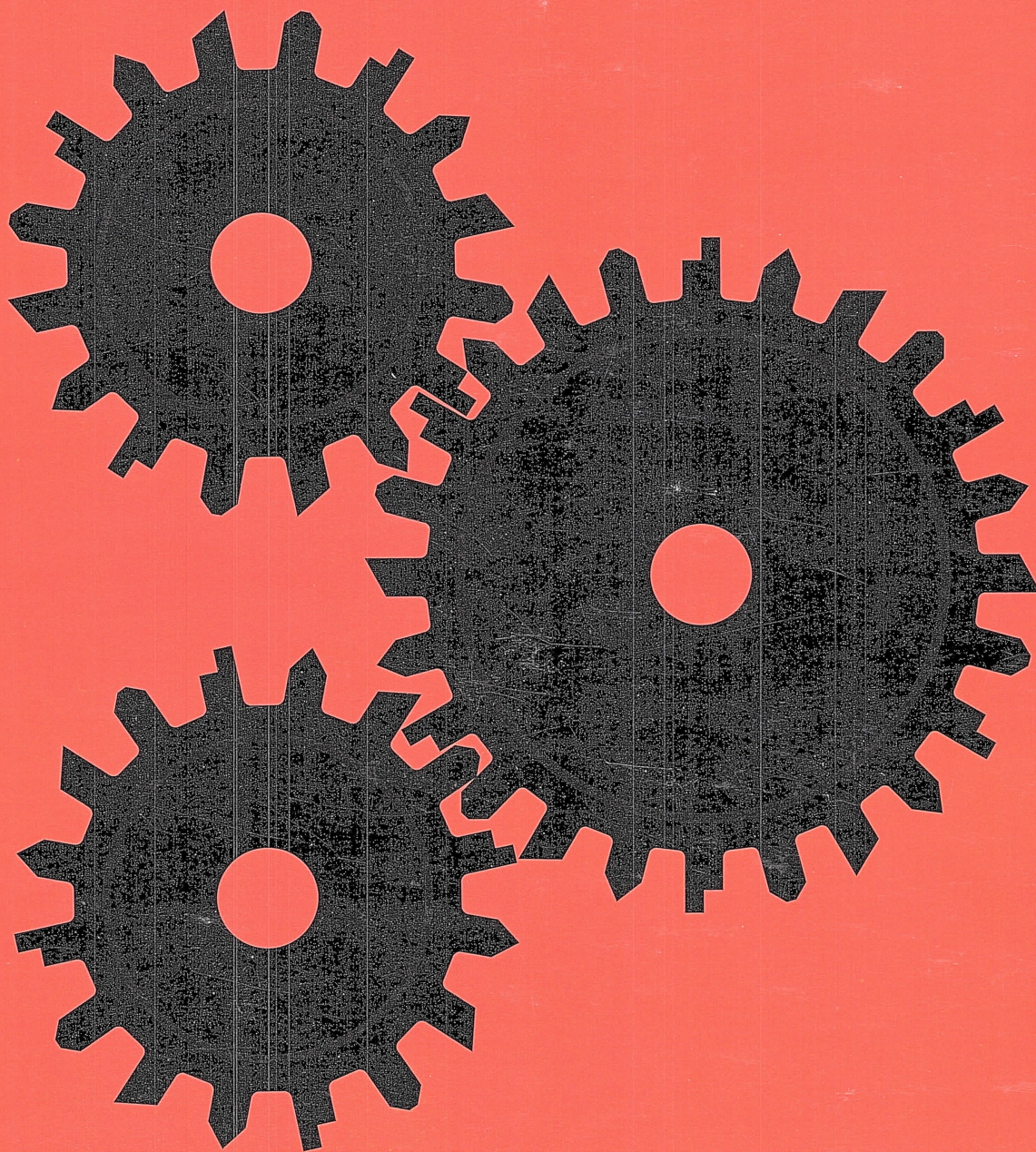


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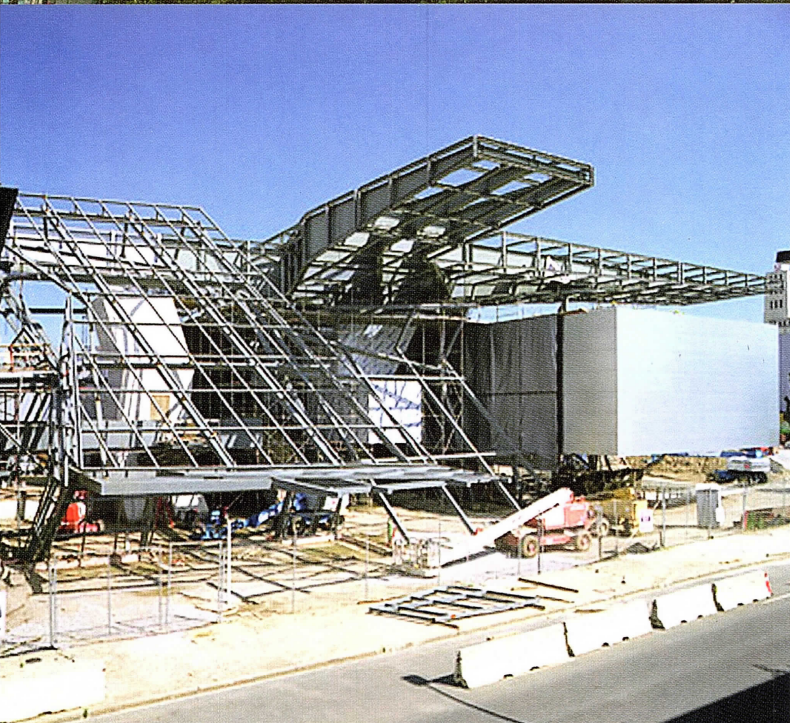




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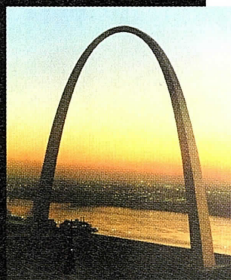
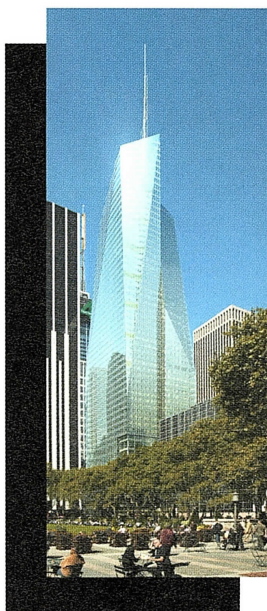
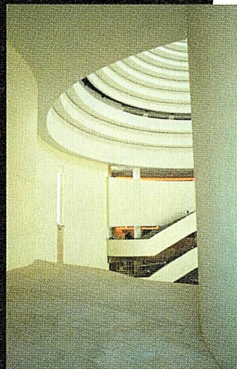


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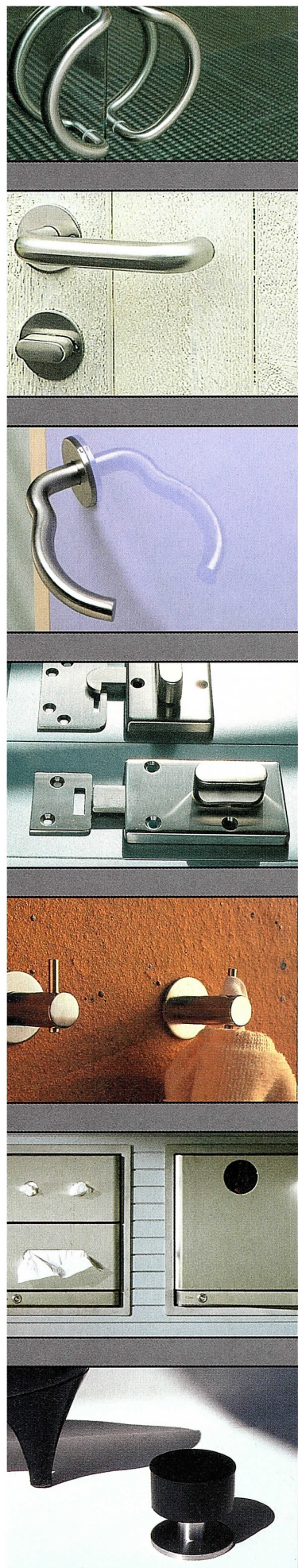
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# Defining a Sustainable Future for New York

First Words  
Letter from Two Presidents

On February 23, 1857, 13 architects met in Richard Upjohn's office in New York to form what would become the American Institute of Architects. The group sought to create an organization that would "promote the scientific and practical perfection of its members" and "elevate the standing of the profession."

In 2007, as we celebrate the AIA's 150th anniversary, it's worth noting that our professional forebears were equally concerned with planning and improving our society as they were with the design of individual structures. Just as they created a legacy of commercial buildings, churches, and residences, many of them, including Upjohn, Leopold Eidlitz, Richard Morris Hunt, and Calvert Vaux, also advanced theories on infrastructure, sanitation, transportation, park planning, and the role of public buildings and spaces within our communities.

In New York City, we are still surrounded by this 19th-century legacy today. Most of our roadways, transit lines, sanitation systems, aqueduct networks, open spaces, and even our power grid had their origins in the 1800s.

As we move into the next 150 years, what kind of legacy are we leaving for future generations? Will it merely be iconic towers rising above the city, or will architects also remain concerned with what is happening on the ground and below the surface?

This issue of *Oculus* explores how our profession is stepping into the future. The long-term consequence of design decisions is our legacy. It is appropriate for us to take a long, hard look at what we will bequeath to our heirs. We hope this issue will help us weigh some of the choices we will be making and envision a course that will provide a positive framework for the future growth of our city and our region.

Mark E. Strauss, FAIA, AICP, and  
Joan Blumenfeld, FAIA, IIDA



ANNIE KURTIN

**Joan and Mark at the Center for Architecture's geothermal well**

This past year has seen the Chapter and the Center for Architecture flourish, and much of the credit for the successes of the past months goes to our 2006 Chapter President, Mark Strauss, FAIA. His theme, "Architecture as Public Policy," has energized our members, and helped engage us with many of the pressing issues important to the community at large. Through his initiatives for New Practices, he has also brought to the fore many of the challenges confronting practitioners starting their own firms. He has been a tireless promoter of architecture in the service of the public good, a subject that is near and dear to my heart. It will remain a focus for the Chapter throughout this year, under our new theme, "Architecture Inside/Out," looking at how the design of our living and working environments affects our daily lives. I hope that over the coming year we will be lucky enough to have Mark, in his role as Immediate Past President, continue his good work on the many programs he initiated last year.

Joan Blumenfeld, FAIA, IIDA

2007 President, AIA New York Chapter

As we move beyond a year focused on "Architecture as Public Policy," I'm proud of our accomplishments, including hosting Mayor Bloomberg at the opening of the "Going Public 2" exhibition in October. I'm also pleased to have had a chance to work closely with our 2007 President, Joan Blumenfeld, FAIA, and turn our focus inward, as we define her theme, "Architecture Inside/Out." The New York Chapter is fortunate to have Joan at our helm. Her astute intelligence, good humor, and innate leadership will serve us well.

Mark E. Strauss, FAIA, AICP

2006 President, AIA New York Chapter



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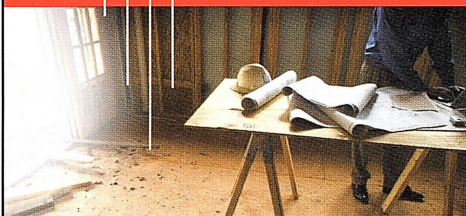
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# The Bones Beneath

A Word from the Editor

It was amusing to see some people's reactions when I told them *Oculus* was devoting an issue to New York City's infrastructure: "You're doing a magazine for engineers?" "Architects do infrastructure?" "That's not very sexy."

Architects do, indeed, "do" infrastructure. And not just on the coat-tails of engineers (though that was the trend for much of the 20th century). One has only to revisit *Oculus* Spring 2003 (the inaugural relaunch issue of the magazine), "History as Prelude: Historic Preservation and Adaptive Reuse," to get an idea of how fast things are moving. A review of the NYC Transit Authority's subway station rehab program highlighted several architect-led projects where sustainable design features were just beginning to take a foothold, and mentioned that for the World Trade Center Transit Hub and Fulton Street Transit Center, "Design teams have not yet been selected."

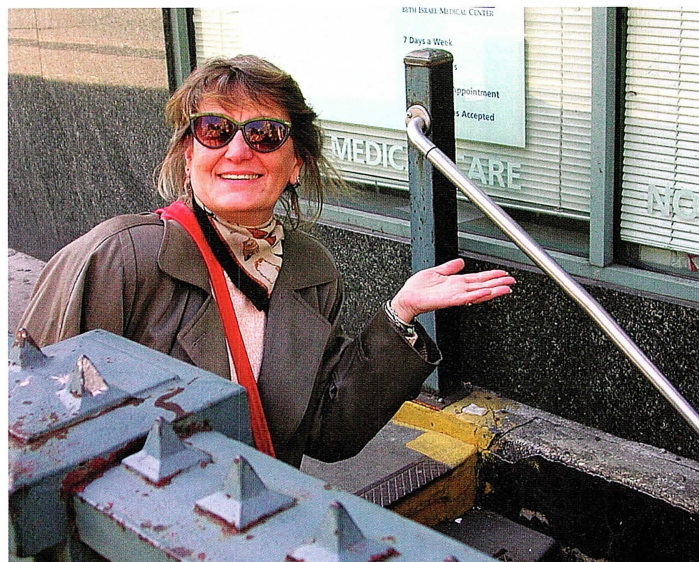
Fast-forward three years – as this issue of *Oculus* was being prepared. In September 2006, the city established an Office of Long Term Planning and Sustainability. In December, Mayor Bloomberg presented "PlaNYC" ([www.nyc.gov/html/planyc2030](http://www.nyc.gov/html/planyc2030)), with incredibly ambitious goals for making New York a sustainable city by 2030. The heart of the plan: "Achieving sustainability for our growing city means protecting its foundation – our infrastructure."

We've come a long way, as you'll see in the pages that follow. Find out how design can be used to turn typically NIMBY (Not In My Back Yard) projects into APPLes (Appropriate Projects Promoting Local Empowerment). Explore how green design is making urban infrastructure work better, in a more neighborhood-friendly way. There are new transportation strategies, including the Second Avenue Subway, which is (finally) getting on track. We also have profiles of projects that are going over, under, and into some challenging new and obsolete infrastructure. And waste management is not the dirty word it used to be. Lastly, will our infrastructure, both natural and manmade, ultimately limit the city's growth?

Regular departments carry on the theme. In "So Says..." urban planner Alex Garvin, Hon. AIA, targets infrastructure as a driver of urban development. Christopher Hume of the *Toronto Star* posits that real urban transformation is being brought about by remaking postindustrial infrastructure. "In Print+" goes underground with books that look at the complex urban fabric beneath our streets.

A new department for 2007 is "AIA150," in honor of the American Institute of Architects' sesquicentennial. The first installment introduces AIANY's own Blueprint Initiatives, the New Housing New York (NHNY) Legacy Project, and the Public Information Exchange, fittingly penned by Mark Ginsberg, FAIA, the New York Chapter's AIA150 Champion.

Special thanks to Jim Wright, AIA, co-chair of AIANY Transportation & Infrastructure Committee, for his invaluable knowledge and guidance in pulling this issue together, and for his thoughtful introduction to our feature articles.



ELLIOTT KAUFMAN

## Editor investigates infrastructure

Though infrastructure may not seem to be a "sexy" subject, while digging through (no pun intended) miles of statistics in preparing this issue, I found mounds of numbers to actually be quite fascinating. They give an indication of the powerful bones upon which this city is built. Among them:

### Transportation:

- 206,000 acres of land area
- 11,605 acres (5.6%) for transportation and utilities
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- 90,000 miles of electric cables; 32 million miles of telephone, television, and high-speed cable lines
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- The average New Yorker consumes half as much energy as the average American.
- New York City uses slightly less energy than Austria, and a bit more than Portugal or Chile.

Kristen Richards

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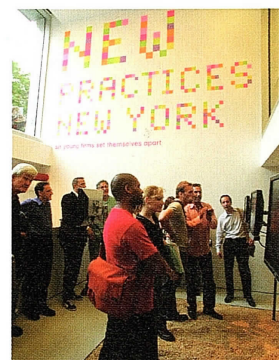
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Heritage Ball 2006: More than 1,300 people celebrated on a spring-like evening in October at Chelsea Piers



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"New Practices New York: Six Young Firms Set Themselves Apart": The juried video exhibition, designed by Christoff:Finio architecture, had crowds coming to preview the future of the architecture profession in the city; portfolios of the nearly 50 submissions were also on view



KRISTEN RICHARDS

In November, the Center for Architecture presented "Infrastructure is Public Space" that explored how the two are knit together to relate neighborhood and city; (l-r) Linda Pollak, AIA, Marpillero Pollak Architects and Neil Gagliardi, Senior Urban Designer DCP Queens Office, presented the Queens Plaza Bike and Pedestrian Improvement Project; Guido Hartray, Rogers Marvel Architects and Fulbright Scholar Barcelona gave a thumbnail of Barcelona's history of transformation; and Project Coordinator Menaka Mohan outlined the recently funded Sustainable South Bronx/South Bronx Greenway project





**"Going Public 2,"** designed by Truck Product Architecture, includes a rotating drum; the interior highlights projects from the city's Design and Construction Excellence initiative



Mark Strauss, FAIA, AICP, offers Mayor Michael Bloomberg an Architecture as Public Policy cap at the October opening of the exhibition, "Going Public 2: City Snapshot(s) and Case Studies of the Mayor's Design and Construction Excellence Initiative"



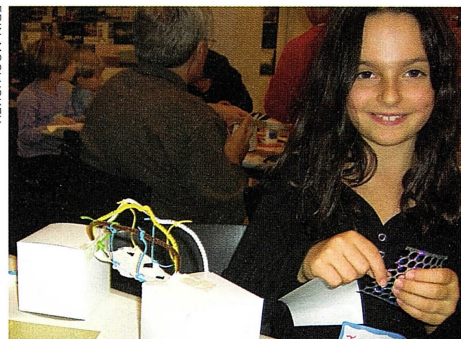
At the AIANY Chapter Inaugural in December, instead of passing the gavel, 2006 President Mark Strauss, FAIA, AICP, passed an inside-out cap to 2007 President Joan Blumenfeld, FAIA, IIDA, in honor of the Chapter's '07 theme, Architecture Inside/Out



Students enrolled in a special Saturday program at the Frederick Douglass Academy in Harlem came to the Center for Structure and Strength, a collaborative school program with the Skyscraper Museum; the workshop focused on engineering and tall building construction

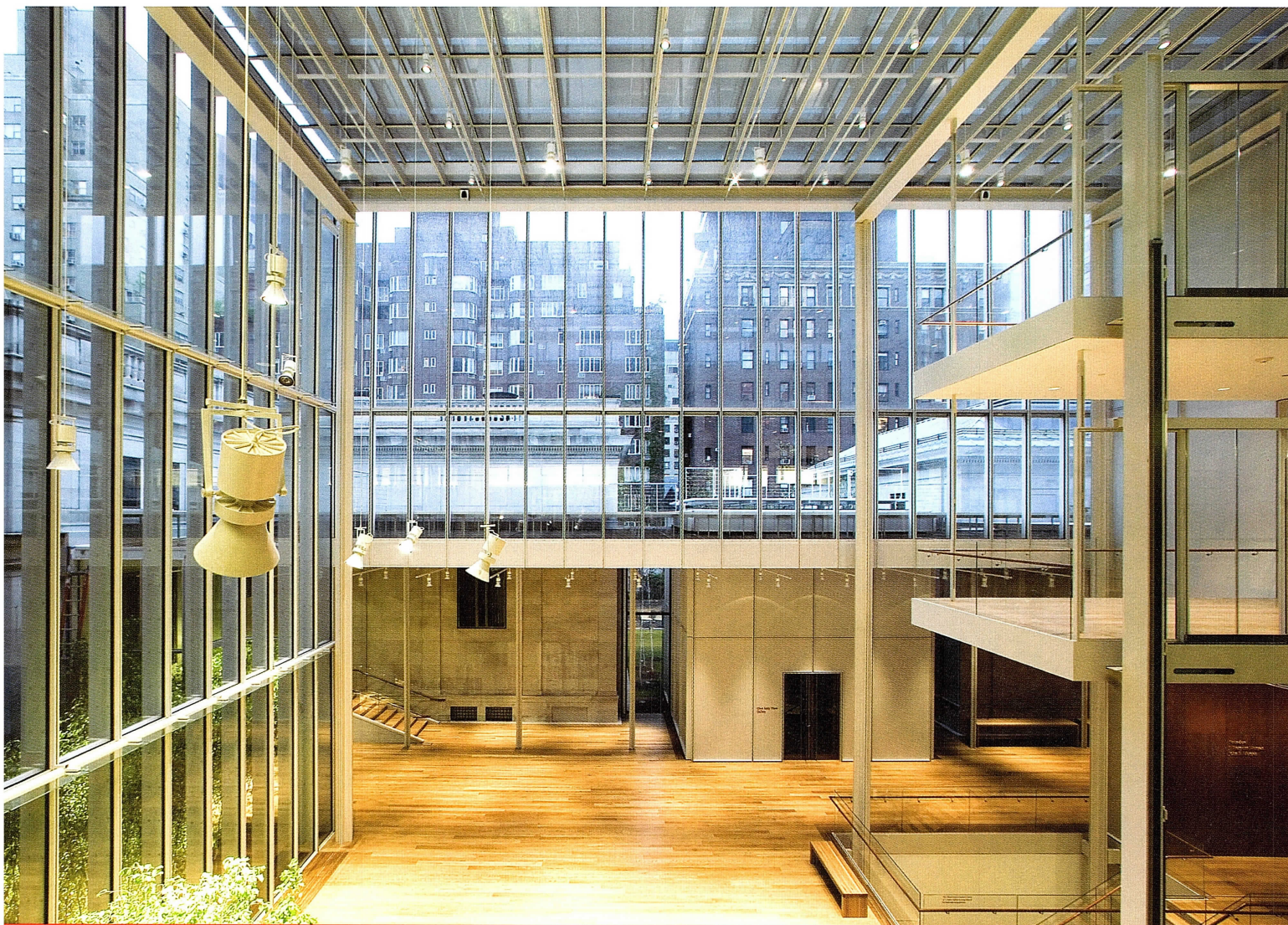


**"Project Showcase: The New York Times Building"** offered an in-depth look at the 52-story tower designed by Renzo Piano Building Workshop (RPBW) and FXFowle Architects; the exhibition (designed by RPBW) included models, technical drawing, and materials



After a tour of the "Going Public 2" exhibition led by David Resnick from DDC and Jeff Miles from Kiss + Cathcart, Family Day kids came up with their own brilliant designs for train stations, bridges, opera houses, power stations, museums, public bathrooms, hospitals, and parks





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**The Pierpont Morgan Library  
& Museum**

Renzo Piano Building Workshop  
Beyer Blinder Belle

Photo Credit © Michel Denancé



Here in New York and across the nation, we have started commemorating the 1857 founding, in Lower Manhattan, of the American Institute of Architects. The sesquicentennial celebration – known as AIA150 – will continue throughout 2007. We are celebrating 150 years of the Institute advancing the profession and improving the built environment. The most significant aspect of our plans both nationally and locally is for the anniversary to create opportunities for architects to “give back” to our communities. AIA150 will create lasting improvements to our society, not just for the architectural profession. A program of “Blueprint Initiatives” – projects to bring about change – has been set up by AIA National. Local components are busy developing their ideas. Information about various sesquicentennial activities and a history of the Institute and Blueprint initiatives can be found at [www.aia150.org](http://www.aia150.org).

The AIA New York Chapter has developed two exciting Blueprint Initiatives. The New Housing New York (NHNY) Legacy Project will create a model for high-quality sustainable design of affordable housing in the South Bronx. Funded in part by AIA National, along with the Enterprise Foundation, The National Endowment for the Arts, and the New York State Energy Research and Development

DATTNER ARCHITECTS/GRIMSHAW



**New Housing New York winner: “Via Verde” Phipps Rose Dattner Grimshaw; Developers: The Phipps Houses Group and The Jonathan Rose Companies; Architects: Dattner Architects and Grimshaw**

BEHNISCH ARCHITEKTEN/STUDIO MDA



**NHNY runner up team: seg Full Spectrum Hamlin Behnisch studioMDA; Developers: seg, Full Spectrum, and Hamlin Ventures; Architects: Behnisch Architekten and studioMDA**

Authority (NYSERDA), this endeavor was undertaken in close collaboration with the NYC Department of Housing Preservation and Development (HPD). It has created a new procurement process for HPD, one that places value on design and construction excellence. NHNY is already influencing how the department conducts its business and will serve as a model for procurement of design and construction services in other communities as well. The juried design competition's five finalists, consisting of architect/developer teams, were:

#### Winner:

**Phipps Rose Dattner Grimshaw**

Developers: The Phipps Houses Group and The Jonathan Rose Companies

Architects: Dattner Architects and Grimshaw

#### Runner-up

**seg Full Spectrum Hamlin Behnisch studioMDA**

Developers: seg, Full Spectrum, and Hamlin Ventures

Architects: Behnisch Architekten and studioMDA



BRP Bluestone Rogers Marvel

Developers: BRP Development Corporation and The Bluestone Organization  
Architect: Rogers Marvel

The Legacy Collaborative

Developers: The Dermot Company, Nos Quedamos and Melrose Associates  
Architects: Magnusson Architecture and Planning and Kiss + Cathcart

WHEDCo Durst Cook+Fox

Developers: Women's Housing and Economic Development Corporation (WHEDCo) and Durst Sunset LLC  
Architect: Cook+Fox Architects, LLP

Visit [www.aiany.org/NHNY](http://www.aiany.org/NHNY) for more information.

The second AIA New York Chapter Blueprint Initiative is the "Public Information Exchange," or PIE. To be located at the AIA's Center for Architecture, PIE will consist of a permanent interactive multimedia installation covering major citywide planning and design projects and issues. Also accessible through the Internet, PIE will include information on regulatory agency hearings and testimony, as well as basic project details. Visitors will be able to offer feedback on the projects described. The Public Information Exchange will create a central nexus of information leading to the exchange of ideas among a wide audience of individuals, institutions, schools, agencies, and professional groups. It will enhance the Chapter's outreach to civic and community organizations and neighborhood residents. Funding

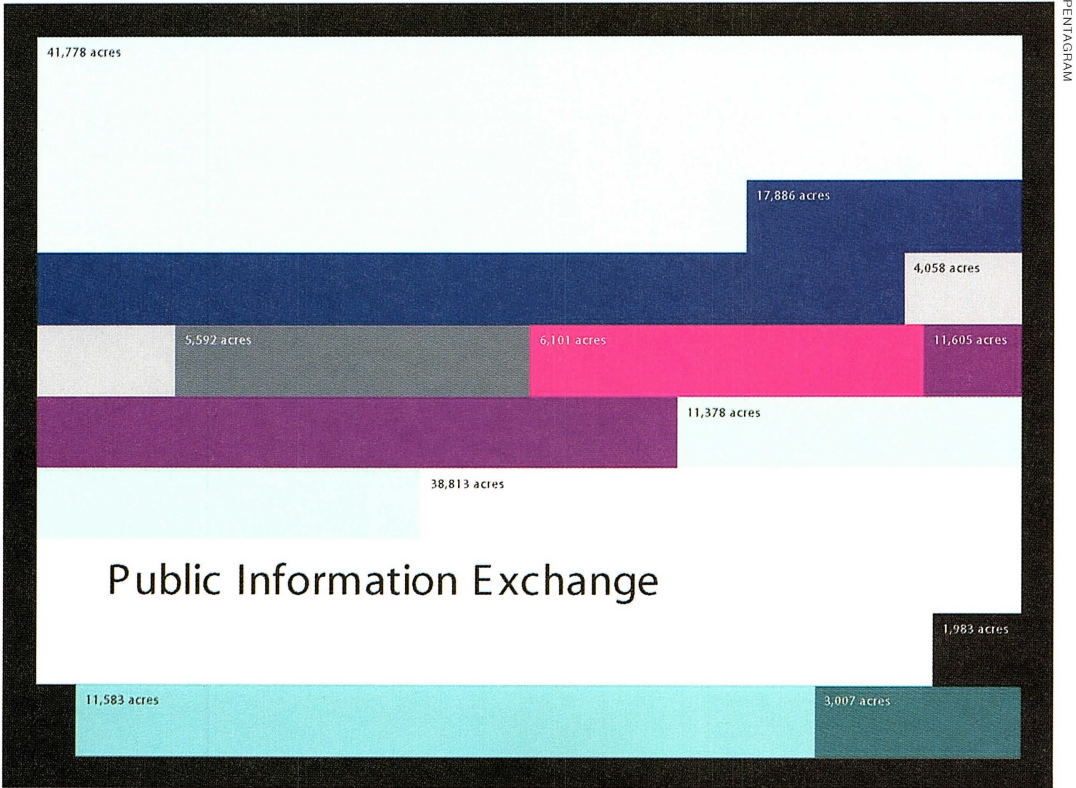
has come from the New York City Council, the National Endowment for the Arts, and the Carnegie Foundation.

Many other AIA150 events are being planned that will bear the AIA150 logo. In April, AIA members across the country will celebrate the sesquicentennial during National Architecture Week (patterned in part after AIANY's weeklong celebration these last three years). A timeline exhibition at the Center, depicting the development of the City of New York, the architectural profession, and the AIA, will educate us about our history and enhance our understanding of where we have come from as we move into the future. The Council of Architectural Component Executives (AIA staff organization) will meet here in August. And October 4-6 the AIA New York State Convention is coming to Manhattan for the first time in memory, with the theme "Past as Prologue."

In planning for the future, we should remember that the AIA has not always been such an open and progressive organization. Many of us who are now active members could not have joined 75 years ago. Women, members of minority groups, and Jews were excluded. Before we boast too much about our current openness, we should look around at an AIA meeting and then compare the demographics of a subway car. AIA gatherings do not fully represent the great diversity of our city. While current efforts to increase diversity are notable, as we move into the next 150 years, the challenge remains to find ways to significantly expand diversity of the Chapter and the profession.

With AIA150 as an impetus, there is much reason to celebrate what we have done and what we in New York are doing to improve our city and profession for the future.

Mark Ginsberg, FAIA, is a partner at Curtis + Ginsberg Architects LLP and is currently the New York Chapter's AIA150 Champion. He has been involved in the AIA at all levels, most notably as 2004 President of the New York Chapter.



Home page for New York City land use data



# So Says...Alexander

Alexander Garvin, founder and principal of Alex Garvin & Associates, Public Realm Strategists, is one of the city's key urban planning and development practitioners. He has taught planning at Yale for almost 40 years, worked in various public-sector positions such as Deputy Commissioner of Housing, a New York City planning commissioner, and vice president of design for LMDC – and headed up civic endeavors such as the NYC 2012 Olympics bid. Garvin sat down with Ernie Hutton, Assoc. AIA, to discuss the importance of infrastructure and the public realm to urban development.

ALEX GARVIN & ASSOCIATES



**Ernie Hutton:** Infrastructure in the largest sense is a generator of urban development – not only transportation and utilities but also parks and street design. You've honed this interest in the public realm, and you're pursuing it as a consultant.

**AG:** Yes. I don't separate this from the rest of planning. Planning is not only about telling people what to do with their private property, it's also about what the public does with the public's property. That balance is something I feel very strongly about restoring.

**EH** In your book, *Parks, Recreation & Open Space: A 21st-Century Agenda*, you define public realm opportunities as a framework for future growth of the city. How do you see these opportunities emerging now in New York City?

**AG** I don't think they're just emerging now. They've been present from the beginning. We as a city have more than 19% of our land surface devoted to parks – a very large number for an American city. We have been doing this since Central Park. So I see this really as part of the continuum. The difference is that then, they were laying these things out in land that was largely undeveloped and today, we have to come back and retake the public realm from other uses that occupy the land.

**EH** There are a number of initiatives and discussions about how to take back that public realm. Cities like London have looked at how to restrict the car by pricing mechanisms, and other places have used legislation and police power. How do you get the correct balance?

**AG** In October I was in Copenhagen, and I was overwhelmed. They have more than 300 kilometers of protected bike lanes – a major investment, in a relatively small city. They started doing this in the 1930s, and now you can get anywhere in the city on bicycle paths. Over a third of the morning rush hour is bicycle traffic. It's not just a matter of regulation or taxation – it's government investment in places for pedestrians and bicycles, not just for motor vehicles. We have to change the balance.

**EH** You're also looking at transit linkages as backbones of future development.

**AG** Cities all over the country are investing in bus rapid transit or light rail. Denver is spending \$4.6 billion on a new system. We could be doing similar things. The key is having the user population needed to support that transit line – but I would go further. My definition of planning in America is public action that generates a widespread and sustained private market reaction. Often there already is an adequate population to support mass transit – where, if you put it in, you can generate tremendous amounts of additional new housing, which will generate the taxes to pay for it.

For example, the old Third Avenue El corridor in the Bronx is an opportunity to serve vacant or largely underutilized sites for tens of thousands of new housing units. Another such area is in Astoria between the elevated subway line and the East River. If you put in a new rapid transit system, you open up a whole new area for people to live.

When I was at NYC 2012, we were rezoning for the Far West Side as well as extending the No. 7 subway line. I don't believe in rezoning without investment in the public realm.

**EH** This is often an issue. It'll be interesting to see how the Greenpoint-Williamsburg waterfront redevelops, because it was rezoned without transit linkage, which will require more parking and reliance on the auto.

**AG** I would certainly favor extending the line I just described in Queens across a bridge to Brooklyn, which would allow a transit line past Greenpoint and Williamsburg down the waterfront to Red Hook. We have to start thinking in those terms.



# Garvin, Hon. AIA

**EH** It's an act of civic will to make these things happen – and you stress the need for the public sector to take the lead. But sometimes that energy ends with one administration and doesn't get picked up by the next. How do you create a sustainable civic will to make things happen over a longer period of time?

**AG** The first thing you need is a compelling idea. If people are committed to that idea, things will happen. As Daniel Burnham said, "Make no little plans."

**EH** That's interesting, because you've been involved in a lot of big plans that, for whatever reasons, have not happened.

**AG** However, many things that went into the 2012 Olympics plan are actually happening. They may be different from what was initially conceived or taken over by somebody else along the way. But they have happened because they were ideas – and not in all cases were they new ideas.

**EH** Following up on the notion of the civic will, what can the professional community – architects, planners, landscape architects – do to help?

**AG** New York New Visions provides a good model, because it put forth ideas and was able to influence what was done. If NYNV had not been there pushing, LMDC would never have done some of the things that became possible. We used to have a very active civic community in New York. Today, who remembers the City Club or the Citizens Union or the Municipal Research Bureau? I remember Roger Starr, then executive director of the Citizens Housing & Planning Council, haranguing at public hearings. He was very good at this. I sat on the planning commission for 10 years and would have loved to have heard some point of view other than a local community. I would argue very strongly that it's important for the professional community to establish such civic institutions, and they have got to take a strong position.

**EH** In your consulting practice, you've worked in a number of different situations. What sort of lessons do you see outside New York that can be applied here?

**AG** There is a mood when you go to Nebraska or Georgia or Tennessee that things are possible. There's a sense in New York of being tired, of "Oh, this is going to be difficult." Well, it's difficult in Tennessee, too. People have to say we're committed to do this and make some of these things happen. We have a remarkable deputy mayor in Dan Doctoroff. There are things going on because he is insisting on it.

I think we can learn by looking back to the New York of a hundred years ago. To put it in architectural terms, in those days nobody said: "What do you mean build a building that's taller than anything else around it?" We have become timid.

**EH** Speak a little bit about the concept – controversial still – of using private development to make public parkland and public realm spaces sustainable, such as Brooklyn Bridge Park with housing development linked to the park's economic maintenance.

**AG** We don't do one thing other cities do, and that is tax increment financing. A locality says, all right, if we put in a park or bridge or some addition to the public realm, it's going to generate development around it. Therefore, for a period of 25 years or so, any tax increase will go to this project and other improvements in the area. In Atlanta, the Beltline Emerald Necklace will generate a tax increment bond yield of between \$1.5 and \$2 billion to pay for the project. We could be doing things like that. Fifteen years after Central Park was created, the value of real estate taxes around the park had multiplied nine times. We could have more than paid for the park on one year's increase in taxes. We have to start thinking in broader terms. We used to in New York.

**EH** So the public realm can pay for itself in terms of the value added to the surrounding development. And our charge?

**AG** Is how to capture that value. But it only works where you have a functioning market. Where we have persons of low income, there may be subsidy requirements. We are fortunate in New York to have large areas where this will work very easily. But we shouldn't forget that there are sections that couldn't generate that kind of money, no matter what the investment.

**EH** That is another issue with which we have to deal: to equitably distribute the value we capture from our public investments.

**AG** Exactly. In fact, we have a case in New York where we've done this, and that's Battery Park City, which throws off money to provide affordable housing for other citizens. There are a lot of things we have not been doing for a long time, and what's interesting is that the Bloomberg administration is beginning to do things that used to be done regularly years ago.

**Ernie Hutton, Assoc. AIA**, is a planner/urban designer and principal of Hutton Associates Inc. His work focuses on downtown, cultural, and preservation planning, with a special emphasis on outreach and participation. He is co-chair of New York New Visions and of the AIANY Planning & Urban Design committee.





The window on the left  
was built in the 1930s.  
The one on the right, last week.

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# The Vision Thing

Just within the past few months the broadly supported redevelopment of the Farley Post Office, centered on a newly created Moynihan Station within the historic McKim, Mead & White building, has seemingly slipped from the grasp of state approval to become a secondary element in a much more ambitious remaking of the surrounding Penn Station district. This despite a bold – many would say visionary – design, a confluence of benefits to the agencies involved, federal funding commitments, and an enthusiastic reception by the ever-vigilant preservation community.

Over a much shorter period the unlikely rebirth of the High Line has become a reality, both as inspiration for a major rezoning of West Chelsea by the City and what looks to be a stunning new urban park. Building on the gallery-centered revitalization of the area, the High Line's promise has already stimulated major residential development between 14th Street and the Western Rail Yards at 30th Street.

I found myself thinking about these two projects after Mayor Bloomberg's December 12 speech kicking off a period of public feedback on the development of a long-range land use plan for the city. There are surely many issues to debate in the twisting fates of these worthy projects, but an aspect that seems particularly relevant is the linkage to larger land use issues. Simply put, Moynihan Station was conceived by New York State as an economic redevelopment project, and the High Line was conceived as a community development project.

This is ironic in the case of the Moynihan Station, since it is located within one of the prime commercial corridors created by the City's Far West Side plan (now Hudson Yards District), but the project was not presented as critical to the success of the plan. Even though this direction may be changing with discussions of a more ambitious "Plan B," it stands as a cautionary tale of the risks inherent in treating ambitious infrastructure projects as isolated from larger land use initiatives.

Another worthy idea that is currently being debated in the public sphere is how to deal with traffic congestion and its effects on the economy and quality of life. Through efforts by the Partnership for New York City, the Citywide Coalition for Traffic Relief, and others there seems to be a real paradigm shift from thinking that "you can build your way out of congestion" to "let's relieve traffic congestion by reducing traffic." Despite the examples of recent successes in harnessing traffic in London (congestion pricing) and in Bogotá (the extensive TransMilenio bus rapid transit system), as well as public realization that something must be done, these efforts seem destined to vanish into oblivion in the black hole of endless studies and conferences, unless they are tied to a strong vision of how we want to conduct our lives in the city.

This is where the Mayor's (or more aptly Deputy Mayor Dan Doctoroff's) long-range plan comes into the picture. The public discussion started by challenging New Yorkers to imagine what we want the city to be in 25 years. Bolstered by predictions that the population will grow by as much as a million residents in that period, this is indeed a heady challenge. The discussion rightly centers on providing an adequate housing supply but quickly moves to environmental stewardship and the quality of life of those residents. This quality of life is largely dependent on a renewed infrastructure that is both purposeful and inspired, but great ideas without a larger plan or compelling public vision are often relegated to compete in the archive of great unbuilt projects.

Several generations ago forward-thinking planners proposed the Lower Manhattan Expressway to help improve regional access and relieve traffic elsewhere in the city, an idea that was killed by a radically new vision of community planning. Funding was shifted to the ill-fated Westway, which in turn suffered a death blow at the hands of environmentalists. The funding was ultimately transferred to what, more than 60 years later, is now called Route 9A and the Hudson River Park. Let's hope that our generation's infrastructure planning doesn't take another 60 years to realize.

This is a roundabout way to introduce this issue of *Oculus*, which examines many of the aspects surrounding the topic of infrastructure: historical patterns, case studies, perspectives by practitioners, and reports on policy initiatives that will set the standard for the next generation of infrastructure design in the city. Architects, planners, and urban designers have been involved in all of these areas and have the opportunity – if not obligation – to be even more engaged in setting the vision as the discourse for a better city emerges in the coming months and years.

Jim Wright, AIA, is co-chair of the AIA New York Chapter Transportation & Infrastructure Committee and is a principal at Lee Harris Pomeroy Architects where he has led many of the firm's transportation projects, such as the Union Square Station rehabilitation and Fulton Street Transit Center.

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# Infrastructure, NIMBY, BANANA, and APPLE

Webster's New World Dictionary, Third College Edition

As citizens, we can educate ourselves about the essential nature of the infrastructure enabling modern civilization, and the shared responsibility of paying for its construction, maintenance, and operation. (Ten minutes of evening news reports about Iraq or Afghanistan can vividly bring home images of societies in which infrastructure has largely ceased to function.) We need to be aware of the environmental consequences of our actions.

Public officials can educate their constituents (us) to value these essential services and alleviate the loads put on these systems by reducing waste, recycling, and conserving water, electricity, and other resources. Officials also bear the responsibility of fostering environmental equity, meaning that no community is unfairly burdened, and

[illegible]



every neighborhood shares in the location of essential public services. (Mayor Bloomberg's Solid Waste Management Plan is a current example.) And, finally, our representatives have the difficult task of securing funding for these large, very expensive, and often invisible projects – think of Water Tunnel No. 3 and the upcoming tunneling of the No. 7 Subway Line extension.

As architects, we can help balance the requirements of these complex structures with the concerns of community residents through a number of design strategies:

- Sensitively site infrastructure projects to mitigate their impact on surrounding neighborhoods. Channeling traffic away from nearby residences, providing screening, and including appropriate landscape design can make most planned facilities acceptable to their communities. Some facilities can be located largely below grade, like the current water treatment structure under Van Cortlandt Park.
- Engender local pride and ennoble daily life through architectural design expressing the civic importance of these vital facilities. The many civic structures that the Works Progress Administration built in New York City in the 1930s are an enduring legacy and inspiring example.
- Decrease life-cycle costs and stretch public funds by creating sustainable, cost-effective facilities using long-lasting materials. Infrastructure projects can serve as highly visible local examples of intelligent, sustainable design. Green roofs can create a community-friendly "fifth façade" while moderating heat gain and harvesting rainfall.
- Educate the public by revealing the workings and purpose of these structures. The heroic scale of filtration plants, wastewater treatment

facilities, and marine transfer stations (MTS) makes them informative destinations for visitors and school groups. New-generation MTS facilities will include a kinetic display of moving gantry cranes loading sealed waste containers onto barges.

- Finally, design these vital facilities to "give something back" to their neighborhoods. Riverbank State Park exemplifies this attempt at fairness and local enhancement. Situated on the 27-acre roof of the North River Water Pollution Treatment Facility in the Hudson River – a facility strongly resisted by the West Harlem community – Riverbank has reportedly become the second busiest state park in New York, used by three million persons annually.

With political leadership, increased public awareness of environmental consequences, and appropriate architectural and engineering design, perhaps BANANA could come to mean Build Appropriate, Notable Architecture Neutralizing Adversity. Or a new acronym, APPLE, could denote Appropriate Projects Promoting Local Empowerment.

Infrastructure is not only the "underlying foundation" on which our physical and social worlds are supported, it is also the product and expression of our shared commitment to each other and our communal life. There is no more important design challenge for our profession.

[Richard Dattner, FAIA](#), is founding partner of Dattner Architects, a firm noted for its infrastructure and sustainable design projects. Dattner Architects received the 2006 Firm Award from AIA New York State, the 1992 Medal of Honor from AIA New York, and the 1994 Thomas Jefferson Award for Public Architecture from national AIA.



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# Green to the Core of the Big Apple

No longer the province of optimists, alarmists, and futurists, green design is overcoming entrenched obstacles and making urban infrastructure work better

By Bill Millard

Signs of a green wave are everywhere. New York City's government has committed itself to ecologically sound practices, first by enacting Local Law 86 and now by creating an Office of Long-term Planning and Sustainability, an advisory board, and a research partnership with the Columbia Earth Institute. Leadership in Energy and Environmental Design (LEED) certification for buildings and accreditation for professionals are both increasing, and high LEED ratings are prominent features of some of the city's most

and heat-efficient housing forms, makes New York a lighter burden on the Earth than lower-density settlements. To those who associate "green" with Thoreau, the idea of gritty, teeming NYC as anything but an environmentalist's nightmare is counterintuitive, but Owen's sources point out scale effects, design features, and transportation patterns that make cities uniquely efficient.

Still, we could be doing far better. As Mayor Bloomberg emphasized in his December 12 address on the PlanNYC sustainability policy,

the city's key infrastructural components will be more than a century old by 2030, and aging systems are burdensome to maintain. New York City spends over half its long-term capital budget on infrastructure repair and improvements, according to Hillary Brown, AIA, LEED AP, principal of New Civic Works. The public right-of-way is the city's largest real estate holding with 20,000 lane-miles – an area larger than Manhattan. Any improvement in how its components perform can have massive

impact on resource sustainability, quality of life, and the regional economy. Yet control over infrastructure is divided among so many civic agencies and utility companies, with often conflicting agendas, priorities, and procedures, that collaborative approaches are not easily pursued here.

In her previous position with the city's Department of Design and Construction (DDC), Brown founded the city's Office of Sustainable Design in 1997. Before and after leaving DDC in 2000, she has worked with government and not-for-profit institutions to bring green thinking into the mainstream of public-sector construction, spearheading the efforts that resulted in the Design Trust for Public Space/DDC publications *High Performance Building Guidelines* (April 1999) and *High Performance Infrastructure Guidelines* (October 2005) (see In Print, pg. 46). The guidelines give city agencies a common philosophy by analyzing systems' materials for such variables as recycled and recovered content, salvage, avoidance of noxious chemicals, energy use, and practical synergies.

A matrix lists 53 best practices along one axis (e.g., more street vegetation, particularly hardy and salt-tolerant species instead of turf-grass; less pavement and higher pavement albedo; trenchless utility technologies) and 16 specific benefits along the other (improved air

DESIGN TRUST FOR PUBLIC SPACE/DDC



**Strategies for integrating high performance infrastructure include: coordinate utility infrastructure for easy access and maintenance and to minimize impact of utility work; improve streetscape for pedestrians and surface mass transit; and increase and improve right-of-way public space and green areas**

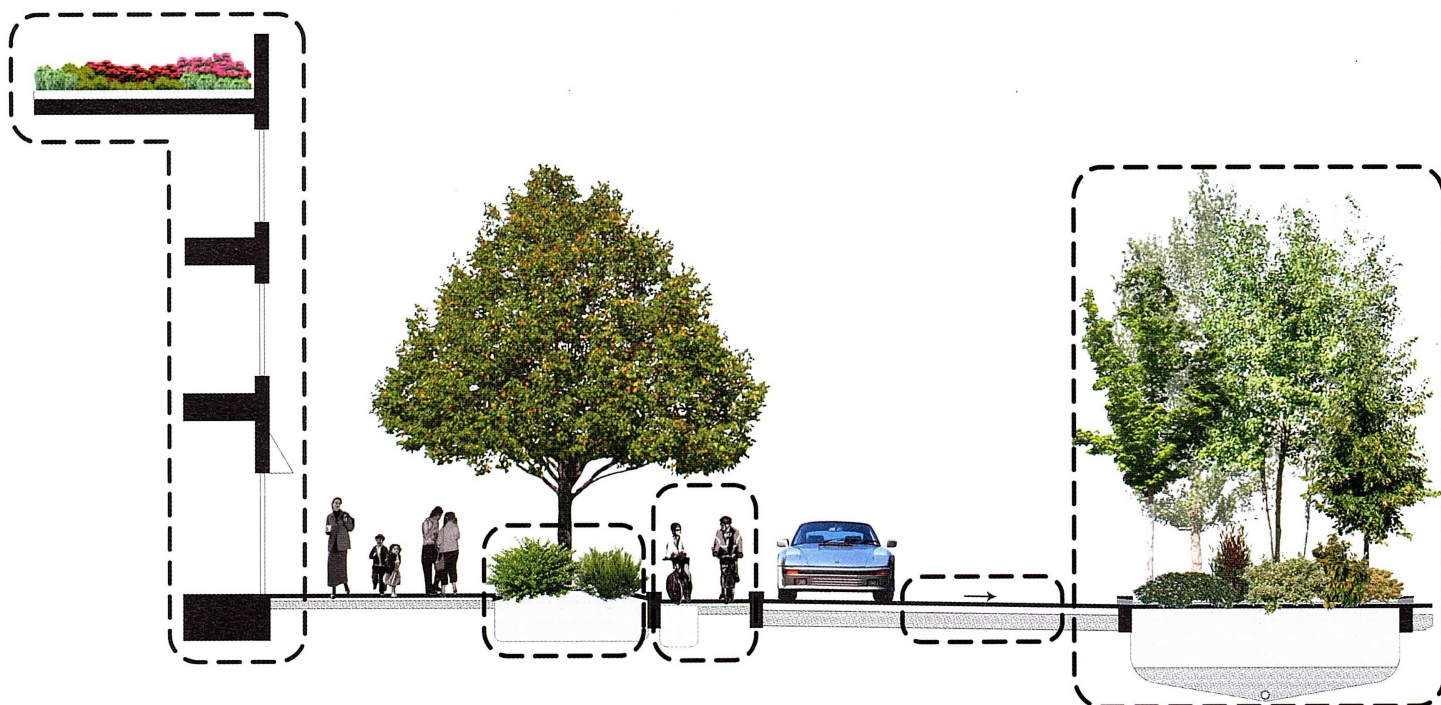
impressive new projects. The AIA's 2006 Sustainability Task Group has laid down a roadmap, and the 2030 Challenge posed by Edward Mazria, AIA, offers benchmarks. Is green – as last May's theme issue of *Vanity Fair* suggested – becoming the new black?

Perhaps fashionability is the worst thing that could happen to the concept of sustainability which is all about permanent rethinking and restructuring, not transience. The most enduring way a community can conserve resources is to apply green principles to the systems that allow it to function: its transportation, water, sewer, power, and communications infrastructures. Most of these systems have arisen by piecemeal accretion rather than planning, often reflecting the conflicting imperatives of interwoven public and private entities. Yet specialists in natural synergies and high-performance technologies have assembled bodies of potent knowledge. The challenge is to implement the ones that yield the best results for the investment.

## Not hugging trees, but putting them to work

In some respects, New York is already a national leader in conservation. David Owen's article "Green Manhattan" (*New Yorker*, October 18, 2004) fleshes out an argument historian Kenneth Jackson made in the 1990s: that high density, coupled with pervasive public transit





**Other strategies include: creating absorbent and water-efficient landscapes; improving streetscapes for bicyclists; and minimizing impervious pavement areas**

and water quality, waste reduction, energy conservation, mitigation of the urban-heat-island effect, lower maintenance costs). This overview allows a quick assessment of measures producing multiple benefits. Planting trees to maximize pavement shading, for example, allows synergies involving water retention, pavement durability, pollution reduction, the heat-island effect, and aesthetics.

One challenge is that financially measurable benefits are more likely to appeal to Office of Management and Budget (OMB) officials, the final arbiters on expenditures, than many qualitative benefits, no matter how substantial. Brown acknowledges that fully quantifying all the observed benefits is a desirable step but must await further study. Landscape architect Signe Nielsen, FASLA, co-principal of Mathews Nielsen and another contributor to the guidelines, emphasizes that it's critical to speak the analysts' language. "The best strategy," she says, "is to demonstrate that any one of these has multiple benefits. That's why, with the street trees, we're [pointing] to lawsuit savings, to the paving savings, to the stormwater, because it's not just about the trees. There are certainly people who I don't think necessarily care about trees; they just think you're some kind of shrieky treehugger." To persuade OMB, she recommends demonstrating cost-effectiveness metrics that appear within a seven-year payback cycle.

This is the main reason a well-publicized feature found in Chicago and elsewhere, green roofing, has not taken hold here. Even omitting maintenance costs, Nielsen says, a green roof costs \$8-10 more per square foot to install, and most officials are not persuaded that this is the strongest investment. "You've got 10% of disposable money on any given project that you can allocate to different green strategies," Nielsen has learned. "That 10%, they feel, buys you more when utilized in other ways than green roofs," such as strategies optimizing day-lighting or indoor air circulation. Green roofs arguably produce other collective benefits – aesthetics, stormwater control, reduction of heat-

island effects, communication of civic commitment – but as long as OMB conducts analyses on a building-by-building basis, the case for intangibles and communal benefits will be difficult. Noting that green features tend to fall into the low-priority category of "site work" on line-item budgets, Nielsen hopes that the new sustainability office will be a strong advocate for the big-picture thinking the guidelines put forth.

### **Fix outputs reactively or control inputs systemically**

New York's water, sewer, and waste systems lag behind techniques well established elsewhere. The city's sewer complex is a combined stormwater/sewage system that cannot prevent combined sewer overflow (CSO) events during heavy rains. In the system's early days it sufficed, but as hard surfaces have proliferated and stormwater loads have grown, CSOs have become a threat to the city's water quality. According to the Hudson River watchdog organization Riverkeeper, in an average rain year, CSOs pour some 27 billion gallons of untreated wastewater (including toxins and pathogens) into surface waters instead of the city's 14 treatment plants.

Bert Gregory, AIA, president and CEO of Seattle-based firm Mithun, views sustainable infrastructure design as a matter of integrating key elements of an entire region, particularly water, energy, and mobility. Gregory contrasts two approaches to this problem in his region. Portland, OR, like New York, takes a "hard-pipe stormwater strategy": After 20 years of contaminated CSOs from the Willamette River, the city is building a six-mile-long, 22-inch-diameter, \$1.4 billion pipe to regulate the overflow. Instead of this "20th-century solution, spending money at the bottom of the pipe," planners in Seattle prefer a top-of-pipe systemic approach aimed at reducing drainage input into the system. Green roofs and other plantings, along with homeowner-scale techniques like reusing rain from downspouts, reduce groundwater infiltration and surface-water inflow.



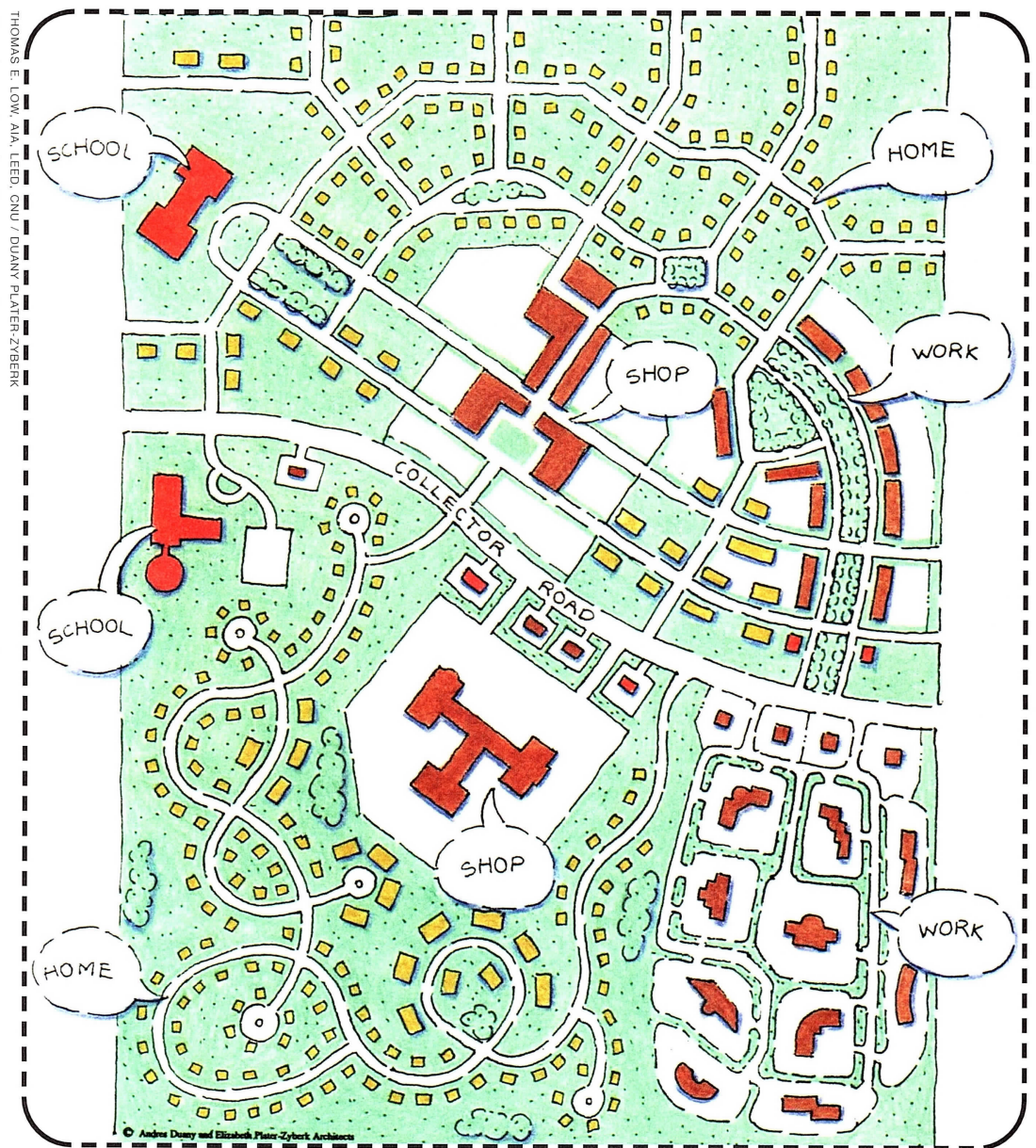
High Point, a 165-acre Mithun project, manages water input on a community-wide basis, using filtration and transpiration to hold approximately 65% of the water on-site. This controls drainage and contributes clean water at the right rate and temperature for Seattle's richest salmon-spawning stream. "Each city," Gregory says, "has to understand the environment in which it sits, and then develop strategies appropriate for its particular use." New York may not be able to employ the same strategies as regions with looser soil – "in Manhattan," Gregory reminds us, "you're pretty much on a rock" – but a geologically appropriate plan here might concentrate more on rainwater capture and reuse, as green skyscrapers like 7 World Trade Center, the Hearst Tower, and the Solaire already do.

Gregory and colleagues assess water-resource management comprehensively, as part of a regionwide ecological superorganism comprising fauna and flora, buildings, public systems, and regulatory and economic incentives driving behavior. He applauds similar systemic approaches worldwide, from Denmark's efficient neighborhood-level distributed energy

systems to Jaime Lerner's bus-rapid-transit innovations in Curitiba, Brazil, to the urban-revitalization project Ekostaden Augustenborg in Malmö, Sweden. In U.S. cities, Gregory says, comparable plans would require choices between collective benefits and private property rights, as recognition of the downsides to sprawl collides with allegiance to market mechanisms. Cities hoping to support an attractive quality of life, he believes, need to foster incentives favoring a density that supports mass transit. "Linking transit with land use," Gregory says, is the key to transforming the 20th century's unhealthy settlement pattern into one that reconnects human and natural systems.

### Letting the city be the city

Transportation reform, Andrés Duany, FAIA, would agree, is essential. "The fundamental sustainable infrastructure is compact, walkable, diverse urbanism," says the principal of Miami-based Duany Plater-Zyberk. "There is nothing remotely as powerful as that in terms of



**Even in low-density neighborhoods, the urban-style mixed-use grid (top) makes workplaces and retail accessible to pedestrians while also improving auto-traffic flow. Conventional sprawl (bottom), with cul-de-sacs and functional segregation, promotes auto dependence and congestion**

using less energy, paving less, and spewing fewer hydrocarbons." Beyond that core principle, however, he dissents vigorously from most U.S. environmentalists on specific strategies. "Green buildings, green roofs, all that stuff that [acts] at a building level is as nothing compared to not having to drive in the first place."

Duany compares green advocates to hammer-wielding carpenters treating everything like a nail. "There's nothing technically wrong [with greening the city], except that if you green it, you lower the density, and you cause people to drive...You know what's causing the environmental problems in this world? The lifestyle of the American middle class...and now that it's being exported to Europe and India and China, it's absolutely explosive." A world built to resemble American suburbs, Duany predicts, will choke on car traffic no matter how much vegetation it sprouts. Replacement of traditional grids by dendritic road systems is particularly egregious: The absence of navigational alternatives creates bottlenecks, whereas a fine-meshed grid dispers-



es traffic and links capacity with connectivity. “The fundamental high-density urbanism is to have an open-mesh network. Now, guess who’s against the open-mesh network? The environmental movement.”

“The way the green movement is conceptualized in this country,” Duany continues, “has to do with how you handle water.” Contiguous unpaved spaces, plantings, reforestation, swales, streams, and green roofs, he finds, obstruct the continuity of the grid and reduce walkability. The primary ecological concern in urban space is not water but human movement, and zoning and environmental laws banning construction of traditional urban spaces like Manhattan or Charleston, SC, have kept people from walking or taking transit, letting in the automotive tide.

**“The fundamental sustainable infrastructure is compact, walkable, diverse urbanism. There is nothing remotely as powerful as that in terms of using less energy, paving less, and spewing fewer hydrocarbons.”** Andrés Duany, FAIA

“We’re working at cross-purposes,” he laments, “and the reason is, the environmental movement only has green. They only manipulate nature; they do not manipulate urbanism...Environmentalists need to learn how to assess the city in terms of the city, and not something that needs to be softened or hybridized with nature. Let the city be the city.” As a corrective to American environmentalism’s reflex assumption that any human presence can only defile nature, he praises the European development model recognizing a symbiosis between nature and cities, not a pure wilderness ideal.

Better tools for truly sustainable infrastructure, in Duany’s view, include building and planning codes that allow dense, walkable, and transit-equipped urbanism to compete with other spatial forms on a level legal playing field. After sketching such a code in *Suburban Nation*, Duany has written a detailed version (see SmartCode at [www.dpz.com](http://www.dpz.com)). Eliminating sprawl entirely is unlikely, he acknowledges; market analyses indicate that about 30% of people actively prefer sprawl. His advocacy of New Urbanism, he says – distinguished from Smart Growth, despite common goals, by being market-driven, not regulatory – simply seeks balanced environmental choices for the rest of the population, which under current law is served a Monty Pythonish menu of sprawl, sprawl, and more sprawl, regardless of preferences or ecological effects.

### **Fixing Humptydumptyopolis**

While prescriptions for repair differ, the extent of the damage is rarely disputed. One planning firm that identifies itself with New Urbanism and traditional neighborhood design, Leyland Alliance of Tuxedo, NY, has worked in public-private partnership with numerous communities to mitigate infrastructural damage caused by either sprawl or industrial decline. Its spokesmen interpret “sustainability” broadly and are optimistic about the changes that combined attention to physical,

social, and economic infrastructure can catalyze.

To Principal Steve Maun and Vice President of Planning and Development Macon Toledano, what makes any community sustainable is a Main Street, a common gathering place combining civic space, transportation, retail, a public library, and areas conducive to chance encounters such as cafés and barber shops. Without such a center, a sense of place is hard to sustain, and when zoning and tax incentives make sprawl the path of least resistance for developers, communities become formless. “What we’re doing,” says Maun, “is putting Humpty Dumpty back together again.”

Transit is only the most obvious of several keys to civic remediation. Leyland has helped communities foster social and informational infrastructure (schools, book clubs, public space for free speech) along with retail, particularly Mom-and-Pop shops instead of chains. Some cities Leyland has studied, such as Lowell, MA, and White Plains, NY, endured long declines but have what Maun calls the “beautiful bones” of preserved physical structures and well-located transportation. Strategic redevelopment efforts have helped both rebound.

For decades, says Toledano, the nation isolated essential program elements, “and look at what we got as a result: vacant cities that were abandoned and poorly treated...We got a world full of highways – more spending on that than on our schools.” Because no dispersed environment can integrate infrastructural elements as effectively as a city, Maun and Toledano see a reversal of centrifugal development. Home buyers who would have been steered to suburbs 20 years ago, Maun finds, now ask brokers, even in small towns, “Do you have anything in the village?”

A widespread rediscovery of urbanity would ease certain pressures on the environment at large while making innovations in cities’ built environment imperative. Brown, while appreciating the advantages of high-density urban life, stresses the principle of biophilia, the inborn human affinity for the green over the gray. For all its strengths, New York is a difficult place to practice biophilic design and “re-infiltrate nature’s workings into our consciousness.” The markers of recent progress, however, are unmistakable. Brown makes sure to get regular exposure to one prominent new feature of the city’s infrastructure: “I bike on the Hudson Greenway every week and practically inhale all of it, visually and sensorially... I would have never imagined it in my lifetime. I came back to New York from Europe in the mid-1970s, when all the piers were burning. How were we ever going to dig ourselves out of this degraded state? Look what’s happened...It’s taken 30 years, but it’s a marvel, and it’s probably what keeps me in New York: our ability to regenerate.”

[Bill Millard](#) is a freelance writer and editor whose work has appeared in *Oculus*, *Icon*, *Content*, and other publications.





PROJECT FOR PUBLIC SPACES

New York City is preparing a sweeping plan for a major surge in population, with new ways to get around Gotham By Richard Staub

# Getting There

They're coming. According to city planners, by 2025 New York's population will swell from 8.2 to 9.4 million. How the city will absorb a million-plus people – where they will live and how they will travel – is the subject of a strategic sustainability plan that the city's deputy mayor of economic development, Daniel Doctoroff, is creating. Described by Mayor Bloomberg as a "sweeping, interagency, five-borough (plan), particularly in housing, transportation, energy, and infrastructure," it was initially due last April and is now expected in early 2007.

In a December 2006 speech, Bloomberg went into much greater detail concerning the scope of the city's planning and called for citizen input. And what many think is a partial preview of the report has already appeared, unofficially and unauthorized, for download on Streetsblog.com. It's called "Visions for New York City: Housing and the Public Realm." Prepared for the city's Economic Development Corporation, its author is Alex Garvin, Hon. AIA (see "So Says..." pg. 20), a city government insider and veteran planner whose last major New York effort was the 2012 Olympics bid.

Half of Garvin's draft report looks at sites for housing development in the outer boroughs – either on the waterfront or on platforms over



Grand Street in SoHo today (above), and reimagined with greater pedestrian amenities (top)

rail yards and sunken highways – and the other half explores transportation options and the development of the public realm. According to Garvin, infrastructure is one of the crucial challenges this (or any plan) will have to meet for new development to succeed. The city's current systems, says the report, are "already having difficulty accommodating current growth. The transportation system, for example, is currently reaching capacity and efficiency limits, thereby inhibiting new commercial and residential development." The morning crush of riders that pour onto the L Line in Williamsburg and the dire subway predictions for the proposed Atlantic Yards development are cases in point.

Thinking ahead, higher residential densities in the outer boroughs will mean new distributions of commercial and entertainment centers. Traveling between all the boroughs will be as important as getting into Manhattan. And the ideal transit plan for 2025 will be its own version of the biblical peaceable kingdom where "the lion lies down with the lamb." Sustainability will rule. Car and truck traffic will be tamed and made to coexist with bicycle and bus lanes. Ferries will taxi between Manhattan and the outer boroughs, linking with public transit as various as street cars and monorails. And all will be landscaped to achieve a much greener, pedestrian-friendly public realm.

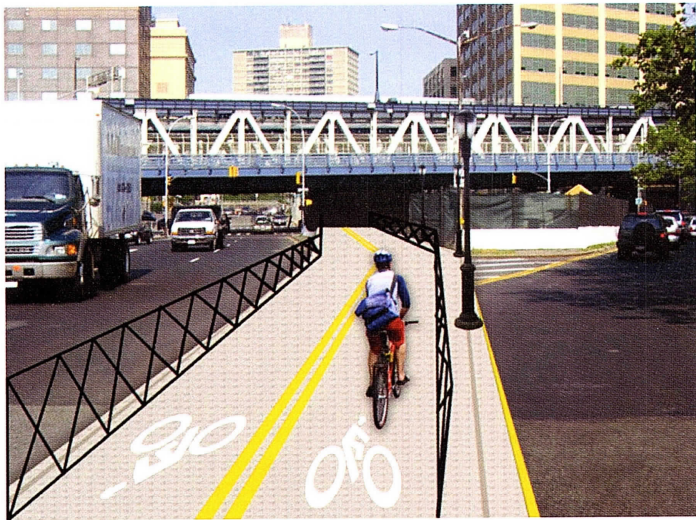
Several leaders of public advocacy groups weighed in on what they would like to see in a long-range transportation plan. For them, transportation planning is already well underway, as evidenced by two events held last fall: the AIANY Chapter's September program, "New Transportation Initiatives: Issues and Opportunities," and an October daylong transportation policy program held at Columbia University,



Thinking ahead, higher residential densities in the outer boroughs will mean new distributions of commercial and entertainment centers. Traveling between all the boroughs will be as important as getting into Manhattan.

"Manhattan on the Move," that drew 600 and dealt with much more than Manhattan.

Paul Steely White, Executive Director of Transportation Alternatives, who spoke at both events, says that one remarkable aspect of the Columbia conference was a near-universal consensus that automobiles aren't the answer. And perhaps the most dramatic signal of change is plans to sharply reduce traffic in the most congested areas of Manhattan. The options include road or congestion pricing, whereby a toll is placed on travel within certain zones such as midtown Manhattan – or limiting altogether the kinds of vehicles that can enter a particular area. The best-known model is London, which reduced traffic 15% by charging approximately \$10 to enter its central district. Tactics to calm the pace could include longer pedestrian crossing periods.



Rendering of the planned protected bike lane on Sands Street in Brooklyn

While car traffic is being discouraged, planners are looking at ways to promote bus and bicycle use. To eliminate the slow pace of bus travel, they are exploring strictly enforced, dedicated lanes so express buses can zip along without having parked cars and trucks block passage. Electronic prepayment of bus rides at the bus stop could make passenger stops as short as possible.

And New York may also come to feel more like such bicycle-centric cities as Amsterdam and Copenhagen. Plans are to encourage bicycle travel with bike lanes as strictly enforced as those for buses, travel routes apart from existing roads, and greatly enlarged areas for parking.

David Burwell, Senior Associate for Transportation at the Partnership for Public Spaces, says, "The major difference in the city's plans will be viewing roadways, which make up 40% of the city's land, as public space with societal benefits." He sees the change in

emphasis apparent in "road diets" that would call for expanded sidewalks, more street closings such as those being proposed around Times Square, and an equitable share of roadways for bus and bicycle use. Already well along in the evaluation phase is Vision42, a citizens' initiative to transform 42nd Street with a low-floor light rail line running river-to-river along 42nd Street within a landscaped pedestrian boulevard.

The role of subways in the transportation mix is less clear. Current plans for the No. 7 Line extension to the west side of midtown Manhattan and the Second Avenue Line are moving ahead. But as population densities in the outer boroughs increase, how will this much larger group of riders get to and from their Manhattan jobs? That's still to be determined.

**"The major difference in the city's plans will be viewing roadways, which make up 40% of the city's land, as public space with societal benefits." David Burwell, Partnership for Public Spaces**

Both White and Burwell feel that Garvin's plan is an excellent start for transportation innovation. They also see other reasons for hope. The Department of Transportation, which is now under Doctoroff's purview, has just introduced an office for strategic planning, a major shift for an agency that usually focuses on traffic flow. Mayor Bloomberg has introduced a new Office of Long-term Planning and Sustainability. And former MTA chairman Robert Kiley has returned to work for New York after six years in London, where he addressed long-standing transit issues.

The sheer magnitude of such a plan brings out the skeptic in long-time New Yorkers who have seen plans of lesser scale run aground. Tom Angotti, Professor of Urban Affairs and Planning at Hunter College, is suspicious of plans that are driven from the top down because they inevitably leave out the voice of the average citizen. He points to a list of recent planning failures that include the 2012 Olympics, Ground Zero, and the West Side Stadium. To which Burwell replies, "We still have to offer a vision so people have ideas to respond to." White says that any plan that's produced should be implemented in small pieces, so that year to year, citizens see an improvement in their city. Deborah Marton, Executive Director of Design Trust for Public Space, says the kinds of change these plans call for will be possible only if there's a top-down reorganization of how city agencies work with one another and greater sophistication in understanding how the pieces come together. And several observers wonder how well a plan begun under Bloomberg's administration will fare under administrations to come.

Who will remain the ongoing champion for the plan, whatever it is? Hop aboard. The ride to 2025 is going to be interesting – and not without a few bumps along the way.

Richard Staub is a marketing consultant and writer who focuses on issues important to the design and building community.



# Here Comes the Train

Promising a more modern passenger experience, plans for the Second Avenue Subway line are on track

By Sara Moss

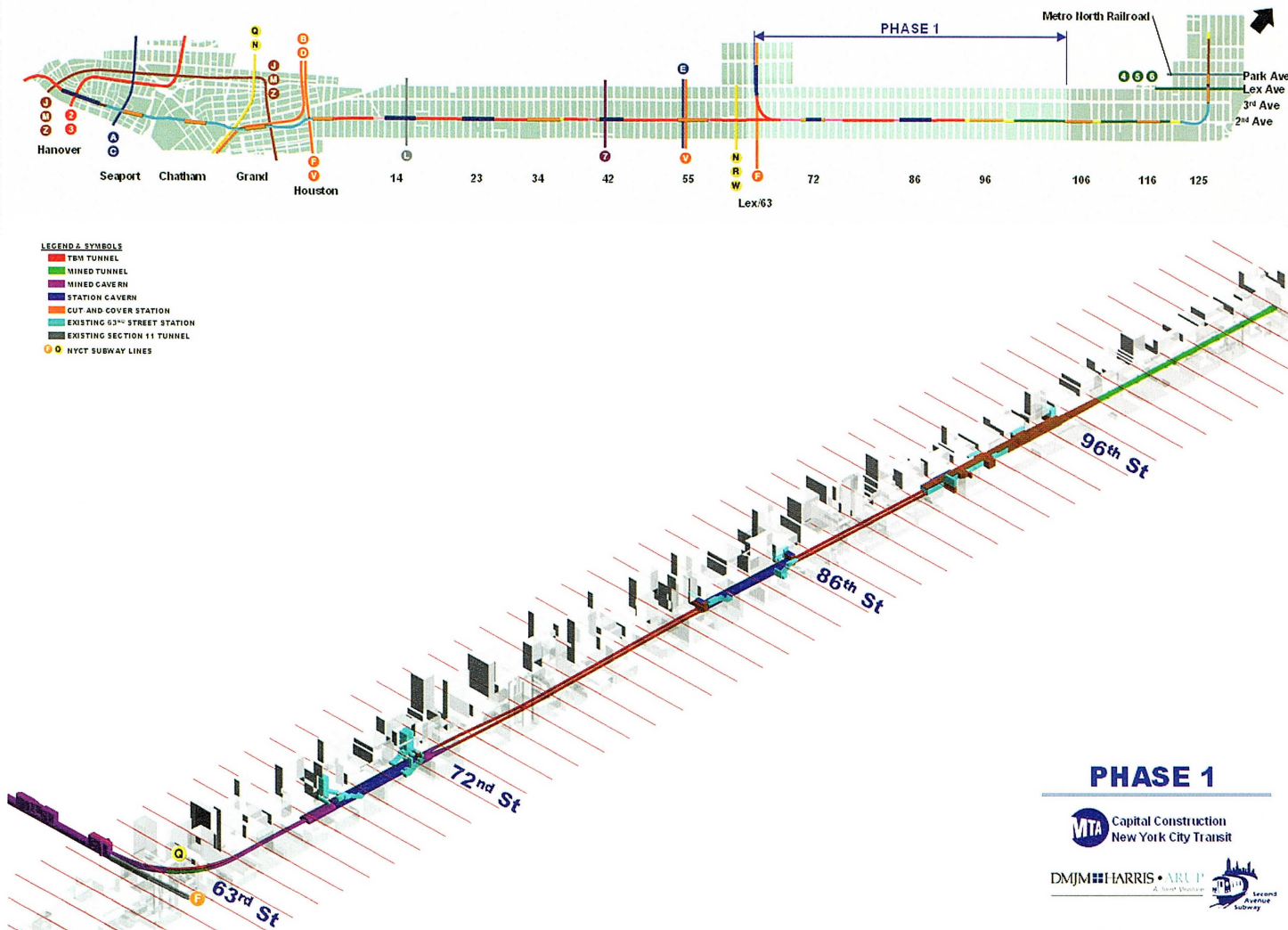
For decades, the Second Avenue Subway has been the stuff of New York City legend. When I worked on the project several years ago, mentioning my job to others got reactions ranging from enthusiasm to disbelief. But now it's really happening. And for a transit system previously built in parts – once comprised of three different agencies, the IRT, the BMT, and the IND – the project presents an unusual chance to usher in architectural improvements on a large scale. With these changes, the project team hopes to improve the experience of hundreds of thousands of passengers.

To conceptualize the design of the 16 underground stations, the project team, led by DMJM+Harris + Arup, JV (Joint Venture), in association with FXFowle Architects and Ben Thompson Associates, Architects and Planners, and New York City Transit (NYCT), developed a set of guiding design principles for the new line in its entirety. These design principles promote ideas like expressing structure,

using modular design, promoting natural light, and integrating services. The team then developed design guidelines for new underground stations, articulating how to implement these principles while including NYCT requirements concerning issues such as safety, maintenance, and accessibility. The guidelines “set the tone for the new underground stations,” says Lead Architect for the Joint Venture Ken Griffin, AIA.

The line will have two station types: mined (with a tube profile) and cut-and-cover (with a box profile). The new stations will be large, column-free spaces, with light-colored finishes and tempered air. The stations are configured to facilitate passengers' orientation in and navigation through the space. “I perceive the old stations as negative spaces; tight, compact,” Griffin says. Since many of the stations are deep mined – and therefore further underground than the usual NYCT stations – enhancing the quality of the vertical circulation is an impor-

SECOND AVENUE SUBWAY PROJECT TEAM



Second Avenue Subway route map (top) with detail of Phase 1



tant part of the design. “Greater reliance on mechanical vertical circulation also means that they are subjected to daunting levels of use (and abuse)...Elevator and escalator systems cannot be out of service for any length of time, especially before, during, or after an emergency,” Griffin says. “That’s why we’re monitoring the development and implementation of APTA [American Public Transportation Association] heavy-duty escalator and elevator specifications – to develop an industry standard that accommodates the new stations.” Specific strategies include the use of heavy-duty escalators as well as additional flat steps at landings to increase safety for riders. All sta-

access) requires extensive coordination between the architects and engineers from various disciplines, not to mention the client. “Every time we have a meeting, we always have support from the maintenance group and the user group [station operations],” says Kachee Cheung, P.E., Design Manager of System Expansion for MTA Capital Program Management. Their work environment facilitates this: The architects, engineers, and NYCT staff share the same Lower Manhattan office, a setup not unusual for transit projects, Griffin says, given the high degree of collaboration required. The architects are also working closely with MTA Arts for Transit Director Sandra



SECOND AVENUE SUBWAY PROJECT TEAM

Rendering of typical mezzanine level

tions will be ADA compliant and the elevators will be housed in glass to enhance security.

Designs for the new stations will draw from a limited palette of materials, including ceramic and granite. A 10-foot vertical module will recur throughout the underground spaces and up at the entrances. Some surfaces will be preassembled as 5-by-10-foot panels, which will allow for closer tolerances and be more cost-effective; panels can be installed quickly with minimal interruption of other construction. “Wherever we can fabricate off-site, we try to do that,” Griffin says. Sustainability has also played an important role, with the team using the LEED system as a standard for exploring possibilities for environmental, energy, and cost savings. Measures include the use of daylight, recycled materials (such as green concrete), and the specification of materials from within a 500-mile radius of the site.

Loudspeakers, lighting, ventilation, and signage will be incorporated into finishes, instead of being add-ons. “A lot of background will be concealed,” says Peter Chamley, C. Eng., Director of Design for the Joint Venture. “This is part of the exercise of the design of the finishes.” Integrating all of these services (while providing maintenance

Bloodworth to create opportunities for artwork that will enhance everyday commuting, with a different artist to be chosen for each station. “Percent for Art will be a component,” says Bloodworth, “and we are in the planning stages for that at this time.”

This rethinking of the passenger experience, however, is not limited to the underground spaces. The entrances present a variety of conditions – some are in existing buildings, some at plazas, some adjacent to buildings. The team has developed a language that responds to these different conditions while consistently applying the main design principles. The entrances will be as transparent as possible to provide both security and a sense of continuity with the underground spaces. They will have a “strong geometric, triangular quality,” Griffin says. “The slope will lead the eye to underground.” Also at street level, the ancillary buildings – housing the line’s ventilation facilities – will be designed using a modular approach, with a ceramic screen façade that will respond to the surrounding context and massing. The colors, according to Griffin, “will be consistent with the masonry vernacular.”

The team is currently working on Final Design of Phase I, which has a budget of \$3.838 billion (including all soft costs). It includes tunnels stretching from 105th to 63rd Streets and Third Avenue, new stations at 96th, 86th, and 72nd Streets, and new entrances at the existing 63rd Street Station.

Sara Moss currently works on the Fulton Street Transit Center for B. Thayer Associates and Grimshaw.



# Over, Under, Around, and Through

Infrastructure challenges are inspiring New York architects to produce some of the city's most exciting projects **By Bonnie A. Harken, AIA**

Projects such as electrical substations, bridges, highways, railroad lines, and tunnels can easily overpower architectural creativity. These large-scale projects – with price tags in the billions – are highly political and must run an obstacle course of budgets and tradeoffs. Even if financing and political will are secured, there are myriad public agencies with overlapping jurisdictions and sometimes conflicting regulations. Once built, maintenance funds for infrastructure are minimal. Finally, post-9/11 paranoia can block creative solutions with impenetrable life-safety and security restrictions.

## Moving a Mountain: 7 World Trade Center

One project that defied the odds is 7 World Trade Center, designed by Skidmore, Owings & Merrill for Silverstein Properties, which creatively incorporates a Con Edison electrical substation generating power to much of Lower Manhattan. Knocked out of commission by the meltdown of the earlier 7 WTC on 9/11, the transformers and their distribution equipment originally spanned Greenwich Street over to West Broadway. When New York New Visions' Connections Committee recommended extending north-south connections through the 7 WTC site to reconnect Greenwich Street from Tribeca to the Financial District – at what was thought would be a cost of millions of dollars – few people were optimistic that anyone would listen. But SOM's Principal-in-Charge of Urban Design and Planning, Marilyn Jordan Taylor, FAIA, who helped found NYNV, immediately grasped the larger significance and helped forge agreements between the public

and private sectors to achieve this objective.

Carl Galieto, FAIA, the firm's senior technical partner, developed a cost-effective solution by stacking ancillary equipment above the 10 transformers (rather than side-by-side), which reduced the overall footprint and cleared the way for both Greenwich Street and a new triangular public park. Con Edison collaborated in the spirit of helping the overall rebuilding of Lower Manhattan. It also cooperated in what turned out to be the most difficult infrastructure challenge of the project:

coordinating the high-voltage lines coming into and out of 7 WTC with the relocation of Verizon's conduits next door on Vesey Street – while keeping the connections active.

Galieto describes the façade solution to enclose the 11 stories of equipment with a double-layered, stainless-steel mesh breathing surface as “serendipitous.” SOM, in association with James Carpenter Design Associates, incorporated the screen as a way to help define the base of the building's 52-story energy-conserving curtain wall, which, in turn, helped 7 WTC win a LEED Gold rating.

## Surfing from the Subway: West 8th St.-NY Aquarium Pedestrian Bridge

In Coney Island, the hassles of getting kids and strollers to the New York Aquarium from an elevated subway at the new West 8th St.-NY Aquarium BMT station inspired weisz + yoes architecture to design a pedestrian bridge that plays with iconic shapes like the world-famous Cyclone rollercoaster. Supported by twin parabolic arches, the bridge will carry pedestrians safely over Surf Avenue, a major thoroughfare. Innovative stainless-steel mesh within the arches creates a sense of

BRIDGE DESIGN BY WEISZ + YOES ARCHITECTURE/DEMBERRY ENGINEERS. PHOTO BY AMY BARKOW

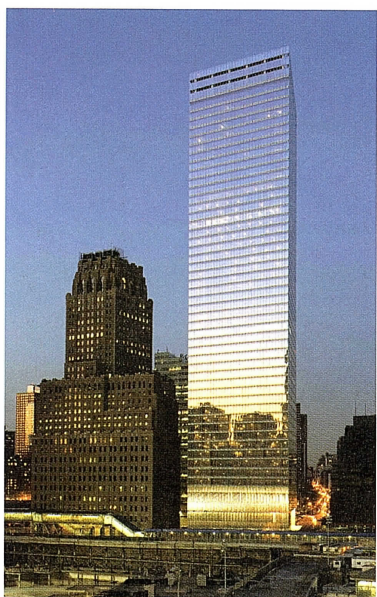


**The Surf Avenue pedestrian bridge takes its cues from Coney Island's famous Cyclone rollercoaster**

enclosure, while requiring minimal maintenance.

Now, weisz + yoes is moving through the approval process with its client, NYC Department of Design and Construction, and discovering challenging regulations, such as NYCDOT's choice of only five paint colors and predilection for highway-style lighting. The bridge's dramatic design, however, has received approval at the committee level from the Art Commission as a symbol of the Aquarium's importance in anchoring Coney Island's entertainment district.

DAVID SUNDBERG/ESTO

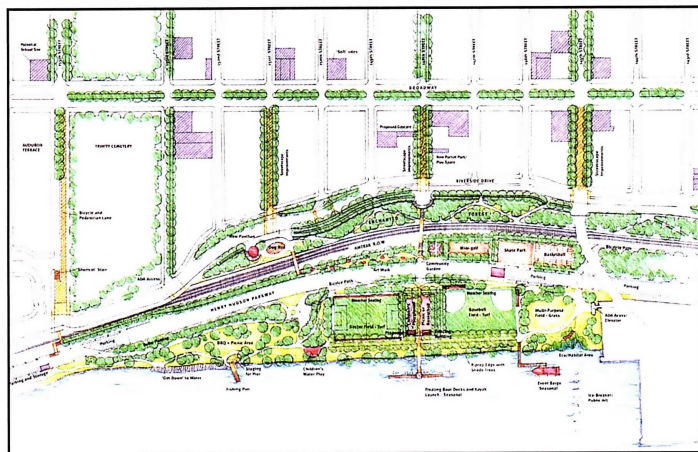


**7 WTC cleared the way for Greenwich Street to reconnect with Ground Zero by incorporating a ConEd substation on its lower floors**



## Water, Water Everywhere: West Harlem Hudson River Waterfront

For decades, the Hudson River waterfront in West Harlem has been a well-kept secret, cut off from the area's residential and business districts by natural and man-made barriers, including the Amtrak railroad lines and the Henry Hudson Parkway. A comprehensive plan named "Take Me to the River" has been created by Donna Walcavage Landscape Architecture + Urban Design with Nautilus International Development Consulting to eliminate those barriers and turn the West Harlem riverfront into an urban oasis, with easy access from a thriving Broadway and the Hamilton Heights community only a short distance to the east. That access requires a complex network of ramps, stairs, bridges, and tunnels. For example, at 148th Street, the plan envisions opening up views through overgrown hillsides, reusing an elegant historic overlook on Riverside Drive, crossing a newly reconfigured pedestrian bridge over the Amtrak lines, and then moving through a redesigned tunnel under the Parkway out to Riverside Park and a new boat dock on the Hudson River.



### "Take Me to the River" connects West Harlem with the Hudson River across Amtrak lines and the Henry Hudson Parkway

Active, concerned local residents were the plan's catalysts with a working group headed by the West Harlem Art Fund, which included numerous local organizations and public agencies. The project was led by the Office of Manhattan Borough President and the State of New York Department of State's Division of Coastal Resources.

Donna Walcavage, ASLA, says, "People living in West Harlem today can barely see – and don't have any safe access to – the Hudson River. This plan will open up views and give people four easy ways to get to Riverside Park. They'll also be able to go boating or fishing for the first time in more than a generation." The project has won two Environmental Protection Fund grants to advance its recommendations, design improved public access, create streetscape design guidelines, and improve the hillsides as an "Enchanted Forest."

### Old Streets/New Highways: Brooklyn Battery Tunnel Plaza

The impact of mid-20th century construction of highways throughout the city left behind many disconnected fragments of former neighborhoods and street grids. One of the most intractable examples is at the Brooklyn Battery Tunnel Plaza in Lower Manhattan. At eight acres,

the plaza represents the largest single development site in Lower Manhattan aside from Ground Zero.

A multidisciplinary team led by H3 Hardy Collaboration Architecture took on this opportunity at the request of the Lower Manhattan Development Corporation. The simple move of lowering a ramp elevation and revising its

route would allow a new deck over the tunnel to meet Greenwich Street at grade. Washington Street could then reconnect as a pedestrian walkway and both Morris and Edgar Streets, which had been severed by the ramps, could be reestablished. These streets create new links between pockets of residential buildings emerging downtown from the conversion of outdated offices. Plans call for a new urban park on the deck sloping up from subway stations on Greenwich to West Street (at an ADA-compatible 1:20) and leading to a pedestrian bridge over to Battery Park City. The formidable bus traffic in the area would be alleviated with an automated parking facility for buses topped with a roof garden. Four new residential towers with retail and cultural components totaling approximately 2.5 million square feet and framing the new park are proposed to offset the infrastructure costs and attract developers. If implemented, the project has the potential to connect from Tribeca through the World Trade Center site to Battery Park.

Bonnie A. Harken, AIA, is President of Nautilus International Development Consulting, Inc., specializing in the urban design of waterfront redevelopments. She helped found New York New Visions and co-chaired its Connections Committee. Harken also served on the Lower Manhattan Development Corporation's Advisory Committee on Transportation and Commuters, where she shaped recommendations about rebuilding major infrastructure after 9/11.

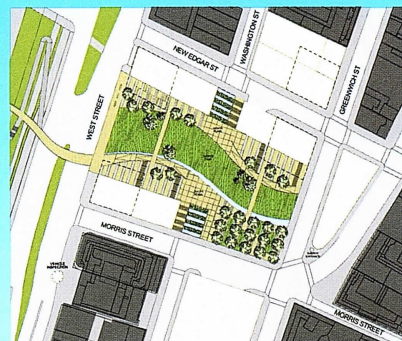
### Consulting Teams:

**7 World Trade Center:** Skidmore, Owings & Merrill LLP; James Carpenter Design Associates; Cantor Seinuk Group, Inc.; Jaros, Baum & Bolles; Cline Bettridge Bernstein Lighting Design, Inc.; Pentagram; Cerami & Associates, Inc.; Philip Habib & Associates; Mueser Rutledge Consulting Engineers; Ken Smith Landscape Architect; Ducibella Venter & Santore; Con Edison Consulting Engineer: Rudell & Associates, Inc.

**Surf Avenue:** Dewberry Engineers; weisz + yoes architecture

**Take Me to the River:** Donna Walcavage Landscape Architecture + Urban Design; Nautilus International Development Consulting, Inc.; McLaren Engineering Group

**Greenwich South:** H3 Hardy Collaboration Architecture; Olin Partnership Environmental Simulation Center; weisz + yoes architecture; URS Corporation; Hamilton, Rabinovitz & Alschuler



### Greenwich South would reconnect old streets and create new park space and residential towers over the Brooklyn Battery Tunnel Plaza

H3 HARDY COLLABORATION  
ARCHITECTURE AND OLIN PARTNERSHIP

DONNA WALCAGAVE LANDSCAPE ARCHITECTURE + URBAN DESIGN  
WITH NAUTILUS INTERNATIONAL DEVELOPMENT CONSULTING, INC.

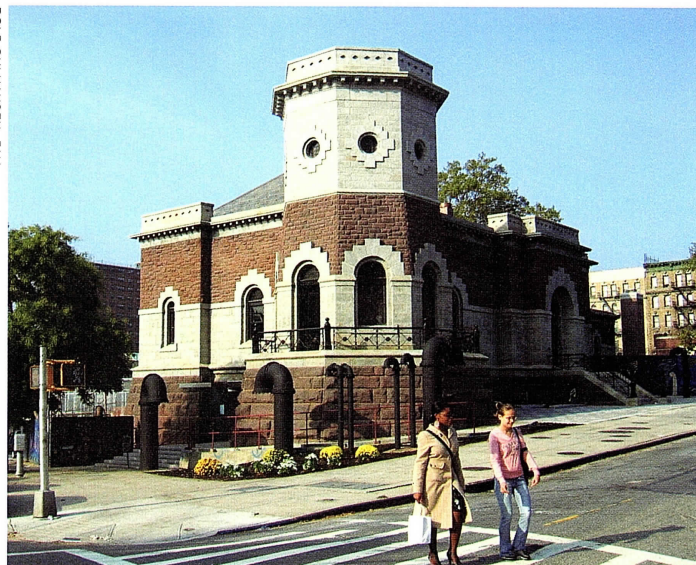


"It takes a vision so compelling that most obstacles can be overcome," says Jim Wright, AIA, speaking of the challenges of adapting obsolete public infrastructure to new uses. As senior associate at Lee Harris Pomeroy Architects, Wright manages the firm's extensive transportation and infrastructure projects. He cites the High Line conversion from abandoned railroad to public park, designed by Field Operations and Diller Scofidio + Renfro, as an example of the power of a compelling vision. As most New Yorkers know from the continuous media coverage, the High Line is an elevated rail deck that once carried freight between factories and warehouses along a 13-mile corridor. Since 2002, the High Line has been the focus of a determined – and finally successful – effort by business owners, preservationists, and activists to save and reuse the 1.5 miles of track, which have escaped the progressive demolition that began decades ago.

Sometimes a compelling vision can transform even a wasteland into a public amenity. Public attention was once again focused on the decommissioned Fresh Kills landfill when the city decided to hold an international competition to convert the 50-year-old garbage dump to a state-of-the-art public park and recreational preserve. The program is ambitious, but the circumstances are extenuating and extraordinary. First of all, there's the enormous scale. Fresh Kills covers 2,200 acres (3.4 square miles). Yet it's not a toxic wasteland, despite public perception. Only 45% of the site was ever used for landfill, and the by-products caused by decomposition have been capped or harvested and converted to energy by the engineering systems in place. There is still reclamation to be done, which is part of the master plan.

New York-based landscape and urban design firm Field

ROLF OHLHAUSEN, FAIA



**The restored Gatehouse for Harlem Stage**

ture seemingly unworthy of any effort beyond demolition.

The previous case studies represent the quirky fringe of infrastructure reuse. More often infrastructure resides in buildings – power plants, mass-transit terminals, pumping stations, waste treatment facilities, etc. When a certain number of factors converge, such as location, scale, structural condition, and other features, an obsolete facility becomes a candidate for reuse. Where there exists architectural merit, infrastructure can be valued as a link to an era when public works were objects of civic pride, designed to show off the technological advances and legacy of the Industrial Revolution.

The New York Landmarks Preservation Commission lists 23,000

# Raze or Reuse

What to do with New York's obsolete infrastructure By Sara Hart

Operations and its multidisciplinary team won the competition in 2001. Its master plan, called Lifescape, proposed a diverse program, including cultural, athletic, and educational programming in tandem with a total ecological restoration of the fields, wetlands, and wildlife habitats. It's the latter goal that exemplifies the importance of this type of adaptive reuse.

The High Line and Fresh Kills are unusual types of adaptive reuse of infrastructure, even for a constantly evolving metropolis such as New York. Typically, adaptive reuse refers to historic or landmarked properties in which the historic features of a building are preserved or restored, while it benefits from a new, often radically different lease on life. In such projects, the goal is to adapt new programs to a structure with minimal disturbance to the original. Infrastructure conversion seeks, in most cases, to accomplish the opposite. The original, in this instance, can be an eyesore, as was the High Line, a derelict struc-

buildings, 107 interior landmarks, 86 historic districts, and nine scenic landmarks. Many of these are industrial buildings that were once part of New York's vast infrastructure and are now obsolete. The Gatehouse, a former pumping station built in Harlem in 1890, distributed water from a Westchester aqueduct to the city. In steady decline since it was vacated in 1988, The Gatehouse has been reborn as the new home of the Harlem Stage, part of the performing-arts complex known as Aaron Davis Hall, located at Convent Avenue and 135th Street in Manhattan. In 1981, the building was designated a landmark and listed on the National Register of Historic Places.

Ohlhausen DuBois Architects, in partnership with Wank Adams Slavin Associates (WASA), converted The Gatehouse into a modern performing-arts center with a 199-seat theater, rehearsal spaces, and offices. The \$16 million adaptive reuse project was conducted in accordance with the Secretary of the Interior's Standards for National



Landmarks. “From the beginning, we knew it was a landmark, so we worked with the existing spirit of the building,” explains Deborah Fantera, AIA, associate partner at Ohlhausen DuBois, mindful of the structure’s enduring significance as an object of civic pride. “It was a challenge to change this building from a temple to the water works system of old New York to a temple for the performing arts of the 21st century. We had to make interjections to the existing building so that it would function, but we did so in a way that respects and complements what was existing.”

The architects had to balance the requirements for historic restoration with the demands of a modern theater. They restored the building façades and exterior railings and medallions, iron doors, and the windows with stained-glass transoms. They also built a new slate roof, and cleaned and repointed the interior brickwork. Since the interior was not landmarked, they had license to insert two new floors to accommodate demountable platform seating and performance stages, and add central air conditioning. “New elements, such as the entry and an addition to the south, were designed in a contemporary spirit,” says Partner-in-Charge Rolf Ohlhausen, FAIA. “The New York Landmarks Commission was in sympathy with this approach and approved the project at the first hearing.”

Fantera is mindful of the fact that New York has a long industrial past and, as a result, has a remarkable inventory of structures that supported it. “For the Harlem community, The Gatehouse is a landmark, both literally and emotionally. Since Aaron Davis Hall celebrates



ROLF OHLHAUSEN, FAIA

#### The completed theater

Both the High Line and Harlem Stage projects required partnership between public and private sectors. The High Line currently has assembled \$130 million of the estimated \$170 million needed. Public funds account for \$103 million, and another \$3 million has been allocated from the federal Congestion Mitigation and Air Quality Improvement Program. The rest of the money will come from state and federal coffers, and private donations.

Similarly, The Gatehouse funding has been raised by the Campaign for Aaron Davis Hall, Inc. Of the \$30 million needed, the Campaign has received \$26 million from the City of New York. The Upper Manhattan Empowerment Zone, the Empire State

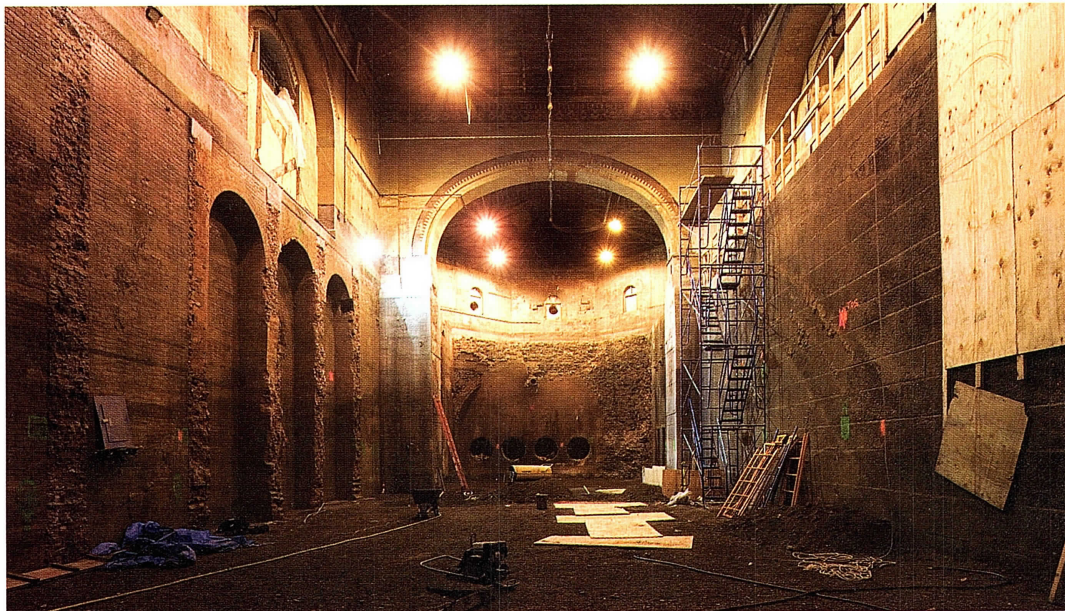
Development Corporation, the New York State Council on the Arts, and the federal government have contributed funding. And as with the High Line, private charitable foundations, corporations, and individuals have provided considerable support.

Whereas adaptive reuse of historic and landmarked structures will continue to be a priority for the city, there are hundreds of hidden pockets of obsolete infrastructure that could be given new life, when collective vision expands the definition of opportunity, and when a city embraces Jane Jacobs’ succinct verdict:

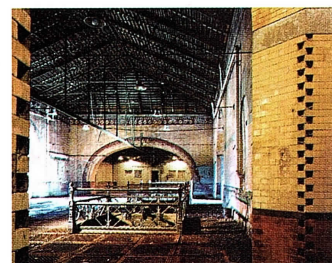
“The point of cities is multiplicity of choice.”

**Sara Hart** is a New York-based freelance writer and former senior editor at *Architectural Record*.

Harlem Stage at The Gatehouse  
 Architect: Ohlhausen DuBois Architects  
 Preservation Architect/MEP Engineer: Wank Adam Slavin Associates  
 Structural Engineer: Robert Silman Associates  
 Theater Consultant: Harvey Marshall Berling Associates  
 Landscape Architect: Elizabeth Kennedy Landscape Architecture



ROLF OHLHAUSEN, FAIA



ROLF OHLHAUSEN, FAIA

**The interior before construction (above), and after demolition to carve out space for theater (top)**

the artists and performers of Harlem, reusing this building and celebrating all that is wonderful about it reinforces the commitment of the theater to the community.”

Compelling vision, of course, comes with a hefty price tag, and success depends on assembling a complex package of funding.



# Changing Our Ways with Waste

Upcoming shifts will make the city cleaner in many ways

By Thomas D. Sullivan

New York City is coming to grips with what it discards, recycles, and flushes in new and better ways. While this may not seem thrilling, it is a significant step in making our huge metropolis more environmentally sound.

Past advances in public health, such as universal access to clean drinking water, may seem prosaic, but such subtle achievements are often the most critical in terms of real progress – especially for the most vulnerable people in our society.

The city is developing a number of facilities to deal with waste and sewage. Those projects reveal New York's developing sensitivity and sophistication in handling the by-products of its eight million residents.

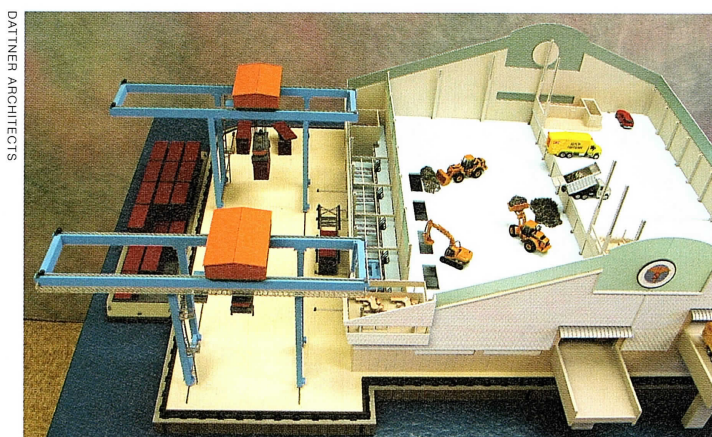
Some of the infrastructure renewal has been on a long process of development: The gigantic City Water Tunnel No. 3, the biggest infrastructure project in New York City's history, was started in 1970 and is slated to be completed in 2020 (see [www.nyc.gov/html/dep](http://www.nyc.gov/html/dep) for an intriguing look at this vast undertaking).

The closing of the Fresh Kills landfill on Staten Island obliged the city to adopt a new approach to handling its solid waste (also known as "garbage" or "trash"). This summer the City Council passed a Solid Waste Management Plan, which aims to be environmentally and economically sound, as well as equitable in terms of the burden on neighborhoods in each of the city's five boroughs.

The new plan requires the city to construct four marine transfer stations, where barges will ship closed containers of solid waste to

intermodal facilities, from which the containers will be put on trains or transshipped to their ultimate disposal.

As Richard Dattner, FAIA, Principal of Dattner Architects, who has long been involved with urban infrastructure projects for the Department of Sanitation and other public agencies, explains, each of the city's boroughs will "attempt to deal with its own solid waste." This means that waste facilities will be distributed more evenly among the city's neighborhoods. Previously these structures were situated in neighborhoods that were poor and not politically well-connected. As Dattner says, "We all have to share the cost" of living and dealing with its inevitable wastes – including the siting of buildings to treat and transship them.



DATTNER ARCHITECTS



DATTNER ARCHITECTS

Dattner Architects: Rendering and model of a Marine Transfer Station prototype





**weisz + yoes architecture: Rendering of NYC's new recycling center at the South Brooklyn Marine Terminal in Sunset Park; aiming for LEED Silver, the project includes wetland reclamation, photovoltaics, and use of materials with recycled content**

Dattner and his firm are working with the engineering firm Greeley & Hansen on the design of four Marine Transfer Stations. The huge scale of these three-tiered facilities will appeal to the inner kid: Trucks will roll up to the top level, then drop their payloads onto the floor below, where front-loaders will shovel the waste through slots in the second level's floor into 30-ton capacity containers, and then a gigantic tamper will compress the containers' contents. The containers will be covered and then rolled out on towering bright-blue gantries and lowered onto barges.

This process is a big step forward from earlier barging practice, in which the waste was dumped into open barges, allowing spillage and harsh odors, which then attracted scavenging flocks of gulls.

A number of shifts are occurring in the way the city handles wastes and recycling. For example, the Department of Sanitation took the unprecedented step of bidding out a 20-year contract for the processing of residential recycling. The long term of that contract provides the economic incentive for firms to create infrastructure for a new and improved generation of waste management.

For David Crawford, an architect with Malcolm Pirnie working on the Station 6 groundwater treatment complex in Jamaica, Queens, the new wave of infrastructure provides opportunities to create buildings that offer a 360-degree environmental benefit – creating environmentally sensitive structures (including meeting LEED standards) whose purpose is to improve our surroundings.

There are concrete benefits to moving solid waste by rail and barge – it will result in a “significant net reduction in miles traveled by trucks,” says Tom Outerbridge, manager of the municipal recycling division of Sims Hugo Neu. Some estimate that the barging and rail shipping of waste will reduce truck traffic by two million miles. That means cleaner air for city residents, and much less wear on the city's streets and highways.

Claire Weisz, AIA, of weisz + yoes architecture, who is working with Sims Hugo Neu on a large recycling facility in South Brooklyn, aims to shape the place to make it environmentally sound and to allow public access – to make it a kind of classroom. She notes that children are fascinated by recycling, and “kids tell their parents,” which increases family involvement in recycling. This kind of grass-roots education is needed: The Associated Press reported late last year that only 16% of the city's residential waste is recycled.

As these new facilities come on line, New York will see an improved quality of life – especially those who live in neighborhoods that have seen (and smelled) more than their fair share of the city's waste. We're getting infrastructure that works – and looks – better, is more sustainable, and provides a better balance of cost and benefit to the city's neighborhoods. Not a bad deal at all.

**Thomas D. Sullivan**, contributing editor of *Oculus*, was formerly the architecture critic of *The Washington Times*.



# Infrastructure: Uncovering Our Limits

By Illya Azaroff, Assoc. AIA

COLLECTION OF THE NEW-YORK HISTORICAL SOCIETY



**Castello Plan, New Amsterdam in 1660, redraft by John Wolcott Adams, 1916**

New York City is projected to grow by around one million people over the next two decades. What are our limits due to the infrastructure of our city? To examine the question of growth we must determine the factors in play. Historically, the limits of any city's growth have been governed by its geography, resources, and infrastructure.

Both New York's geography (waterways, shorelines, wetlands) and its infrastructure systems (roads, bridges, mass transit system, power plants) continue to change and are actively altered to meet demands of the day and the era. Shorelines are filled in and extended to create new land, and new water tunnels are quietly constructed more than 700 feet below the surface of Manhattan.

The roles that this partnership of geography and infrastructure fulfill have staggering magnitudes and dimensions. A few examples offer a sense of the scope of these systems:

— New York's water usage is approximately 1.09 billion gallons per

day (g.p.d.), which equals about 133 g.p.d./person. The entire water supply system is worth around \$144 billion.

— Annual power consumption is about 44.2 billion kilowatts; New York City's peak was 13.103 megawatts during our last power crisis in July 2005.

— The MTA system provides 2.4 billion trips per year in the metropolitan area. Average weekday ridership across the entire system is about 7.8 million riders; 7.13 million ride NYCTA subways and buses.

All of these systems have their limits, as we are continuously reminded in jolting and uncomfortable ways: long lines for packed trains, lower water pressure, summer brown outs.

## Our Natural Infrastructure

Water access is at the heart of New York's historic growth. Water has been a conduit as well as a barrier. Remarkably, 35.31% of the city's



468.9-square-mile area is water. New York Bay is one of the most intricate natural harbors in the world. It is at the confluence of three major bodies of water: the Atlantic Ocean, Long Island Sound (both are tidal bodies but are several hours out of sync), and the Hudson River, a non-tidal-flow component. Together, they generate a complex system of tides and currents, or hydrologic system, that extends from Albany to Montauk Point to Sandy Hook. These naturally occurring “superhighways” enabled early New Amsterdam to reach out to Upstate New York, Canada, and the rest of the known world. These natural highways not only contributed to the rapid growth of the city, but continue to reach an exceptionally large hinterland that directly supports the city both economically and with natural resources. These geographic features and abundant resources enabled New York City to become a world city and to rapidly grow beyond similar New World cities such as Boston and San Juan in a very short time.

Natural elements that are less apparent include the infrastructure developed by Native Americans, animal trails, and previously settled areas, as well as the geology of Manhattan Island. At the inception of New Amsterdam in 1613, area Indian groups, primarily the Lenape Indians, had long occupied parts of what are now the five boroughs. A remnant of their occupation is still visible. What we call Broadway was built on a Native American trading trail that stretched from lower Manhattan to Canada – and still does.

### Watering the Seeds of Growth

By tapping into the abundant clean water supply of Upstate New York, the Hudson Valley, Catskill watershed, and Delaware drainage basins, the city is supplied with clean drinking water. Its abundance has allowed the city's population to grow and will potentially allow its continued growth to its natural limit. The city's vast water supply system requires long-range planning and investment. The third city water tunnel, the most striking contemporary example of this long term commitment, began construction in the 1970s and won't be completed until 2020.

### Planes, Trains, and Automobiles

The city's mass transit system and its global portals represent an enormous infrastructural network and investment. The city has the two busiest rail stations in the country, and a complex and extensive transportation network with more than 12,000 yellow cabs; 120,000 daily bicyclists; subway, bus, and railroad systems; large airports; landmark bridges and tunnels; and ferry service. While nearly 90% of Americans drive to their jobs, only about 30% of New Yorkers do; about one in every three users of mass transit in the United States and two-thirds of the nation's rail riders live in New York and its suburbs. Three major airports serve New York City: John F. Kennedy International Airport, LaGuardia Airport, and Newark Liberty International Airport in New Jersey. About 100 million travellers used these airports in 2005 as the metropolitan region surpassed Chicago to become the busiest air gateway in the nation. These man-made or superimposed infrastructure elements take advantage of or overcome the given geography in a rather haphazard way. The biggest question is whether they can sustain the city's population growth. Already crowded systems like the

Long Island Rail Road and LaGuardia airport would likely be stressed beyond capacity.

### Think Globally, Not Locally

Given the equally abundant natural and man-made infrastructures, clean water, and access to resources, the question is where the natural limit for growth lies: Will the natural limit depend on energy resources, or will further growth be aided by innovation that brings energy efficiency to every home? Cities larger than New York, such as Tokyo, London, and Mexico City, do not have the natural water resources we do and use far less energy per person. Are they successful models for our growth? Perhaps the natural limits lie in geography. Is New York City at its limit, given the proximity to other major metro areas?

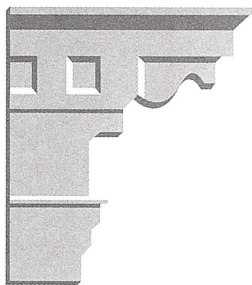
These questions suggest that a change in scale is necessary. Perhaps we should look at the issue globally rather than regionally. Current geographic and global resource management research has switched from local and regional models to the idea that earth is a single organism. The global model (or Gaia model) states that every change or action, no matter how minute, has some effect that is felt by the whole body. In that case, given the limited resources available and the expense of infrastructure to maintain constant resource delivery, the future growth of New York City is plausible but will occur at the expense of other metro areas in the Bos-Wash megalopolis. Geographic and resource limitations will ultimately cap the city's population growth.

Human activity resulting in global warming will have the greatest impact on the population growth of the city. In fact, the inevitable reconfiguration of the given geography of New York City by some natural catastrophe such as rising sea levels will impact not only future growth but any sustained identity as a city. If recent data from low orbiting atmospheric satellites' TOMS (Total Ozone Mapping Spectrometers) is accurate, the shape of the five boroughs will be unrecognizable in 50 years. Over the past 20 years, TOMS and URAS (Upper Atmospheric Research Satellites) have collected data on the earth's atmosphere that has been used in global weather modeling computers in Japan and the U.S. Resultant models show the rapid progression of global warming that, in the worst-case scenario, would result in a 20-foot rise in our oceans in the next 50 years. The shoreline as we know it, as well as the city, would change dramatically. Most of Manhattan would be underwater and Staten Island would be gone, as well as large parts of all the boroughs. The best-case-scenario model has the seas rising one to two feet, enough to submerge coastal wetlands such as Jamaica Bay and change ecosystems.

Under the pressure of a growing population, systems can be expanded and behavior altered. But the limits will be space (and our associated notions of what constitutes a livable environment) and the global threats of both resource scarcity and climate change. It's an open question just how limited the city's growth will be. Architects and engineers will have a large role in determining how the question is answered.

Ilya Azaroff, Assoc. AIA, is the director of design at the design collective studio. In addition to his work in design, the arts, and serving as AIANY VP for Design Excellence, he holds a BA in Geography and is a former member of the Association of American Geographers.





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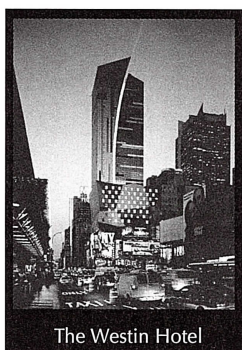
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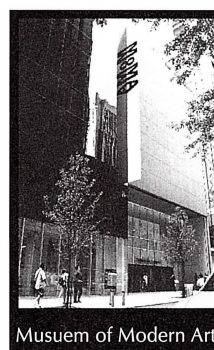
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# Urban Ecology

Outside View

By Christopher Hume



FIELD OPERATIONS/DILLER SCOFIDIO + RENFRO, COURTESY THE CITY OF NEW YORK

**Field Operations and Diller Scofidio + Renfro: the High Line, New York City**

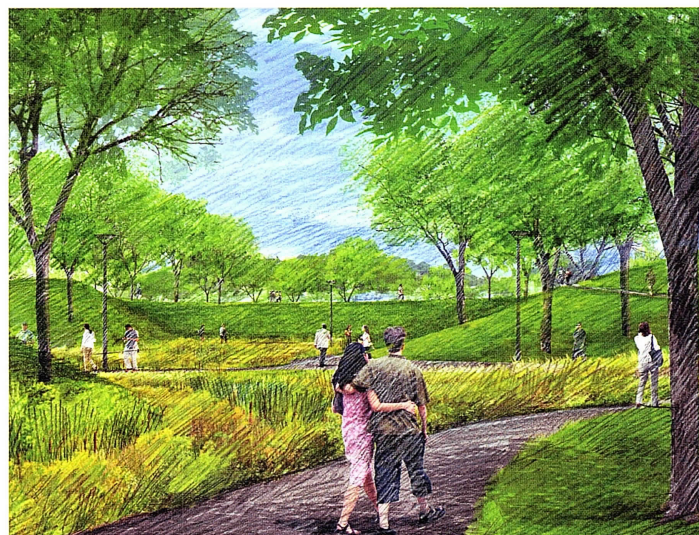
If the 20th century belonged to architects, the 21st may go to landscape architects.

Despite the rise of the celebrity designer, each dedicated to creating his own instantly recognizable object buildings, the real urban transformation is being brought about by remaking the postindustrial infrastructure. This means finding new uses for the decommissioned shipyards, empty harbors, abandoned rail lines, and landfill sites that proliferate in cities throughout Europe and North America.

There are no better examples than New York and Toronto, where firms such as Michael Van Valkenburgh Associates and Field Operations (New York), West 8 (Rotterdam), Janet Rosenberg and Associates (Toronto), and Claude Cormier Architectes Paysagistes (Montreal) have begun the process of regenerating the urban ecology. Whether dealing with small downtown properties (Teardrop Park) or vast sites (Fresh Kills Park, Lake Ontario Park), derelict structures (High Line Park) or topographical engineering (Don River Park), these landscapists are altering profoundly the very ground we walk upon.

In the process, they are opening up and reintegrating numerous tracts of land that have been long forgotten and neglected. Ironically, it is these forgotten districts and neglected areas that could well turn out to be the city's saving grace. In Toronto, where there are 2,000 acres on the waterfront waiting redevelopment, the potential is vast; indeed, the revitalization of the precinct will bring 100,000 residents downtown and give the city a new face. In New York, Van Valkenburgh's scheme for the Brooklyn waterfront will breathe life into a moribund precinct. Even before work starts, the inevitable luxury condos are being planned.

Similarly the High Line has prompted enormous development pressures. As Field Operations, with Diller Scofidio + Renfro, reimagines the 1.5-mile elevated railway, it will eventually become an extra-



MICHAEL VAN VALKENBURGH ASSOCIATES

**Michael Van Valkenburgh Associates: Don River Park, Toronto**

ordinary linear park. Another Field Operations project, Fresh Kills, will turn the 2,200-acre landfill site on the west shore of Staten Island into an enormous park with wetlands, woodlands, bicycle paths, and open vistas, as well as industrial remnants. Work, which will start in 2007, could last as long as 30 years. The same kind of timelines apply on the Toronto waterfront, which won't be completed for decades.

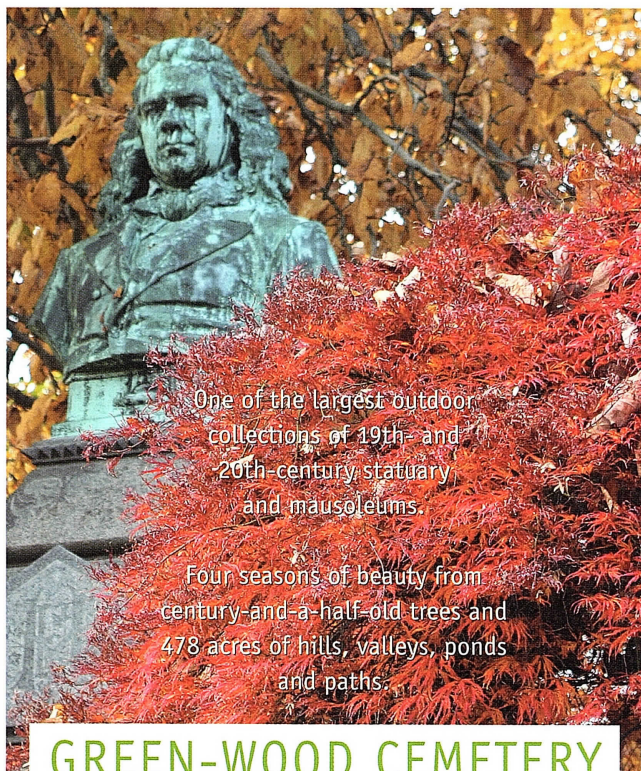
Interestingly, in both cities the promise of revitalization – of new sustainable landscapes, partly natural, partly manufactured – comes at a time when the return to urbanity has become a stampede. For the past 15 years that has meant little more than condo towers popping up in every available space; perhaps that untrammelled growth has led to the renewed interest in landscape architecture. We have built up our cities to unprecedented heights and densities but without much thought to the infrastructure that makes them livable, let alone sustainable.

As has been observed many times, it's not the buildings but the quality of the space between them that makes a city a success or failure. That space is the domain of the landscape architect, and suddenly it seems there is a generation of practitioners who have the ability, literally, to change the world.

Their response will not be the pastoralism or artificial naturalism of the 19th century. The 21st-century park and contemporary urban ecology represent an attempt to reconcile past, present, and future. Even if history could be undone, it couldn't be forgotten. We inhabit it, after all. But it can be remade and remediated: A garbage dump can become a park; an abandoned harbor, a thriving community. The landscape will never be the same, but at last we will be able to live in it.

Award-winning journalist [Christopher Hume](#) is the architecture critic and urban affairs columnist of the *Toronto Star*.



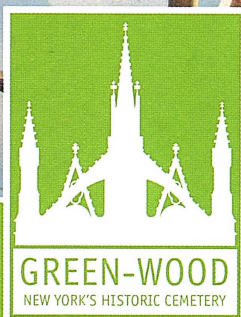


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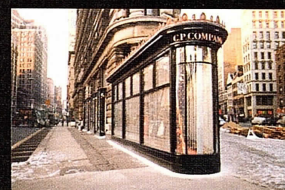
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# 50-Year Watch

**First Presbyterian Church  
(Fish Church), Stamford,  
CT, by Wallace K. Harrison,  
1956-58**

**By Fred Bernstein**



FRED BERNSTEIN

**Wallace K. Harrison's First Presbyterian Church (Fish Church) in Stamford, CT**

hope it's my last capital campaign," says David Van Dyke, pastor for 27 years of the First Presbyterian Church in Stamford, CT. He is raising \$750,000 to help waterproof one of the most underappreciated buildings in the New York region – a masterpiece by Wallace K. Harrison that marries the glories of a gothic cathedral with the structural possibilities of reinforced concrete.

Harrison, who had never designed a church before, was determined to create an ethereal space. After visiting the legendary Ste. Chapelle in Paris, he reportedly told members of the congregation, "We can take the stained glass even higher." After all, he had new technologies to work with. Harrison devised a system in which 20,000 one-inch-thick panes of glass were inserted into mostly triangular or trapezoidal concrete panels, which in turn were inserted into walls of folded concrete. Their folds gave them the strength to rise to a height of 64 feet without additional supports.

Looking to make the building acoustically perfect, Harrison shaped it like a giant megaphone. But the budget was tight (about \$1.5 million), and to compensate for the great height at the rear of the sanctuary, he let the roof swoop down over a much lower narthex, or foyer. The result was the fish shape that Harrison said was unintentional, but which led to the nickname "Fish Church" (the fish is an early Christian symbol).

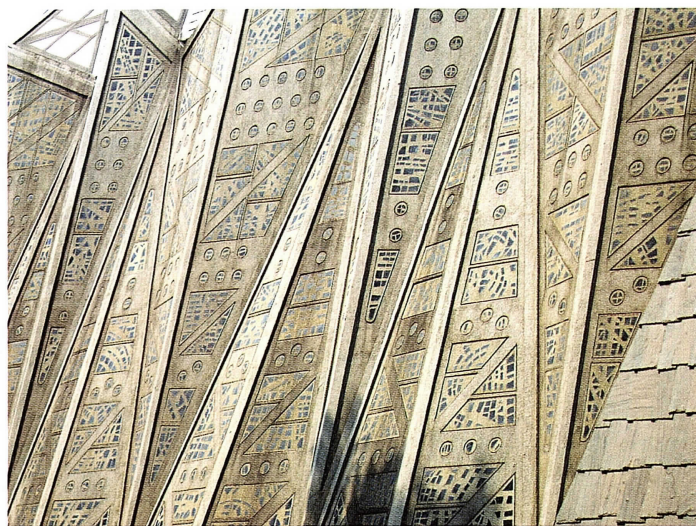
The church's most extraordinary features are the panes of glass that form most of the wall surface. From the outside, the effect is intriguing – the dark glass forms an abstract composition. From the inside, the effect is overpowering. As the architecture critic Wolf von Eckardt wrote after visiting the building nearly 50 years ago: "From a small, dark narthex, we were drawn into an immense, gothic-like vault of multicolored glass...We were immersed in soaring space and jeweled light."

Minor adjustments over the years, involving lighting and furniture, have done nothing to diminish the impact of Harrison's building.

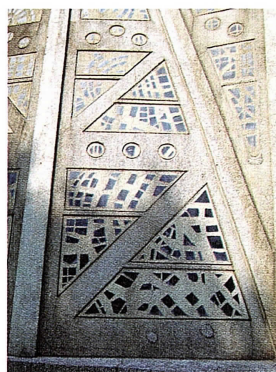
But the church, however inspirational, has always had practical problems. Chief among them, the concrete was made with too much silica, according to Christine Negroni, a congregant involved in raising money for the latest renovation. "The silica reacts with moisture to create a gel. As the gel expands, it creates cracks."

About 15 years ago, the south façade (which, under direct sunlight, expanded and contracted more than the north side) was replaced – a job that required the creation of thousands of pieces of glass by Rohlf's Stained & Leaded Glass Studio in Mt. Vernon, NY (the original glass was made in France). This time, the panes were placed in panels of epoxy. According to Rev. Van Dyke, "The epoxy has the ability to expand and contract with the building, which the concrete didn't do." In the meantime, the north façade is holding up, and the latest round of repairs, to the roof and flashings, is meant to prolong its lifespan by keeping moisture out of the concrete.

The repairs are a financial strain on the congregation of about 400 families. But by preserving the building, they aren't just ensuring themselves an inspirational place to worship – they're helping to ensure that Harrison (an Episcopalian whose funeral was held at the Fish Church in 1981) is remembered not just as a builder of monoliths, but as an architect of subtlety and grace.



FRED BERNSTEIN



FRED BERNSTEIN

**Detail of triangular and trapezoidal concrete panels with stained glass inserts**

Fred Bernstein, an *Oculus* contributing editor, studied architecture at Princeton and law at NYU, and writes about both subjects. His work appears regularly in *The New York Times*, *Metropolitan Home*, *Architectural Record*, and on his own Web site [www.twinpiers.com](http://www.twinpiers.com).



# Manhattan Works

In Print +

**The Works: Anatomy of a City, by Kate Ascher. New York: The Penguin Press, 2005. 256 pp. \$35.**



Just as Gray's *Anatomy* reveals hidden structures beneath the skin, Kate Ascher's *The Works: Anatomy of a City* reveals the infrastructure of New York beneath that picture-postcard skyline. Each chapter looks at a system that is vital to the hustle and bustle of New York. The coming and going of people; the transporting of freight; the making, moving, and using of energy; the transmission of

words, images, and sounds; the flow and flushing of water; and the hauling of garbage – all are presented from an array of perspectives. How did the subway system grow from the 1904 IRT line? How is electricity made? How do 30 billion pounds of steam flow beneath Manhattan streets? How do the 10,000 employees of the Sanitation Department dispose of 25,000 tons of garbage daily? And why are some trees good street trees?

On every page, images nicely supplement the text. The journey of a carrot from California to the Hunts Point Market? A map shows its route. What are the kinds of bridges? Ten types are illustrated. What type of ship is that in the harbor? Check out the drawings on page 73. Why are there so many types of railroad cars? An illustration linked over seven pages depicts the types of cars and their cargoes that a train pulled into town on August 26, 2003. How does that aqueduct flow? A diagram charts its elevation from the Catskills to the Kensico Reservoir.

*The Works* begins and ends with streets. The anatomy lesson starts with the observation, "The streets themselves, while simple in appearance, provide either the covering or the foundation for a world of related infrastructure." Closing the circle, we learn in the last section that "the Department of Sanitation endears itself most to New Yorkers during snowstorms....Once two inches cover the ground...they hit the streets."

The final chapter looks at future projects and concepts. New plans for moving people, moving freight, getting power, communicating, and keeping the city clean will grow out of the infrastructure that is New York. After reading the book, such issues as development of the Second Avenue Subway and the Lloyd Aquifer are easier to understand.

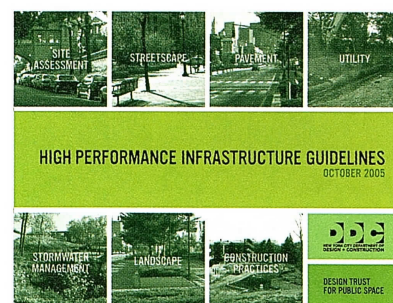
This book packs a lot of information. The reader will wonder at the intricacy of the details, chuckle at some, and feel relieved that someone else is handling the rest. This information serves not just

urban planners, designers, and builders, but any serious citizen who has ever wondered what's beneath it all.

Pamela Drury Kliment, a landscape architect, coordinates the neighborhood parks development program of the City of Seattle. Born and raised in Manhattan, she has what is reputedly the nation's largest photographic collection of manhole covers.

**High Performance Infrastructure Guidelines, by Hillary Brown, AIA, Steven A. Caputo, Jr., Kerry Carnahan, and Signe Nielsen. Published jointly by the New York City Department of**

**Design + Construction and Design Trust for Public Space, 2005. 224 pp. Free PDF download at [www.nyc.gov/html/ddc/html/ddcgreen/reports.html](http://www.nyc.gov/html/ddc/html/ddcgreen/reports.html)**



A no-nonsense guide to green infrastructure, this book is divided into three parts: Achieving High Performance, City Process, and Best Practices. In an introduction, Department of Design and Construction commissioner David J. Burney, AIA, writes: "This document outlines the range of possibilities suggested by the notion of green infrastructure. The landscape-intensive nature of this concept demands a certain kind of approach, and the reader may note particularly urban variables such as scale, age, and proximity, have been given special consideration."

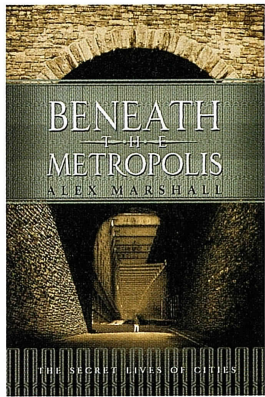
Especially useful is a two-page matrix listing over 50 activities, such as conducting soil analysis, using bioretention, and minimizing the effect of utility work, and their impact, or lack of it, on such desirables as reducing waste, improving air quality, and reducing noise pollution. There's also an excellent glossary.

Stephen A. Kliment, FAIA

**Beneath the Metropolis, by Alex Marshall. New York: Carroll & Graf, 2006. 268 pp. \$29.95.**

"From the lost secret chambers of a first-century religious cult under the streets of Rome to the steel-and-glass trains that whisper through the Paris Metro, and the murky rivers and streams that run under London – these subterranean regions reveal a city's character – its purpose, its past, and perhaps its future. Life below the street tells us how cities survive, grow, and change; of engineering brilliance, political upheaval, and hidden history – a DNA imprint of what goes on above ground."

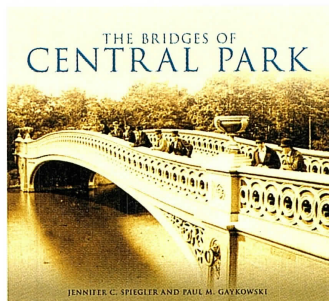




This excerpt from the introduction marks the flavor of Marshall's entertaining book, which includes life under the surface of cities such as New York, Chicago, Cairo, Moscow, London, Paris, and Rome. The first page in each city contains a vertical sketch – a cross-section of what happens below ground there at every level. Agreeably illustrated and written in a breezy style, it is clearly aimed at the serious lay person.

Stephen A. Kliment, FAIA

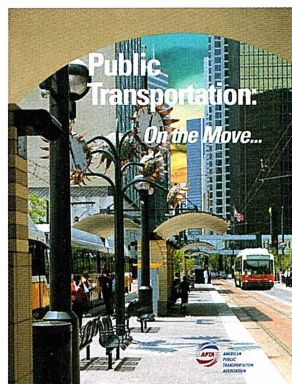
**The Bridges of Central Park,**  
by Jennifer Spiegler and  
Paul Gaykowski. Charleston,  
SC: Arcadia Publishing,  
2006. 144 pp. \$19.99.



If you like bridges, feast on more than 200 images of the 50-plus bridges that serve as the infrastructure of Central Park by linking/separating the park's multimodal path and road system. In 1862, the Board of Commissioners of Central Park classified the bridges into three groups: utilitarian transverse road bridges built in "a plain manner" of ordinary stone and brick so as to remain inconspicuous (some are hewn out of solid rock); fancy bridges made of imported stone and brick, many of them finished with special stone abutments and iron superstructures; and simple rustic bridges made chiefly of wood. Calvert Vaux's assistant Jacob Mould designed the more ornate bridges.

Stephen A. Kliment, FAIA

**Public Transportation: On the Move,** edited by Marc Wortman.  
John Morris Dixon, FAIA, consulting editor. New York: Visual Reference Publications and Washington, DC: American Public Transportation Association, 2005. 223 pp. \$60.00.



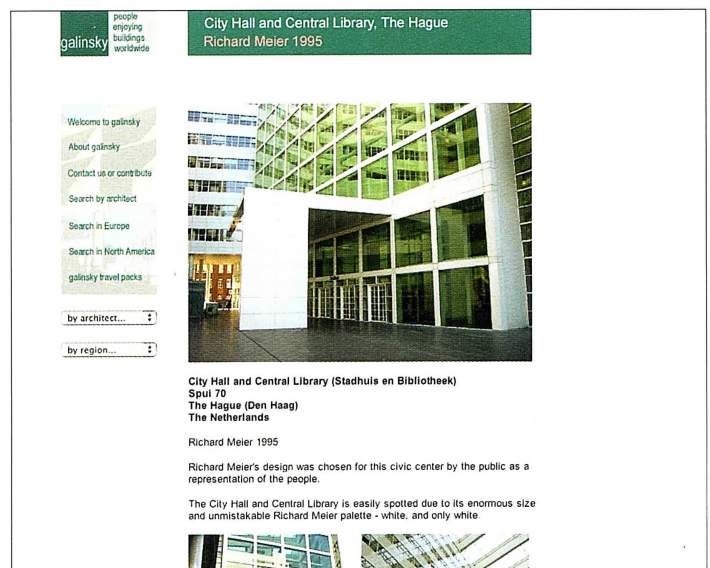
An impressive picture book showing the work of the nation's top transportation planners and architects. With all those riches, why do so many folks still rely on the automobile?

Stephen A. Kliment, FAIA

**Click Here:** [www.galinsky.com](http://www.galinsky.com)

A rarity in architecture media that seldom mentions if the featured building is built, where it is, and how one can actually visit it, Galinsky.com is a guide focused on modern buildings as actually experienced. This free architectural resource features straightforward assessments and photographs from contributors who steer clear of "architecture speak." Organized by architect and by region, the site offers useful information about the location of the structure, related Web sites, and relevant publications.

Writing this review from Holland prompted me to put Galinsky.com to an "NL" test. I quickly located 13 relevant pages of buildings. Richard Meier's 1995 City Hall and Central Library in The Hague has good photographs and directions. The description is tepid, however. It could use a little dish, such as the fact that the design was a second-place competition winner behind an OMA/Rem Koolhaas proposal for a Manhattan skyline-like structure. It also misses a good description of the immediate context: a larger urban redevelopment that includes buildings by Rob Krier, Michael Graves, and Kohn Pedersen Fox. Koolhaas's seminal Dance Theater preceded the City Hall and is right next-door – but is not referenced. Renzo Piano's National Center for Science and Technology (NeMo) in Amsterdam has a similar dearth of contextual information, like the nearby Oosterdok's modern housing from the likes of David Chipperfield, Future Systems, and Cruz y Ortiz.



But the page for Asymptote's Hydra Pier in Haarlemmermeer is terrific. Excellent photographs and text give an idea of what the architects originally intended when it was built in 2002, then its deteriorated state as encountered in 2005. This stellar entry, however, shows two weaknesses of the site: Not all entries meet the minimum information requested in editorial guidelines, and the status of some buildings obviously needs to be updated. Perhaps Galinsky.com can enlist architecture enthusiasts worldwide to check on and update its growing listings.

By Margaret Rietveld, AIA





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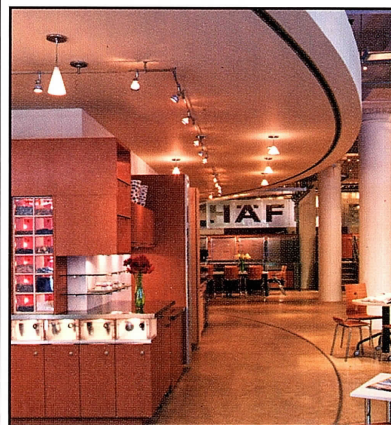
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# Show Me the Water

## Last Words

**Rick Bell, FAIA**

**Executive Director**

**AIA New York Chapter**

**Water, water everywhere, nor any drop to drink.**

Samuel Taylor Coleridge

**Of all our natural resources water has become the most precious.** Rachel Carson

The link between water and development has influenced the growth and health of every major city. Cities are defined by water. And cities, including New York, are undertaking mammoth civil engineering projects to assure ongoing access to sources of drinking water. This is not new. The dispute between Alexander Hamilton and Aaron Burr was exacerbated when they worked with common cause to create the Manhattan Company, New York City's first water utility. Its waterworks, boasting a storage tank "holding a maximum of 123,354 gallons of water" (according to Gerard T. Koeppel in *Water for Gotham*) was located between Chambers and Reade Streets, more or less facing the present-day offices of the NYC Department of City Planning. This site overlooked the Collect Pond, the source in 1799 – when the Manhattan Company was approved by the New York State Legislature – of most of New York's barely potable water.

Hamilton and Burr agreed on one thing, that the water company they created should first and foremost be a financial instrument. It quickly evolved into the Chase Manhattan Bank. In 1804, Burr and Hamilton crossed the Hudson in separate boats to resolve other disputes on the Weehawken heights. Their seconds in the famous duel, John Coles and John Church respectively, had both been board members of the Manhattan Company. By then the Bank of the Manhattan Company was "firmly established as one of the nation's most powerful and influential financial institutions," but Koeppel reports that the water it supplied was dismal.

A hundred years later, the Board of Water Commissioners was created in Los Angeles. According to historian Kevin Starr in *California: A History* (Modern Library, 2005), the water supply that came via the Los Angeles Aqueduct's 235 miles of canals and conduits allowed for the enormous eventual growth of the city but was "plagued by claims of deception, double-dealing, and conflict of interest." Starr writes of the "desiccation and devastation of the once-fertile Owens Valley when the Owens River was siphoned off to Los Angeles." Roman Polanski's film, *Chinatown*, dramatically fictionalized the waterborne creation of Los Angeles, with the Mulholland surrogate justifying annexation by saying, "Either you bring the water to L.A., or you bring L.A. to the water." Neither Los Angeles nor New York, with its Croton Aqueduct system bringing water down to the expanding city from upstate, would have been possible without water from elsewhere.

Disputes about water appropriation have occurred in as many places as civil engineers have roamed. In *Water Wars: Drought, Flood, Folly, and the Politics of Thirst*, Diane Raines Ward writes of rural residents in Wales who "blew up two water-supply



**Bell above Water Tunnel No. 3**

dams to protest the diversion of their water to the English city of Liverpool." She also speaks of the rising costs of water in places such as Bangkok, Jakarta, Manila, and Mexico City, where "groundwater has been so depleted that the ground underneath the cities is collapsing."

Lewis Mumford, in *The City in History*, wrote: "New York was the first big city to achieve an ample supply of pure water, through the building of the Croton system of reservoirs and aqueducts, opened in 1842." The current water supply of New York City is 1.2 billion gallons a day. When Water Tunnel No. 3 is completed, this supply will double, and according to Mayor Bloomberg, "Future generations of New Yorkers will have the clean and reliable supply of drinking water essential for our growing city." As far as NYC development goes, the names Hudson Yards and Atlantic Yards both immediately evoke the need for drinking water. The city's aspiring actors and perspiring politicians all seem to carry bottles of spring water whose labels proclaim: "possibly the best tasting water in the world." Bottled water, carbonated or otherwise, has been the drink of choice for many who can afford it worldwide. Bottles can be large – Diane Ward talks of "Medusa Bags" that Canada's Global Water Corporation would use to send 5 billion gallons of water a year to China from Sitka, Alaska's Blue Lake.

Without assured sources of clean water, will the coasts be toast? The recent "Who's on Top" debate between the AIA New York Chapter and the Institution of Civil Engineers was held at a watering hole in the East Village. The debate proved to many in attendance that the infrastructure design of a city's water supply and the way we bridge across the divides that define city edges are simply too important to be left to civil engineers without creative collaboration with architects.

Water politics can no longer be a reflection of appropriation or reflexive annexation. Nor is abstinence a possibility. If we can complete the Bruckner Boulevard, we can finish the third water tunnel. If we don't, it will be standing room only in Sitka.

ANNIE KURTIN



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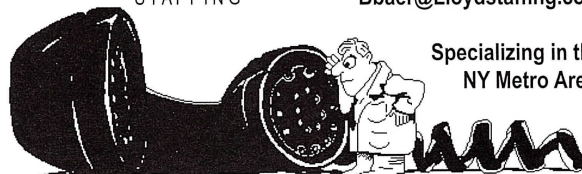


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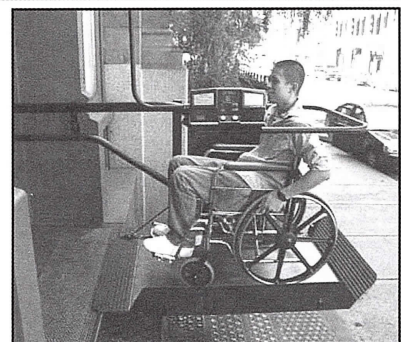
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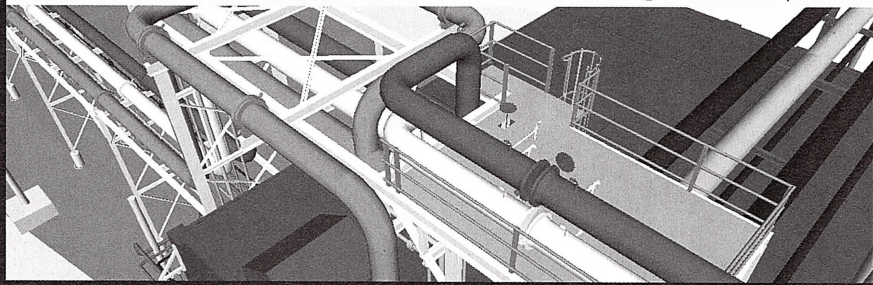


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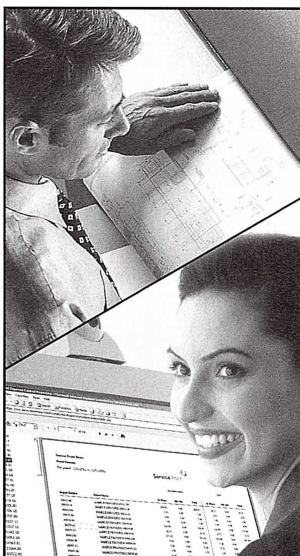
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