Measure Your Urbanism
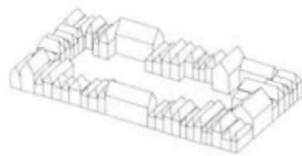
What do urban planners need? Data—and lots of it.
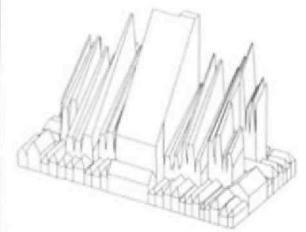
18TH CENTURY BLOCK	FAR = 0,8	EXTRUSION OF THE INNER COURT	VIEWLINES FROM THE STREET	CUT OFF 1
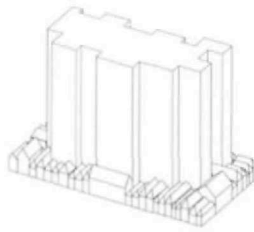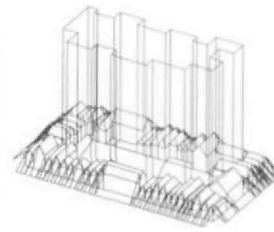
When architecture becomes urbanism, it enters realms of quantities and infrastructure, of time and relativism. Psychological issues, anti-disaster patterns, lighting regulations, acoustic treatments — all these manifestations can be seen as "scapes" of the data behind it. — MVRDV[1]
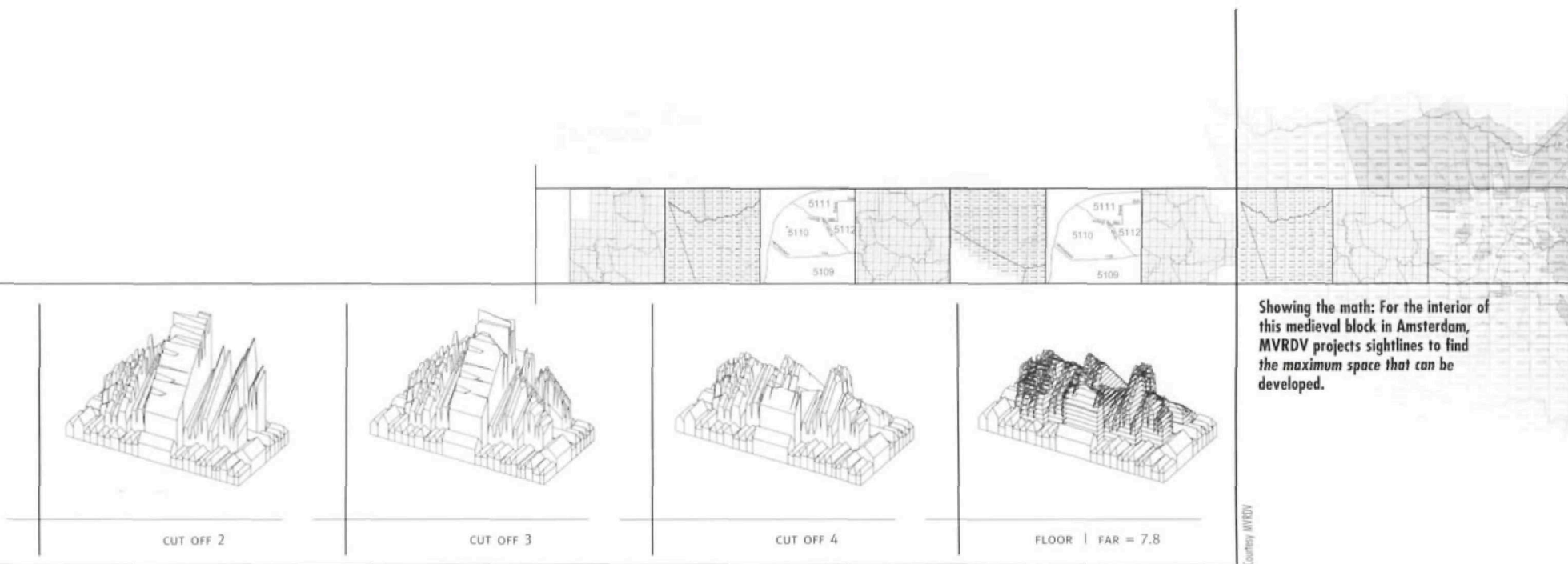
BY JOHN KALISKI

Cool *and* calculated: In this senior-housing project, MVRDV's data-driven design overcomes lot coverage and solar envelope restrictions.

From Numbers to Design

FOR THE PAST DECADE the Dutch architecture firm MVRDV has explored the three-dimensional manifestations of urban codes and zoning, using information technology to study the relationship of environmental factors to architectural form.[2] MVRDV also applies social-science methodologies to three-dimensionally "map" the forces of contemporary globalism. Combining, collaging, and projecting the results, they forecast a theoretical urbanism and architecture grounded in the facts and figures of information frameworks (see, for instance, the drawings at the top of this and the next page).

Using the conceit of maximum densification, or FARMAX (Floor Area Ratio — square feet of building area divided by square feet of site area — MAXimized), MVRDV deftly moves conceptual blocks of urbanism and architectural bulk hither and thither in a surreal operation that produces a topos of fantastic urban imagery and compelling architecture. Though their method and work has been described as the "... status quo disguised as an incredible endless amount of ... paper,"[3] the work touches a visual nerve, especially with younger designers.

MVRDV makes its point powerfully: a new critical urbanism and urban architecture is best realized by first extrapolating and then playing with the comprehensive system of rules and numbers that govern everyday life in the metropolis. For these architects, artistic or traditional town-making simply clothes contempo-

CUT OFF 2   CUT OFF 3   CUT OFF 4   FLOOR | FAR = 7.8

Showing the math: For the interior of this medieval block in Amsterdam, MVRDV projects sightlines to find the maximum space that can be developed.

rary urban forces in ill-fitting suits without addressing — indeed, by denying — growth, modernity, and the fact of ever-present virtual datascapes. In the 1980s and 1990s, during the high-water mark of postmodernism, architects seemed more interested in design semantics and symbols than in the scientific method. Now architects and urban designers, as exemplified by MVRDV and their spiritual (if market-obsessed) mentor Rem Koolhaas, are once again seeking to generate innovative forms from the investigation of data sets. These architects view quantifiable information as a key component of design, and they are not alone.

The Good City Is Good Numbers

The quantification of cities is limited only by individuals' capacity to invent new criteria to gauge. Thus urban intensity and quality is measured in many ways: people per square mile, dwelling units per acre, vehicle trips per hour, sales tax per square foot of retail space, water runoff per minute, percentage of sidewalks shaded, and so on. Such measurements lead inevitably to comparisons between settled areas. These comparisons in turn stimulate discourse regarding the ideology and shape of contending urban models. For instance, it recently was reported that daily one-way commute times in Los Angeles (28.1 minutes) are lower than those of comparable big cities.[4] Does this mean that Los Angeles has a more logical form and higher quality of life than New York (39 minutes), San Francisco (29.6 minutes) or Washington, D.C. (28.5 minutes)? Perhaps yes. Does the availability of such information lead inevitably to changes in urban policy that in turn affect urban form? Indeed yes.

Over the past decade, federal, state, and local governments, entities such as

universities and civic associations, and individuals have collected a landscape of urban data and made it available to the public, particularly on the Internet. Census data, environmental impact reports, housing affordability studies, traffic studies, air and water quality measures, and other databases have been mined to support countless community discussions. Data is marshaled to argue for and against infrastructure improvements, developments, master plans, and urban design policies. In most cities the public at large uses this information and becomes a key player in shaping both urban form and the legislation that determines that form. In the 21st century, obsessive counting and codifying by urban designers, architects, planners, bureaucrats, and developers — as well as by average citizens — increasingly define the planning and design of cities and city life. To design a city, you now need good numbers.

Measured Versus Visual Urbanism

Still, for many urban designers, the measure of North American urbanism is emphatically not numerical. As opposed to data, most architects and urban planners typically utilize in their design practices an amalgam of images from places other than the ones where they live their daily lives. Italian hill towns, a great neighborhood in Savannah, Georgia, or Charleston, South Carolina, Disneyland's Main Street — name your favorite place — are picked through and selected like postcards at a flea market. Indeed, these places conjure up strong emotions and wonder. The designer and the citizen ask: Why can't our city, our community, and our street feel just like this?

Some practitioners of urban design make a pseudo-science of revealing these

popular precedents and turning them into vision plans. Unfortunately, this methodology measures and projects only one very narrow aspect of the urban continuum: the visual framework of the city. Though the visual framework is of course critical, increasingly this aspect of urban design — in essence, the artful city — is only the narrowest gauge of the good city. Architects and communities need to move beyond the idea that if it looks good, it is good.

The design of urbanism is at a crossroads. On one side of the ideological fence are those who continue to design the city solely for the eye. On the other side are practitioners, citizens, and grassroots organizations who use a flood of data that may, or may not, have any connection to traditional definitions of urban beauty. In the increasingly fierce competition between urban regions, those places that take the time to measure and then benchmark unique urban qualities will have a competitive advantage over those that simply visualize and then haphazardly implement what has proven to be successful someplace else.

Urban Design by the Numbers

An information revolution has occurred. There is no doubt that it is affecting city design. For instance, Andres Duaney, godfather of New Urbanism, claims to be spearheading a web site that for a small fee will deliver to your doorstep neo-traditionally inspired code and zoning approved plans.[5] This effort foreshadows the development of smart programs that will assist non-professionals in the self-design, engineering and approval of projects such as individual homes and small commercial properties.[6] In Los Angeles, anyone with a PC and web access can look up individual land parcels and

download complete zoning and lot information.[7] Here the implication is that the public can know, enforce, and necessarily shape what can be built in their communities before developers do. Perhaps the best use of information and data with regard to the design of cities is found within the rapidly emerging discipline of geographic information systems, or GIS. GIS transforms data into maps that can tell powerful stories and reveal the forces at work in the city.

With GIS, building and safety departments can quickly discover clusters of buildings with higher-than-average safety complaints, and then dispatch code enforcement teams to help stabilize and reverse the decline of neighborhoods. Planning departments can visualize flood plains and immediately compare 50-year, 100-year, and 500-year inundations to proposed development before it is approved. With GIS, not only agencies but citizen experts can map their city in accordance with the factors of their choice. The only limitation is the depth and breadth of the data available.

In the past, ideal city form was an abstraction, understood and generated by a small elite in service to a cadre of the privileged. GIS, combined with ever-increasing networks of accessible information, forever puts a brake on this type of city formation by the select. The necessity of ideal city patterns passed down from one generation of professionals to the next gives way to the development of urban trajectories shaped by popular will. One illustration of this phenomenon is the role a group of bus riders is playing in designing Los Angeles' transit system.

For years, the Los Angeles Metropolitan Transportation Authority's official policy was to build a subway and light rail system consisting of approximately 150 miles of rail. Future growth, com-

mercial and residential, was to be concentrated at centers served by rail transit. The construction of the rail lines was seen as a "world-class" means to address increasing vehicular congestion and commute times.

From 1980 to 1995 the transit authority poured billions of federal, state, and local dollars into heavy rail and light rail construction. Though the success of the completed lines is impressive — the service is used by approximately 150,000 people a day — less impressive is the lines' influence on overall urban form. From a regional perspective, rail transit has had virtually no effect; Los Angeles continues to spread out based on the enormous convenience and relative cheapness of automobiles. At the same time, for the millions of mostly poor individuals and people of color who stay on the bus and never transfer to rail, the emphasis on rail caused problems; as rail transit was implemented, bus service deteriorated.

Throughout this period a group of dedicated labor and public transit activists closely monitored the situation. As the problem grew worse, they rode the lines and organized a bus riders' union. The union then gathered data both from its own surveys and the MTA. Bus riders were able to document that wait time at bus stops was increasing. The number of standees on buses was also increasing. The number of buses off the road due to breakdowns was ever increasing. In turn, the only people seeing improvements in service were wealthy commuters whose rail trips were heavily subsidized by federal dollars. The Bus Riders Union and their advocates sued, arguing that the numbers clearly indicated a pattern of discriminatory use of federal funds. They won.[8] As a result of the lawsuit, the transit authority agreed to buy thousands of new buses and increase the quality of service based on quantitative criteria that can be monitored both by system operators and the Bus Riders Union. The lawsuit also spurred the transit authority to more quickly introduce cost-effective "Rapid Bus" service on two major bus corridors in Los Angeles. The lines were an immediate success. More rapid bus lines are now planned, and the mayor of Los Angeles is on the record as supporting a shift of transit priorities from rail to rapid bus.

In Los Angeles, this type of planning, action, and reaction to the use of information by citizen experts is abundantly evi-

Measurable improvement: After number-savvy citizens demanded transit improvements, Los Angeles speeded up the introduction of its popular, cost-effective "Rapid Bus" system.

dent in the arenas of air quality, open-space acquisition, tree planting, school-yard greening, and restoration of the Los Angeles River. The region as a whole has made great strides forward in these areas and others even as growth continues. Citizen advocates, acting in a democratic arena, are using careful quantification and organization of information to shape the urban design of Los Angeles.

Houston by the Numbers

The long-term success of Houston, like that of Los Angeles, will be determined by its general population's rigorous attention and reaction to facts. But unlike the residents of many other big cities, Houstonians as a whole appear casual, if not cavalier, about their urban quality-of-life benchmarks. How else can one explain the relative lack of response, compared to other regions, to basic ecological vitality? Is Houston too accepting of poor air quality? Why is the flood plain so grossly overbuilt, leaving the city prone to devastating inundations?

Houston's built-form situations are fascinating to speculate upon. Perhaps they herald some new type of super-individualistic, ephemeral, market-driven hyper-urbanism.[9] Unfortunately they also suggest a lack of close attention to the science of urban design. The built-form juxtapositions one sees in Houston — towering new residential buildings intruding visually into adjacent neighborhoods; vast swaths of land vacated to further real-estate speculation at the cost of collective property values; institutional agglomerations such as the TexasMedical Center with little sense of human scale — show that most Houstonians don't believe that, from urban facts, they could craft land-use and built-form systems such as zoning in ways that would benefit both individuals and the community as a whole.

Most cities are getting better at managing vast reservoirs of urban information and using them to improve the collective quality of life and the local economy. When cities compete on a global basis for business, intellectual know-how, and cultural significance, attention to the science of urban detail will differentiate the cities that are magnets for ideas and talent from the has-beens. No doubt there are individuals, groups and leaders in

Houston who are as committed as people any place to improvement of the overall urban environment. But the sum of Houston's built environment suggests that citizens have not learned to make effective use of urban-design tools and the data that support them — and such use must be very effective indeed to counterbalance the singular intensity of land speculators and developers, not to mention the bureaucrats and consultants who support them.

Do these powerful interests have the right to pursue their activities? They do. On the other hand, the city designed as a product for consumption, whether in the form of production housing tracts, shopping malls or business improvement districts, does not adequately address the vast in-between spaces of the city where most daily life occurs. Nor do singular development interests adequately pursue in their projects the complexity that is a hallmark of the best places. The citizens of Houston need to more effectively wrestle with Houston information so they can play a more vital role in the nurturing of this urban complexity. With data in hand and a belief that the data can be used to establish constructive counter-policies for the evolution of the city, grassroots groups and citizen experts can help ensure that a more sustainable urban environment is realized more quickly than will be the case if development and growth interests act alone.

Measure Your Urbanism:
An Agenda for Urban Quantification

At this very moment, someone is literally designing your city by organizing information and developing urban design equations. Do you know where the data is collected? Who writes the equations? What factors are considered? Which criteria are ignored? To realize the good city in an information age, citizens must do the following:

1. Develop an easy-to-use, publicly accessible urban database with information about air, water, soil, flooding, traffic and transportation, housing, built forms, building permits, and code violations.[10] All the information that people typically gather to understand the life of the city needs to be easily available and beyond dispute. To ensure public trust, city departments that are typically per-

You do the math: In Houston, unfettered development — such as this new "loft" building — comes at the expense of the city as a whole.

ceived as disinterested players, such as libraries and city-supported higher-education entities, need to have a greater role in the development, dissemination and guardianship of essential urban data.

2. Establish and monitor urban design benchmarks. Benchmarking organizes and facilitates the discussion of urban values. With annual or semi-annual monitoring, communities can formulate urban design objectives, measure progress, and establish changing goals that address new contingencies. Benchmarking also allows citizens to place urban design expectations upon themselves and their leaders.

3. Make the urban database visible. As data is collected, it should be mapped and illustrated in three dimensions. Geographic Information Systems that illustrate the location of data points and reveal criteria comparatively are a basic tool of urban design and planning in the information age. Rapid visualization, like rapid prototyping of industrial design products, needs to be both available and required as part of the normal process of planning, designing and approving projects in the city. Like urban databases, urban visualization systems should be publicly available and easy to use.[11]

4. Accept and institutionalize the role of the citizen expert. An informed citizenry, armed with good data, will apply the creative checks and balances needed to shape development towards a larger public good. Citizen experts also are the surest long-term advocates of enduring quality.

There is no doubt that in Houston, government, academics, and most espe-

cially developers measure the urban. The critical question for Houston and all modern democratic cities is whether citizens have an equal interest and means to measure their urbanism for themselves. A higher quality of urban life will be possible in Houston — and any other metropolis with aspirations for greatness — only when lay citizens embrace the science of urban design, and are able to counterbalance the powerful groups that already use these tools. ∎

1. MVRDV, FARMAX: *Excursions on Density* (010 publishers, Rotterdam, 1998), page 101.
2. ibid.
3. Irene Lund, "dada (data)," from *Hunch: the Berlage Institute Report*, No. 3, Spring 2001, page 132.
4. *Los Angeles Times*, November 20,2001, page B7.
5. Duaney has talked about this on many occasions, including a debate on New Urbanism sponsored by the American Institute of Architects' Regional and Urban Design Committee. The debate was held February 20, 1998, at Disney World.
6. See www.smartcode.com for Duaney Plater Zyberk & Company's most recent work in code development.
7. See the Zone Information Map Access System (ZIMAS) at http://plngis.lacity.org
8. See *The Los Angeles Times*; October 19, 2001, Record edition; page B.4.
9. See Lars Lerup, *After the City* (2000, Cambridge, MIT Press)
10. The Federal Housing and Urban Development Department's Community 2020 software program has included simple mapping software so that Consolidated Plan applicants would have standardized means to illustrate grant applications.
11. New School for Social Research's Environmental Simulation Laboratory is one of many entities that have developed 3-D software and urban design imaging techniques to help communities understand development proposals.