents of New York City and surrounding counties. A specially designed Land Acquisition Program gives the city the right to purchase land in order to manage and protect its water source. This program was extended in 2010 and has been approved to continue operation until 2027.

New threats to the city’s water have appeared on the horizon, however. Hydraulic fracturing might take place only a thousand feet from the watershed's boundaries. Increased construction and development in the watersheds will put additional strain on the aging system. In the face of these threats, DEP’s water quality monitoring program conducts extensive testing across nearly 1,000 quality sampling stations.

History

The story of this modern marvel began with the first settlement of the island of Manhattan. The first public well was dug in what is now the Financial District. By 1776, when the city had grown to house a population of some 20,000, a reservoir was created downtown. The completion of the Old Croton Aqueduct in 1842 marked another turning point, as New York City began looking further afield in order to source its drinking water.

New connections were added and the outlying boroughs consolidated as the water supply system expanded and diversified. The New Croton Aqueduct of 1890 made the need for a secure watershed management plan patently clear and served as a foundation for the Board of Water Supply’s 1905 decision to develop the Catskill region as an additional source. The first drops of Catskill water arrived through the finished Catskill Aqueduct in 1915, and the infrastructure has since steadily grown. At present it consists of three upstate reservoir systems, 19 individual reservoirs, and three controlled lakes. The total storage capacity exceeds 580 billion gallons.²

Approximately 95% of this total supply is delivered to the consumer by gravity. Only the remaining 5% is regularly pumped to maintain the desired pressure.

Recent Infrastructure Investment

Recent infrastructure investment has focused on ensuring consistency and quality. The City’s Third Water Tunnel, started in 1970 and expected to be completed in 2020, has received $2.5 billion under the Bloomberg Administration with an anticipated total budget of $6 billion.

As for quality concerns, the Land Acquisition Program has been extended until 2027 and authorizes New York City to acquire up to 105,000 acres of sensitive lands in the Catskill and Delaware watersheds. Under the new permit, the State and City owned portion of the total watershed is projected to increase from 34 percent to 44 percent.³

Report 2. Drinking Fountains in New York City

As New York City’s vast water infrastructure funnels towards the city through a series of narrowing aqueducts and tunnels, watersheds are almost entirely directed towards private consumption. The NYC drinking fountain still offers a network of free, public, and available water. Yet, this network is profoundly incomplete, as it was created ad-hoc over a number of years and managed by many different authorities. Drinking fountains are not clearly integrated with the experience of most New York residents. This failure begins with inadequate publication of fountain presence, quality standard, maintenance and convenient siting. Ultimately, the public drinking fountains of NYC fail to achieve a self-reinforcing “network effects”, where uncertainties about water acquisition are removed and citizens have little incentive or need to purchase bottled water on the streets of the city.

Types of Drinking Fountains

Drinking fountains have played a central role in urbanization over the millennia. Ever since the Roman aqueducts brought water to a central locus, public fountains have served as a source of communal engagement. Shifting to the modern day, the contemporary drinking fountain was invented in the early 1900s. One of the earliest developers was Halsey Willard Taylor whose Halsey Taylor Company is still thriving. Over the years, Portland’s Benson Bubblers, London’s Victorian masterpieces, and the Naiads immortalized in Paris’s Wallace Fountains have each been profound testaments to civic pride. Unfortunately, barring an occasional exception, NYC lacks this tradition of elegant and iconic fountains. Although the Benson Bubbler of Portland and some European Victorian models demonstrated bold designs for much of the past century, water fountains are typified by utilitarian preferences. Issues that affect the drinking experience include allowing drains to be hidden, and creating spigots that are difficult to contaminate. Some designs have begun to show progress on this issue with lateral spigots suitable for filling water bottles and drainage systems that place the drain on the ground and allow water to cascade to it such as on the Highline. Simple design interventions, greater knowledge sharing, and coordinated government action can once more position the water of New York as a source of public pride.

New York City Drinking Fountain Plans

In 2009 the “Halsey Taylor 4705” was selected as the standard fountain design for all future New York City Park Locations and bears a customized “NYC Water” logo and a distinctive blue color. As part of PlaNYC, new parks are being developed and city agencies have increasingly indicated the benefits of drinking fountains in well designed urban space. However, despite the many policies and sustainability plans that indicate the need for more drinking fountains, the scale of new drinking water installation has yet to match it potential. Furthermore, the existing fountain infrastructure lacks adequate

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signage and thus risks relegating this unique public offering to anonymity after centuries of being at the forefront of civic pride.

New York City does not have a public process for identifying locations of drinking fountain need. While the city has created elaborate documentation of when and how to install bike racks there is no comparable mechanism for installing new fountains. An observational study by the New York Times provides an illuminating look at how diverse the beneficiaries of drinking fountains are, cutting across age, race, and socio-economic categories.⁶

NYC’s new “Water-On-The-Go” program has begun to successfully introduce portable water fountains as a mobile option. The initiative is an important effort to bring more attention to New York’s superb drinking water. In light of its success, there is clear momentum to further develop drinking fountains to ensure that the needs of everyday users are fully met.

Management and Mapping of NYC Fountains

While the New York City Parks Department manages the vast majority of the City’s nearly 1500 fountains, the data is not readily accessible. In the age of the instant smartphone app and constant information, there is no easy means for a thirsty urbanite to locate a drinking fountain. Initial efforts conducted by our team to map the locations for the drinking fountains in NYC can be seen below.

Recent Legal Development Affecting Drinking Fountains

Privately Owned Private Space (POPS) occupy an important role in NYC’s land use and development law. They have also become increasingly more hospitable to visitors and have even include drinking fountain requirements as a means of ensuring they offer usable public space. Since 2007, the Department of City Planning has required a drinking fountain to be built in all “primary spaces” designated within a POPS.⁷ DCP recommends their use elsewhere in all residual spaces as well. Effectively this means that every plaza built in conjunction with a development will require a drinking fountain for public use.

There has also been significant emphasis on the right to access water indoors. In particular, the development of Health & Toxicity Recommendation (“HT 20”)⁸ provides an important example of the City’s water initiatives being developed into binding law. HT 20 urges an increase in the availability of drinking fountains stating that “People buy and consume bottled water and sugary drinks, in large part, because there are not enough easily accessible water fountains. All bottled drinks stress the environment by wasting

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⁷ APPENDIX E: Design Requirements for Plazas, Residential Plazas and Urban Plazas Developed Prior to October 17, 2007 at Appendix E 27-124, stating “All primary spaces shall provide at least one drinking fountain”, available at [http://home2.nyc.gov/html/dcp/pdf/zone/appendixe.pdf](http://home2.nyc.gov/html/dcp/pdf/zone/appendixe.pdf). Nearly every POPS has a “primary space” which is defined as “the major portion of a ‘residential plaza’ that abuts a ‘street’, and is accessible to the public for recreational use.”

materials, using energy for transportation, and creating waste. Also, sugary drinks can contribute to chronic diseases." The Report specifically recommends the city to "Increase the number of required drinking fountains, and also require that they include faucets for filling bottles. Do not allow bottled water to substitute for fountains."

NYC Local Law 55/2010 addressed the concerns of HT 20 and provided for new and revised provisions to be incorporated into the Plumbing Code. These provisions will be enforced by the Department of Buildings in the same manner as all other aspects of the Construction Codes. Local Law 55/2010 reverses a 2007 change to the Plumbing Code that permitted (fee-based) bottled water dispensers to be substituted for up to half of the required drinking fountains. It requires faucets on all drinking foundations and allows up to 50% of drinking fountains to be substituted by bottle filling faucets. Furthermore, drinking fountains are required to have both a bubbler faucet design to fill containers at least 10 inches tall. It goes into effect July 1, 2012 and will not apply retroactively. It is only triggered when construction activity requires a permit for work covered by this section of the Plumbing Code.⁹

⁹

One of NYC’s few iconic fountains, in Tompkins Square Park. Photo Scott Francisco

A typical problem – low water pressure results in having to suck water out of the spigot. Photo Scott Francisco
Report 3. Bottled Water and New York City:

How Much Bottled Water NYC is Drinking, and Why It’s a Problem

State and municipal governments in the United States spend billions of dollars and countless people-hours creating and maintaining some of the most well established municipal water systems in the world. We can find clean drinking water just about anywhere in the US, but in New York City, it’s particularly healthy and delicious.

“New York City is fortunate to have some of the best drinking water in the world,” said Mayor Bloomberg. Cas Holloway, commissioner of the NYC Department of Environmental Protection (DEP) noted that “New York City’s drinking water is nationally recognized for its high quality and for good reason—it tastes great.” New York City tap water comes from the pristine watersheds of the Catskill Mountains, and the Delaware and Croton Watersheds. The DEP performs more than half a million tests on the water each year in order to maintain its high quality. In 2007, the Environmental Protection Agency deemed tap water in NYC clean enough that it did not need filtration, which means it is not subject to the harsh chemical treatments that other municipalities must use, and in a 2006 state taste test, NYC water beat out all 150 other NY State municipal water systems.

Despite all this, bottled water continues to be a popular source of drinking water for New York City—and the rest of the country. The Environmental Working Group notes that “Americans drink twice as much bottled water today as they did ten years ago, for an annual total of over nine billion gallons with producer revenues nearing twelve billions.” Indeed, bottled water consumption in the United States has been steadily rising since the 1980s (see graph to right). In 2010, more than 60% of households in NYC were regularly consuming bottled water.

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12 ibid
Almost as if to add insult to this injury, in 2007, a young entrepreneur in NYC, Craig Zucker, realized that indeed, people love NYC tap water. So much so that they were willing to buy it pre-bottled for $1.50 each\(^{15}\). He called the product Tap’d NY, and the bottles proudly state that the product is nothing more than NYC tap water in a bottle.

While Zucker’s solution to the fact that, as he explains, “there aren’t necessarily fountains or places to get clean water on every street in New York”\(^{16}\) makes for a good business, it makes for a dirtier environment. New York City tap water, with it’s fresh flavor and high quality, should not contribute to the problems that bottled water—usually the alternative to tap water—causes.

What problems are those?

It’s Expensive

The table below summarizes the total and average consumer expenditures on bottled water in 2010 for both New York City and the United States (for comparison). Indeed, NYC actually spends less per household (on average) than other Americans. Even still, New Yorkers spent on average $64 per household per year on bottled water. While that doesn’t seem like a lot, do the math: if 60% of NYC’s 8.4 million people spend $64 on bottled water every year, that means that New Yorkers spent over $323 million together just on bottled water. In fiscal year 2009-2010, the NYC government alone spent nearly $1.2 million stocking its offices and events with the stuff.\(^{17}\)


\(^{16}\) ibid

Compare all of that to tap water, which, according to Cas Holloway, costs about a penny per gallon. In other words, bottled water costs approximately 1900 times more than tap water does—unless of course, one buys it in its own plastic bottle.

It isn’t just the bottles of water themselves that cost New York City and the people living there so much money. When they’re empty, the bottles themselves cost the city money too. The New York City Department of Sanitation (DSNY) is responsible for trucking all of the trash and recycling generated within NYC to other cities and states. Each truckload cost the city (and its taxpayers) money. Every bottle of water that is purchased, emptied, and disposed of (even in a recycling bin) means more truckloads of waste that need to be taken away from the city—at a cost.

It Contributes to Global Warming

Bottled water can come from as close as our own city—in the case of Tap’d NY—but in a lot of cases, it can travel huge distances from source to store. Plus, in most cases, the different components—the bottles, the water, and the consumer—all come from different places. All of this means that a single bottle of water can contribute enormously to carbon emissions and global warming. For example, for a bottle of water from Fiji:

1) Bottles and caps are produced in China from virgin plastic. The process emits **206 grams of CO2E** (carbon dioxide equivalents—a way to normalize the differing global warming potentials for different greenhouse gases) per bottle.

2) The empty and compressed bottles are shipped to Fiji on a barge. This process,

<table>
<thead>
<tr>
<th>2010 Numbers18</th>
<th>USA</th>
<th>NYC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Bottled Water Expenditure</td>
<td>$65</td>
<td>$64</td>
</tr>
<tr>
<td>% Households - Bottled Water &amp; Seltzer</td>
<td>60.79%</td>
<td>60.55%</td>
</tr>
<tr>
<td># Households - Bottled Water &amp; Seltzer</td>
<td>71,982,303</td>
<td>1,965,186</td>
</tr>
<tr>
<td>Total Population</td>
<td>308,455,134</td>
<td>8,414,998</td>
</tr>
</tbody>
</table>

All together, a single bottle of water coming from Fiji emits almost one pound of CO2E.
since the bottles are empty, emits 4.3 grams of CO2E per bottle.\textsuperscript{22}

3) The bottles are inflated and filled with water from Fiji. This process is the least energy and carbon intensive, emitting 0.6 grams of CO2E per bottle.\textsuperscript{23}

4) The now full bottles are packed onto another barge and shipped to New York for distribution and consumption. Because the bottles are so heavy, this process emits 153 grams of CO2E per bottle.\textsuperscript{24}

5) Finally, the bottles are not delivered directly to the consumers. The consumers have to come get the bottles, which emits on average 9.4 grams of CO2E per bottle.\textsuperscript{25}

All together, a single bottle of water coming from Fiji emits almost one pound of CO2E. For comparison, the Oregon Department of Environmental Protection completed a comprehensive lifecycle analysis (LCA) of the energy and material inputs and outputs that result from the production of different drinking water options. Most notably, the report looks at tap water, locally produced bottled water (less than 100 miles between the water source and the water distributor), and long haul bottled water (internationally produced, like the Fiji water above). The graph above shows the global warming potentials for each of these water choices, which shows that tap water generally has less global warming potential than either bottled water choice.\textsuperscript{26}

\textsuperscript{22} ibid
\textsuperscript{23} Oregon State Department of Environmental Protection bottled water Lifecycle Analysis, website: http://www.deq.state.or.us/lq/sw/wasteprevention/drinkingwater.htm
\textsuperscript{24} ibid
\textsuperscript{25} ibid
\textsuperscript{26} Oregon State Department of Environmental Protection bottled water Lifecycle Analysis, website: http://www.deq.state.or.us/lq/sw/wasteprevention/drinkingwater.htm
It Creates a LOT of Waste

By design, at the end of a bottle of water, you’re left with a bottle, usually plastic. Considering the fact that Americans consume nearly 50 Billion bottles of water per year, that means a lot of waste. But it’s not just the bottles that make the waste from bottled water. There are also the caps, the packaging (often times a cardboard tray wrapped in a layer of plastic), and manufacturing wastes.

“Even by the best estimates, tens of billions of plastic bottles are ending up in landfills every year.”

According to Corporate Accountability International in 2010, plastic water bottles are the fastest growing form of municipal solid waste in the United States. Each Year, more than 4 billion pounds of plastic bottles end up in landfills or as roadside litter. We see the same thing happening in New York City. The New York City Department of Sanitation (DSNY) picks up and handles over 61,000 tons of trash every year. In 2004-2005, DSNY did a comprehensive waste composition study and found that about 3% of that trash (not recycling) was made up of plastic jugs and bottles.

“In 2004-2005, DSNY found that about 3% of NYC’s trash was made up of plastic jugs and bottles.”

If we return to the Oregon DEP study, they too found that bottled water produces far more waste than tap water does. However, they found that the bottles themselves only account for about half of the waste that bottled water generates. The other half comes from the packaging that the bottles of water come wrapped up in, solid waste byproducts from the fuels needed to make and transport the bottles, and any other byproducts that result from making, filling, shipping, and distributing bottled water. All told, that is a lot of waste for a single bottle of water.

If all of the waste from bottled water got recycled, then the waste problem might not be so much of a problem. But all of the waste doesn’t get recycled. Not even close.

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32 Oregon State Department of Environmental Protection bottled water Lifecycle Analysis http://www.deq.state.or.us/lq/sw/wasteprevention/drinkingwater.htm
Estimates on exactly how many plastic bottles get recycled every year differ depending on the source. The NRDC estimates that about 13% of bottles get recycled.\(^{33}\) Elizabeth Royte, author of *Bottlemania: How Water went on Sale and Why we Bought It*, estimates that less than 20% of bottles make it into the recycling bin.\(^{34}\) Annie Leonard, maker of the film *The Story of Stuff* and the short *The Story of Bottled Water*, also estimates that about 80% of the water bottles consumed in the US get sent to landfills instead of recycling facilities.\(^{35}\) Oregon DEP estimates that about 70% of postconsumer waste from bottled water ends up in landfills.\(^{36}\) Even the most optimistic estimates, that of the International Bottled Water Association, guesses that a mere 31% of bottles from bottled water get recycled.\(^{37}\) So even by the best estimates, tens of billions of plastic bottles are ending up in landfills every year.

**It’s Energy Intensive**

The NYC Department of Environmental Protection (DEP) reports “Plastic water bottles produced for the U.S. use 1.5 million barrels of oil a year—enough to power 250,000 homes or 100,000 cars all year. And it takes more than 3 liters of water to produce each bottled liter of water.”\(^{38}\) And that’s just the domestically produced bottled water. The production of all the bottled water necessary to meet American demand uses more than 17 million barrels of oil every year.\(^{39}\) Indeed, according to Elizabeth Royte, you can represent the energy needed to make a single bottle of water by filling it 1/4 full of oil.\(^{40}\)

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\(^{34}\) Elizabeth Royte’s Blog: http://www.royte.com/blog/


\(^{36}\) Oregon State Department of Environmental Protection bottled water Lifecycle Analysis http://www.deq.state.or.us/lq/sw/wasteprevention/drinkingwater.htm


\(^{40}\) Ibid
Report 4: “Life Cycle Assessment” of Bottled Water Use in NYC

Life cycle assessment (LCA) is an evaluation method used to quantify and qualify environmental impacts during the entire life cycle of a product. In essence, an LCA is an inventory of all the material inputs and outputs generated to create a product and the potential impacts associated with them. A life cycle begins with the acquisition of raw materials from the earth and finishes post-consumer use when the product is discarded; hence an LCA is often referred to as a “cradle-to-grave” approach. LCA is a valuable tool because it can reveal hidden environmental impacts that are often not obvious during the normal context of a product. The information derived from an LCA can help its users make more informed and accurate decisions by exposing the comprehensive environmental implications for any given product.

For the 100 Fountains project, Pilot Projects Design Collective, LLC solicited the development of an LCA on water bottle consumption in New York City. Originally, a comparative LCA to compare water bottle impacts with the proposed construction of 100 fountains in New York City was considered, but the lack of data on water fountain construction and New York City water pipelines prevented the feasibility of a comparative LCA with the semester time constraint. However, even this singular LCA on water bottle consumption will help to quantify environmental and human health impact of water bottle production. Energy consumption, and therefore global warming potential and carbon footprinting, is the focus of this study and will highlight the energy intensity of PET single-use water bottles.

A cradle-to-gate approach, which is an assessment of a partial product life, for a water bottle begins at the production of PET resin from raw materials and ends with the waste management scenario of recycling, incineration, or landfilling of the bottle. A study by Gleick and Cooley (2009) reveal the energy consumption for water bottles from cradle-to-grave and breakdown the life cycle into 11 major energy steps, with the first 7 being the most energy intensive:

**Energy Consumption Steps in Water Bottle Life-Cycle:**

1. Making PET resin from raw or recycled materials
2. Transportation of PET
3. “Blowing” PET bottles from resin
4. Transportation of empty bottles
5. Water Processing (bottling, testing, labeling)
6. Transportation of finished product (seller)
7. Chilling for sale and use
8. Transportation (consumer)
9. Collection and disposal
10. Transportation (waste management)
11. End of life (landfill, incineration, or recycling)

Steps 8 through 11 represent the use and end of life stages, which have been proven to be less energy intensive compared to the manufacturing and transport life stages of a PET single use

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water bottle. Since recycling data for water bottles in New York City was quite ambiguous (e.g.: there is some recycling, waste, and incineration data for PET containers, but this includes all PET beverage containers such as soda, sport drinks, and juices), this LCA is a cradle-to-gate study such that the vast assumptions or uncertainty about water bottle waste management scenarios are eliminated. The gate in this study represents the water bottles at the retailer—post-distribution but prior to consumer purchase.

Examining the Gleick and Cooley framework for Steps 1 through 7, there are a number of factors that can vary the total amount of energy needed for the life cycle of a specific water bottle. The major factors include:

- Location and type of water source
- Distance from bottler to consumer
- Types of material of bottle
  - Including mass of PET which is dependent on style, thickness, and size of bottle
- Types of packaging used
- Method of transportation

Thus, to account for this variation, the LCAs examine four different water bottle brands to represent the diversity of water bottle consumption in New York City and the diversity of energy impacts between water bottle brands.

The U.S. Food and Drug Administration regulates the labeling rules for bottled water in the U.S. and identify eight major “Standards of Identity,” which include:

1. Artesian water
2. Ground water
3. Mineral water
4. Purified water
5. Sparkling bottled water
6. Spring water
7. Sterile water
8. Well water

The top three types of bottled water purchased in New York City are artesian water, purified water, and spring water. The FDA provide the following definitions for these three types of water:

**Artesian water**: water from a well tapping a confined aquifer in which the water level stands at some height above the top of the aquifer.

**Purified water**: water that has been produced by distillation, deionization, reverse osmosis, or other suitable processes and that meets the definition of “purified water” in the United States Pharmacopeia, 23d Revision. (e.g.: municipal “tap” water)

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42 Electronic Code of Federal Regulations:  http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr&sid=e8b7a7992ba5413d50490c47e2f2e69b&rgn=div5&view=text&node=21:2.0.1.1.38&idno=21#21:2.0.1.1.38.2.1.1
Spring water: water derived from an underground formation from which water flows naturally to the surface of the earth. Spring water shall be collected only at the spring or through a bore-hole tapping the underground formation feeding the spring.

From these three categories a brief survey and best estimate was made for the top four brands to represent the majority of New York City water bottle purchases—with two representing the most common and price value products and the other two representing higher premium products. The details of type of water, water source, bottling site location, and various additional water processing for these four brands are outlined in Table 1.

Table 1: Details of the four sample water bottle brands

<table>
<thead>
<tr>
<th>Brand</th>
<th>Company</th>
<th>Type of Water</th>
<th>Source</th>
<th>Bottling site</th>
<th>Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dasani</td>
<td>Coca-Cola</td>
<td>Reprocessed municipal water</td>
<td>Municipal water (NY)</td>
<td>Maspeth, NY</td>
<td>Granular activated carbon filtration, reverse osmosis, UV dis-infection, re-mineralization, ozonation.</td>
</tr>
<tr>
<td>Poland Springs</td>
<td>Nestlé Waters NA</td>
<td>Spring (ground) water</td>
<td>Many spring and distilled water sources in Maine</td>
<td>Various; Poland Spring (ME), Kingfield (ME), Hollis (ME), Jersey City (NJ), Breingsville (PA)</td>
<td>Transported by either pipelines or stainless steel tankers to the plant, one-micron filter removes particles, micro-filtration, UV/ozone disinfection</td>
</tr>
<tr>
<td>Fiji</td>
<td>Fiji Water Company</td>
<td>Artesian import</td>
<td>Yaqara river valley, Viti Levu (Fiji Islands)</td>
<td>onsite; Fiji Islands</td>
<td>Pumped, filtered to remove particulate matter, micron-filtered to remove microbiological particles, UV to disinfect</td>
</tr>
<tr>
<td>Smartwater</td>
<td>Glacéau</td>
<td>Purified water</td>
<td>Municipal water (NY)</td>
<td>Whitestone, NY</td>
<td>Granular activated carbon filtration, vapor distillation, UV dis-infection, re-mineralization, ozonation</td>
</tr>
</tbody>
</table>

Pilot Projects Design Collective LLC provided this study with a number of 1.25 billion single-use PET water bottles consumed in New York City each year, and this total number was used throughout the entire study. Due to the major variation in energy consumption between the water bottle brands, two hypothetical scenarios were chosen to represent water bottle consumption in New York City. Scenario #1 is an equal 25% distribution of each water bottle brand, which represents a possible average consumption, but is somewhat unlikely since Fiji and Smartwater
both represent premium, high cost products. Scenario #2 is our best guess of the water bottle distribution in New York City with 40% given to both Dasani and Poland Springs, which represent the more standard and price value option, while 15% is given to Smartwater and 5% give to Fiji, to represent the less purchased, high-end consumer goods. The two different scenarios will help highlight the discrepancies between the environmental impacts and energy consumption imposed by each water bottle type, as well as a solid baseline.

To account for the differences in mass of PET used per bottle, water bottles of various sizes were collected for the different brands, left to dry completely for a minimum of 48 hours, and then weighed to the closest hundredth of a gram. Table 2 highlights the findings.

[Note: the study was conducted in Connecticut, and it was difficult to obtain more than one size of Dasani water bottle, therefore the sample size (1) was quite low for this brand.]

Table 2: Mass of PET for different water bottle brands and sizes

<table>
<thead>
<tr>
<th>Brand</th>
<th>Volume</th>
<th>Volume (mL)</th>
<th>Weight (g)</th>
<th>Mass/Volume (g/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiji</td>
<td>1.5 L</td>
<td>1500</td>
<td>47.79</td>
<td>0.03186</td>
</tr>
<tr>
<td>Fiji</td>
<td>1.0 L</td>
<td>1000</td>
<td>47.88</td>
<td>0.04788</td>
</tr>
<tr>
<td>Fiji</td>
<td>500 mL</td>
<td>500</td>
<td>25.31</td>
<td>0.05062</td>
</tr>
<tr>
<td>Smartwater</td>
<td>1.5 L</td>
<td>1500</td>
<td>53.03</td>
<td>0.03535</td>
</tr>
<tr>
<td>Smartwater</td>
<td>1.0 L</td>
<td>1000</td>
<td>39.02</td>
<td>0.03902</td>
</tr>
<tr>
<td>Poland Springs</td>
<td>1.5 L</td>
<td>1500</td>
<td>26.18</td>
<td>0.01745</td>
</tr>
<tr>
<td>Poland Springs</td>
<td>700 mL</td>
<td>700</td>
<td>24.17</td>
<td>0.03452</td>
</tr>
<tr>
<td>Poland Springs</td>
<td>500 mL</td>
<td>500</td>
<td>11.54</td>
<td>0.02308</td>
</tr>
<tr>
<td>Poland Springs</td>
<td>8 oz</td>
<td>237</td>
<td>12.75</td>
<td>0.05379</td>
</tr>
<tr>
<td>Dasani</td>
<td>20 oz</td>
<td>591</td>
<td>22.85</td>
<td>0.03866</td>
</tr>
</tbody>
</table>

From these numbers, it is apparent that the smaller the volume size of the bottle, the higher its PET mass to volume ratio. This is demonstrated within the Poland Springs brand: its 8oz (237mL) bottle weighs 12.75g while its larger volume 500mL bottle weighs less at 11.54g. Also notable, is that the 700mL form of the Poland Springs water bottle has a “sports cap,” which uses more plastic than its slim cap counterparts. From these numbers, the average PET mass to volume ratios were
calculated for each brand as seen in Table 3, with Fiji water bottles weighing the heaviest, followed by Dasani, Smartwater, and Poland Springs weighing the lightest on average. A size of 700mL was chosen to represent the average size water bottle consumed in New York City and applied to the 1.25 billion total water bottles consumed in New York City.

**Table 3: Average PET Mass/Volume (g/mL) per water bottle brand**

<table>
<thead>
<tr>
<th>Brand</th>
<th>Average (g/mL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiji</td>
<td>0.0435</td>
</tr>
<tr>
<td>Smartwater</td>
<td>0.0372</td>
</tr>
<tr>
<td>Poland Springs</td>
<td>0.0322</td>
</tr>
<tr>
<td>Dasani</td>
<td>0.0387</td>
</tr>
</tbody>
</table>

The first step in the LCA for water bottle production is to account for the amount of bottle-grade polyethylene terephthalate (PET) used to make the water bottles. The PET production process begins by first producing its two main raw material components: monoethylene glycol (MEG) and terephthalic acid (PTA). PTA is produced from paraxlyene, which is derived from crude oil and processed very similar to gasoline. MEG is also derived from crude oil, with its main raw material ingredient being ethylene, which is derived by natural gas that undergoes a process of stream cracking hydrocarbon. Thus, the two essential components of PET are almost completely derived from nonrenewable, crude oil-based resources so PET itself has energy embodied in it was additional energy required to turn PTA and MEG into PET and PET into bottles.

After procuring the two raw materials of MEG and PTA, streams of both materials come together in a chemical reaction to produce PET resin in small pellets. Pellets are melted and injected into a mold to produce ‘preform’ – a thick-walled test tube with a finished neck and set of cap threads, which is then heated, stretched, and blown into final bottle shape.

Two previously studied LCAs (Bousted 2005; Franklin Associates 2007) found that 70-83 MJ (thermal) kg\(^{-1}\) of energy is needed to produce PET resin with an additional 20 MJ (thermal) kg\(^{-1}\) of energy to produce preforms and turn them into bottles. Thus, total energy used to produce PET bottles with some transportation energy included (moving resin to the point where bottles are produced and filled) is about 100 MJ (th) kg\(^{-1}\) or 100,000 MJ (th) per ton of PET.\[^44\] \[^45\]

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\[^43\] Oil in My Water? Polaris Institute: [http://www.polarisinstitute.org/oil_in_my_water](http://www.polarisinstitute.org/oil_in_my_water)


Using these previous energy calculations applied to the three different scenarios, the total amount of energy required to produce the PET to manufacture the 1.25 billion water bottles consumed in New York City in one year are seen in Tables 4 and 5 as applied to the respective scenarios.

Table 4: Energy to Produce PET and PET into 1.25 billion water bottles under Scenario #1

<table>
<thead>
<tr>
<th></th>
<th>Number of bottles</th>
<th>Total PET (g)</th>
<th>Total PET (met. ton)</th>
<th>Energy to Produce PET bottle (MJ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiji</td>
<td>312,500,000</td>
<td>9,505,416,666.67</td>
<td>9,505.42</td>
<td>950,541,666.67</td>
</tr>
<tr>
<td>Smartwater</td>
<td>312,500,000</td>
<td>8,134,583,333.33</td>
<td>8,134.58</td>
<td>813,458,333.33</td>
</tr>
<tr>
<td>Poland Springs</td>
<td>312,500,000</td>
<td>7,046,996,967.30</td>
<td>7,047.00</td>
<td>704,699,696.73</td>
</tr>
<tr>
<td>Dasani</td>
<td>312,500,000</td>
<td>8,457,593,062.61</td>
<td>8,457.59</td>
<td>845,759,306.26</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,250,000,000</td>
<td>33,144,590,029.91</td>
<td>33,144.59</td>
<td>3,314,459,002.99</td>
</tr>
</tbody>
</table>

Table 5: Energy to Produce PET and PET into 1.25 billion water bottles under Scenario #2

<table>
<thead>
<tr>
<th></th>
<th>Number of bottles</th>
<th>Total PET (g)</th>
<th>Total PET (met. ton)</th>
<th>Energy to Produce PET bottle (MJ)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiji</td>
<td>62,500,000</td>
<td>1,901,083,333.33</td>
<td>1,901.08</td>
<td>190,108,333.33</td>
</tr>
<tr>
<td>Smartwater</td>
<td>187,500,000</td>
<td>4,880,750,000.00</td>
<td>4,880.75</td>
<td>488,075,000.00</td>
</tr>
<tr>
<td>Poland Springs</td>
<td>500,000,000</td>
<td>11,275,195,147.68</td>
<td>11,275.20</td>
<td>1,127,519,514.77</td>
</tr>
<tr>
<td>Dasani</td>
<td>500,000,000</td>
<td>13,532,148,900.17</td>
<td>13,532.15</td>
<td>1,353,214,890.02</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1,250,000,000</td>
<td>31,589,177,381.18</td>
<td>31,589.18</td>
<td>3,158,917,738.12</td>
</tr>
</tbody>
</table>

After the water is processed, machines are used to clean, fill, seal, and label the water bottles. Gleick and Cooley found that energy efficiency varies with machines, but typical high production facilities, as seen with the four companies that represent this New York City sample, about 0.014 MJ\(_{(\text{th})}\) of energy is required per bottle. Thus, since total number of bottles remain the same under all three scenarios, the total energy requirement for this step is 1.25 billion multiplied by 0.014 MJ\(_{(\text{th})}\) of energy totaling in 17,500,000 MJ\(_{(\text{th})}\) of energy.

Next, water bottles are packaged to be ready for transport out of the bottling facility. Water bottles are sold in various counts; bound first in packaging film made of low-density polyethylene (LDPE) and then placed into cardboard boxes. A generic 24 pack of water bottle was chosen and
assumed that 10g of packaging film is required to bind each 24 pack such that 520,833.33 kg of LDPE is required for the 1.25 billion water bottles. The U.S. Environmental Protection Agency recycling data states that an old corrugated cardboard box with dimensions of 48” x 48” x 60” weighs 4 pounds. Assuming that the average water bottle height of a 700mL bottle is about 12 inches high with a diameter of 2.5 inches, the dimensions of a 24-pack would be 21” x 14” x 12” and 30-24 packs, or 720 bottles, could fit into one 48” x 48” x 60” box. Thus, with the U.S. EPA data, a total of 3,149,305.56 kg of packaging cardboard would be needed to package the 1.25 billion water bottles consumed in New York City.

After the bottles are packaged they are shipped from the bottling facility to retail stores and consumers around the world. For this New York City specific study, the most likely bottling facility was chosen and its distance from New York City was measured in kilometers. Fiji Waters, Smartwater, and Dasani all source their water onsite so there is no added transportation of the water to the bottling facility. Poland Springs is the only company in the sample size that transports its water from its source to the bottling facility, so this distance was added to the distance of the bottling facility to New York City, thus amounting to total transportation distance. It was assumed that for all land transportation, a generic greater than 28 ton trucking lorry with gas efficiency at the fleet average was utilized and the appropriate distances were applied.

Furthermore, Fiji Waters is the only company requiring transoceanic freight shipping, as its water bottles are shipped from Lautoka, Fiji to Los Angeles, United States of America. The distance between these two major ports is 4,600 nautical miles which is equal to 12,408.40 km. Impacts from transoceanic freight shipping are calculated in a simple unit of freight called a kilogram-kilometer (kgkm), which is the service of moving one kilogram of payload one kilometer. Thus, the more weight of the product, the greater the impacts from transoceanic freight shipping.

After the water bottles are transported to the appropriate retailer such as a grocery store, office building, or convenience store, energy is required to cool the bottled water from the ambient temperature to the temperature of a refrigerator or commercial display cooler. Gleick and Cooley (2009) calculated that ambient room temperature is around 20°C and a typical refrigerator or cooler has an average temperature of 3.3°C. The spec energy of water is 4.2 kJ kg⁻¹ K⁻¹ therefore to cool 1 liter of water 17°C (from 20°C to 3.3°C) requires 220 kJ, or 0.2 MJ l⁻¹. Assuming that the average water bottle stays in a cooler or refrigerator before it is consumed, a total of 175,000,000 MJ is required to cool the 1.25 billion water bottles consumed annually in New York City.
Table 6: Transportation distances per water bottle brand

<table>
<thead>
<tr>
<th>Brand</th>
<th>Source</th>
<th>Bottling site</th>
<th>Distance source to bottler</th>
<th>Distance of Bottling site to NYC</th>
<th>Total Transportation Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dasani</td>
<td>New York City municipal water</td>
<td>Maspeth, NY</td>
<td>0 km</td>
<td>15 km</td>
<td>15 km</td>
</tr>
<tr>
<td>Poland Springs</td>
<td>Poland Springs, ME</td>
<td>Kingfield, ME</td>
<td>115 km</td>
<td>700 km</td>
<td>815 km</td>
</tr>
<tr>
<td>Fiji</td>
<td>Yaqara River Valley, Viti Levu (Fiji Islands)</td>
<td>onsite; Fiji Islands</td>
<td>0 km</td>
<td>6,700 nautical miles (Lautoka, Fiji to Los Angeles, USA) and 4,600 km from Los Angeles to New York City</td>
<td>4,600 km</td>
</tr>
<tr>
<td>Smartwater</td>
<td>New York City municipal water</td>
<td>Whitestone, NY</td>
<td>0 km</td>
<td>30 km</td>
<td>30 km</td>
</tr>
</tbody>
</table>

LCA SimaPro Results

SimaPro software developed by Netherlands based PRé Consulting was used to conduct this life cycle assessment (LCA) of water bottle consumption in New York City. SimaPro is one of the leading and most comprehensive LCA software on the market; however, it does come with limitations for studies in the US since the majority of its database is based on European data. While this may cause some discrepancies, all of the other major LCA software (e.g.: Gabi software by PE International, Inc.) are created by European companies and research groups, so this discrepancy is nearly universal in LCA work.

The Tools for the Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI) impact assessment model was chosen for primary model for this particular study to evaluate the potential effects of environmental stressors and human health related effects such as ozone depletion, global warming, acidification, eutrophication, tropospheric ozone formation, ecotoxicity, human health cancer effects, human health non-cancer effects, fossil fuel depletion, and land-use effects. An additional LCA was conducted for both scenarios using the Intergovernmental Panel on Climate Change (IPCC) 2007 Global Warming Potential (GWP) 100a impact assessment method to calculate product and process-specific greenhouse gas emissions.

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As with most LCAs, data availability for both the sample study and within the SimaPro database were limited. The following materials were included in the product assembly:

- Total amounts of PET resin
- Drinking water with SimaPro-specific purification processes to represent the spring water sources (Fiji, Poland Springs)
- Tap water to represent the reprocessed municipal water (Smartwater, Dasani)
- LDPE packaging film
- Packaging corrugated cardboard

The following processes were also included:

- Blow molding: for making water bottles from PET resin
- Electricity: to represent energy to fill, clean, label, seal bottles
- Production of cardboard boxes
- Transoceanic freight ships
- Transport trucking lorries
- Electricity: for cooling water bottles to refrigerator temperature

Thus, a number of assumptions were made including the exclusion of transport of PET resin to bottler facility. While this could definitely be a significant omission, these data are quite difficult to find per bottling company and was therefore excluding for every brand. It also seems likely that the larger companies of Nestle Waters (Poland Springs) and Coca Cola (Dasani) might actually encompass the entire PET to bottle process at their facilities.

There are no water treatment processes in the SimaPro library so best choices were made from the available water sources in SimaPro. Drinking water with built in European Union water purification treatment standards was used for Fiji Waters and Poland Springs to represent the less treated water from spring and artesian sources. Tap water by European Union standards was used to represent Smartwater and Dasani, which are the reprocessed municipal water sources.

Machinery and infrastructure are also not included in this LCA, primarily because the water bottle companies do not release their machinery data. However, it is likely that the machinery lifetime over number of bottles produced is so high that the inclusion of machinery would have a fairly small impact on the results.

A comparative LCA between Scenario #1 and #2 was conducted first to compare the different scenarios to help highlight the discrepancies between the environmental impacts, and specifically energy consumption, in each water bottle type.
Table 7: Number of bottles per brand in each hypothetical scenario

<table>
<thead>
<tr>
<th></th>
<th>Scenario #1 Number of bottles</th>
<th>Scenario #2 Number of bottles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiji</td>
<td>312,500,000</td>
<td>62,500,000</td>
</tr>
<tr>
<td>Smartwater</td>
<td>312,500,000</td>
<td>187,500,000</td>
</tr>
<tr>
<td>Poland Springs</td>
<td>312,500,000</td>
<td>500,000,000</td>
</tr>
<tr>
<td>Dasani</td>
<td>312,500,000</td>
<td>500,000,000</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,250,000,000</strong></td>
<td><strong>1,250,000,000</strong></td>
</tr>
</tbody>
</table>

The U.S. EPA Tool for Reduction and Assessment of Chemical and Other Environmental Impacts (TRACI) model was chosen for the initial comparative LCA and evaluates the life cycle on the following impact categories:

- **Global warming**
  Global warming is an average increase in the temperature of the atmosphere near the Earth's surface and in the troposphere, which can contribute to changes in global climate patterns. Global warming can occur from a variety of causes, both natural and human induced.\(^47\)

- **Acidification**
  Decrease of pH and increase in acidity in the Earth’s water sources (oceans, freshwater), which poses a threat to the natural carbon cycle and the interconnected food chain associated with these bodies of water.\(^48\)

- **Carcinogenics**
  Any substance that can cause or aggravate cancer.\(^7\)

- **Non-carcinogenics**
  Toxicity to humans but of non-cancerous effects.\(^7\)

- **Respiratory effects**
  When inhaled, particles less than 2.5 microns in diameter (fine particles) can penetrate into the small airways and air exchange regions of the lung, which can evade the lung’s natural defenses and harm both cardiovascular and respiratory health.\(^49\)

- **Eutrophication**
  The process of excess nutrients accelerating the growth of algae, ultimately depleting the water of dissolved oxygen.\(^7\)

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\(^{47}\) U.S. EPA Terminology Services – Definition http://www.epa.gov
\(^{48}\) Center for Biological Diversity: Ocean Acidification http://www.biologicaldiversity.org/campaigns/ocean_acidification/
\(^{49}\) American Lung Association – Dangerous to Breathe: Why EPA needs to protect us from Coarse Particles (March 2011).

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• **Ozone depletion**
  Destruction of the stratospheric ozone layer, which shields the earth from ultraviolet radiation harmful to life. This destruction of ozone is caused by the breakdown of certain chlorine and/or bromine containing compounds (chlorofluorocarbons or halons), which break down when they reach the stratosphere and then catalytically destroy ozone molecules.\(^7\)

• **Ecotoxicity**
  Toxic (harm from chemicals) effects on nonhuman organisms, populations, or communities.

• **Smog**
  Dust, smoke, chemical fumes that pollute the air and make hazy, unhealthy conditions.\(^7\)

The results from the 2-way comparison TRACI model are displayed as total amounts per impact category in Table 8 and the relative comparisons are displayed graphically in Figure 1.

**Table 8**: The total amount of impact for each TRACI Impact Category per scenario

<table>
<thead>
<tr>
<th>Impact Category</th>
<th>Scenario #1 Total</th>
<th>Scenario #2 Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global warming</td>
<td>221,000,000 kg CO2 equivalent</td>
<td>193,000,000 kg CO2 equivalent</td>
</tr>
<tr>
<td>Acidification</td>
<td>86,900,000 H+ moles equivalent</td>
<td>57,200,000 H+ moles equivalent</td>
</tr>
<tr>
<td>Carcinogenics</td>
<td>340,000 kg benzene equivalent</td>
<td>308,000 kg benzene equivalent</td>
</tr>
<tr>
<td>Non-carcinogenics</td>
<td>3,940,000,000 kg toluen equivalent</td>
<td>3,810,000,000 kg toluen equivalent</td>
</tr>
<tr>
<td>Respiratory effects</td>
<td>355,000 kg PM2.5 equivalent</td>
<td>247,000 kg PM2.5 equivalent</td>
</tr>
<tr>
<td>Eutrophication</td>
<td>473,000 kg N equivalent</td>
<td>434,000 kg N equivalent</td>
</tr>
<tr>
<td>Ozone depletion</td>
<td>8.08 kg CFC-11 equivalent</td>
<td>5.41 kg CFC-11 equivalent</td>
</tr>
<tr>
<td>Ecotoxicity</td>
<td>282,000,000 kg 2,4-D equivalent</td>
<td>268,000,000 kg 2,4-D equivalent</td>
</tr>
<tr>
<td>Smog</td>
<td>809,000 g NOx equivalent</td>
<td>474,000 g NOx equivalent</td>
</tr>
</tbody>
</table>

Figure 1 shows a relative comparison between Scenario #1 and #2 and from both the numerical and graphical representations, it’s evident that Scenario #2 has lower impacts across the every environmental and human health impact category, compared to Scenario #1. The largest discrepancies between the two scenarios occur in the impact categories of Smog (Scenario #2 has almost 40% lower impact), Acidification (Scenario #2 has a 35% lower impact), and Respiratory Effects (Scenario #2 has a 30% lower impact). The IPCC 2007 GWP 100a impact assessment model produced similar results (see Figure 2) with Scenario #2, again, being a less
impactful option in terms of global warming potential. In our estimation, Scenario #2 presents a more realistic representation of water bottle consumption in NYC.

**Figure 1:** Bar graph comparing the TRACI Impact Categories between Scenario #1 and #2

![Bar graph comparing TRACI Impact Categories between Scenario #1 and #2](image1.png)

Red is Scenario #1, Green is Scenario #2

**Figure 2:** Bar graph comparing the IPCC 2007 GWP 100a impacts between Scenario #1 and #2

![Bar graph comparing IPCC 2007 GWP 100a impacts between Scenario #1 and #2](image2.png)

Red is Scenario #1, Green is Scenario #2
The IPCC 2007 GWP 100a impact assessment model also evaluates the individual material and process inputs and can weigh the amount of global warming potential for each input. The detailed results are displayed in Table 9 below.

**Table 9**: Process and material Global Warming Potential contribution for Scenario #1 and #2

<table>
<thead>
<tr>
<th></th>
<th>Scenario 1</th>
<th>Scenario 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>kg CO2 eq</td>
<td>kg CO2 eq</td>
</tr>
<tr>
<td>PET (bottle grade)</td>
<td>112,549,611.61</td>
<td>107,267,881.13</td>
</tr>
<tr>
<td>Electricity to cool water bottles</td>
<td>37,496,811.10</td>
<td>37,496,811.10</td>
</tr>
<tr>
<td>Blow molding, PET</td>
<td>36,037,990.63</td>
<td>34,346,799.07</td>
</tr>
<tr>
<td>Transoceanic freight ship</td>
<td>25,620,153.44</td>
<td>5,124,030.69</td>
</tr>
<tr>
<td>Packaging, corrugated board</td>
<td>3,882,018.66</td>
<td>3,882,018.66</td>
</tr>
<tr>
<td>Electricity clean, fill, bottle</td>
<td>3,749,681.11</td>
<td>3,749,681.11</td>
</tr>
<tr>
<td>Packaging film, LDPE</td>
<td>1,403,698.32</td>
<td>1,403,698.32</td>
</tr>
<tr>
<td>Production of carton board boxes</td>
<td>948,539.90</td>
<td>948,539.90</td>
</tr>
<tr>
<td>Drinking water, water purification treatment</td>
<td>252,402.49</td>
<td>227,162.24</td>
</tr>
<tr>
<td>Tap water</td>
<td>72,819.54</td>
<td>80,101.49</td>
</tr>
<tr>
<td>Ground transport, lorry</td>
<td>5,822.53</td>
<td>5,822.53</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>222,019,549.33</strong></td>
<td><strong>194,532,546.22</strong></td>
</tr>
</tbody>
</table>

It is apparent from these results that PET itself has the greatest impact in terms of carbon footprint. For Scenario #1, PET material amounts to 50.7% of its carbon footprint and 55.1% of the carbon footprint of Scenario #2. This is likely due to not only the energy intensive process of producing PET, but also the fact that PET itself embodies so much energy since its two main raw material inputs are primarily derived from crude oil.

Table 10 shows that this difference in Global Warming Potential between the two scenarios is likely due to the fact that Scenario #2 uses 1,555.41 tons less PET than Scenario #1.
Table 10: Amount of PET required in Scenario #1

<table>
<thead>
<tr>
<th>Brand</th>
<th>Scenario #1 Total PET (metric ton)</th>
<th>Scenario #2 Total PET (metric ton)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiji</td>
<td>9,505.42</td>
<td>1,901.08</td>
</tr>
<tr>
<td>Smartwater</td>
<td>8,134.58</td>
<td>4,880.75</td>
</tr>
<tr>
<td>Poland Springs</td>
<td>7,047.00</td>
<td>11,275.20</td>
</tr>
<tr>
<td>Dasani</td>
<td>8,457.59</td>
<td>13,532.15</td>
</tr>
<tr>
<td>TOTAL</td>
<td>33,144.59</td>
<td>31,589.18</td>
</tr>
</tbody>
</table>

Focusing specifically on Global Warming Potential (amount of CO₂ equivalent) from the IPCC 2007 GWP 100a impact assessment results and using the U.S. EPA Greenhouse Gas Equivalencies Calculator, 50 1.25 billion water bottles consumed annually in New York City is analogous to these everyday terms in Table 11:

Table 11: Global warming potential everyday equivalents for the two scenarios

<table>
<thead>
<tr>
<th>Impact Category</th>
<th>Scenario #1 Total</th>
<th>Scenario #2 Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global warming</td>
<td>222,019,549.33 kg CO₂ equivalent</td>
<td>194,532,546.22 kg CO₂ equivalent</td>
</tr>
<tr>
<td>Annual greenhouse gas emissions from:</td>
<td>43,533 passenger vehicles</td>
<td>38,144 passenger vehicles</td>
</tr>
<tr>
<td>CO₂ emissions from the electricity use of:</td>
<td>27,683 homes for 1 year</td>
<td>24,256 homes for 1 year</td>
</tr>
</tbody>
</table>

In conclusion, it is evident that water bottle consumption in New York City embodies not only a large amount of energy, but also has a large carbon footprint in terms of the global warming potential associated with the process of producing water bottles from raw materials and delivering the finished water bottle product to the consumer. If even a small amount of the total number of single use PET-water bottles consumed in New York City can be reduced, it can have a significant and positive effect on reducing the carbon footprint of New York City and therefore other environmental and human health effects.

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Report 5. Fountain Density and Consumer Expenditure Maps

Water, Water Everywhere...So Why Put it in Bottles?
Consumer Bottled Water Expenditures, Drinking Fountain Densities, and How They Relate to Each Other.

1) Per Capita Annual Expenditures: Bottled Water

Legend
Bottled Water Expenditure Per Person Annually ($):
- $0 - $25
- $26 - $50
- $51 - $75
- $76 - $100
- $101 - $150
- $151 - $200
- $201 - $300

2) Drinking Fountain Density: Fountains per Acre

Legend
Drinking Fountain Density Fountains per Acre:
- Fewer Fountains
- More Fountains

The map to the right describes the best- and worst-serviced boroughs in New York City in terms of access to public drinking fountains. The total amount of money each borough spent on bottled water was compared to the total number of drinking fountains in that borough. Boroughs were ranked according to this ratio; more money spent on bottled water with fewer drinking fountains available meant a worse-serviced area, and vice versa.

3) Drinking Fountain Service by Expenditure

Legend
Drinking Fountain Service By Expenditure:
- Worst Served
- Poorly Served
- Average Served
- Well Served

26
Report 6. NYC Sustainability Commitments:

What do city agencies say about sustainability? Great strides have been taken toward sustainable infrastructure, but drinking fountains have been largely forgotten.

Mayor’s Office and PlaNYC

Mayor Bloomberg has become well-known for his commitments to sustainability in New York City. In 2007, he released a comprehensive, long-term sustainability plan for the city, PlaNYC, that was an “unprecedented effort” to bring together city agencies and make life for New Yorkers greener and healthier. In 2009, he pushed City Council to ban plastic bags (which they denied) and limit the number of cars roaming pedestrian-heavy parts of the city like Times Square and Herald Square (which they accepted). But the sustainability efforts for NYC aren’t just limited to the Mayor’s Office. Many city departments have sustainability commitments, and many of them are in line with the “100 Fountains” project goals of increasing accessibility and affection for urban drinking fountains.

New York City Office of Environmental Coordination

In 2006, a year before the release of PlaNYC from the Mayor’s Office, the NYC Office of Environmental Coordination, in partnership with the Design Trust for Public Space, released the 2006 Sustainable New York City Plan. The plan defined sustainability and included detailed case study examples from other cities’ sustainability efforts. The goal of the plan was to show that large cities can successfully execute large-scale plans for reducing their environmental footprint, and NYC could be among them. An excerpt from the plan details the ways in which sustainable development should be measured:

“The success of sustainability as an environmental strategy for New York and other cities can and should be measured, both qualitatively and quantitatively, on the basis of five principal criteria:

- Stewardship of natural resources,
- Health and productivity,
- Economic development,
- Efficient government, and
- Education.”

Many of these points can be addressed through the 100 Fountains project:

Stewardship of Natural Resources: “Sustainable approaches to the local and global environment should seek to protect and preserve irreplaceable existing resources, use required resources efficiently, and to improve and restore natural resources that benefit

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53 http://www.designtrust.org/publications/publication_05sustnyc.html
both humanity and nature.” Through discouragement of single-use plastic bottles of water and the accessibility of drinking fountains, the resources going in to and the waste coming out of the City will be greatly reduced.

Health and Productivity: “Sustainability efforts should demonstrate that improvements to the environment also enhance the well-being of local residents, workers, and visitors.” Greater access to drinking fountains allows more people to stay well hydrated and will provide a healthy and free alternative to sugary drinks in plastic bottles.

Economic Development: “Sustainable development should also contribute to urban economic development by creating a cleaner environment.” All of NYC’s trash and recycling gets trucked away to other cities and states. Every truckload that can be eliminated from the City’s waste stream saves money. Additionally, a project like 100 Fountains will draw more people to the City, which stimulates the economy and helps business owners and the City itself.54

Education: “Sustainable development must engage the…public in civic and volunteer efforts, raise awareness of the environmental impact of individual behaviors, and build support for long-term government initiatives.” A large scale and highly public project like 100 Fountains will provide a perfect platform to tout the benefits of NYC’s tap water and the importance of waste reduction. Information about waste reduction and water use can be embedded in the fountains themselves, accompany the fountains, and will be found on the website where the public will vote for its favorite fountain during the exhibit, giving both children and adults the opportunity to get more from the experience than a sip of cool water.

Despite the many ways drinking fountains can lead to a more sustainable city, there is no mention of this as a strategy to reach any city sustainability goals in this report.

New York City - Department of Planning

In April of 2011, New York City became one of nine cities to join “The New York – Connecticut Sustainable Communities Consortium.55 According to the press release, the Consortium “plans to work together to develop livable communities and growth centers around the region’s commuter rail network that will expand economic opportunity by creating and connecting residents to jobs, foster new affordable, energy-efficient housing, provide more transportation choices, strengthen existing communities and make

“Drinking fountains are a glaring omission from most Department of Planning documents…plazas and waterfronts are ideal locations for drinking fountains, but they can be easily overlooked when omitted from official plans.”

54 See summary on “Public Art Precedents: Details and Logistics”
the region more globally competitive.”

While this plan is more focused on home energy and public transportation, goals set by the 100 Fountains project can coexist nicely within the plan. Public transportation centers are a perfect location for drinking fountains, as they provide people with a sip of water much more quickly than a vending machine or vendor could. These are high-traffic areas that would likely see a lot of drinking fountain use. A detail like this ought not to be overlooked by planners who execute projects to meet Consortium goals.

In 1993, the NYC Department of Planning put forth their 30-year Greenways Pedestrian and Bike Trail System plan. The vision is to provide places “to enjoy the sun, the breeze, or waterfront views; and to exercise, relax, and experience nature. By contributing to physical fitness, greenways can offer New Yorkers important health benefits.” Despite the obvious links between increased access to water through, for example, more drinking fountains, and physical fitness through more walking and biking, drinking fountains are not mentioned in the report as a strategy.

Indeed, drinking fountains seem to be a glaring omission from most NYC Department of Planning documents. DOP plans to increase privately owned public spaces like plazas and waterfronts, provide extremely detailed descriptions of required amenities for the spaces, from the number of stairs allowed, the height and width of seating, and requirements for signage, but there is absolutely no mention of drinking fountains or access to water. Like public transit stations and greenway paths, plazas and waterfronts are ideal locations for drinking fountains, but they can be easily overlooked when omitted from official plans.

New York City - Department of Transportation

Similar to the Department of Planning plaza plan, the Department of Transportation runs a public plaza program. DOT will work with local non-profit groups to establish, fund and maintain public plaza spaces. These plazas address the PlaNYC goal to have a public park or greenspace 10 minutes’ walk away from every New Yorker in the city. In contrast to the description of the plaza plans for Department of Planning, however, DOT’s plan mentions drinking fountains directly:

“DOT will fund the design and construction of the plaza. Design will strive to create environmentally friendly public plazas that are appropriate to neighborhood context. Possible amenities may include tables and seating, trees and plants, lighting, public art, and drinking fountains.”

However, DOT leaves the design up to the non-profit organization, to allow for the plaza to address the needs of each individual space within the context of its neighborhood.

In addition to DOT’s public plaza program, which will add several ideal spaces for the artistic drinking fountains envisioned by 100 Fountains, DOT runs an urban art program for which 100 Fountains is perfectly suited. According to the website,59

“The Urban Art Program is an initiative to invigorate the City's streetscapes with engaging temporary art installations. Part of the World Class Streets initiative, Urban Art seeks to create public art that helps to foster more vibrant and attractive streets and offer the public new ways to experience New York City's streetscapes.”

The spaces created and maintained by DOT, paired with programs that the department runs will create several opportunities for increased public art and drinking fountains to find homes within the city, while contributing to DOT’s goal to provide “shorter, direct crosswalks; more usable public space; and safe, comfortable travel paths for pedestrians, cyclists and motorists alike.”

It is however, worth noting that the PlaNYC initiatives have tasked DOT, along with the Department of Long Term Planning and Sustainability, the Department of Environmental Protection, and the Department of Public Relations, with implementing “public education campaigns to reduce litter, encourage switching to reusable bags and reusable water bottles for tap water.”60 These efforts will be nicely complimented by the goals of the 100 Fountains project.

**New York City - Department of Sanitation**

In fiscal year 2005, the Department of Sanitation (DSNY) picked up and hauled away over 61,500 tons of trash and recycling61 To address this enormous amount of waste, DSNY updated its waste management plan in 2006. The plan details the history of waste management in NYC, and addresses the fact that the current truck-based system is not sustainable in the long run. In order to reduce the cost (both economic and environmental) of trucking waste away from the city, there has been a strong urge to reduce the quantity of waste.

In 2004-2005, DSNY did an extremely thorough and comprehensive waste composition study to better understand the contents of NYC trash. It found that 2% of the trash (not including, in addition to, recycling) is plastic bottles and jugs62. Many of these items can easily be eliminated from both landfills and garbage trucks by reducing consumption of single-use plastic bottles. Drinking fountains placed more pervasively throughout the city is one way to address waste reduction on the user-side.

“DSNY found that 3% of the trash (not recycling) in New York City is plastic bottles and jugs.”

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Indeed, as a result of the PlaNYC initiatives, DSNY, in partnership with the Department of Long Term Planning and Sustainability, will “install redesigned drinking fountains in public spaces and parks to encourage adoption of reusable water bottles.”

This goal is directly in line with the goals of 100 Fountains, which could have a huge impact on the number of water bottles used and thrown away every year in New York. The DSNY Bureau of Waste Prevention, Reuse, and Recycling estimates that each person in NYC throws away an average of 9.05 pounds of plastic bottles every year.

**New York State “Bottle Bill”**

While the City of New York has missed some opportunities to include drinking fountains in sustainability plans and documents, New York State has recently made great strides towards goals that are directly in line with the goals of 100 Fountains. The New York State Returnable Container Act (more commonly known as the “bottle bill”) was put into law in 1982. The act has been modified several times since then, but most recently, an amendment to the law made bottled water—including flavored or nutritionally enhanced water, which does not contain sugar—subject to New York’s Returnable Container Act.

The bottle bill adds a five-cent deposit to the plastic bottles, which distributors must first pay, and which the consumer then pays when they purchase the bottle. The consumer can then return the bottle and get their deposit back. When the bottle bill came into law, non-carbonated drinks did not have a significant portion of the market share. However, now bottled water makes up about 23% of the New York beverage market share, so allowing the bottle bill to apply to it bodes well for increasing recycling rates of bottled water containers in New York (estimates currently range from 18% to 30% for bottled water recycling rates).

**Conclusions**

Mayor Bloomberg and the other Departments and City offices in New York have clearly made commitments to a reduced environmental footprint, increased and improved public spaces and amenities, and reduced waste. NYC can continue to pursue its sustainability goals through creative innovation and new partnerships with non-profit and community groups. Although drinking fountains have so far been substantially overlooked in many NYC department sustainability plans, their important role in bringing NYC closer to its goals cannot be denied.

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65 [http://www.dec.ny.gov/chemical/57687.html](http://www.dec.ny.gov/chemical/57687.html)

66 [http://www.dec.ny.gov/chemical/8500.html](http://www.dec.ny.gov/chemical/8500.html)


Additional NYC Government Resources


2. High Performance Infrastructure Guidelines (DDC & Design Trust for Public Space) (2005)\(^70\)

3. High Performance Landscape Guidelines (DDC & Design Trust for Public Space) (2005)\(^71\)


5. Sustainable Urban Site Design Manual (DDC) (2009)\(^73\)

6. Active Design Guidelines (DOHMH & DDC) (2010)\(^74\)

7. Sustainable Streets: DOT Strategic Plan for 2008 & Beyond (DOT) (2008)\(^75\)

8. Street Design Manual (DOT) (2009)\(^76\)


Report 7. Public Art Precedents:

How Other Public Art Projects can Inform 100 Fountains

It is well accepted by City leaders that public art can play an important role in shaping urban culture and identity. This research looks at several public art projects that were influential in their respective cities, and which can inform the 100 Fountains project. Understanding previous art projects is important since we can learn from the processes those projects followed and avoid “reinventing the wheel.” We were particularly interested in which City agencies and departments were involved with their approval, funding, and execution, what other sources of funding did the projects rely on, and what the budgets and other logistical details of the projects were.

This report looks at several examples of large-scale and influential public art projects in New York City, since other NYC projects are likely to follow similar processes to get approved, funded, and installed. Following is a couple relevant public art examples from other large cities that are similar in scope and purpose to 100 Fountains. Finally, there are two examples of public art projects that are themselves water fountain projects; water fountains has been a successful subject for public art projects in the past.

One important aspect of the analysis provided here is the economic benefit that many of these projects are said to have brought to their host cities. Many cities and public art organizations will tout the enormous economic benefit that can come from public art projects, but these numbers must be taken with a grain of salt. The methods used to calculate these benefits are sometime dubious, often relying on the “spillover effect” to increase supposed benefits (“For example, waiters tipped by Waterfalls tourists would, in turn, spend that money at local stores, causing a ripple effect.”). Despite the unreliability of these numbers, it is important to remember the non-economic benefits of public art; one “obvious example” quoted in a report about economic value of public art, is of course “sheer joy.”

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77 http://www.artsjournal.com/culturegrrl/2008/10/waterfalls_trickledown_theory_1.html
78 ibid
Part One: New York City Public Art Precedents

1. New York, NY: The New York City Waterfalls

What: In order to bring “the spectacular beauty of nature” to an urban environment, artist Olafur Eliasson constructed and installed four waterfalls, ranging in size from 90 to 120 feet tall along various points in the New York Harbor. This was a temporary installment, on display June through October of 2008.

How Much Did it Cost: Construction of the waterfalls totaled $15.5 Million.

Who Paid For It: The piece was commissioned by the Public Art Fund and paid for by private donations:
- $2 Million came from Lower Manhattan Development Corporation
- Over 120 private donors paid for the rest, including Mayor Bloomberg and his company, Bloomberg L.P.

Estimated Economic Impact: The City of New York estimates that $69 Million were generated as a result of The New York City Waterfalls display.

What City Offices and Programs were Involved:
- The Public Art Fund, a non-profit organization who raises funds from private donors to install public art around NYC.
- The Mayor’s Office—Bloomberg pushed the project because of its economic potential in the wake of Christo and Jean-Claude’s “The Gates.”
- Department of Parks and Recreation (dealt with the side effects of salt-water spray damaging nearby stands of trees).
- Permits came from Department of Environmental Conservation, Army Corps of Engineers, Coast Guard, and others.

Other Info: A team of almost 200 people worked on the project, ranging from members of the artist’s studio and the staff of Public Art Fund, to partners with the City and State of New York and its various agencies.

More Info:
- NYC Waterfalls Official Website
- Public Art Fund Website on NYC Waterfalls
- New York Magazine on NYC Waterfalls
- City of New York Economic Impact Report for NYC Waterfalls

What: New York artists Christo and Jeanne-Claude installed 7,503 vinyl "gates" along 23 miles (37 km) of pathways in Central Park in New York City. The exhibit ran from February 12, 2005 through February 27, 2005. The piece was originally proposed to the city in 1979, and was only approved after Bloomberg was elected as mayor.

How Much did it Cost: The artists estimate the total cost was $23 Million.

Who Paid for It: The entire project was funded by the artists themselves.

Estimated Economic Impact: Data indicates that The Gates attracted over 4 million visitors to Central Park and generated an estimated $254 million in economic activity.

What City Offices and Programs were Involved:
- Department of Cultural Affairs (supports art and culture in NYC)
- Department of Parks and Recreation (manages Central Park)
- NYC Economic Development Corp. (supports projects that will positively affect the city’s economy)
- NYC & Company (advertises things to do for tourists)

More Info:
- City Economic Impact Report for The Gates
- NYC Official Website for The Gates
- Artists' Website for The Gates


What: Twenty “hubs” dispersed along the length of Broadway will serve as sites for collaboration between artists, scientists, policy makers, and local community groups. Installations are designed to make sustainability tangible to citizens at street level and catalyze future projects by artists and environmental designers. The hubs are planned to be revealed in summer of 2013.
Who is Paying for It?:
- The Rockefeller Foundation Cultural Innovation Fund (grant)
- The Ford Foundation
- The Graham Foundation for Advanced Studies in the Fine Arts
- New York Foundation for the Arts
- Private Donors

What City Offices and Programs Are Involved:
- Department of Transportation
- Department of Parks and Recreation
- Department of Planning
- Department of Buildings
- Department of Cultural Affairs
- Mayor’s Office of Long Term Planning and Sustainability

Expected impact: “The central message 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.”

More Info: Broadway: 1000 Steps Official Website

Part Two: Public Art in Other Cities

1. Geneva, Switzerland: The Stairs

What: In 1994, the mayor of Geneva invited artist and filmmaker Peter Greenaway to commission the construction and installation 100 white staircases around the city. At the top of each staircase was a small viewing hole, which pointed the viewer’s sights at one specific place in the city. According to one critic, “These ranged from the grand and obvious—The Music Conservatory, The Russian Orthodox Church, The Peace Statue—to obscure and trivial—the Night Safe on the Quai de L’Ile, the Passenger-Arrivals Exit Geneva Airport, numerous flights of steps—each treated with reverence, each accorded a unique number. The point is made that a city need not (indeed, should not) be seen purely in terms of its historic infrastructure.”

More: Book Review "The Stairs"
2. Chicago, IL: Cows on Parade (CowParade)

What: From July to November 1999, 320 almost-life-sized fiberglass cows were placed around the city of Chicago. Each of these cows was painted and adorned by local artists. The project was so popular that CowParade became its own brand of sorts, stemming projects in more than 50 other cities around the world. Some cities have given their own spin to the CowParade idea, adorning their cities with other creatures (like the Toronto Moose in the City project79). Over 5,000 artists worldwide have participated in Cow Parade events – professional and amateur, famous and emerging, young and old. CowParade claims to be the “biggest and most successful public art event in the world.”

How Much Did it Cost: The cost for CowParade events varies depending on the city, but each cow costs roughly $5000-$10,000 for artist fees, installation, and maintenance. The original Chicago event is estimated to have cost approximately $1 million.

Who Paid For It: The cows are paid for by private sponsors, both large and small companies and individuals. Typically, a company or individual chooses to sponsor one cow.

Estimated Economic Impact: The Cows on Parade exhibit in Chicago was wildly popular. It is estimated that between 1 and 2 million people came to the city just to see the cows, and that this brought between $200 million and $500 million to the city. Other CowParade events have had similar economic benefits.

Charitable Impacts: When the Chicago event was over, the cows were auctioned off to businesses and private art collectors. The auction raised $3.5 million, which was donated to local charities around the city. Other CowParade events have followed suit, and over $20 million have been donated to non-profit organizations around the world.

What City Offices are Involved: The 1999 Chicago event was a collaboration between Chicago businessman Peter Hanig, and with Commissioner of Cultural Affairs Lois Weisberg.

79 http://www.toronto.ca/moose/home_revisit.htm
More Information:
- Official CowParade Website
- Chicago Tribune Article
- CowParadeWiki

Part Three: Drinking Fountains as Public Art Precedent

1. Minneapolis, MN: Artist-Designed Public Drinking Fountains Public Art Project

**What:** In July 2008, Minneapolis leaders announced plans to commission and install 10 artist-designed drinking fountains throughout the city in order to celebrate the 150th anniversary of Minneapolis and the city’s long history and connection to the nearby lakes and rivers.

**Where:** The Minneapolis Arts Commission chose the sites based on several criteria:
- Destinations that celebrate both water and Minneapolis
- On pedestrian corridors or bike trails, near schools, libraries, within plazas, or other public gathering places
- Publicly owned sites that are easily accessible
- Readily accessible to sources of water and to a broad range of people
- Associated with a public or private partner able to provide daily and ongoing maintenance.

**How Much Did it Cost:** The city gave $500,000 for the project—$50,000 per fountain.

**Who Paid for It:** Funding for the sculptures comes from the city’s Art in Public Places Program, a program added to the city’s Capital Improvement Program in 1992.

**What City Offices and Programs Were Involved:**
- Minneapolis Arts Commission, a committee appointed by the mayor and city council, and managed through the Department of Community Planning & Economic Development
- Minneapolis Department of Public Works
- Art in Public Places Program, through the Department of Community Planning & Economic Development.
Where Does the Water Come From: The Department of Public Works considered each fountain’s water source on a case-by-case basis. At some locations, the water comes from and goes to nearby buildings; others are connected to nearby water mains. In all cases, the fountains use municipal water sources.

Other Information:
- Each fountain’s artist partnered with a local business or organization (typically ones close to the fountain’s location). This partner is responsible for the day-to-day and annual maintenance of the fountain.
- Artists, community members or organizations may apply to place artworks on City property, either temporarily or permanently. There is a process for such applications.
- While the fountains are at their core pieces of art, elevating them above a normal drinking fountain, in form and function they are relatively straightforward. The fountains have fairly standard mechanisms for delivering water to the user and draining the water away from the fountain (a standard basin drain).

More Info: [Art in Public Places Website](#)

2. London, England: Tiffany—Across the Water

What: Many of the drinking and sculptural fountains found throughout London’s famous Royal Parks have fallen into disrepair and are in need of refurbishment or replacement. The Royal Parks and The Royal Parks Foundation initiated a restoration program to address the issue, but after much searching, found that no standard-issue water fountains were elegant enough to dot the high-profile parks. To address this deficiency, these organizations partnered with the Royal Institute of British Architects to create a design competition to find “The Ultimate Drinking Fountain.”

Design Criteria:
- Aesthetics
- Robustness for life in a public park
- Ease of maintenance and installation
- Sustainability and environmental impact
- Affordability

Where: This project focuses on the 43 existing drinking fountains within the city’s eight Royal Parks, rather than on the construction of new drinking fountains in new locations.
How Much Did it Cost: $1.25 Million was designated to run the design competition and restore or replace the 43 existing drinking fountains within the Royal Parks, as well as the creation of a stunning new water fountain in St James’s Park and restoration of The Italian Gardens in Kensington Gardens.

Who Paid for It: Celebrating its 10th Anniversary, the Tiffany & Co Foundation provided a $1.25 Million grant to fund the project.

What City Offices and Programs Were Involved:
- The Royal Parks, an executive agency of the Department for Culture, Media and Sport.
- The Royal Parks Foundation, a charity that helps support London’s eight amazing Royal Parks so that everyone can enjoy them now and in the future.
- The Institute of British Architects (RIBA), an independent organization that does not receive any government funding. Many members also hold government positions.

Where Does the Water Come From: The new fountains are replacing existing ones, and will draw on existing infrastructure.

Other Information:
- The point of the design competition was to find a design for a water fountain to be placed throughout all of the Royal Parks. Thus, functionality and reliability are at the core of the entrees, rather than artistic vision alone.
- Two winners were announced and both designs will be used throughout the parks. The project team hopes that these designs can be implemented in other cities’ drinking fountain campaigns around the world.

More Information:
- Royal Parks Foundation Fountain Outreach
- Royal Parks Official Press Release
- RIBA Design Competition
Report 8. Acting with the Heart, Not the Brain

Emotions and Art as an Opportunity to Shape Behavior and Decision Making

Introduction

Since “the environment” came into greater public awareness in the 1970s, activists and educators have attempted to show people that their actions have environmental consequences, and have attempted to change peoples’ behaviors towards “greener” living. However, even after more than 40 years of such campaigning, we find that most people in the United States are living unsustainably, even with an increased awareness of climate change, environmental impacts, or sustainability. Clearly, there is something wrong. The 100 Fountains project seeks to address this discrepancy by engaging the heart, body, and mind through powerful, playful, and functional pieces of art.

The Knowledge-Behavior Gap

- There is a well-researched and documented gap between “knowing” something and acting in accordance with that knowledge.  
- Similarly, there is a well-researched and documented gap between providing more information to a person, and seeing noticeable behavior change. In other words, more information does not mean a change in behavior for people. 
  - For example, in a survey of 500 people, 94% claimed that individuals had a personal responsibility to do such things as pick up litter they found on the ground. However, when faced with a piece of litter planted outside of the interview, only 2% of people picked it up.
  - Another study in the Netherlands showed that when households were presented with information about how to save energy in the home, there was little or no change in energy use in the homes that were educated.
- Because of this, traditional environmental campaigns that focus on distributing knowledge (via factsheets, informational emails, talks, etc) have been largely ineffective.

A Strategy for Effective Culture/Behavior Change

It would seem, then, that the way to bridge the knowledge-behavior gap is to provide people with something other than more information to fuel changes in behavior or decision-making. An emotional connection to an issue—like the natural environment or

83 ibid
even sustainability—could be the key to this complex relationship between knowledge and behavior. When a person actually cares about an issue, he or she is more likely to do something about it—they will literally “act with the heart”—rather than make a choice based on rationality or logic.

**Emotion and Decision-Making**

- Emotions have been well-documented as essential in the decision-making process for individuals, via a “goal-based check-in” feedback loop that is initiated when people feel emotions.
  - i.e.: “This happened to me and I feel this way about it. Is this in line with my goals for success, happiness, etc?”
  - People will change their behaviors such that their goals will be better met, a process they learn through emotional reactions to situations, not through logical processes.
- This process, known as emotional intelligence, is the way people adapt to the ever-changing circumstances of their lives. Even for people who have the most set and solid routines, every day presents different challenges and questions to meet and answer. Emotional Intelligence, the process of using our internal goals as a guide to our emotional reactions, allows us to meet these daily challenges without having to reassess our entire existence with each new question.

**Emotion vs. Logic**

- Humans process information and make decisions in two ways: experiential processing and analytic processing
  - Experiential processing relates current circumstance to previous experience
  - Analytic processing relates current circumstance to numerical and statistical knowledge
- Experiential processing is more important than analytic processing, and is used more (though subconsciously) by humans
- Experience conjures very strong emotions (like fear, joy, awe), which are linked to very old—and very well developed—parts of our brains, unlike analytic processing.
- Emotional appeals, rather than informational ones, are more likely to change people’s behaviors and attitudes about things—like tap water and water fountains.

**Art and Emotion**

The connection between human emotion and the arts seems obvious, but exploring how and why this connection exists is an important step in order to understand how emotion-

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art connections can then move people from knowledge to action. The history of art is an interesting place to start to understand this connection.86

- The idea of “the arts” has been around, some would posit, for the whole of human evolutions—even in proto-humans who came before Homo Sapiens.
- The “behavior of play” and the “behavior of art” are two human behaviors that do not seem to be connected to the survival of the species, yet they have persisted throughout our evolutionary history.
- Through play, animals and humans learn skills that will help them in the future, like socialization and the proper ways in which to interact with other members of the community.
- This argument can be applied to art by acknowledging that play makes things “not what they are”; they become “extra-ordinary.”
- The objects of art are also identified as “special” or “extra-ordinary.”
- The other things deemed “special” in a culture are often emotionally-charged events like weddings, births, and deaths.
- It follows, then, that other things deemed “special” through art will also be highly emotional or likely to cause emotional reactions.

**Conclusions**

Almost all of us have a movie that always makes us cry or a song that always puts us in a good mood. Some of us will look at a painting or listen to an opera and be moved to tears by its immense strength and beauty. There is no question that art is deeply connected to our emotions. And because emotions drive decision-making and behavior to a greater degree than logic, it would follow that art can be an important way to communicate important ideas about an issue—like the environment or sustainability. Art allows individuals and communities to develop an emotional connection to an issue, which will then drive changes in behavior.

Looking at and interacting with a drinking fountain that is both functional and beautiful will do more than quench a thirsty New Yorker’s desire for a sip of water. The fountains created through the 100 Fountains project will have an emotional impact on the viewer or user, which will have a much more powerful impact than a traditional campaign to hand out information about tap water, city beautification, or waste reduction. These fountains will have the power to change the way people actually feel about tap water and drinking fountains as a whole.

Report 9. 100 Fountains Competition - Design Brief and Guidelines

For the purpose of this document, and our proposed competition, we have defined the four terms here:

1. **Applicant**: Anyone who has submitted a design for the 100 Fountains contest

2. **Contestant**: An artist, architect, designer, engineer or some other individual who has submitted a design proposal for a fountain to be apart of the 100 Fountains contest, and has had their design approved for construction.

3. **Winner(s)**: The best design(s) chosen from the 100 Contestants.

4. **Selecting Committee**: The jury who will choose the 100 Contestants from the pool of Applicants.

**On Design Competitions**

According to the American Institute of Architects\(^{87}\), “the well-run design competition requires:

- A conscientious sponsor
- A competent professional adviser
- A thorough and carefully written program
- Complete graphic and other illustrative materials
- Fair and precise rules governing the competition
- Clear submission requirements
- A realistic schedule
- A qualified jury
- Appropriate prizes and/or stipends
- Arrangements for publicizing the winning design”

Without these things, a design competition cannot go smoothly, and in some cases, will fail all together. A failed design competition wastes the time and resources of the sponsor organization (such as the City of New York), and will diminish the reputation of that sponsor. In order to prevent failure, the conscientious sponsor must make sure their competition has adequate time for planning and execution, adequate funds to run the competition and to pay out stipends, and adequate expertise close at hand—both a professional advisor and a well-qualified selecting committee.

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The details of a design competition will vary depending on the size, scope, and desired outcome of the competition. As such, the sponsor organization must make some decisions about what sort of competition style best fits their goals. Choosing a design competition model that does not fit with the goals of the competition is another sure way for the competition to fail and the sponsor to lose time, money, and the confidence of its followers. The table above offers some of the choices that a competition sponsor will have to make.

The many decisions a sponsor must make before starting a competition can be boiled down into some classic models for competition. These models are frequently used and show some of the ways successful competitions can be run. There are several different models to use when running a design competition. The Royal Institute of British Architects discusses four commonly used design competition models:

1. **Competitive Interview**: Used to identify the right designer, at an early stage of project development. Only a broad brief is required, with a commitment to appoint the winner. Designers submit examples of previous work and relevant experience. A shortlist is selected for interview.

2. **Open Ideas**: Used to stimulate ideas and encourage “blue-sky” or “sky-is-the-limit” thinking, without any commitment to proceed beyond the competition stage. Designers prepare design proposals in response to a conceptual brief.

3. **Open Design**: Used to identify a preferred design solution, with a commitment to appoint the winner. Often involves an anonymous first stage followed by clarification interviews. Designers submit design proposals in response to a detailed project brief.

4. **Invited Design**: Used to identify a preferred design solution, with a commitment to appoint the winner. Designers submit examples of previous work and relevant experience. A shortlist is invited to develop design proposals in response to a detailed brief.

These competition models are not mutually exclusive. They can be blended and tweaked to fit the needs of the sponsor organization.
The 100 Fountains Project

100 Fountains is an international competition to create 100 of the world’s most creative outdoor drinking fountains while celebrating New York’s superb drinking water and the cause of healthy water infrastructure.

The top 100 applicants will be selected to have their drinking fountains constructed and installed in NYC for a summer-long exhibition. Once installed, the public will judge these contestants in several categories and choose a winner. A total of $100,000 will be distributed to the top ten fountain designers. One fountain may be considered as a new drinking fountain for wider use in NYC. When the competition is over all fountains will be auctioned to raise funds for global water charities.

A 100 Fountains mobile app will be developed to provide a virtual guide to the exhibition featuring interactive maps, artist bios, local neighborhood attractions, voting platform and other resources.

100 Fountains Competition Timeline

1) Call for Submissions [Sept 2012]
   a) Candidates receive “Competition Handbook” with rules and regulations, safety and technical guidelines, and zoning and site information.
   b) Candidates select sites from within predefined neighborhood zones.
   c) Concept drawings and images (with location specifications) are submitted via online platform.

2) 100 Fountains Selecting Committee [Nov 2013]
   a) Panel of NYC officials and notables select top 100 fountains for installation.
   b) $5000 stipends awarded to these contestants. A waiting list of 20 alternates will also be selected in case of drop-outs.
   c) 100 Contestants announced

3) Design Development [Dec-Feb 2013]
   a) Contestants will develop their designs to “professional specifications” in conjunction with Guidelines and design officials. These specifications will be used for safety review and manufacturing.
   b) Plumbing valve-kits will be specified with allowance for approved adaptations.

4) Fountains Construction & Installation [Mar-May 2013]
   a) Pre-selected NY local manufactures will work with artists and 100 Fountains design officials to construct fountains.
   b) City contractors will install the fountains on approved sites. Required adjustments will be accommodated by artists and manufacturers.

5) 100 Fountains NYC Exhibition [June - Sept 2013]
   a) Drinking water is served up to city residents and visitors New York style!
   b) Mobile App will act as guide to 100 Fountains with maps, links, schedules, local advertisements and other helpful information.
   c) Mobile App will serve as conduit for feedback and voting.

6) Grand Prizes Awarded [Sept 2013]
   a) Winners will be announced in five categories with a runner up in each.

7) Auction of Fountains [Sept 2013]
   a) A public auction will sell each fountain and raise funds for global water charities
   b) Fountains will be removed by the city and given to auction winners
What criteria will the Selection Committee use to choose the Contestants?

The Selection Committee will judge the Applicants’ designs based on:

- Design excellence: The fountains need to be exciting, engaging and aesthetically pleasing.
- Functionality: The goal of 100 Fountains is to get more drinking fountains into the city. The artistry of the fountains cannot overshadow their functional purpose.
- Creativity: While the fountains need to be functional, we do not want to simply add more standard-issue fountains to the city. The fountains will need to take a fresh look and push the boundaries of what a drinking fountain can be. What new ideas can be introduced in terms of ergonomics, water flow, visibility etc?
- Fun: While there are serious reasons for this project to go forward (environmental protection, etc), this is a project that seeks to engage people of all ages and walks of life. The final products should reflect a feeling of inclusion, surprise and delight.
- Safety and health: The drinking fountains are for public use, and will be outdoors in a demanding environment for several months. The designs must be safe for adults, children, and pets to use without getting hurt or sick. Details will be posted in the 100 Fountains Guidelines book.
- Budget adherence: Artists will receive a specified budget that they will need to design within. The designs must show that they will stay within budget, through the bidding process with the chosen local manufacturer.
- Feasibility: While we are looking for fanciful and fun interpretations of drinking fountains, the designs must be able to be translated into real, working fountains in and for the time allotted.
- Maintenance needs: Will the fountain need to be cleaned every day to stay safe to use? Is the fountain likely to break and need repairs during the exhibit? The needs of the piece in this light will be taken into consideration.
- Sustainable Materials: The mission of Pilot Projects is to put forth cutting-edge projects that are creative, catalytic and sustainable. The fountains should be in-line with these sustainability goals in both initial production as well as long term use.

Who will be on the Selection Committee?

The selection committee will consist of NYC department representatives (DEP, DOT, PlaNYC, etc), a selection of notable NYC creatives (artists, designers, architects) and the mayor. Additionally, one or more Pilot Projects representatives as well as key outside consultants will be part of the selection committee. It would be ideal if several prominent artists or designer participated, as this may lend additional legitimacy and appeal to the competition.

What will happen after the Contestants are chosen?

Each of the 100 Contestants chosen from the pool of Applicants will be given a design stipend to pay for the construction of their fountain. Members of the Pilot Projects 100 Fountains management team will match each fountain with a location, and will work with the artist and New York City offices to figure out the logistics of installing the fountain, hooking it up to a water supply, and dealing with drainage. Additionally, the management
team will check in with the artists periodically to make sure they are on track to complete the fountains in time for installation around the city.

**How will the Winner(s) be chosen?**

There are several ways the Winner(s) could be chosen from the pool of 100 Contestants:

- A second review by the Selection Committee: The 100 pieces chosen for the design competition will receive a second, more intensive review on the projects. This review will look at how the actual fountain compares to the original design, how well it stayed on budget, and how functional and well-designed the fountain is.
- A “people’s choice” award that comes from web-based voting. Each fountain can be accompanied by a small plaque that describes the project and gives information on a website and mobile app that would allow people to choose their favorite of the 100 fountains.
- Some combination of the Selection Committee and the popular vote: The vote given by the public can be given some degree of weight, as can the opinions of the Selection Committee (that will be made up of experts in art, architecture, and knowledge of New York City).

**What will the Winner receive?**

The details of this stage of the competition will need to be clarified as a relationship with funders, artists, and the city develop. However, the winners will receive:

- Additional prize money: +/- $100K distributed to winners - amount will depend on funding model.
- Wide-spread recognition: This is an international competition with major publicity and publication opportunity, there is also the possibility for a winning fountain to be chosen to be replicated and installed throughout New York City (similar to the Royal Parks Drinking Fountain Competition in London).
- Notoriety: The opportunity to have a piece of art on display in New York City is exciting, and the bragging rights will be huge—especially if the piece is chosen for wide-spread use throughout the city.

**What will happen to the fountains after the summer exhibit is over?**

After the exhibit is over, many of the fountains will be removed and where possible replaced with a standard drinking fountain. Similar to the CowParade events, the fountains will be auctioned off to both private individuals and companies. The funds raised in this auction will be donated to several international water education and equality projects.

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Report 10. Sample Rules for 100 Fountains Design Competition

The following Sample Rules were modeled on previous design competitions that have been conducted by NYC agencies. These include “urbancanvas” and “urbanSHED” two competitions sponsored by the Department of Buildings for selecting aesthetic building shrouds during construction and for designing pedestrian debris roofs. The Department of Transportation has recently conducted “cityracks” a competition for a new bike rack design as well as “reNEWable Times Square” a temporary design for the Times Square pedestrian plaza. The Office of Emergency Management also conducted major international competition with “What if NYC… Design Competition for Post-Disaster Provisional Housing.” The following competition rules are meant to be illustrative only.

SAMPLE COMPETITION RULES

To compete, all participants must meet the eligibility requirements, complete the online 100 Fountains Design Competition Registration Form and agree to comply with the Official Rules of the competition. All submissions will be reviewed for compliance with competition rules and regulations, and the 100 Fountains selection team will only consider competitors who have completed and signed the registration form, submitted all required and meet all technical requirements of the 100 Fountains Competition Brief. By submitting a proposal, each competitor automatically affirms compliance with the competition requirements, rules and guidelines and agrees that any violation will result in immediate disqualification from the competition.

- The 100 Fountains pre-Jury selection team reserves the right to request additional information from any competitor about images used in a submission at any time.
- The 100 Fountains Design Competition Sponsors and the City of New York are under no obligation to assemble, use or install any Artwork resulting from this competition.
- The 100 Fountains Design Competition Sponsors and the City of New York are under no obligation to declare lists or winners or make any award. The 100 Fountains pre-Jury selection team and the Jury's decision shall be un-appealable.
- This solicitation does not commit the 100 Fountains Design Competition or the City of New York to enter into a contract or award any services related to this document; and any and all costs incurred in submitting any materials in connection with this competition are the sole responsibility of the competitor.
- The [Pilot Projects/The City of New York] cannot control all fabrication and cannot guarantee complete fidelity to the submitted design.
- All submissions will constitute a transfer of the intellectual property to 100 Fountains PILOT PROJECTS AND THE CITY OF NEW YORK RESERVE THE RIGHT TO ISSUE UPDATES DURING THE COMPETITION PROCESS. SUCH UPDATES WILL BE POSTED ON THIS WEBSITE AND THEREFORE MADE AVAILABLE TO ALL PARTICIPANTS EQUALLY. POTENTIAL COMPETITORS ARE ENCOURAGED TO REVISIT WEBSITE PRIOR TO SUBMISSION.
Registration Deadline

The deadline for registration is 5:00pm EST on [XXXX XX 2012]. After this date, the online registration form will no longer be available.

Late Submissions

All submissions must be received at the offices of [Pilot Projects/City of New York]

This is not a postmark deadline. Submissions received after 3:30pm EST on [XXXX XX 2012] will be considered late entries. Late entries will be disqualified from the competition.

Anonymity

The 100 Fountains selection committee will not receive any information concerning the authorship of submissions. CD or DVD submissions and their digital files must have no name or mark that in any way identify the project or competitor other than the registration ID number assigned to the competitor upon completion of registration. No participant may directly or indirectly reveal the identity of any design or communicate with any member of the 100 Fountains selection team or 100 Fountains Jury or the 100 Fountains Sponsors except as provided in this competition document. Any competitor or juror found in violation of this rule will be disqualified immediately. Jurors and selection team members are required to excuse themselves from discussion or voting on a particular entry in the event that they can determine the competitor(s) submitting all or part of any entry.

Awards

No prize substitution is available, except at the sole discretion of the City of New York.

All federal, state and local income taxes on prize and gratuities are solely the responsibility of the winners. Payments to potential winners are subject to the express requirement that they submit to the [Pilot Projects/The City of New York] all documentation requested by [Pilot Projects/The City of New York] in compliance with all applicable state, federal and local tax reporting and withholding guidelines. The winners are responsible for ensuring that (s)he complies with all the applicable tax laws and requirements. If a winner fails to provide such documentation or comply with such laws, the prize may be forfeited and the 100 Fountains selection team may, in its sole discretion, select an alternative winner.

Announcements, Displays, Exhibitions and Publications
Competitors, by virtue of their submissions, agree that the [Pilot Projects/The City of New York] may reproduce, publish, exhibit, perform, transmit or otherwise utilize the physical or electronic materials submitted by competitors for non-commercial purposes at their own discretion and without compensation to the competitor, other than the awards granted to winners. Competitors, by virtue of their submission, also agree that any program created in connection with the competition is the intellectual property of the [Pilot Projects/City of New York].

Registrants and all team members, upon entering the competition, agree to credit the 100 Fountains Design Competition by name in any subsequent exhibition or publication of their submission. [Pilot Projects/The City of New York] reserves the right to utilize a competitor’s submission, for an indefinite period of time for purposes of exhibition and publication or other non-commercial purpose. Reasonable and best efforts will be made to credit the competitor for use of their submission materials for such purposes.

**CONTRACTUAL OBLIGATION**

**STOP. PLEASE READ.**

Competitors are hereby placed on notice that all Competition Winners will be required to enter into an Agreement with the [Pilot Projects/The City of New York] prior to eligibility for an award.

The Agreement will include, but is not limited to, the following provisions:

a. That as a Winner or Honorable Mention you reaffirm your Agreement with all of the terms and conditions set forth in the Competition Materials.

b. That the [Pilot Projects/The City of New York] shall own the copyright and patent, if applicable, of the submitted Design and transfer all intellectual property rights to the design to [Pilot Projects/The City of New York]. This includes any and all materials, 3-dimensional digital models, renderings, documentation, drawings, sketches, plans, mock ups or depictions in any format submitted that make up the Design.

Competitors will receive a sample Agreement at the same time they receive their registration number. Within ten (10) business days of notification that he or she is a potential Winner or Alternate, the Competitor will be required to agree to the terms and conditions as set forth in the sample Agreement. Failure to receive a fully signed Agreement will void the Competitor’s entry in the Competition. Competitors are encouraged to review all of the terms and conditions set forth in the Agreement prior to entering a Submission. Any questions with regard to your legal rights and obligations under the Agreement should be discussed with private counsel prior to entering a Submission. If a potential Winner or Alternate declines to enter into the proposed Agreement with the [Pilot Projects/City of New York], he or she may withdraw from the Competition.
ELIGIBILITY

This is an Open Competition subject to the following restrictions:

- No purchase is necessary to apply for an Award under this Competition. This Competition is void where prohibited by Law.
- Competitors must be 18 years or older.
- Only one Registration Form may be submitted per person for the duration of the Competition.
- Team work is encouraged. A Competitor that wishes to work with a team must list his or her team members in the space provided on the Registration Form. Team members cannot register separately as individual Competitors and will not be recognized as Competitors.
- Awards are non-assignable and non-transferable. Any Awards issued by the Sponsor shall be to a registered Competitor only.
- There is no fee to register. Competitors remain anonymous until the Jury has made its selections.
- Competitors that submit incomplete Registration Forms are not eligible to compete.
- Employees of Pilot Projects and the City of New York and their affiliates, advertising and promotion agencies and anyone involved in the development or execution of this competition, and the immediate families (parents, spouses, siblings, and children and their spouses) and members of the households of such employees are ineligible.
- Additionally, no partner, associate, employer/employee or immediate families of a selection member may participate. No member of the selection committee shall be eligible to compete in the competition, assist a competitor, or act in any other capacity whatsoever to advise or aid a competitor in the development or presentation of his or her submission.
- 100 Fountains shall exclude and declare ineligible any submission which has been received after the time limit; is incomplete in its essential elements; submits in graphic or written material to the selection committee which carries an identifying mark(s) of the authors; or violates any provisions of the competition description, evaluation criteria and conditions.
- By entering this competition, competitors will be declaring that the designs in their submission have been developed solely for the purposes of this competition and represent no infringement of any third party’s existing trademark, copyright, patent or other intellectual property right.

GENERAL CONDITIONS OF PARTICIPATION

1. All Competition Winners and any others selected for recognition will be required to enter into an Agreement with [Pilot Projects/The City of New York] prior to eligibility for an award (see Contractual Obligation section above).
2. All Competitors represent and warrant that any materials he or she submits shall be wholly original material not published elsewhere; shall not violate any copyright, trademark or other applicable law; and shall not, to the best of the Competitor’s
knowledge, constitute a defamation or invasion of the right of privacy or publicity, or an infringement of any kind, of any rights of any third party.

3. The Competitors shall comply with all applicable provisions of federal, state or local laws, rules and regulations throughout the duration of this Competition.

4. Competitors are responsible for all costs of applying to the Competition.

5. Competitors and Award Recipients agree to release the [Pilot Projects/City of New York], the Sponsor, Jury Members and each of their respective affiliates and all of their officers, directors, employees, agents and insurers from and against any liability or damages arising as a result of or otherwise related to their participation in the Competition.

6. The Sponsor may edit any Submissions for grammar and clarity.

7. All Submissions will not be returned and become the property of the Sponsor.

8. Awards are non-assignable and not transferable

9. Under no circumstances may a Competitor contact a Jury Member about a Submission. If a Competitor contacts a Jury Member about his or her own Submission or the Submission of any Competitor, the Competitor will be disqualified.

10. Competitors who fail to observe these conditions shall be declared ineligible and the selection committee shall be so informed by the competition advisor. The decision of the 100 Fountains Design Competition with respect to any such disqualification shall be final and binding on all competitors.

CONTEST SPONSOR RIGHTS AND RESPONSIBILITIES

1. [Pilot Projects/The City of New York] is the sole sponsor of the Competition.

2. [Pilot Projects/The City of New York] and their agents, respective affiliates, subsidiaries, directors, officers, and employees:
   a. Are not responsible for error, omission, interruption, deletion, defect, delay in operations or transmission, theft or destruction or unauthorized access to or alterations of application materials, or for technical, network, telephone equipment, electronic, computer hardware or software malfunctions of any kind or inaccurate transmission of or failure to receive Submission information on account of technical problems or traffic congestion on the Internet, or any website or combination thereof.
   b. Are not responsible for any injury or damage to the Competitor’s or any other person’s computer related to or resulting from downloading any materials related to the Competition.
   c. Are not responsible for late, lost, stolen, illegible, incomplete, mutilated, destroyed, delayed, or postage due mail or misdirected Submissions.
   d. Are not responsible for any oversights, omissions, or errors on their part.
   e. Reserve the right, at their sole discretion, to suspend, modify or cancel the electronic method of access to the application if it becomes technically corrupted.
EXHIBITION AND PUBLICATION

By registering for the Competition, the Competitors grant the Sponsor, the Competition Support and each of their respective agents, affiliates, subsidiaries, directors, officers, and employees, an irrevocable, perpetual, world-wide and fully paid up license to reproduce, publish, exhibit, transmit or otherwise utilize in any format now known or hereafter devised the Competitor’s Submissions and any and all portions thereof. The Sponsor will make every effort to credit the Competitor or winner for use of their Submission for such purposes.

OWNERSHIP, COPYRIGHT AND PATENT

All materials submitted in either Period of the Competition shall become the sole property of the Sponsor. Award Recipients and the City of New York shall co-own the copyright and patent, if applicable, of any and all materials, 3-dimensional digital models, renderings, documentation, drawings, sketches, plans, mock ups or depictions in any format submitted of or as part of the Design as well as the completed Design itself. All physical materials and electronic copies of digital materials, which are furnished by the Award Recipient at no cost to the Sponsor shall become the property of the Sponsor and will not be returned. Each Award Recipient will be required to enter into an Agreement which incorporates these terms and conditions.

CONFIDENTIALITY

Confidentiality of personal information will be maintained by use of reasonable means, subject to the following: By virtue of their Submission, Competitors agree that their names shall be available to the Sponsor to use in any manner in which the Sponsor deems appropriate. In addition, to the extent information submitted in the application is not information that the Sponsor will endeavor to protect from disclosure pursuant to this paragraph, Competitors agree that such information shall be available to the Sponsor to use in any manner in which the Sponsor deems appropriate. Neither Pilot Projects, the City of New York, DEC, nor any affiliated entity assumes or shall be held responsible for any liability whatsoever for any disclosures of any information submitted by any Competitor, whether such disclosure is made inadvertently or otherwise by any Jury Member, staff, consultant, affiliate or other individual connected with, participating in, reviewing, hearing, or receiving information from or in connection with the Competition. Personal information, including but not limited to date of birth, sex, address and phone number may be used to generate statistical information but will not be intentionally disclosed on an individual basis by the Sponsor, nor any Jury Member. The Sponsor will endeavor, in accordance with applicable law, to protect from disclosure any confidential and/or proprietary information that the Competitor and its owners submitted as part of the Registration or Submission process.
The Sponsor may be required, pursuant to the New York State Freedom of Information Law (New York Public Officers Law section 87 et seq.) to disclose to the public a completed Registration Form, Submission or portions thereof. In the event that a request for disclosure is made, the Sponsor will provide notice to the Competitor as far in advance as practicable of any deadline for response to such request and shall consult with the Competitor to evaluate the extent to which such information may be withheld from disclosure under the provisions of the Freedom of Information Law. Consistent with the requirements of that law, the final determination about whether information may be withheld from disclosure shall be made by the Sponsor. In the event that the Sponsor determines that information may not be withheld from disclosure, the Sponsor will attempt to provide the Competitor with timely notice of intent to disclose in order that the Competitor may invoke any rights or remedies to prevent disclosure to which it believes it may be entitled under the law

GOVERNING LAW AND JURISDICTION

All issues and questions concerning the construction, validity, interpretation and enforceability of the Competition Materials, documents, terms and conditions and the rights and obligation of Competitors, and the Sponsor, in connection with the Awards or this Competition shall be governed by and construed in accordance with the laws of the State of New York without giving effect to any choice of law or conflict of law provisions that would cause the application of any other state's laws. Each Competitor irrevocably agrees that the state and federal courts located in New York, New York shall have exclusive jurisdiction over any suit or other proceeding arising out of, relating to or based upon the prizes or these official rules, and each applicant hereby waives any claim as to the convenience of such forum.

TERMINATION AND MODIFICATION

The Sponsor reserves the right to terminate or withdraw this Competition and to change, modify, alter the terms and conditions governing this Competition, as set forth in the Competition Materials, at any time, without prior notice. Pilot Projects, The City of New York, the Sponsor, Jury Members, each of their respective affiliates and all of their officers, directors, employees, agents and insurers are not responsible for any damage, loss, inconvenience or injury suffered by any Competitors due to any termination, withdrawal, changes, substitutions, rescheduling, or for any reason whatsoever.

INTELLECTUAL PROPERTY

Those competitors submitting the winning designs, by virtue of their submissions, hereby agree that the City of New York shall have all rights necessary for the publication and exhibition of entries that are selected as winning designs (in addition to the rights set forth in the next paragraph). To that end, competitors whose submissions are selected as the winning designs hereby grant to the City a worldwide, perpetual, royalty-free, exclusive
license to (1) use, modify, and edit entries (including by changing size, coloration, and adapting the entries to fit particular areas and formats), (2) transmit or display the entries in any medium now known or hereafter devised, including the internet, and (3) sublicense to site owners and sponsors the right to use and reproduce the entries.

Those competitors submitting the finalist designs by virtue of their submissions hereby agree that the City of New York shall have all rights necessary for the publication and exhibition of entries that are selected as winning designs. To that end, competitors whose submissions are selected as the finalist designs hereby grant to the City a worldwide, perpetual, royalty-free, non-exclusive license to (1) use, modify, and edit entries (including by changing size, coloration, and adapting the entries to fit particular areas and formats), (2) transmit or display the entries in any medium now known or hereafter devised, including the internet, and (3) sublicense to site owners and sponsors the right to use and reproduce the entries.

All competitors hereby grant to the [Pilot Projects/The City of New York] a worldwide, royalty-free, non-exclusive license during the [term of the competition/perpetual] to use and/or reproduce the entry in any way, in any medium now known or hereafter devised, for any purpose, including but not limited to inclusion in publications, exhibitions, and an archive of the competition. The City and sponsors will make reasonable efforts to credit entrants at all times.

All competitors, by virtue of their submission, hereby certify that the materials and ideas submitted to the competition are original and have not been previously published. Competitors additionally certify that neither their entry, nor the use thereof, violates, infringes or otherwise conflicts with any copyright, trademark or property right of any third party, and agree to defend, indemnify, and hold the City and sponsors harmless from any third-party infringement claim.

Entrants acknowledge that the 100 Fountains Design Competition partners may exhibit all competition entries in an online gallery and a selection of competition entries may be chosen for physical exhibition and/or public display.

Entrants acknowledge the existence, if any, of their statutory moral rights as those rights are described in 17 U.S.C. § 106A, and knowingly enter the 100 Fountains Design Competition on the following terms: (i) the 100 Fountains Design Competition is intended to permit temporary installation and exhibition of selected designs; (ii) the Entrant expressly and forever waives any and all rights under 17 U.S.C. § 106A, and any rights arising under U.S. federal or state law or under the laws of any other country that conveys rights of the same nature as those conveyed by 17 U.S.C. § 106A, or any other type of moral right or droit moral.
PROPOSED AGREEMENT FOR 100 FOUNTAINS DESIGN COMPETITION WINNERS AND ALTERNATES

This document is an agreement ("Agreement"), effective on signed date this document, between [Pilot Projects/The City of New York] located at {XXXXXX} and _____________ (Contestant) whose mailing address is ________________________________.

100 Fountains Design Competition ("Contest") is a development and design competition that requires the submitter to design and develop a drinking fountain for installation in New York City. The submitted work (Submission) will be evaluated by a group of judges determined by the 100 Fountains Design Competition Committee ("Contest Committee").

In consideration of the promises, and other consideration, the receipt and adequacy of which is hereby acknowledged, the parties agree as follows:

1. Contest Prizes. The estimated value of the prizes is equal to their retail prices. Substitute prizes, of equal or greater value, may be awarded if the selected prize is unavailable. All prizes are not transferable nor redeemable for cash. All taxes on prizes and incidental expenses are the responsibility of the winners. Acceptance of prize constitutes permission (except where prohibited by law) to use the winners' names and hometowns for purposes of advertising, promotion and publicity without additional compensation.

2. Winners. Winners of this Contest will be determined by the 100 Fountains Contest Committee and all decisions are final.

3. Contest Conditions. 100 Fountains Design Competition is not responsible for any lost or delayed submissions, whether electronic or otherwise, nor for any telephone, network, electronic or computer failures of any kind, nor for any submissions that are stolen, incomplete, garbled, or delayed by computer transmissions, misdirected, or damaged. Contestant will follow the guidelines for this Contest as outlined on the 100 Fountains website, http://www.100Fountains.org

4. Contest Withdrawal. In the event that this contest is compromised in any way, electronically or otherwise, that is beyond the control of [Pilot Projects/The City of New York], the organizers reserves the right to withdraw the further transmission of this contest, and award the remaining prizes among entries received prior to the date of the contest being compromised.

5. Eligibility. The Contestant certifies that they qualify for this Contest and that the Contestant meets all eligibility requirements. All federal, state and local laws and regulations apply. Void where prohibited.
6. Ownership and Copyright. The Contestant certifies that the submitted design is solely the efforts of the Contestant and does not include any intellectual property of any other parties, with the exception of any open source code, information, or technique that they have the legal rights to reuse or include in the creation of the Submission.

The Contestant certifies that Contestant is the sole owner of the Submission. The Contestant agrees to that Submission constitutes the transfer of all intellectual property related to the design to [Pilot Projects/The City of New York]. The Contestant grants 100 Fountains the rights to publicize the Contestant’s name and their Submission in reference to the Contest whether they are the winner of the Contest or not. 100 Fountains grants the Contestant the rights to use the 100 Fountains Logo or 100 Fountains name for the sole purpose of the publicizing Contestant’s participation in the Contest.

7. Indemnification. The Contestant shall defend, indemnify and hold harmless [Pilot Projects/The City of New York], including the Contest Subcommittee and its judges, from and against any claims, losses, liabilities, damages and costs, including reasonable legal fees and expenses, based upon the claim that the Contestant’s Submission infringes the intellectual property rights of a third party. The Contestant shall defend and settle at its sole expense all proceedings arising out of the foregoing. 100 Fountains agrees to notify Contestant of any such claim promptly. Failure to so notify Contestant shall not relieve Contestant of its obligations under this Agreement. Contestant agrees to reasonably cooperate with 100 Fountains during any such proceedings. This section shall survive termination of this Agreement.

8. Warranty. The Contestant warrants that the Submission does not contain a deficient design whose function or use may damage the water supply network or human users. In addition, the Contestant warrants that the application does not contain offensive content that may reasonably violate or offend any contestant, 100 Fountains, or third parties.

9. Limitation Of Remedies and Liability. Neither party shall be liable for any lost profits, lost business, lost revenues or any special, incidental, indirect or consequential damages arising out of or in connection with this Agreement.

In no event will 100 Fountains be liable for damages, including lost profits, lost benefits, or other incidental or consequential damages, resulting from the use of, or inability to use, the software and/or hardware delivered by Contestant under this Agreement.

10. Terms. This Agreement is effective from the signed date.

11. Sole Agreement. This Agreement shall supersede all prior agreements and understandings, if any, between the parties respecting the subject matter hereof.
12. Disqualification. If Contestant violates or breaches any part of this agreement, the Contestant will be disqualified from the Contest. The decision to disqualify a Contestant will be solely determined by 100 Fountains and Contestant waives their rights to challenge the disqualification.

13. Governing Law, Severability. This Agreement shall be construed and interpreted in accordance with the laws of the State of New York. If any term or provision of the Agreement shall be held to be invalid, illegal, or unenforceable in any respect under the laws of any state or of the United States of America, such term or provision shall be deemed omitted and the validity, legality and enforceability of the remaining provisions shall not be affected or impaired thereby.

14. Waiver of Breach. No failure on the part of either party hereto to exercise, and no delay in exercising, any right, remedy or power under this Agreement shall operate as a waiver thereof; nor shall any single or partial exercise of any such right, remedy or power preclude any other or further exercise of any other right, remedy or power; and no waiver shall be valid unless it is in writing and signed by the party to be bound thereby.

15. Execution. In Witness Whereof, the Contestant has executed this Agreement, as of the date indicated next to their signatures.

100 Fountains Design Competition Submitter (Contestant)

_________________________
(signature and date)

______________________________
(printed name)

_________________________
(title)

_________________________
(organization)
Report 11. LEGAL ISSUES RELATING TO DRINKING FOUNTAINS

NYC Charter: References to Fountains

Powers of Commissioner to install drinking fountains

Chapter 21 § 533. Powers and duties of the commissioner. The commissioner shall have the power and it shall be his or her duty:

a. Parks…

4. to plant and maintain trees and to construct, erect and establish seats, drinking fountains, statues and works of art in any place within his or her jurisdiction, and to determine when and where lamps or lighting appliances shall be placed and lighted therein and the design thereof;

Requirements for Placement of Public Art

Chapter 37 § 854. Approvals by the Commission.

a. The term “works of art” as used in this chapter shall apply to and include all sculptures, paintings, mural decorations, mosaics, stained glass, statues, carvings or castings in high or low relief, inscriptions, monuments, and fountains installed or erected or to be installed or erected upon or over land belonging to the city whether the works of art be the property of the city itself or of an institution, corporation or private individual, and whether intended for ornament, commemoration or actual use.

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89 The Commissioner referenced is for the Department of Parks and Recreation as specified in Chapter 21 § 531.

“‘There shall be a department of parks and recreation the head of which shall be the commissioner of parks and recreation.’

90 Commission refers to as follows:

Chapter 37 § 851. Constitution and appointment. a. There shall be an art commission the members of which shall be the mayor, who may appoint a person to represent him and replace such representative at his pleasure, the president of the Metropolitan Museum of Art, the president of the New York Public Library (Astor, Lenox and Tilden foundations), the president of the Brooklyn Museum, one painter, one sculptor, one architect, and one landscape architect, all of whom shall be residents of the city, and three other residents of the city no one of whom shall be a painter, sculptor, architect, landscape architect or active member of any other profession in the fine arts.

b. All the members of the commission shall serve without compensation for their service on the commission. Those whose service is not ex officio shall be appointed by the mayor from a list of not less than three times the number to be appointed, such list to be submitted by the Fine Arts Federation of New York. In case the Fine Arts Federation shall fail to present a list of nominees within three months from the time when a vacancy occurs, the mayor shall appoint without such nomination. In case the mayor shall fail to appoint within one year from the time when a vacancy occurs, such vacancy shall be filled by the commission for any balance of the unexpired term.

c. In all matters which come before the commission pertaining to work under the special charge of an agency, the head of such agency may act as a member of the commission. Each president of an institution who is an ex officio member may, by a writing filed with the executive director of the commission, appoint a trustee of the institution of which he is president to serve in his place as member of the commission. Such appointment shall be revocable at any time by such president and shall terminate whenever he ceases to be president.

91 Although no precedent was found that precisely addresses this point, it is likely that “fountains” can be interpreted as including drinking fountains throughout the NYC legal and regulatory environment.
b. The term "structure" as used in this chapter shall apply to and include all buildings, walks, bridges and viaducts and their approaches, exterior walls, arches, docks, piers, gates, fences, steps, curbing, distinctive pavings, benches, lamps, posts, traffic signals, and signage other than signage guiding, directing or otherwise regulating and controlling traffic erected pursuant to chapter seventy-one of the charter.

c. On request or on its own initiative, the art commission may consult with and advise any such agency as to the suitability of preliminary plans for any work of art under consideration for acquisition or the design or location of any work of art or any structure under consideration for installation or erection in, on or over any property of the city.

d. No work of art shall hereafter become the property of the city by gift or otherwise, or be purchased, commissioned, contracted for, accepted, erected or placed in or upon any public building, or allowed to be placed on or extend into or over any public street, avenue, highway, square, park, dock or pier or other public place belonging to the city, unless such work of art or a design of the same, accompanied by a specification and an estimate of the cost thereof, a plan showing its proposed location, and, if the commission deems it necessary or desirable, also a model, and any other pertinent information as may be required by the commission including a plan in such detail as the commission may require for the maintenance or conservation thereof, shall first have been submitted to the commission by the agency having jurisdiction, and such work of art or the design thereof, its location, and the plan for its maintenance or conservation, shall have been approved in writing by the commission. The commission shall have authority to bar final payment for the purchase or erection of any such work of art if the president or executive director of the commission certifies that the work of art has not been completed substantially in accordance with the approval of the commission.

e. No structure, except as provided in subdivision f or h, shall be erected or placed upon land belonging to the city, and no arch, bridge, structure or approach which is the property of any corporation or private individual shall extend over or upon any street, avenue, highway, park or public place belonging to the city, and no new lines, grades or plotting or layout of public ways and grounds shall be accepted or work in pursuance thereof commenced unless the design thereof, accompanied by an estimate of cost and a plan showing the proposed location, shall have been submitted to the commission and the design, and in the case of a building or other structure its location in relation to existing or projected developments in the vicinity, shall have been approved in writing by it. If exterior wall, fences, gates, steps, curbing, distinctive paving, benches, lamps, posts, signage, traffic signals or other structures of the same type and design are considered for installation at various locations, the commission may approve the type and design with specifications as to the types of location for which they would be approved as suitable without passing on each individual installation. In addition, replacements-in-kind need not be approved by the commission. The commission shall have the authority to bar final payment for such structure, or for such lines, grades or plotting or layout of public ways and grounds if the president or executive director of the commission certifies that the work has not been erected or placed substantially in accordance with the approval of the commission.

f. In the case of any building or other structure that is part of a construction or other project, where the total estimated cost of such project shall not exceed one million
dollars, the approval of the commission pursuant to this section shall not be required if
the mayor or the council shall in writing request the commission not to act. Nothing in this
section shall be construed as intended to impair the concurrent power of the
commissioner of parks and recreation to refuse his or her consent to the erection or
acceptance of any public monument or memorial or other work of any sort within any
park, square or other public place under his jurisdiction.

   g. Designs for all works of art or structures intended for temporary use in a fixed
location during a period of more than one year, shall be subject to the same forms of
procedure as those adopted for permanent use; but the approval of such designs shall be
for a period to be determined by the commission, not to exceed three years, after which
the commission shall either extend the period or order the removal of the work of art or
structure.

   h. Notwithstanding any inconsistent provision of this chapter, if an approval of a
structure pursuant to subdivision e of this section primarily concerns a landmark,
landmark site, landmark interior, an existing building within a scenic landmark, or an
action within an historic district, and also requires a report or determination by the
landmarks preservation commission pursuant to chapter three of title twenty-five of the
administrative code of the city of New York, then, in that event, the powers and duties of
the art commission with respect to such structures pursuant to such subdivision e and
subdivisions f and g of this section shall instead be exercised by the landmarks
preservation commission pursuant to its own rules and procedures. If such commission
shall fail to take action upon any matter legally submitted to it within sixty days after such
submission, its action shall be deemed unnecessary. Any action taken by such
commission pursuant to this subdivision shall be filed with the art commission.

Powers and Duties of the Commissioner regarding the provision of water

Chapter 57 § 1403. Powers and duties of the commissioner. Except as otherwise
provided by law, the commissioner shall have charge and control of and be responsible
for all those functions and operations of the city relating to the provision of a pure,
wholesome and adequate supply of water, the disposal of sewage and the prevention of
air, water and noise pollution, and shall be authorized to respond to emergencies caused
by releases or threatened releases of hazardous substances and to collect and manage
information concerning the amount, location and nature of hazardous substances. The
powers and duties of the commissioner shall include, without limitation, the following:

   a. Water resources control.

      (1) The commissioner shall have charge and control of:

      (a) All structures and property connected with the supply and distribution of water for
public use not owned by private corporations, including all fire and drinking hydrants and
all water meters;

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92 Chapter 57 § 1401. Department; commissioner. There shall be a department of environmental protection, the
head of which shall be the commissioner of environmental protection.
(b) Furnishing the water supply and maintaining its quality, and of the investigation for and the construction of all works necessary to deliver the proper and required quality of water with ample reserve for contingencies and future demands; and

(c) Making and enforcing rules and regulations governing and restricting the use and supply of water;

(2) The commissioner shall examine into the sources of water supply of any private companies supplying the city or any portion thereof or its inhabitants with water to see that the same is wholesome and the supply is adequate, to establish such rules and regulations in respect thereof as are reasonable and necessary for the convenience of the public and to exercise superintendence, regulation and control in respect to the supply of water by such water companies;

(3) Except as otherwise provided by law and subject to the provisions of this chapter, the commissioner shall regulate and control emissions into water within and about the city of New York of harmful or objectionable substances, contaminants and pollutants; enforce all laws, rules and regulations with respect to such emissions; make such investigations and studies as may be desirable for the purpose of such enforcement and of controlling and eliminating pollution of such waters, and for such purpose shall have the power to compel the attendance of witnesses and to take their testimony under oath.

NYC Administrative Code: References to Fountains

Title 25
Land Use

§ 25–401 Authorization for the establishment of city business improvement districts. Pursuant to the provisions of section nine hundred eighty of the general municipal law, business improvement districts shall be established and extended as hereinafter provided.

§ 25–404 Powers of the city council. Upon establishment of a district pursuant to the provisions of this chapter, the city council shall have authority to exercise the following powers with respect to such district, subject to the provisions of this chapter: (a) To provide for district improvements located on or within municipally or district owned or leased property which will restore or promote business activity in the district:

(1) construction and installation of landscaping, planting, and park areas;
(2) construction of lighting and heating facilities;
(3) construction of physically aesthetic and decorative safety fixtures, equipment and facilities;
(4) construction of improvements to enhance security of persons and property within the district;
(5) construction of pedestrian overpasses, underpasses and connections between buildings;
(6) closing, opening, widening or narrowing of existing streets;
(7) construction of ramps, sidewalks, plazas, and pedestrian malls;
(8) rehabilitation or removal of existing structures as required;
(9) removal and relocation of utilities and vaults as required;
(10) construction of parking lot and parking garage facilities; and
(11) construction of fixtures, equipment, facilities and appurtenances as may enhance
the movement, convenience and enjoyment of the public and be of economic benefit to
surrounding properties such as: bus stop shelters; benches and street furniture; booths,
kiosks, display cases, and exhibits; signs; receptacles; canopies; pedestrian shelters and
fountains.
(b) To provide for the operation and maintenance of any district improvement;
(c) To provide for additional maintenance or other additional services required for the
enjoyment and protection of the public and the promotion and enhancement of the
district whether or not in conjunction with improvements authorized by this section,
including:
(1) enhanced sanitation services;
(2) services promoting and advertising activities within the district;
(3) marketing education for businesses within the district;
(4) decorations and lighting for seasonal and holiday purposes; and
(5) services to enhance the security of persons and property within the district.

Title 27
Construction and Maintenance

§ 27–292.13 Drinking fountains. (a) Location and number of drinking fountains
shall be provided in accordance with the requirements set forth in table 16–5.
(b) At least one drinking fountain on a story on which drinking fountains are
provided shall be accessible and comply with the requirements set forth in reference
standard RS 4–6.
(c) Where outside drinking fountains are provided, at least one shall be accessible
and comply with the requirements set forth in reference standard RS 4–6.

§ 27–292.18 Signage. (a) Symbols of accessibility shall be provided at the following
locations:
Parking spaces designated as reserved for people having physical disabilities
Passenger loading zones
Public toilet and bathing facilities
Drinking fountains
Public telephones
(b) Information and directional signage shall be provided where deemed necessary.
(c) Symbols and characters shall comply with the applicable requirements set forth in
reference standard RS 4–6.

§ 27–908 Cross-connection of supplies and identification. (a) Cross-connection.
No person shall connect water piping supplied directly from street water mains to other
sources; and no cross-connection shall be made between the potable water distribution
system and any portion of waste or soil systems, or between the potable water
distribution system and fixtures or devices that may contaminate, pollute, or otherwise
render the water nonpotable.
(b) Identification. Water supply systems not approved as potable shall be identified at
each outlet with a warning sign stating that the water is unfit, and its use prohibited, for
drinking purposes. Piping carrying potable water shall be identified and distinguished
from water piping carrying nonpotable water by distinctive painting or markings as prescribed in reference standard RS-16.

(c) Construction. The construction of water supply systems shall be in accordance with the requirements of reference standard RS-16.

Title 28
New York City Construction Codes

410.1 Approval. Drinking fountains shall conform to ASME A112.19.1M, ASME A112.19.2M or ASME A112.19.9M, and water coolers shall conform to ARI 1010. Drinking fountains and water coolers shall conform to NSF 61, Section 9. Drinking fountains required by table 403.1 shall be equipped with both a bubbler faucet for drinking and a separate faucet designed for filling a container at least 10 inches in height.

410.2 Required drinking fountains. Where water is served in restaurants, drinking fountains shall not be required. In other occupancies, where drinking fountains are required, up to 50 percent of required drinking fountains conforming to Section 410.1 may be substituted by dedicated plumbing fixtures with faucets designed for filling a container at least 10 inches in height. Bottled water dispensers shall not be substituted for required drinking fountains.

410.3 Prohibited location. Drinking fountains and plumbing fixtures with faucets permitted to be substituted for required drinking fountains shall not be installed in public restrooms.

423.1 Water connections. Baptisteries, ornamental and lily pools, aquariums, ornamental fountain basins, swimming pools, and similar constructions, where provided with water supplies, shall be protected against backflow in accordance with Section PC 608.

424.1 Approval. Faucets and fixture fittings shall conform to ASME A112.18.1 or CSA B125. Faucets and fixture fittings that supply drinking water for human ingestion shall conform to the requirements of NSF 61, section 9. Flexible water connectors exposed to continuous pressure shall conform to the requirements of Section 605.6.

604.3 Water distribution system design criteria. The water distribution system shall be designed, and pipe sizes shall be selected such that under conditions of peak demand, the capacities at the fixture supply pipe outlets shall not be less than shown in Table 604.3. The minimum flow rate and flow pressure provided to fixtures and appliances not listed in Table 604.3 shall be in accordance with the manufacturer's installation instructions.
Table 604.3 Water Distribution System Design Criteria Required Capacity at Fixture Supply Pipe Outlets

<table>
<thead>
<tr>
<th>Fixture Supply Outlet Serving</th>
<th>Flow Rate(^a) (gpm)</th>
<th>Flow Pressure(^b) (psi)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bathtub</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Bidet</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Combination fixture</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Dishwasher, residential</td>
<td>2.75</td>
<td>8</td>
</tr>
<tr>
<td><strong>Drinking fountain</strong></td>
<td>0.75</td>
<td>8</td>
</tr>
</tbody>
</table>

604.5 **Size of fixture supply.** The minimum size of a fixture supply pipe shall be as shown in Table 604.5. The fixture supply pipe shall not terminate more than 24 inches (610 mm) from the point of connection to the fixture. Each fixture supply shall have a stop valve. A reduced-size flexible water connector installed between the supply pipe and the fixture shall be of an approved type. The connector shall be used singularly. Coupling of two or more connectors shall not be allowed. The supply pipe shall extend to the floor or wall adjacent to the fixture. The minimum size of individual distribution lines utilized in parallel water distribution systems shall be as shown in Table 604.5.

Table 604.5 Minimum Sizes of Fixture Water Supply Pipes

<table>
<thead>
<tr>
<th>Fixture</th>
<th>Minimum Pipe Size (inch)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bathtubs(^a) (60 &quot;x 32&quot; and smaller)</td>
<td>(\frac{1}{2})</td>
</tr>
<tr>
<td>Bathtubs(^a) (larger than 60&quot; x 32&quot;)</td>
<td>(\frac{1}{2})</td>
</tr>
<tr>
<td>Bidet</td>
<td>(\frac{3}{8})</td>
</tr>
<tr>
<td>Combination sink and tray</td>
<td>(\frac{1}{2})</td>
</tr>
<tr>
<td>Dishwasher, domestic(^a)</td>
<td>(\frac{1}{2})</td>
</tr>
<tr>
<td><strong>Drinking fountain</strong></td>
<td>(\frac{3}{8})</td>
</tr>
</tbody>
</table>

608.15.1 **Protection by air gap.** Openings and outlets shall be protected by an air gap between the opening and the fixture flood level rim as specified in Table 608.15.1. Openings and outlets equipped for hose connection shall be protected by means other than an air gap.
Table 608.15.1 Minimum Required Air Gaps

<table>
<thead>
<tr>
<th>Fixture</th>
<th>Minimum Air Gap</th>
<th>Away from a Wall** (Inches)</th>
<th>Close to a Wall (Inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drinking water fountains, single orifice not greater than $\frac{7}{16}$ inch in diameter or multiple orifices with a total area of 0.150 square inch (area of circle $\frac{7}{16}$ inch in diameter)</td>
<td>1 (min air gap)</td>
<td>$1\frac{1}{2}$ (inches from wall)</td>
<td></td>
</tr>
</tbody>
</table>

709.1 **Values for fixtures.** Drainage fixture unit values as given in Table 709.1 designate the relative load weight of different kinds of fixtures that shall be employed in estimating the total load carried by a soil or waste pipe, and shall be used in connection with Tables 710.1(1) and 710.1(2) of sizes for soil, waste and vent pipes for which the permissible load is given in terms of fixture units.

Table 709.1 Drainage Fixture Units for Fixtures and Groups

<table>
<thead>
<tr>
<th>Fixture Type</th>
<th>Drainage Fixture Unit Value as Load Factors</th>
<th>Minimum Size of Trap (inches)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drinking fountain</td>
<td>$\frac{1}{2}$</td>
<td>$1\frac{1}{4}$</td>
</tr>
</tbody>
</table>

1109.5 **Drinking fountains.** On floors where drinking fountains are provided, at least 50 percent, but not less than one fountain, shall be accessible.

NYC Rules: References to Fountains

**Title 15**
Department of Environmental Protection

§20-08 **Water Use Restrictions and Fire Hydrant Use.**
(a) **Water use restrictions.** The use of water is permitted, subject to the following restrictions:

(1) **Prohibition of Use as a Source of Energy.**
The use of the pressure or flow of water as a source of energy is prohibited, except when specifically approved by the Department.

(2) **Restrictions on Use for Coolant Purposes.**
The use of City water for coolant purposes in industrial and commercial equipment is prohibited, except with the use of an approved "water conservation device," in accordance with §20-06.

(3) **Required Recirculation in Fountains, Ornamental Pools, Aquariums and Similar Structures.**
Display fountains, ornamental pools, aquariums, and similar structures using water in excess of the rate of one-half ($\frac{1}{2}$) gpm shall be recirculated.

(4) **Shutoffs Required for Drinking fountains and Recreational Sprinklers.** Drinking fountains shall operate only when activated by a user. Recreational sprinklers shall be
equipped with a timer to stop flow if the sprinkler is not being used or shall not operate when not in use.

(5) **Restrictions on Serving of Water.**

No person or entity shall cause, permit or allow the serving of water from the City water system to any patron of a restaurant, club, or other eating place unless it is specifically requested by such patron.

**Title 24**
Department of Health and Mental Hygiene

§45.11 **Physical facilities.**

(f) Drinking water shall be available near classrooms and playrooms and easily accessible to the children. Except when bubbler **fountains** are used, individual drinking cups shall be provided within reach of the children. If bubbler **fountains** are used, they shall be of the angle jet type with suitable guards and shall have water pressure which is sufficient to raise the water high enough above the spout to avoid contamination.

…. §47.43 **Plumbing; toilets, hand wash, and diaper changing facilities.**

(a) **Plumbing installation.** Plumbing shall be installed only by a licensed plumber and shall be free of cross-connections and other hazards to health. Drinking water from faucets and **fountains** shall be tested for lead content and the permittee shall investigate and take remedial action if lead levels at or above 15 parts per billion (ppb) are detected.

…. §47.61 **Food and food safety.**

(b)

(4) Water shall be made available and shall be easily accessible to children throughout the day, including at all meals. Potable drinking water supplies shall be located in or near classrooms and playrooms. Except when bubbler **fountains** are used, individual disposable drinking cups shall be provided within reach of children. If bubbler **fountains** are used, they shall be of the angle jet type with suitable guards and shall have water pressure sufficient to raise the water high enough above the spout to avoid contamination.

…. §48.19 **Compliance with other laws.**

(e) Camp drinking water facilities shall comply with Article 141 of this Code. Common drinking utensils are prohibited. **Drinking fountains** when provided shall be in accordance with the New York State Uniform Fire Prevention and Building Code.

…. §165.33 **Water Supply and Waste Water Disposal.**

(a) **Water supply.** The water supply serving all plumbing fixtures, including **drinking water fountains**, lavatories and showers shall meet the provisions of §165.43.

…. 
§165.43 Water Supply, Waste Water, and Sewer Connections.

(a) Water supply. (1) The source and quality of the water supplied to the pool and/or spray ground and all plumbing fixtures, including drinking fountains, lavatories and showers, shall be obtained from the municipal water supply or a source of potable water pursuant to §141.01 of this Code.

(2) Cross-connection control. The potable water supply shall be protected against interconnection or cross-connection to any potential source of contamination, including but not limited to backflow and back-siphonage. Water introduced into the pool and/or spray pad, either directly or to the recirculation system, shall be supplied through an air gap of at least 6 inches or two times the pipe diameter, whichever is greater. In pools and/or spray pad where it is not possible to provide an air gap, the pool and/or spray water shall be protected by an approved backflow prevention device.

(3) Drinking water fountains. Drinking fountains shall be of a slanting jet-type with a surrounding guard and nonsubmersible opening. They shall be accessible by patrons at the pool and be supplied with adequate water pressure.

....

§167.31 Facility Use and Maintenance.

(a) All bathing beach facilities shall be properly lighted, ventilated, and maintained and operated in a safe, clean, and sanitary condition at all times. The floors, fixtures, showers, and toilets shall be kept clean, free of dirt and debris, and in good condition. Floors shall be maintained in a slip-resistant condition. A supply of toilet paper shall be provided at each toilet at all times.

(b) Toilet. Toilet and shower facilities shall be provided and maintained at all bathing beaches in accordance with §167.39.

(c) Hosing. A minimum length of 50 feet of hosing shall be provided and available within the bathhouse to flush the entire area. Vacuum breakers shall be attached to all hose bibbs.

(d) Lavatories. All lavatories shall be provided with liquid soap in an acceptable dispenser, paper towels or other individual towels or electrical hand-drying units, and a covered waste receptacle. Common use of bar soap or cloth towels shall not be permitted.

(e) Structural Condition. Walls and floors of the bathing beach facility shall be free from cracks or open joints. The floors must be well drained.

(f) Drinking Water. Water supply serving all plumbing fixtures, including drinking fountains, lavatories and showers, shall use the City water supply or shall meet the applicable drinking water quality standards for all sources of water supply in New York state. All facilities shall be provided with drinking water through a drinking fountain or served by disposable single-service drinking cups.

....

§167.39 Bathhouses.

(a) Materials. Floors of the facility shall be of smooth-finished material with non-slip surfaces, impervious to moisture, cleanable and sloped at least one-fourth inch per foot to drains. Carpeting shall not be permitted in shower and toilet areas or other areas receiving bathers. Junctions between walls and floors shall be coved. Walls and partitions shall be of smooth, impervious materials, free from cracks or open joints. Partitions between dressing cubicles shall maintain at least 10 inches of open space from the floor or shall be placed on continuous raised masonry or concrete bases at least four inches high or on legs with bottom of locker at least 10 inches above the floor.
(b) Toilets, Washbasins and Showers. All bathing beach facilities shall be provided with an adequate number of toilets and handwashing facilities.

(1) A facility shall provide properly lighted, vented and maintained toilets and handwashing sinks and an adequate number of showers or a dressing facility containing toilets and showers.

(2) Separate toilet facilities shall be provided for each sex. All toilet facilities shall be provided with soap, paper towels or electrical hand drying units, and covered waste receptacles. Suitable sanitary napkin receptacles shall be provided in toilet facilities used by females.

(3) Where showers are provided, they shall be supplied with water at a temperature of at least 90 degrees Fahrenheit and no more than 110 degrees Fahrenheit at a rate of at least 1.5 gallons per minute per showerhead. Thermostatic, tempering or mixing valves shall be kept in good operation to prevent scalding of bathers.

(c) Drinking Water Fountains. Where drinking fountains are provided, at least one drinking fountain for each 500 feet distance or for every 1,000 users shall be provided.

(1) Fountains shall be of slanting jet type with surrounding guard and non-submersible opening.

(2) Fountains shall be supplied with a minimum water pressure of 20 lbs per sq. inch.

Title 56
Department of Parks and Recreation

§1-04 Prohibited Uses.

(f) Unhygienic use of fountains, pools, and water. No person shall use, or permit any animal under his or her control to use, any water fountain, drinking fountain, pool, sprinklers, reservoir, lake or any other water contained in the park for the purpose of washing or cleaning himself or herself, his or her clothing or other personal belongings. This subdivision shall not apply to those areas within the parks specifically designated for personal hygiene purposes (i.e., bathroom, shower room, etc.), provided, however, that no person shall wash his or her clothes or personal belongings in such areas.

Federal Law: References to Fountains

Americans with Disability Act
When the cost of alterations necessary to make the path of travel to the altered area fully accessible is disproportionate to the cost of the overall alteration, the path of travel must be made accessible to the extent that it can be made accessible without incurring disproportionate costs.\(^\text{93}\)

In choosing which accessible elements to provide, priority should be given to those elements that will provide the greatest access, in the following order:

(1) an accessible entrance;
(2) an accessible route to the altered area;
(3) at least one accessible restroom for each sex or a single unisex restroom;
(4) accessible telephones;
(5) accessible drinking fountains; and
(6) when possible, additional accessible elements such as parking, storage, and alarms.\(^\text{94}\)

\(^{93}\) C.F.R. § 36.403(g)(1).
\(^{94}\) C.F.R. § 36.403(g)(2).
Claudia Peresman - Communication Steward  Claudia is the Communications Steward for Pilot Projects. Claudia applies her organizational, editorial and managerial skills to the group’s print, web and social media messaging. During her years as a communication and education consultant in publishing and public education, Claudia learned that all successful interactions rely on clear communication. She holds a M.Ed. in Educational Technology from Lesley University in Cambridge, MA. She recently received certification in Permaculture Design.

Scott Francisco - Pilot Projects Founder . Project Director  Scott is a practicing designer, consultant and cultural theorist in New York City. He has written and taught extensively on design, innovation and culture and worked for several large architecture firms in New York City. He holds a Masters of Science in Architecture Studies from M.I.T., a Bachelor of Architecture from the University of Toronto and has taught design and design research at Parsons the New School for Design, the University of Kentucky and MIT.

Project Team


Jeffrey Zarnoch - Creative Director . Project Manager  Jeffrey is a creative designer, innovation consultant and a strong organizational manager. He has an extensive portfolio of interior architectural work and is an adjunct professor at Philadelphia University. His strengths include design thinking, managing difficult problems, and marketing. He holds a Bachelor of Architecture from The University of the Arts in Philadelphia and is a graduate of the DMBA Leading by Design Fellow’s program from California College of the Arts in San Francisco.

Yasmin Fodil - Project Media Advisor  Yasmin Fodil is the founder of BYO consulting, a consultancy focused on solving public problems through digital innovation. She is passionate about using technology to increase collaboration, participation, and accountability, and has worked in strategy with numerous government agencies, including the NYC Department of Education, NASA, and Chicago Public Libraries. Yasmin holds a B.A. in Government - Cornell University and a Masters in Public Policy - Harvard Kennedy School.
Contributors

Bryant Cannon . Legal Research Intern
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Melissa Marsh . Organizational Development Advisor
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Jon Bucholtz . Architecture Intern
Martin Misiak . Education Advisor
PILOT PROJECTS

PILOT PROJECTS is an incubator for ideas that make vibrant and sustainable cities. Pilot Projects Design Collective LLC is a network of designers, strategists and craftspeople who create concrete solutions to challenging problems.

Founded in 2008 by Scott Francisco, the goal of Pilot Projects is to co-create a better world through the things and the way we make them. We focus on how spaces, services, systems and products are used and shared. We believe that design must address both culture and infrastructure to make a lasting impact. We see each of our projects as a catalyst for creating new knowledge and lasting cultural change.

Our 25 contributing members are ambitious and down to earth. We believe most problems in society and organizations can best be solved by involving people more directly, so all of our projects bring people together – physically, not virtually – into more meaningful relationships, first through our process, and ultimately through built solutions.

Our projects cover a wide range of scales, sites, materials and systems: from urban planning, civic interventions and urban agriculture to commercial and residential architecture; from organizational consulting, strategy and programming, to furniture, product design and art installations.

Our services include front-end strategy consulting and proposals, design development and project management. Our involvement begins as early as possible so we can lay the proper groundwork, cultivate relationships and create an environment that supports strong collaboration and results. We work on for profit, not for profit and pro-bono projects and pursue partnerships with like-minded organizations.
PILOT PROJECTS is an incubator for ideas that make vibrant and sustainable cities. We provide a matrix of people, space and material resources for these ideas to germinate and take root. Founded in 2008 by Scott Francisco, PILOT PROJECTS NYC now has over 20 contributing members from a variety of professional backgrounds. From our main studio in Chinatown, we offer a wide array of consulting and design services, and pursue productive partnerships with other not-for-profit organizations.

Current Work

These current endeavors highlight the intersection of culture and infrastructure that defines the PILOT PROJECTS ethos:

**Brooklyn Bridge Forest:**
An innovative solution for replacing the aging wooden planks of the Brooklyn Bridge Promenade boardwalk through a sustainable forestry partnership. New Yorkers will sponsor each of the 10,000 boardwalk planks while funding a permanent forest reserve in South America.

**Power Playground:**
When your hours and days are spent on the road, finding a place to exercise is tough. Power Playground is a human-powered air-compressor that invites travelers to work out and learn about energy while providing free compressed air to those that pull into the rest stop behind them.

**Bike Rescue:**
Every year thousands of bicycles are abandoned on the streets of NYC. Bike Rescue will salvage, restore or recycle these bicycles with a team of trained youth riding custom pedicab vehicles and using GPS web-tracking software.

**NYC Green Hub - Transit Pavilion:**
Imagine that your favorite NYC café was also a bike storage valet, urban garden, solar station and a place to wait for the next bus or train. Locking your bike has never been so secure, convenient, and dignified.

**Chess Mob:**
A project to revitalize the chess culture of Central Park so it can become a valuable 'piece' of the NYC chess scene. Our integrated program, service and space design intervention will attract nearby student populations, chess gurus and the elderly to create a magnetic place for diverse social interaction, competition, learning and mastery.