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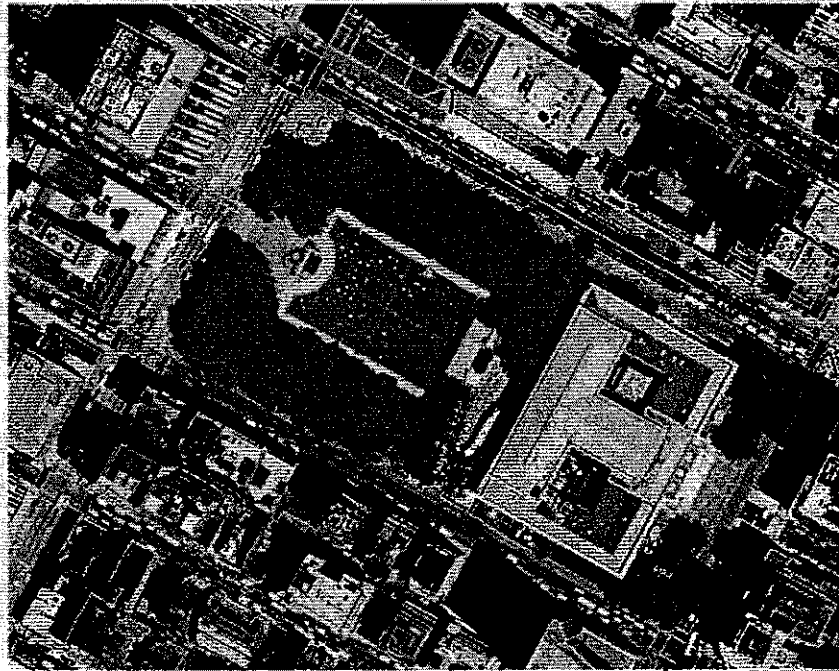
STREET FURNITURE

The most complete map of the city and everything in it.

BY ADAM GOPNIK

On a gray Thursday morning a couple of weeks ago, in a big faceless building near City Hall, an "elite" group of city-government people got together to look at what the Map has already captured, and to tell the mapmakers what they dreamed of capturing next. People like to say that New York is a city of interesting and obscure subcultures, and

of a kind of mirror-image Hong Kong: a successful socialist city-state plumped down in the midst of an ocean of dogmatic free-marketters. They know that everybody in the big country outside looks at them suspiciously. They have evolved a defensive, careful formal language of their own, which other New Yorkers only occasionally overhear, in subway an-



The orthographic depiction of Bryant Park and the Forty-second Street library.

one of the most interesting and obscure of these is the City of New York. The people who run the city (as opposed to the politicians and the police, who mostly react to it) often spend more money and touch more lives than the people the newspapers like to write about, but they are mostly invisible to the rest of us. (The Department of Environmental Protection, for instance, spends about a *billion* dollars every year, but you do not know the name of Joel A. Miele, the man who is in charge of spending it.) New York City government people tend to regard themselves as citizens

nouncements of the supervisors-are-currently-investigating-the-delay-we-hope-the-trains-will-be-moving-shortly variety. They also have a more informal language—someone will say of a project, "It's stuck on Stanley's desk," to instant nods of understanding, as though someone at a DreamWorks meeting had said, "Steven's reading it this weekend"—and even a decorating style, which is partly Moscow-on-the-Hudson, partly good-government civics textbook from the sixties. Where everyone else in New York offices does small things in stylish ways, they do very big things with no style at

all. The other morning, for instance, bits and pieces of the Map had been put up on a white wall with masking tape that seemed to date from the Wagner administration. As Alan Leidner, who is the head of geographic-information systems for the city, and the father of the Map, spoke about what the Map could do, the Map itself kept falling down behind him, like the baggy pants of a burlesque comedian.

Leidner has the look of a city man. He wears white shirts, thin ties, and an air of steady, ingenuous sincerity—like a high-school teacher of the fifties, concerned about juvenile delinquency, but sure there are no bad kids. “Well, the wonderful news,” he announced to the group, “is that LION and GOGIS are close to being fully registered to the base map, and”—he held up a sheaf of six CDs in jackets—“*here* it is, in two versions, seamless, and borough by borough. Within a week, the Map will be ready. But don’t ask me how we distribute it.”

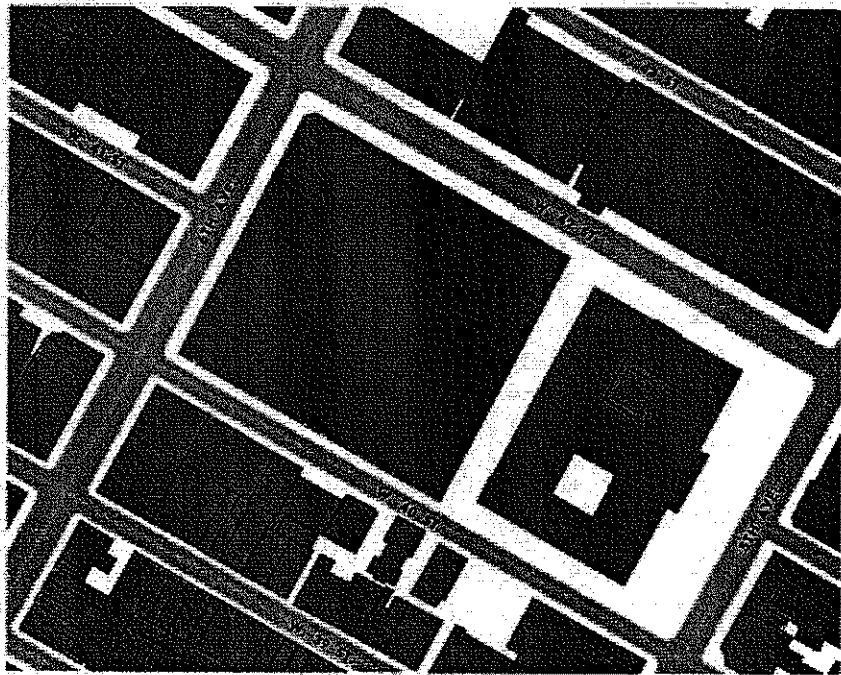
What is the Map? The Map has not yet got a lot of P.R., partly because it is a colossal event only in the geographic-information-systems world, and *GEO-World*, the *Women’s Wear Daily* of G.I.S., typically runs articles with headlines like “Geospatial Events Promote Federal Initiatives” and “Saskatchewan Implements New Land Title System.” Nonetheless, the Map is a big deal. Its official name is NYCMAP (pronounced “nice map”), and it is the first integrated, one-inch-to-a-hundred-feet, perfectly accurate map that has ever been made of the entire City of New York and everything in it. It was finished about three months ago and has been called “probably the most complicated and detailed urban map ever created,” the most nearly complete picture of a city that has ever been made. It shows—not just as imagery but as defined, color-coded, click-on-this-encyclopedia-entry items—more than a million and a half distinct features, including every building, street, tank, bridge, tower, antenna, courtyard, runway, curb line, railway fence, elevation, ventilation grate, cemetery boundary, river, lake, pond, stream, swamp, beach, shoreline, pier, pavement center line, alley (1,976), and ocean (one) in the entire City of New York. It will soon show every tax lot, sewer main, subway entrance, and power line in the city, not to

mention the paths in the parks. By the time it is revised, next spring, it will show all the “street furniture” of the city, giving a place name to every parking meter, fire hydrant, manhole, and telephone booth. It even has its little quirks. It has no category for statues, and Liberty exists, alone, as a hidden allusion. She is merely called a “monument.”

One of the difficult things about the Map is that it is really many maps, a layer cake of plans, each laid accurately on top of the one before. There are so many new elements being mapped onto it every day that there are city people who seem to believe that in a couple of years it may be cheaper and more comfortable to forget about the city and just

any version of the Map on top of any other version of the Map and say, Oh, this is the same place.

Of all these versions, or layers, though, the two “base” layers are the orthographic map and the planometric map. The orthographic map is basically a very big, amazingly well-focused overhead snapshot of New York, broken down into seven-block units called “tiles.” There are 1,870 tiles. Its dominant colors are asphalt-black, tree-green, and rooftop-beige, with the reds and blues of undocumented cars sprinkled over it like confetti. The planometric map is a stylized map that outlines all the features in the photographs and gives everything a name. You can adjust the colors to taste, but the dominant color of

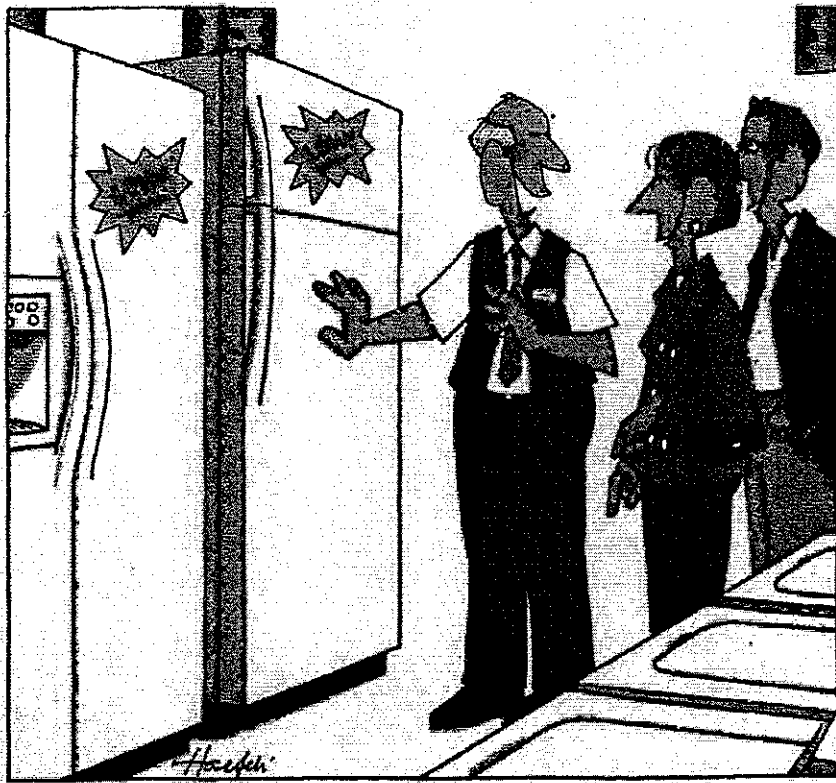


The same area in the stylized, planometric version of the map.

move into the map. When people ask Alan Leidner how big it will be, for instance, he finds it hard to answer, since it exists in as many forms as you have questions to ask it. And because it has so many versions, it’s very hard to describe. When people ask if you could put it in your glove compartment, the answer is that you could, if you drive a very big car. But the real value of the Map is that every version of it—the one that shows sewer mains, say, and the one that shows tax lots—will be drawn to the same scale and will point in the same direction, so that you could lay down

the map that day was red—since red stood for buildings—except in Queens, which was mostly green. (White stood for nothing worth noting. There was more white on the map than you might expect, especially on the West Side.)

A project as vast as the Map ought to have begun as a sketch on a napkin. The Map began as a sketch on a napkin. A decade ago, Alan Leidner was having lunch with Richard Steinberg, of the Department of City Planning, at Spaghetti Western, a restaurant on Reade Street popular among city people. At the time, there were a lot of maps but



"Now, this baby can hold up to five hundred magnets."

no one map. "We talked about the difficulties of the situation as it existed," Leidner says. "If you had a water-main break, say, you had five responding agencies, each arriving with its maps, and a Keystone Kops comedy of 'Mine is here, where's yours?' There were lots of maps of the city, but basically none of the maps had anything to do with each other." On a Spaghetti Western napkin, Leidner sketched out the idea of a base map to which all other maps could be oriented—"a pastrami sandwich with Velcro tags."

"Step by step, we went through the city to win approval," he says today, shaking his head at the thought, like a man who has ascended Everest not only without oxygen but without a sweater. It took about five years and two administrations until the actual mapping started, in the spring of 1996. The Map began with a big overhead snapshot. Taking a big overhead snapshot of New York, as it turns out, is not so easy. If you take overhead pictures of the city in summer, you cannot see the features on the street because the leaves cover them. If you take

pictures in "leaf-off" time, the sun will be at an oblique angle, casting long, occluding shadows on tall buildings and on the pavement below. The mappers had to make two series of flights. One was in "leaf-off" time, in early spring. The second filled an entire day around the summer solstice, June 21, 1996. (If you were out walking your dog that day, you might be on the map.) They took 1,672 overhead individual photographs, each of about a ten-square-block area, and the photographs were scanned into a computer at a resolution of about one foot. (This means that if something is a foot large or longer on the ground, you can see it clearly in the photograph.)

Then everyone got into an argument about what features to "capture" on the second layer, the planometric map. Alleys and airshafts were included, at long last, but water towers and fire escapes were left out. Awnings were the subject of an intense debate. "Awnings! What do you *do* with them?" Leidner says, aching. "And then driveways! When you capture them, what do you do with them?" The map men finally decided to

itemize concrete awnings—movie marquees, for instance—and not fabric awnings. (They omitted some other important features. At that Thursday-morning meeting, the Department of Finance complained that the mappers had forgotten all about the billboards. Since billboards pay taxes, the Department of Finance would like to know exactly where they all are. When the revision is completed, it probably will.)

Once the city men had decided which items on the photographs they wanted captured, they sent the photographs and the list of features to a company called Analytical Surveys, Inc., in Colorado Springs, where seven people, working with styluses on computer screens, drew outlines around the features in the photographs—each Rocky Mountain analyst staring through a stereo viewer for a year at a little quadrant of Brooklyn, trying to distinguish a driveway from a walkway. (The Map was cheap. It cost around three million dollars—or something less than Carolyn Roehm has spent to redo one centimetre of it. This is because computer mapping is an eager new industry, and all the people in it knew that whoever worked on the map of New York would be able to put on airs, and up prices, when the people from Akron came, asking for *their* map.)

"The trouble was, once we had the planometrics from Colorado, how do you do quality control?" Alan Leidner says. "The map is worthless if it's not drawn right, but how do you know if two million features have been drawn right? Fortunately, we were able to bring in Sean Ahearn's team at Hunter and people like Bob Sklar."

Bob Sklar was born fifty years ago in East Flatbush. He has always been interested in maps of New York—when he was eleven, he wrote to the city with a query so detailed that he was offered a job in the map department. (His mother still has a copy of the letter.) It became his job to compare the planometric tiles to the photographic tiles. He became the fact checker of New York. "I used my particular knowledge of the city to clarify roads that run under roads," he says. "The roads under the Major Deegan Expressway around 149th Street in the Bronx, for instance. I was very pleased to be able to untangle that from memory."

I was also able to use my firsthand knowledge unravelling the interchanges of the George Washington Bridge. That was probably the hardest thing on the Map. There are two complete levels, each of which has feeder roads, and the interchanges are all duplicated there. That was like untying a knot."

When Bob Sklar didn't remember how the roads and buildings really ran, he got on the subway with a piece of the Map and went to look. "There were many places where I went to check the arrangements by myself. I'm very pleased with my work on the buildings at the Staten Island Ferry Terminal, for instance. There were also many visible subway tracks that had to be clarified. There's a very confusing section of the B-train tracks in Brooklyn, and I spent an enjoyable day clarifying those." His favorite incident in his two years of work involved a piece of the Map that showed a bit of Manhattan and a bit of the Bronx in a single tile, on either side of the Harlem River. "The Colorado coder had left the streets in the Bronx as 'No-Name.' I learned later that he was under the misapprehension that the Bronx was part of New Jersey. After marvelling that someone was allowed to eat and breathe who thought that, I decided that he ought to be introduced to George Steinbrenner, as he is always trying to move the Yankees to New Jersey, and would find it funny to meet someone who thought they were already there." In the end, Bob Sklar made about thirty thousand corrections to the tiles.

Once the Map was ready, its first uses were pretty mundane. The Parks Department used it to help in a lawsuit, for example. It was only with the coming of the latest West Nile virus scare that the Map proved that it mattered. "The basic elements that people had to pay attention to were pretty clear," Mario Merlino, of the Department of Health, explains. "The problem was mosquitoes, which live in shallow, stagnant water, which is often near tire dumps. The Map could show us not just where the tire dumps were, using the imagery, but also, with the topographic elevations, it could show us where the stagnant water was likely to collect. We were able to focus the spraying on the areas that needed it."

The only problem with the Map is

that it is too good. The men who made it would like to let it out in the world—put it on the Internet where everyone could use it—but the federal government is not crazy about this idea, since the F.B.I. and the F.A.A. regard the Map, in all its layers, as that often imagined thing a "blueprint for terrorism."

Melancholy map-gazers will no doubt detect other hazards, once they get a chance to see it. The one sure thing about maps, after all, is that in retrospect they look more like the time that made them than like the thing they were meant to show. We chart our cities, and we chart ourselves. Maps of New York from the early nineteenth century, which you can see right now in the "Art and the Empire City" exhibition at the Met, have a comic, George M. Cohan feistiness to them: New York was really such a teeny-weensy provincial town then, still wet behind the ears and on the edges, and yet its cartographers drew its little steeples, its Cherry Tree Lane of a Broadway with majestic pride. The Panorama of the City of New York from the 1964 World's Fair, which sits lonesome in the Queens Museum of Art—and until now was the most ambitious attempt to get it all down right—today looks less like New York than like the mind of Robert Moses, the Ozymandias of the approaches to the Triborough Bridge. (The skyscrapers are made of wood and plastic, and don't look the least bit delirious, while the cloverleaves of the Major Deegan are picked out in heroic detail.)

And our map—what will it show that we can't see yet? "I really believe that the Map will change everything," Alan Leidner says. "Because now we will have a record of everything that happens. We'll be able to watch one particular tree grow, die, get replanted, and it will all be on the Map. Or watch a building rise, decay, and get torn down. A hundred years from now, people will be able to compare their version of the Map and our version of the Map and say, 'Look, that's how it was, and this is how it is.' History begins today." Yet the Map, being all maps to all men, will, in its nature, remain forever unfinished. It may be the first great map in which the old cartographic function, to point a path, matters less than a new one: to provide a picture of everything, in depth, in case, for now. ♦

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Notes on Tufte, Edward. *The Visual Display of Quantitative Information*. 2nd. ed. Cheshire: Graphics Press, 2001.

1. Who is Edward Tufte?

NPR/Scott Simon interview June 5, 2010

<http://www.npr.org/templates/story/story.php?storyId=127481819>

“minister of information and Da Vinci of design” emeritus professor of political science, statistics & computer science at Yale

sparklines

recruited by White House to devise ways to track way stimulus money is spent

master of making information clear

“cool accountable transparent data displays” – maps, 100 biggest medical projects, 100 smallest, or put your own zip code in and see projects

2. graphical excellence, the “efficient communication of complex quantitative ideas”

3. Graphical displays should

- show the data
- induce the viewer to think about the substance rather than about methodology, graphic design, the technology of graphic production, or something else
- avoid distorting what the data have to say
- make large data sets coherent
- encourage the eye to compare different pieces of data
- reveal the data at several levels of detail, from a broad overview to the fine structure
- serve a reasonably clear purpose: description, exploration, tabulation, or decoration

4. Problem with cancer “patch” maps: Our visual impression of clarity is commingled with the circumstance of geographic boundaries, shapes and area – the chronic problem afflicting shaded-in area designs of such “blot maps” or “patch maps”.

5. Data maps have a curious history, appearing in 17th Cent, 5,000 years after first appearance of geographic maps

6. Halley’s trade winds map of 1686 one of first data maps

The eye tends to pick out linear patterns even in random noise (26)

Playfair: Graphics preferable to tables because graphics show the shape of data in comparative perspective (32)

Playfair: danger of bar chart (over time-series) is that it doesn’t “comprehend any portion of time” – no shape and no ability to compare same branch of commerce with itself over different periods (33)

simple passage of time is not a good explanatory variable (37), but an effective device is to add spatial dimensions (40). Three examples follow: