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Joel Warren Barna is author of *The See-Through Years*. He lives in Austin.

Alison Cook reviews restaurants for the *Houston Chronicle*. Her work has been published in *Gourmet*, the *New York Times Sunday Magazine*, and the *Houston Press*.

Terrence Doody is a professor in the English Department at Rice University.

Stephen Fox is a fellow of the Anchorage Foundation of Texas.

Lisa Gray is managing editor of *Cite*.

Cynthia Greenwood, a freelance writer in Houston, frequently covers the arts.

Jean Krchnak curates the teaching collection of architecture visual resources at the Gerald D. Hines College of Architecture, University of Houston.

Barry Moore is an architect at Gensler. He is also an adjunct professor in the Gerald D. Hines College of Architecture, University of Houston, and directs its Workshop for Historic Architecture.

Carrie Rushing is program administrator for the Rice Design Alliance.

Danny Marc Samuels, FAIA, is a partner at Taft Architects and a visiting professor at the Rice University School of Architecture, where he is the director of the Rice Building Workshop.

Mitchell J. Shields was managing editor of *Cite* from 1998 to 2001.

Christof Spieler is an associate at Matrix Structural Engineers, Inc., and a lecturer in the Rice University Department of Civil and Environmental Engineering.

Bruce C. Webb is a professor in the Gerald D. Hines College of Architecture, University of Houston.

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A Publication of the Rice Design Alliance

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WebCite: www.rda.rice.edu

COVER: Collage by Cheryl Beckett.

Cite

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RDA NEWS

20/20

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The 16th annual Rice Design Alliance Gala, "20/20," celebrated the 20th anniversary of its journal, *Cite: The Architecture and Design Review of Houston*, and the 30th anniversary of RDA. Gala chairs Dee Ann and Yandell Rogers III and honorary chairs Susan and Raymond Brochstein welcomed 1,000 RDA supporters to the gala, which was held on the east club level of the new Reliant Stadium. Lauren Rottet and Eric Ragni designed the eye-catching environment. Graphic designer Herman Ellis Dyal conceived the *Cite*/sight theme for the party decorations, which included illusions, giant eyes, and a black, white, and red-all-over lighting design. Party favor ViewMasters included a special reel of 3-D photographs of Houston taken by *Cite* photographer Paul Hester.

The gala recognized a number of longtime *Cite* contributors, among them Stephen Fox, Paul Hester, Craig Minor, Danny Marc Samuels, Barrie Scardino, William F. Stern, Linda Sylvan, Drexel Turner, and Bruce C. Webb. RDA president Jim Burnett announced that RDA had signed a contract with UT Press to print an anthology of *Cite* articles; the book will be published in fall 2003. Lars Lerup, dean of the Rice School of Architecture, and John Casbarian, associate dean, received a Steuben Glass bowl, donated by Neiman Marcus, in appreciation of the school's continuing support of RDA. Lerup and Casbarian were celebrating anniversaries of their own: The Rice School of Architecture was 90 years old in 2002, and John Casbarian had spent 30 years at the school.

The Underwriting Committee, headed by Jane Page, raised nearly $400,000, and Cindy Reid's auction committee raised more than $50,000 in auction sales. The gala is expected to net RDA $260,000, which will support the 2003 RDA programs, including *Cite*.

The Rice Design Alliance would like to thank the following underwriters and donors whose support made the gala such a success.

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2. Cite contributors Craig Minor, Cheryl Beckett, Bruce Webb, Nonya Grenader, Bill Stern, Barrie Scardino, and Lisa Gray. (Photo by Gael Cunningham Williams.)
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4. RDA president Jim Burnett with gala co-chair Dee Ann Rogers, Kim Burnett, and gala co-chair Yandell Rogers.
5. Gala honorary chairs Susan and Raymond Brochstein; environment chair Lauren Rottet. (Photo by Gael Cunningham Williams.)
6. William F. Stern, Patrick Peters, and Elizabeth Gregory. (Photo by Gael Cunningham Williams.)
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23. Drexel Turner and Herman Ellis Dyal, graphics chair.

Unless noted, all photos by Phyllis Hand.

Design for a Better World

A THORNY SOCIAL problem confronted architects and students who went head-to-head in a charrette mounted by the Rice Design Alliance this summer. During the juried competition on August 10, participants designed a homeless shelter for a pricey, block-wide lot in the heart of Midtown, where affluent homeowners dream of Montrose-style gentrification.

Even before competitors gathered in a second-floor studio inside the Gerald D. Hines College of Architecture at the University of Houston, a Midtown resident, unaware the shelter being discussed was hypothetical, e-mailed a complaint to charrette organizer Jody Beck.

The proposed site sat squarely along Main Street's new light-rail system. It was south across McGowan from the Lone Star Cadillac dealership, and was flanked by a Vietnamese restaurant on Travis and *The Greensheet*'s building on Main.

Among the four judges was Don Hall, who directs the mobile outreach program for SEARCH, a nonprofit group that serves the homeless. Hall, formerly homeless himself, spoke to participants about the need to imbue living spaces with green space and airy, light-filled courtyards in order to humanize them. He discouraged the use of prison-like wards for people who are already beaten down by society.

Participants considered Midtown's expensive real estate costs, its varied population, and a few theoretical budget constraints on construction, maintenance, and staff. They also devised architectural solutions to give shelter residents safety, privacy, and dignity during their stay. Throughout the project, four teams proposed buildings that would encourage residents to break free of homelessness.

Charles Sims, principal of Charles Edgar Sims Architects and Planners and a solo participant, envisioned a building with repair shops where residents could make salable products and maintain the building themselves.

A five-person team envisioned the shelter as a six-story mid-rise with features that would encourage residents to mingle with the neighborhood. The ground floor would consist of a public park accessible to residents, business people, and anyone waiting at the nearby light-rail station. Inside, retail shops that attract pedestrian traffic would serve as a revenue source for the owner and developer. Job training services would go on the second floor. Both shops and services would offer employment and empowerment to residents, said David Wynn Robinson, architect and principal of the Robinson Architecture Workshop.

The five-person team also designed a modular building that could be altered if the homeless population shrank. "As homelessness diminishes, the building actually decreases in size," explained Matthew Brugman, a student enrolled concurrently at the Texas Academy of Mathematics and Science and the University of North Texas. Such flexibility is based on principles applied to buildings for the homeless in Germany.

Another team proposed ways that the homeless might create a livelihood and some day buy their own room on the premises. As more of the homeless owned their own rooms, the shelter would then turn into a low-cost condominium complex.

Hector Moreno, a team member from Kirksey Architects, said that he believes that architects can help solve the problems of homelessness. "We can be advocates for the spatial needs of the urban environment as well as the users," said Moreno. — *Cynthia Greenwood*

Switzerland Via Dallas

THE RICE DESIGN ALLIANCE has kindled a partnership with the Dallas Architecture Forum for its spring 2003 lecture series, "Swiss Made." Similar in mission to RDA but 25 years younger, the Dallas group provides a continuing and challenging public discourse on architecture and urban design in the Dallas area. The series collaboration began with a conversation between RDA board member William F. Stern and Dallas Architecture Forum board member Ed Baum. Lars Lerup, dean of the Rice School of Architecture, which once had a satellite program in Switzerland, issued the invitations.

Some of Switzerland's top architects (for a list, see this issue's Calendar on page 8) will lecture first at the Museum of Fine Arts, Houston, and then travel to Dallas to lecture at the Dallas Museum of Art. By highlighting these architects' work, RDA and DAF will contribute to the appreciation of Switzerland's often overlooked cultural resources, and of regionally inflected modernism. The Museum of Fine Arts, Houston will host a concurrent film series, "CinemArchitecture: Swiss Views."

The new partnership with the Dallas Architecture Forum helped RDA afford to bring these important architects from across the world. The collaboration also appealed to the lecturers: By stopping in two cities, they can see more of Texas' best architectural works, including Tadao Ando's new Museum of Modern Art in Ft. Worth. This could be the beginning of a beautiful friendship. — *Carrie Rushing*

CALENDAR

RICE DESIGN ALLIANCE SPRING 2003 LECTURE SERIES: SWISS MADE
Brown Auditorium
The Museum of Fine Arts, Houston
713.348.4876 or www.rda.rice.edu

Wednesday, January 22, 7:30 p.m.
ANNETTE GIGON of Gigon/Guyer will speak. The firm's work includes the Sports Center Davos, the Kirchner Museum Davos, and the Museum of Transportation Lucerne.

Wednesday, January 29, 7:30 p.m.
KURT W. FORSTER, founding director of the Getty Center for the History of Art and the Humanities in Santa Monica and former director of the Canadian Centre for Architecture, will give a historical overview of Swiss architecture and culture.

Wednesday, February 5, 7:30 p.m.
MARIANNE BURKHALTER will lecture on her exploration, with partner Christian Sumi, of the nature of materials and construction. Their firm, Burkhalter + Sumi, has built a series of remarkable buildings in wood and stone in Germany and Switzerland.

Wednesday, February 12, 7:30 p.m.
LIVIO VACCHINI's designs feature an extreme coherence of theme and practice. An important value of his work lies in its intentional untimeliness.

CINEMARCHITECTURE: SWISS VIEWS
Brown Auditorium
The Museum of Fine Arts, Houston
713.639.7515 or www.mfah.org

Sunday, January 26, 7 p.m.
Kemein, directed by Veronique Gael, follows a radical house built in 1930-31 on the banks of Lake Geneva. *The Sunflower*, directed by Christoph Schaub and Marcel Meili, concerns Casa Girasole, a 1930s Futurist house that turned on an axis like a flower following the sun.

Sunday, February 2, 7 p.m.
New Living resulted when 1930s avant-garde director Hans Richter was commissioned to create a film promoting standardized living spaces. In *A City at Chandigarh*, Alain Tanner documents the would-be utopia that Le Corbusier created in the Himalayan foothills of India.

Sunday, February 9, 7 p.m.
Tate Modern, directed by Beat Kuert, shows the provocative new London art museum, which Herzog and de Meuron transformed from a power plant into a vast exhibition space. In *Meta-Mecano*, directed by Ruedi Gerber, Italian architect Mario Botta describes his design of a Basel museum dedicated to Jean Tinguely.


Swiss architect Livio Vacchini, known for his outside-of-time designs, speaks on February 12.

Sunday, February 16
Berlin Cinema: A Working Title is director Samira Gloor-Fadels' rambling reflection on the parallels between filmmaking and architecture in 1990s Berlin. In *Jean Nouvel — The Aesthetic of Wonder*, director Beat Kuert considers the work of Parisian architect Jean Nouvel.

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February 20–23, 2003
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HOUSTON TALKS LECTURE
Brown Auditorium
The Museum of Fine Arts, Houston
713.348.4876 or www.rda.edu
Wednesday, March 19, 7:30 p.m.

Architect and architectural historian EDUARDO LUIS RODRIGUEZ, who edits the magazine *Arquitectura Cuba*, will speak.

RDA ANNUAL ARCHITECTURE TOUR
713.348.4876 or www.rda.rice.edu
Saturday, March 29, and Sunday, March 30, 1-5 p.m. each day

This year's tour will examine one of the best places in Houston to experience the richness of the city's domestic architecture. The N.P. Turner Addition (now known as the Museum District) and West Ranch Estates represent two distinct approaches to the development of residential neighborhoods. Both have undergone substantial new residential construction, making them a microcosm of inner-city housing and architectural trends of the last 20 years.

SALLY WALSH LECTURE
Brown Auditorium
The Museum of Fine Arts, Houston
713.348.4876 or www.rda.rice.edu
Wednesday, April 9, 7:30 p.m.

BILLIE TSIEN and TOD WILLIAMS will speak. Their buildings emphasize the importance of place and explore the nature of materials. Among their works are the Phoenix Art Museum, the Neurosciences Institute in La Jolla, and the Museum of American Folk Art in New York.

RICE SCHOOL OF ARCHITECTURE WINTER 2003 LECTURES
Farish Gallery, Anderson Hall
713.348.4864 or www.arch.rice.edu

Thursday, January 23, 7 p.m.
JASON GRIFFITHS and ALEXANDRA GINO, Gino Griffiths Architects/London, will speak.

Monday, February 10, 7 p.m.
OLE BOUMAN of Amsterdam-based Archis Magazine, speaks on "Publishing Architecture: Converging Practices."

Monday, March 3, 7 p.m.
Author MARK WIGLEY asks, "How Old Is Young?: The Concept of the Young Architect."

Monday, March 17, 7 p.m.
Rio de Janeiro author MARIA ELISA COSTA speaks on "Brasilia in the Flesh."

The Museum of Fine Arts' "Cinemarchitecture" film series tackles Swiss architecture. Top: *Jean Nouvel — The Aesthetic of Wonder* shows February 16. Bottom: *Kenwin* shows January 26.

Wednesday, March 26, 7 p.m.
SARAH WHITING and RON WITTE of WW/Cambridge, discuss "Bounce."

Monday, April 7, 7 p.m.
LARS SPUYBROEK of NOX/Rotterdam, discusses "Machining Architecture."

UNIVERSITY OF HOUSTON GERALD D. HINES COLLEGE OF ARCHITECTURE LECTURE SERIES: HISTORIC MODERN ICONS
College of Architecture Theater, Room 150
713.743.2400 or www.arch.uh.edu/news

Tuesday, February 18
WILLIAM F. STERN speaks on Brasilia, 2:30 p.m.
DAVID LEATHERBARROW lectures on "Modern Analysis," 3:30 p.m.
Panel Discussion, 5 p.m.

Tuesday, February 25, 6 p.m.
MATTHIAS BOECKL speaks on "Transforming the Modern Heritage: Current Architectural Trends in Austria."

Tuesday, March 25
PATRICIA C. LOUD speaks on Louis I. Kahn, 2:30 p.m.
BARRY BERGDOLL speaks on Marcel Breuer, 3:30 p.m.
Panel discussion, 5 p.m.

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The Rice Design Alliance, established in 1972, is a not-for-profit organization dedicated to the advancement of architecture, urban design, and the built environment in the Houston region through educational programs; the publication of *Cite*, a quarterly review of architecture and design; and active programs to initiate physical improvements. Membership in the RDA is open to the general public.

Individual Membership $35
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www.rda.rice.edu

Photos courtesy Catherine Kueffer and Jason Blumenkamp

The bathhouse that became a house: Rear (left) and front (right) views of HOPE's recycled-materials house.

TALE OF A TUB

When You Build Your Own House, You Also Build Connections

Out on a lonely stretch of farm-to-market road just outside Huntsville, where suburbs begin to encroach on horse pastures and a sky-blue mobile home rests not far from a brick-clad ranch home, Catherine Kueffer and Jason Blumenkamp are building a house. It's not a very noticeable house, which may be one of its virtues; it tends to blend into the land on which it sits, a seeming part of its surroundings. It's also not a very big house, which may be another of its virtues; its compactness tends to send people out onto its wraparound porch and into the fresh air.

But perhaps the house's chief virtue is that it cost almost nothing. Granted, that was made possible in part because Blumenkamp's family already owned the ten acres the barely 600-square-foot structure perches on. But more important has been the fact that Kueffer and Blumenkamp provided much of the construction work themselves, and that much of the material they used is material they could get for free — end pieces of wood scrounged from lumber yards and construction sites, plastic from signs, brick piers from a trash pile.

Despite the seemingly random nature of the building supplies, and the admitted detours the design sometimes had to take to accommodate what was available, Kueffer's and Blumenkamp's home looks anything but thrown together. And that, the pair says, is the point. With a little time, a little effort, a little imagination, and a considerable amount of flexibility, almost anybody can build something that's not just serviceable, but also attractive. It's not necessary to turn your housing needs over to outside professionals. Others can do what they've done.

To help prove the truth of that, beginning in early 2003 Kueffer and Blumenkamp intend to hold workshops to teach others what, through trial and error as well as considerable reading, they've managed to teach themselves. With the help of workshop participants, the recycled materials house will be followed by a cob house, an adobe house, and perhaps a bamboo house, all to be grouped together in a complex under the rubric of Housing Options for Planet Earth, otherwise known as HOPE.

For those who might wince at the starry-eyed appellation, Blumenkamp points out that it came from his mother. Her first name is Dilek, which means hope in Turkish. And since his mother is, in a roundabout way, responsible for the housing workshops settling into Huntsville, Blumenkamp and Kueffer felt it only proper to name the organization that would host those workshops in her honor.

Actually, a bathtub fits into the equation as well, though that comes later. What came first was Blumenkamp's mother falling ill, and Blumenkamp deciding that he should move back to Huntsville from Houston to be nearer to her. A graduate of Sam Houston University with a degree in chemistry and biology, Blumenkamp worked as an engineer with a biotech company. But he had also worked as a sculptor and jewelry designer, and traveled to Nicaragua and Mexico, where he'd been intrigued by how the poorer residents of those countries managed to build houses out of the detritus of the rich.

If he was going to return to Huntsville, he decided, he should build his own house. He began looking into alternative building options, and ran across information about a cob workshop being held in Terlingua. It was there that he met Kueffer, who'd grown up in New Mexico and upstate New York, and had an anthropology degree from Columbia University. Kueffer had moved to Texas to apprentice with Simone Swan, the founder of the Swan Group in Presidio County. Swan is a disciple of the late Egyptian architect Hassan Fathy, who was renowned for his use of adobe and his advocacy of inexpensive building techniques. Kueffer, too, is an admirer of Fathy, and hoped to learn more about him and his ideas. Since the hand-formed lumps of earth, sand, and straw that make up cob are a cousin to adobe's bricks of dried clay, a cob workshop seemed to Kueffer a reasonable extension of her research.

In meeting, Kueffer and Blumenkamp made both a personal connection and a philosophic one. Kueffer decided to move to Huntsville with Blumenkamp, and Blumenkamp decided to expand his idea of building a house for himself to the idea of showing others how to build houses for themselves.

"I don't like the stigma that's attached to sustainable building, that it's either for the extremely poor or the extremely wealthy," Kueffer says. "It's either shanty towns or straw-built houses that are comparable in cost to a conventional house. I thought we could help point people to something in between, to something that's inexpensive while still being interesting."

Before that could happen, however, the couple needed a bathroom. Though greater Huntsville has little in the way of building codes to impede the do-it-yourselfer, it does have a regulation against outhouses or permanent port-o-johns. If Kueffer and Blumenkamp were going to hold workshops in sustainable building techniques, they had to have a place for workshop attendees to bathe and use the toilet. The bathhouse, they decided, would be made of recycled materials, and would be near their cob house, giving them examples of two types of sustainable building patterns. In honor of their resolution, an artist friend gifted them with a claw-foot bathtub, and told them to fit that in if they could.

Blumenkamp and Kueffer did so by making their bathhouse a trapezoid, with the narrower end being just big enough for the bathtub and the wider end having room for showers. It was the tub that helped define the look of the structure, something Blumenkamp enjoys pointing out, as if to emphasize the adaptive nature of building on your own. The approach is so adaptive, in fact, that as the bathhouse grew, Kueffer and Blumenkamp decided to eliminate the "bath" part of its designation and just make it their house. "We were doing most of our work on weekends, and we ended up camping inside once we got the walls and roof up," Blumenkamp says. "Then we realized we could put a loft in the highest part of the bathroom and actually live here. And that's what we did."

As Blumenkamp says this, he is holding a cup of hot tea on the porch of his still-under-construction residence. Kueffer sits near him, looking out into a light rain. It has taken them more months than they thought to get to this point, and there is still a ways to go: shingling to be done, interior walls to complete, the tub — which now rests in the yard — yet to install. But the house is livable, and the pair is already thinking ahead to the next addition to their compound, a communal cob house that will be sited just a short distance away from where they sip their afternoon drinks and consider the future.

None of what they're doing is new or novel, Blumenkamp admits. There are plenty of other sustainable building workshops around, even if east Texas isn't brimming with them. And making your own house from scratch, if not exactly the norm today, isn't unheard of either. People have been doing that sort of thing since the pioneers and before. Still, their experience has been unusual enough that they hope others can learn something from it. "Not everybody has the time to devote to building their own house that we've been able to manage," Kueffer says. "And so I think it's important that we're able to refine it enough that we can teach others how to make it feasible."

"To some degree, what I'd like is to have workshops that are like barn raisings," Blumenkamp adds. "We get people to help and learn here, and in turn that creates a community that can help somewhere else."

Community, he notes, is an almost inescapable result of building your own house, especially if you build with recycled material. It's not just that people inevitably ask what you're doing, though they do, nor that if you're scrounging supplies it helps to be friendly with those you scrounge from, though it does. It's also that the time and effort involved in creating your own living quarters invests you in them in a way that simply shelling out money can't.

Or, for that matter, simply moving a trailer onto your property can. "If there's one question we get more than any other, it's why don't we just buy a trailer?" Kueffer says, rolling her eyes over toward Blumenkamp. "And really, sometimes it's just a hard thing to explain." — *Mitchell J. Shields*

(For more information on HOPE, go to www.homestead.com/terrahope.)

Top: The John Maher house survives in River Oaks. Bottom: St. Thomas demolishes Guinan Hall.

BELEAGUERED BARNSTONES

IN THE SUMMER of 2002, Howard Barnstone's Guinan Hall was demolished by the University of St. Thomas to make way for a much larger structure for student housing and parking. The university had legitimate concerns about keeping the 31-year-old structure, including the fact that its open site plan created security problems. In addition, the ratio of rooms per square feet of land was too low for a fast-growing school on a landlocked site. And maintenance and utility costs were the highest on campus.

In spite of this rationale, the loss of this significant building should alert preservationists and architects alike that more work by one Houston's greatest architects may also be at risk.

St. Thomas owns a small gem of Barnstone's — the brilliantly remodeled former residence on Yoakum Blvd. retrofitted for a fledgling art department when Dominique DeMenil was chairman. This building, which now houses various faculty offices, occupies the only "unfilled" site on the Miesian academic quadrangle.

Neglect or insensitive renovation have rendered other Barnstone projects barely recognizable as works of genius. That dispiriting list includes the Maher house on Lazy Lane, the Riverside Terrace residence on Parkwood, and Piney Point Elementary on Pagewood.

The Howard Barnstone houses in the more affluent neighborhoods of River Oaks, Briar Hollow, Memorial, and Old Braeswood are for the most part well-loved and well maintained, but could easily succumb to the "big lot — too small a house" syndrome. (Number 54 Briar Hollow is long gone.)

The brightest thought among this gloomy speculation is that some of Barnstone's best urbane work seems to be safe for the foreseeable future. This would include the 4923–27 Graustark townhouses (1971), the family-owned Vassar Place Apartments (1965), and the justly renowned Rothko Chapel (1971).

The next preservation battles will be for our great architecture of the '50s, '60s, and '70s. In fact, the war is already on — which is all the more reason for Houstonians to embrace and protect the work of one the best designers the city has seen. — *Barry Moore*

ON THE MOVE

BY BRUCE C. WEBB

SINCE THE INDUSTRIAL REVOLUTION, AMERICA HAS BEEN A COUNTRY ON THE MOVE. A NATION OF RELATIVELY INDEPENDENT TOWNS SERVING LIMITED AND CONTIGUOUS HINTERLANDS CHANGED IRREVOCABLY INTO A NATION OF INDUSTRIAL CITIES INTEGRATED INTO A NATIONAL ECONOMY. LARGE METROPOLITAN CENTERS EVOLVED INTO INTERCHANGE JUNCTIONS WITHIN AN EVER-EXPANDING TRANSPORTATION WEB THAT MOVED RAW MATERIALS, MANUFACTURED GOODS, AND PEOPLE FROM PLACE TO PLACE. IN A VERY REAL WAY, PHYSICAL LINKAGES TO THE REST OF THE COUNTRY SUBSTANTIATED THE 20TH-CENTURY INDUSTRIAL CITY. WHERE YOU WERE WAS ONLY A TEMPORARY STATE.

Inset above: Superstudio's grid. Background: An aerial station, as envisioned in 1916 by "Biedermann."

VISIONARIES OF THE POST-INDUSTRIAL SOCIETY IMAGINED A WORLDWIDE COMMUNITY WITHOUT PROPINQUITY, AN ELECTRONIC NETWORK OF CONTACT POINTS REPRESENTED, FOR EXAMPLE, BY THE ITALIAN DESIGN GROUP SUPERSTUDIO AS AN ENDLESS COMMUNICATIONS AND SERVICE GRID OF THE NON-PLACE URBAN REALM. THE GRID ITSELF BECAME A METAPHOR FOR MODERNITY, WHETHER IN THE RATIONALIZED GEOMETRIES OF INTERNATIONAL STYLE ARCHITECTURE OR IN THE LINES OF TRANSMISSION AND SERVICE THAT DISTRIBUTED TECHNOLOGICAL ENTITLEMENTS TO HOMES AND BUSINESSES. ELECTRIFICATION BROUGHT ENERGY TO REMOTE LOCATIONS FOR ILLUMINATING, HEATING AND COOLING, AND POWERING ENGINES; ELECTRIC LINES ELIMINATED THE NEED TO WIDELY DISTRIBUTE BULKY FUEL. A SUCCESSION OF COMMUNICATIONS DEVICES — THE TELEGRAPH, TELEPHONE, RADIO, TELEVISION — MADE IT POSSIBLE TO DISSEMINATE VAST AMOUNTS OF INFORMATION AND ENTERTAINMENT WITHOUT ANYONE'S HAVING TO TRAVEL FROM THE RECEIVING END AT HOME BASE. ALMOST ANYTHING THAT COULD BE REDUCED TO BINARY ABSTRACTION — MONEY, FOR EXAMPLE — COULD BE TRANSMITTED ELECTRONICALLY, ELIMINATING THE NEED FOR MANY FACE-TO-FACE ENCOUNTERS. BUT ALAS, NOT EVERYTHING CAN BE E-MAILED. UNTIL SCIENCE CATCHES UP WITH THE BEAM-ME-UP CAPABILITIES OF STAR TREK, HUMAN SOCIETIES MUST STILL MOVE PEOPLE AND GOODS THROUGH PHYSICAL SPACE.

The evolution of transportation stretched and shaped cities. The first settlers of most 18th- and 19th-century American cities arrived by water. Houston was not a seaport city, but open water and access to the world were tantalizingly close. In 1914 a massive dredging operation created a channel linking the inland city to the Gulf 50 miles away, a channel that was enlarged in 1935 and again in 1963.

In the 19th century, transportation by water began to share primacy with the railroads, and cities soon found themselves weaving obtrusive rail lines into the city fabric. The railroad station introduced a new kind of civic space and a new building type: Stations exuded a pride of place, rivaling the city hall in a traveler's memory. Railroads were essential to the settlement of Texas, with its far-flung destinations, and Houston's dependence on them was celebrated in the city's crest, where a locomotive is pictured as the most prominent element.

But in a process of natural selection railroads lost out to the road, trucks became the prime movers of goods (trucks now move more than 67 percent of all freight), and passenger travel dwindled to a trickle. Industrial trucking now links the port of Houston, the city's two airports, and the mainline railroads into an intricate mega-system.

America's romance with the trip and the almost mythical places celebrating the adventure of travel is hard to evoke in Houston. Despite the Port of Houston's ranking as the third-largest seaport in the country, Houston thinks of itself mainly as inland, and the port hasn't lodged itself in the consciousness of the city. Ships seem to sneak in and out along the artificial waterway, and the port itself, though a fascinating, constructivist landscape of powerful machines, is as formidable as a military base.

Houston's single extant station from the heydays of the railroad was absorbed into the new downtown baseball stadium like an anchoring rock rooting the stadium in time. Passengers seeking a rail trip today are directed to Amtrak's tiny, inauspicious concrete-block building on Washington Avenue north of downtown, which serves the purpose of the train trip but fails to evoke its romance.

Little of the sense of a genius loci that gave charm and character to railroad stations entered into the design of airports, whose diagrammatic formulations, streamlining, and sterile neutrality seem to belong more to the airplane nation than to any particular geographic locale. The operational requirements of an airport put them at a considerable distance from anything else, and arriving at one is arriving at a faux destination. Still, the transience of the airport embodies a reductive form of contemporary urbanism, where 24-hour rush-hour crowds move purposefully in mall-like settings of shops and restaurants. And at the airport hotel, that most non-place activity of the business class — the airport meeting — can be held without anyone ever setting a foot outdoors.

Today we contemplate our transportation systems as potential Trojan horses. The sheer magnitude of trains, planes, ships, and highway trucks define another dimension of experience and power. With morbid fascination and fear, we devour new reports of train derailments, airplane crashes, and accidents involving 40-ton 18-wheeler tractor-trailers. That fascination and fear amplified our psychological response to the terrorist attacks on the World Trade Center and Pentagon. If a plane could turn into a missile, what seemingly benign cargo carrier might next be turned into a weapon? Can we trust tanker cars? Trucks? Ships?

Certainly we don't trust planes anymore. Starting long before 9/11, but with more urgency since then, the airport has changed from a terminal similar to the railroad station into the building as initiation ritual. A maze of security measures, customs screenings, and baggage checks act as technological stations of the cross that simultaneously allay and provoke fear.

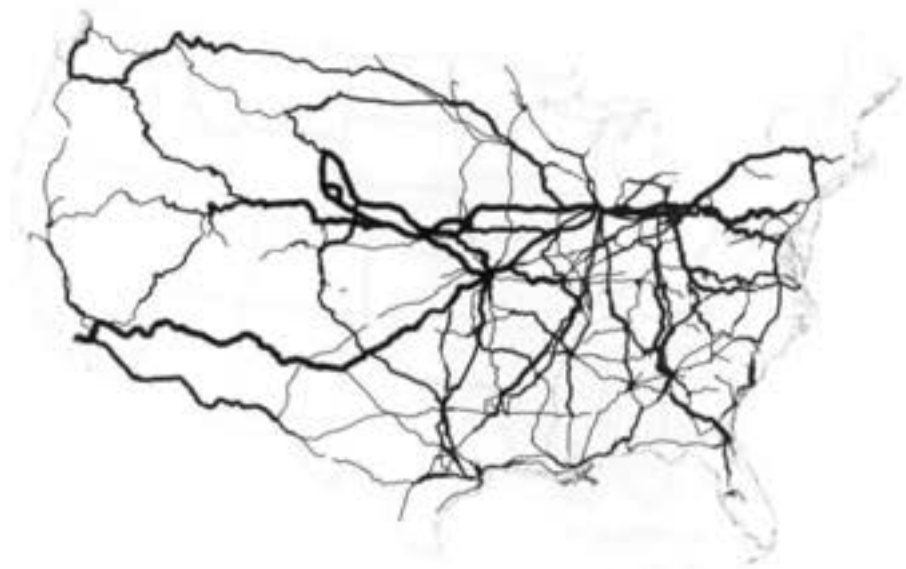
Mostly, this massive movement of people and materials by water, road, rail, and air goes unnoticed unless something goes wrong — usually something big, something catastrophic. Or until the system presses itself into our consciousness — for example, when a half-mile long train at an on-grade crossing keeps us from getting to where we want to go. This issue of *Cite* looks at the city literally on the move at the beginning of the third millennium — and at how the design of the city accommodates its biggest and most demanding users. ■

PLANES

Can you fly to any airport in the world from Houston? Of course you can — but whether you can fly to a foreign city directly, without a layover, often depends on whether the route belongs to Continental Airlines, which uses George Bush Intercontinental Airport as a hub. These maps show the destinations of daily non-stop flights from both Hobby and Intercontinental in November 2002.

Information courtesy of Houston Airport Operations

MAPPING THE CONNECTIONS :



TRAINS

Since the days of the frontier, most American railroad traffic has run east-west. Much of that traffic still goes through Chicago, where western transcontinental lines connect to lines serving the population centers of the northeast. The coal fields of Wyoming, which fuel most of the Midwest's power plants, are another railroad center. Houston looks insignificant by comparison; Dallas has more traffic and the busiest line in Texas goes through Amarillo. But much of that traffic is simply passing through. Houston originates and terminates as much railroad traffic as Texas' other metropolitan areas combined; twenty percent of freight tonnage originating in the state is Houston chemicals.

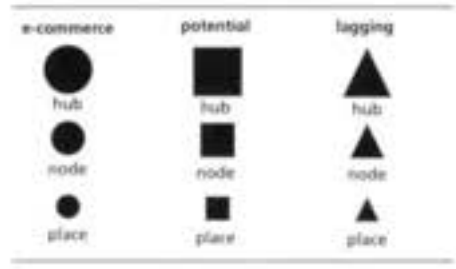
Map courtesy of the Bureau of Transportation Statistics, U.S. Department of Transportation

THE INTERNET

In the early years of the digital era, maps of the Internet often showed U.S. cities linked by "trunk lines" — high-speed data connections linking a handful of universities and research facilities (including Houston's Rice University). How fast your data traveled depended on how quickly you could get it to a trunk line. In the new fiber-optic age, though, everything is connected to everything else; your house may be directly connected to a high-speed line. Many people who map the Internet no longer find old-fashioned geography relevant.

But geographer Matthew Zook of the University of Kentucky argues that location still matters to Internet businesses. In "Hubs, Nodes and Bypassed Places" (published in *Tijdschrift voor economische en sociale geografie*, January 2003), he shows that companies using the Internet to make money are not evenly distributed across the country but tend to concentrate in the cities where tech workers are plentiful. Even after the bursting of the dot-com bubble and the e-commerce shift to "bricks and mortar" companies, cities such as Seattle retain their early lead in the field, and cities in the South and Midwest lag behind. In Zook's classification, Houston receives the lowest ranking: a "lagging place." Petroleum may flow freely in and out of this city, but electronic money goes elsewhere.

Map courtesy of Matthew Zook

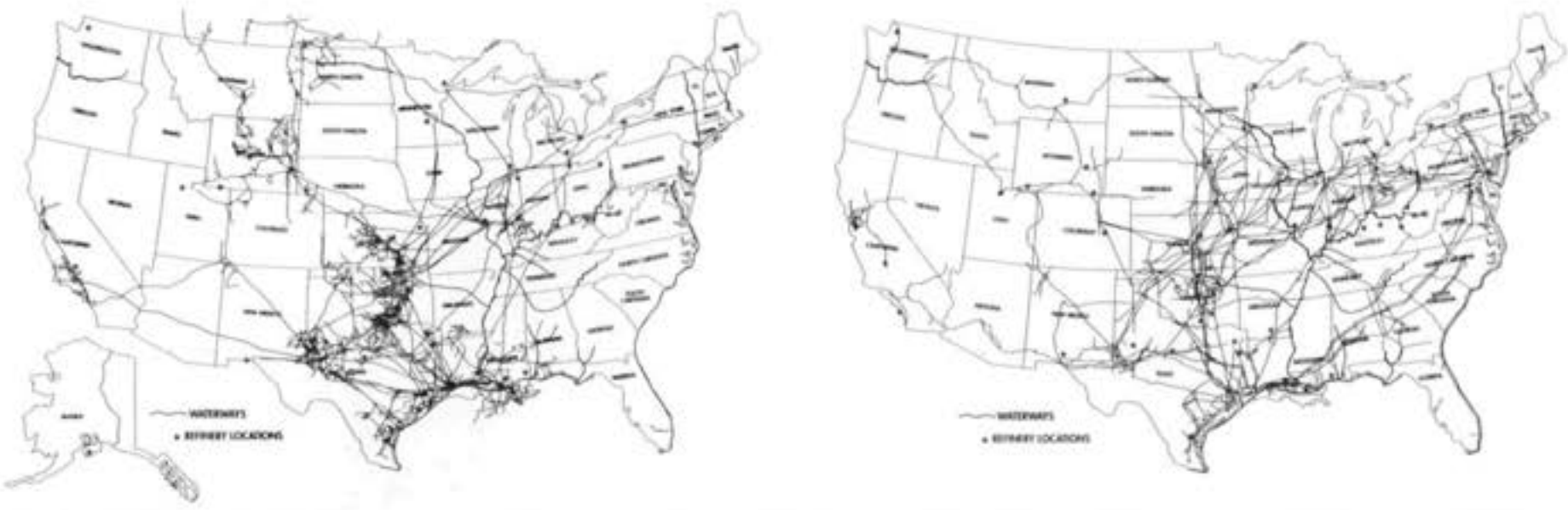


SHIPS

The Port of Houston processes nearly 200 million short tons of cargo per year — more than any other port in the U.S. Both the top import commodity and the top export commodity are (you guessed it) petroleum and petroleum byproducts, so it's not surprising to see oil countries heavily represented on this map of regularly scheduled shipping service from the Port of Houston. On the map at right, a dot represents a city with one port. Numbers indicate mark cities with more than one port.

Map data courtesy the Port of Houston

HOW HOUSTON REACHES THE REST OF THE WORLD



PIPELINES

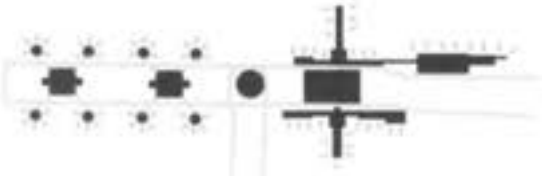
More than 12.9 billion barrels of petroleum travel through interstate pipelines each year, and a high percentage of those trips either begin or end at Houston refineries. Above, the map on the left shows U.S. pipelines for crude oil — that is, for stuff headed from the oilfields or coastal shipping terminals to the refineries. The map on the right shows pipelines for refined petroleum products — the gasoline, heating oil and jet fuel that's headed from the refineries to distribution centers, and from there, eventually, to their end users.

Maps courtesy the Association of Oil Pipe Lines

FLIGHTMARE

AIR TRAVEL CHANGES FAST. AIRPORT BUILDINGS DON'T.

IAH as of 1996



HOU as of 1995

JFK as of 1994

BY JOEL WARREN BARNA

"DISMAL" AND "AWFUL": That is the impression that Houston's two major airports gave travelers over most of the last decade, according to the head of the Houston Airport System.

Since 1998, Richard Vacar has been director of the Houston Airport System (HAS), which administers the city's two passenger facilities, George Bush Intercontinental Airport and Hobby Airport, as well as Ellington Field, the former military base now used for civilian general aviation. Says Vacar, "I started with HAS in 1995 and became director in 1998. It struck me then that the appearance of both Hobby and Bush Intercontinental both was dismal. The buildings weren't clean, and there was a general beige look from all that exposed concrete. The interiors were worse than the exteriors, with all the brown terrazzo from the 1960s. The lighting was poor, and things were generally dark. Compare to other, more modern airports, they were awful."

Vacar, armed with a 1998-2004 capital-expenditures budget that tops $3 billion — compared with only about $60 million per year on average from 1988 to 1997 — is working to change the way travelers perceive Houston's airports. And it's a good thing, because there are so many travelers. Without a lot of public fanfare, passenger traffic at Bush Intercontinental Airport has been growing by seven percent per year for the last ten years — twice the national average, according to Vacar. More than 41 million passengers passed through the airport in 2000, compared with just over 21 million in 1991. (The numbers were down for 2001 and 2002, as they were worldwide in the wake of the terrorist attacks of September 11, 2001.)

Bush Intercontinental has become the eleventh busiest airport in the country in overall passenger count. In addition, it grew more than 10 percent per year in international travel over the last decade — from two million passengers in 1990 to more than six million in 2000. Now Bush Intercontinental ranks as the nation's eighth largest international airport, with more international travel than Dallas/Forth Worth (which has nearly twice the overall boardings of Houston). And those passenger numbers, combined with a similar boom in cargo operations, represent big business.

Using economic models from the Federal Aviation Administration, HAS claims $7.8 billion in annual economic impact in the Houston area, with an amazing 90,000 jobs deriving from airlines, rental cars, airport services, construction, cargo operations, tourism that the airports stimulate, and other related functions.

The airports themselves bring in more than $183 million each year from rents and fees paid by airlines and concessionaires; they cost on the order of $103 million to operate (or so say figures from HAS's 1998 economic development study). The excess goes to fund bonds for capital improvements, of which a prodigious number are underway or planned. Houston's climate, its location on the Gulf of Mexico, and its connections to the oil and gas and petrochemical industries all factor into the growth of air travel to and from and through the area. Along with airline deregulation and changing travel habits around the country, these factors promise considerable stimulus to growth as well.

The earliest commercial air service to Houston started in the 1920s at a private airport owned by the W.T. Carter Lumber company. The site was acquired in 1937 by the City of Houston. A moderne terminal building with what was at the time an imposing octagonal central tower was built in 1940 (it's still visible on the airport grounds), facing onto crossing runways that are still in use.

In 1955, that building was replaced by the current airport terminal, a V-shaped building faced in pink marble, folded around a central parking lot on the passenger side and flaring out to accommodate airline gates on the runway side. There was considerable period charm: A sweeping curved glass wall looked out onto the runways from the central restaurant and bar, and visitors were welcome to go up on the terminal's roof to wave to arriving and departing passengers. In 1967, the city renamed the airport in honor of William P. Hobby, former lieutenant governor (1914-1917) and governor (1917-1920) of Texas and owner of the *Houston Post*.

More than a decade before this name change, the area around the intersections of Telephone Road, Old Spanish Trail, and Airport Boulevard had been filled in by residential development, and Hobby Airport had no way to expand to handle the larger and faster airplanes that were then coming into use.

The city began construction of Houston Intercontinental Airport in the mid-1960s. It opened in June 1969; Hobby Airport closed the same day. Intercontinental's huge site — nearly 10,000 acres of oak and pine forest were cleared — was planned for jet airliners and plenty of growth. Gone was Hobby Airport's friendly scale and relaxed relationship to the airline operations side. The first two buildings to go up, Terminals A and B, were enormous — 250,000 square feet each, with cavernous spaces and a closed-in, futuristic feeling. Passengers could park on surface lots or drive up ramps and park atop the terminals themselves, something perfect for a city in love with automobiles. At the same time, little plastic robot trains ran between the buildings — an innovation at the time. Exposed concrete provided the frame, the walls' surfaces, and the coffered ceilings, which glimmered with a distant, chilly fluorescent light. The airplanes were reached by pods at the buildings' corners, which were themselves reached through futuristic, windowless corridors thrusting out into a scaleless space. The passenger-screening system mandated in 1973 following the hijacking of several flights to Cuba (one of which had originated in Houston) fit right in with the spaces.

This was an airport for the new jet age, when the future seemed to promise nothing but non-stop, long-haul flights linking all the major cities in the world. According to architect Richard Maxwell, head of the aviation division of Gensler's Houston office, other airports built in the 1960s used different strategies to handle passengers. At Dulles Airport, outside Washington, D.C., passengers boarded mobile lounges to get to their planes, which could be parked anywhere on the broad service area. At New York's JFK

DFW as of 1995

DEN as of 1993

SFO as of 1993

Airport, says Maxwell, the emphasis was on small buildings for each carrier, with short walkways in between. At Dallas/Forth Worth Airport, each terminal was built as an arc, with parking spots in the curve of the arc making it possible to leave one's car right outside the departure gate. "The emphasis was on customer convenience, which meant the shortest walking distance possible," says Maxwell. "Then came deregulation, and the air carriers turned to 'hubbing,' and none of those terminal plans worked particularly well anymore."

At Houston Intercontinetnal, a third terminal, designated as C and topping 500,000 square feet, opened in 1981. In the continuing evolution of airport design, it had become clear that the corner "service connector" pods could not be easily reconfigured either for larger airplanes or for smaller, and more numerous, ones. Terminal C had broad, T-shaped concourses. A smaller Terminal D, for international travel, opened in 1990. Really just one long concourse, it was named for the late Houston congressman Mickey Leland.

An economic slump hit Houston in the late 1980s and lasted for almost ten years. At the same time, the airline industry was feeling the effects of the 1978 federal airline deregulation act. Eastern, Braniff, National, Texas International, People Express, Pan American, and Western airlines all went out of business or were absorbed by competitors. Among the survivors, Continental Airlines reshaped itself into one of the hub-and-spoke carriers that were coming to dominate the industry. And Houston became Continental's hub.

"Continental went through two bankruptcies," says Vacar. "Their inability to contribute had a lot to do with keeping the old look of [Intercontinental]. In 1994, a new team started turning Continental around, and the airline's growth set off the big expansion."

The 1980s and early 1990s had seen a number of splashy airport expansions and renovations, from Chicago's O'Hare to Atlanta's Hartsfield International Airport, the world's busiest with more than 80 million annual passengers. Hub-and-spoke system designs meant that most passengers were taking connecting flights, and the airports where these passengers waited for their connections were shaped to place greater and greater emphasis on passenger amenities such as bookstores, restaurants, and other services. Intercontinental's isolated terminals were suddenly outdated. In the original terminals only half a dozen gates lay behind each security checkpoint, meaning that changing planes usually required going through security, and often required schlepping your carry-on bags to another terminal. "The airport complex reduces neatly to a flow diagram that operates both laterally and vertically to minimize the distance travelers must walk within a terminal or between terminals," Stephen Fox notes in his *Houston Architecture Guide*. The old direct-flight model was built into Intercontinental's master plan, just as the hub-and-spoke model was built into the design of more modern airports such as Denver's Stapleton Airport.

By the late 1990s, new terminals in Pittsburgh, San Francisco, Washington, D.C., and Denver had essentially become retail malls, destinations in themselves. Gensler's Maxwell notes that following the 9/11 attacks, and the subsequent tightening of airport security, these airport malls have become expensive albatrosses, sealed off from the unticketed masses that were supposed to make them profitable.

The improvements to George Bush Intercontinental (as it has been known since 1997) started in 1998, in what was to have been a $1.9 billion capital improvement program. New concourses were built on the south side of Terminal A, replacing the connector pods. New wall coverings and new lighting were installed. A new, 5,600-car parking garage, replacing the surface lot, was built between Terminals A and B. Terminal B was renovated; its corner pods were left in place, since they work for well for the small "regional jets" operated by Continental for flights to medium-sized cities.

Terminals C and D will be renovated in the next three years — and none too soon, as the boxy, crowded, poorly lit and poorly ventilated spaces of Terminal C are among the most unpleasant in the country. A new consolidated rental-car terminal is under construction. Federal funds will pay for a new international inspections building (for customs and freight inspections). And Continental will spend $800 million for a new 500,000-square-foot Terminal E. The new international building and Terminal E are to open by the end of 2004.

More changes are happening on the airline operations side of the airport. Currently, three runways serve Bush Intercontinental; two more are being added. And massive changes now underway will address the new federal security requirements. In September 2002, HAS announced that it's two airports were among those requesting that the government delay its December 31, 2002, deadline for 100 percent screening of passenger luggage. With some 429 airports in the U.S., there were widespread doubts that needed equipment and personnel could be put in place in time. Earlier in 2002, managers of the nation's 100 largest airports jointly petitioned the government to delay the deadline.

Finally, Intercontinental's cargo facilities are expanding significantly on a 120-acre site to the northeast of the terminal complex (the expansion also replaces some facilities demolished for runway expansion). Three private companies — Trammell Crow, Aeroterm, and Lynxs Holdings — are investing $40 million to build ramp space for 20 wide-body aircraft; three new warehouses will provide 550,000 square feet of space for air-cargo processing and distribution.

Hobby Airport, which shut down in 1969 and was supposed to have withered away, reopened in 1971 when Southwest Airlines set up shop there. Southwest has been the most consistently profitable carrier of the deregulation era, focusing from the start on short routes, low fares, and few frills, and Hobby Airport has become its single biggest hub. Though traffic at Hobby, limited by the difficulties of expanding the airport's operations, grew only 1 percent per year during the last decade, the airport nonetheless served 8.6 million passengers in 2001, making it the country's 41st busiest airport.

Several improvements have taken place and are planned at Hobby. An expanded parking garage opened in the late 1990s, dwarfing and all but blocking out the pink marble façade of the terminal building. New concourses under construction will greatly expand the terminal's capacity. Southwest Airlines now operates 13 gates in Concourses A and C; a new concourse, currently under construction will provide 24 gates for Southwest, while renovations to Concourse A will provide 12 gates for the seven other airlines operating from Hobby.

All in all, more than $3 billion is being spent at Bush Intercontinental and Hobby airports, with the goal of changing what Richard Vacar has condemned as the "dismal" and "awful" visitor experiences of the past into something more positive. At the same time, passenger numbers are expected to grow 4 percent per year, doubling today's passenger count by 2017. Piling on the numbers while absorbing the effects of more stringent security measures will certainly test the capacity of new wall coverings, lighting, and art work to make travel through Houston a pleasant experience. ■

WELCOME TO...WHERE ARE WE AGAIN?

Searching, desperately, for a sense of place at IAH

BY ALISON COOK

During a brief lull in the fall monsoons, I overheard a Houstonian welcoming his out-of-town visitor as they walked from the baggage claim at Bush Intercontinental Airport's Terminal C. "You can tell you're in Texas, Jim!" chortled the native. "Smell that musty mold?"

Ah, yes. The musty mold. The wall of hot, damp air that smites you as you emerge from IAH. It's an indelible sensory impression, all right. But why does it have to be the most vivid memory travelers take away from the major airport in America's fourth largest city?

I love airports. There are airports I look forward to with an almost ritual sense of anticipation, and it has always grieved me that my own is not among them. I have been known to route a trip through Amsterdam's Schiphol solely for the pleasure of standing at one of its open-faced sandwich kiosks, nibbling on fresh herring and sipping a teeny-tiny bottle of champagne. Serious shopping for chocolates and cheese ensues. How civilized can you get?

At Chicago's O'Hare, I hop on the moving sidewalks between United's two terminals whether I need to or not, just to soak up the weird magic of the connecting tunnel. Neon tubes pulse overhead, unearthly music pings, back-lit wall panels surge with color. The tunnel is in ill repair these days, but it says "Chicago" to me as powerfully as the aromas of pizza-by-the-slice in the lobbies upstairs.

I long to revisit the charming little salmon run inside the airport lobby at Cork, Ireland. I shoot for long stopovers at Heathrow just so I can browse the great English bookstores. I show up early for flights out of San Juan, the better to cruise the artisanal shops in the gate areas. I pick a seat that gives me an approaching view of Denver's Stapleton airport — its stark-white tented silhouette as festive as a nomadic encampment, poised theatrically on the far edge of the Great Plains with the Rockies as backdrop.

So what if furnace-like desert heat lurks outside the Phoenix airport? As a people-mover whisks me to the rental cars, I'm too busy checking out the cool xeriscaping to suffer. Nonsmoker that I am, I even welcome the acrid stench of cigarette smoke that greets arrivals at DeGaulle in Paris. One whiff and I know exactly where I am: on the brink of a French adventure.

At IAH, one could be anywhere. Okay, so we'll never have the jaw-dropping, snow-clad volcano setting that makes the descent into Portland, Oregon's airport such a thrill. But an airport can create a unique world with its architecture, art, interiors, retail, food, and landscaping. So far, IAH has blown the opportunity.

Domestic-flight terminals A, B, and C — which I think of as the Bland Beige Boxes — are remarkably devoid of a sense of place. The main gesture towards local color is those eerily waxen studio portraits of the mayor, city council, and entire congressional delegation hung mercifully high overhead.

And that's pretty much it, unless you count the Terminal A shoeshine guy who affects a cowboy hat. Or the amusingly in-yer-face sculpture of the late Congressman Mickey Leland inside the grand industrial hall of the international terminal, a space that at least provides a pleasing color palette and some sense of occasion. But what's up with the colossal, flag-wrapped pick-up sticks flung into the earth outside Terminal D? I can't help but think of this lame sculpture garden as the International Obelisk Ranch; it's something Stanley Marsh 3 might dream up on a bad day.

For a liberal taste of Houston, the traveler can get a decent sliced brisket sandwich from Harlon's BBQ, the only palatable local choice among the woeful food purveyors. "Airport Food Doesn't Have to be Terminal," brags a poster from CA One, the company that holds the IAH concessions contract. They could have fooled me.

You would think a city so self-conscious about its image — and so rich in its food culture — would contrive to offer better eats at the one facility that presents its public face to the world. Or, for that matter, that Houston would set up visitor information desks to rival the excellent ones at airports from Cleveland to Albany to Denver, where every conceivable map and brochure is available in a soaring lobby centered by a fountain and staffed by retirement-age greeters in Western outfits. Sweetly corny; wonderfully useful.

At IAH, one searches in vain for such amenities. At 6:30 on a recent Saturday evening, a tiny visitor information booth near the baggage claim in Terminal A was shut up tight, with just one lonely brochure set out for our guests: a guide to Greenspoint.

Getting around inside our terminals involves entirely too much trudging: even the grim Newark airport has enough moving sidewalks to lighten the task. But I confess to a perverse fondness for our toy-like trains that make an underground circuit among four terminals and the Marriott Hotel. With an SRO capacity of only 36 passengers, the three-car trains provide a wild, whippy ride reminiscent of the state fair. ("You really slide around if you're wearing polyester pants!" an airport employee told me.) World class? No. Fun? Absolutely.

Getting around IAH is more difficult than ever of late, thanks to the welter of construction wrought by the capital-improvements project. The vast new parking garages confound the unwary; helpful graphics urging you to remember your level omit the crucial instruction that you must also remember your area. It is not uncommon to see visitors wandering between the Great Wall of China Level and the Leaning Tower of Pisa Level, nursing blisters and punching their panic buttons in the forlorn hope that they will hear their lost vehicles bleating somewhere in the maze.

There is frustration in the makeshift arrangements; trying to access Terminal C from parking deposits you in front of hand-lettered plywood signs directing you elsewhere, as primitive as something you'd find at a trading post deep in the Amazon basin. But there are also signs of hope, of intelligent airport life.

The new garage ramps, big drums clad in skins of diamond-patterned mesh, are luminous and airy at night. Plantings of native oaks and holly are digging in around Terminals A and B. The waiting areas for private cars and taxis are newly user friendly: landscaped, comfortable, attractive. Quite a change from the grimy concrete holding areas of old, which resembled nothing so much as a minor level of purgatory.

And in at least one location, even Gertrude Stein would have to admit there's a there there. The new corridor linking Terminal B with its parking garage is filled with seaweedy underwater light and undulating mosaics of Texas wildlife: great blue herons, egrets, roseate spoonbills, giant surreal hummingbirds. Embedded in the wavy lines of colored granite flooring are detailed metal reliefs of aquatic fauna.

Finally, something I could learn to look forward to. In that corridor, I spied two small Asian boys down on their hands and knees, inspecting the likeness of a blue crab. Their faces were studies in wonder, and surprise. ■

Tracking Growth

Part I: How Railroads Created Houston

BY CHRISTOF SPIELER

past

In the 1910s, Houston promoted itself as the place "where 17 railroads meet the sea." Like most Chamber of Commerce slogans, this was one part fact and one part fiction. The 17 railroad lines in question belonged to only five railroad companies. Some never left the Houston area, and one could argue that the three that ran from Houston to Galveston met the sea on the island, not at Buffalo Bayou.

In a bigger sense, though, the slogan was entirely correct. Business leaders realized early on that Houston's future prosperity depended on railroads. When it seemed the city might be bypassed, they acted. The first railroad in the area, The Buffalo Bayou, Brazos, and Colorado Railroad, started building west from Harrisburg in 1851. Houston's city council appropriated public funds to build a connection to it. The Columbia Tap was completed in 1856 and sold to private interests two years later. More railroads followed. Harrisburg became a historical footnote; Houston became a railroad center.

By the end of the 19th century, the small early railroads had consolidated into bigger systems. The last lines built into Houston were extensions of well-financed regional systems that stretched as far as Chicago and San Francisco.

In their golden age, railroads were the preeminent means of transportation. Inland steamships were all but gone, cars and trucks struggled with bad roads, and airplanes were novelties. Virtually everybody and everything coming in and out of a city came by train. Better railroad connections meant lower rates for freight and convenience for businessmen, and Houston had the best railroad connections in southeast Texas. Until 1879, Galveston's only connection to the rail network was through Houston. Houston's natural geography gave it no advantages, but its railroad geography did. From Houston, then the nation's 45th-largest city, business travelers could take a deluxe sleeping car direct to New Orleans, Los Angeles, San Francisco, St. Louis, Denver, or Chicago. No fewer than five railroads offered service to Dallas. Less deluxe trains carried passengers just about everywhere, connecting small towns such as Katy, Columbus, or Conroe to Houston.

But the railroad's freight service was even more important. Railroads made possible industrial concentration on a national scale. Trains brought Texas cotton to Houston, where it was sent by train to southeastern mills or by ship around the world. Houston refineries received crude oil by train and shipped gasoline, kerosene, and heating oil. Texans mail-ordered clothes, farm equipment, and even houses, and received them by train. Railroads transformed Houston from a rough frontier town to part of the national economy.

Railroads also transformed the look of the city. Before railroads, there were no purely industrial neighborhoods. But factories' need for rail sidings made land alongside the tracks too valuable for mixed uses. In Houston, the railroads came first on the east side, then extended into the undeveloped north bank of Buffalo Bayou. As a result, the city's best neighborhoods — the ones remote from the noise, dirt, and industrial surroundings of the railroads — were southwest of downtown. Areas to the north and east became poorer and more industrial, places where switch engines went down streets to serve a dense fabric of factories and warehouses. Factories of all sizes had sidings where they received raw materials and shipped finished products. Industries not on the rail line used wagons to move goods to the railroad. Open loading platforms called "team tracks" and enclosed freight houses transferred goods from wagons to railcars.

Streetcars connected the city's neighborhoods. Houston's first lasting streetcar line opened in 1874. By 1890, two companies operated 32 miles of horse-drawn street railways. Then came electric trolley cars, one of the great innovations of the American city. Electric power increased speeds, eliminated horse manure, and was remarkably durable and inexpensive to build. Richmond, Virginia, launched the first successful electric streetcar line in 1888, and within a few years, virtually all cities of any size had streetcars. Houston's first electric streetcar ran in 1891. Fifteen months later, all the lines had been electrified. In 1927, the system peaked at 90 miles of routes. Streetcars provided the armature around which the city grew. Neighborhoods grew around new lines and new lines were built into new neighborhoods. Since the streetcars were privately operated, the city could not use them as development tools. But developers could. Outlying land was suitable for development only if connected by a streetcar line. If necessary, the developer built that line himself.

Downtown — a concentration of retail and offices — was not possible without streetcars to bring in shoppers and office workers. Carriages and pedestrians could never support such density. Our modern view of the city — a dense commercial downtown surrounded by sprawling residential neighborhoods, a place where one worked in one place and lived in another — is an invention of the streetcar.

Outside the city, streetcars became high-speed interurbans. Houston had two. The Galveston-Houston Electric Railway ran on city streets in downtown Houston (where it shared tracks with streetcars) and down the center of Broadway in Galveston. In between, it used a high-speed railroad-style right of way. Nonstop trains with parlor cars made the run in 75 minutes. Regular trains took longer, stopping in places like Texas City and League City. The other interurban, the Houston North Shore, connected to the streetcar system on Lyons Street and headed east to Goose Creek. Interurbans flourished briefly in the 1910s and 1920s, then were driven out of business by automobiles and the Great Depression. The North Shore survived as a freight line; the Galveston line was abandoned, having never covered its construction costs. But it left a string of small towns that have since become a solid swath of suburbia between Houston and Galveston.

Houston streetcars didn't survive the depression, either. The last streetcar route was replaced by buses in 1940. By then, the railroad industry was in decline as well, though that would not become obvious until the 1950s, when Houston's leaders turned their attentions to highways and jet planes. But trains had left lasting marks in the shape of the city, in its neighborhoods and suburbs, and in the industries the trains attracted. More fundamentally, the railroad era was responsible for Houston's prosperity and its continuing regional dominance. Railroads made Houston.

MAP: In 1927, Houston was in the midst of one of its periodic booms. The streetcar system was at its peak in size and ridership, but developers were already creating new car-centered developments such as River Oaks and Braeswood. The last railroad line into Houston was completed that year. Houston's growth over the previous 50 years had been driven by streetcars and railroads. From then on, cars took that role, creating a very different urban fabric. But this old Houston — a city of small lots and walkable street grids — is still there, buried in the middle of a 21st-century metropolis.

The map's streetcar network is derived from Steven Baron's Houston Electric (self-published, Houston, 1996). Urban development and railroad lines are from a 1928 map of Houston published by the River Oaks Corporation (Center for American History, The University of Texas at Austin) and United States Geological Survey quadrangle maps: Aldine, 1919; Bellaire, 1921; Deepwater, 1922; Houston Heights, 1922; Humble, 1919; Park Place, 1922; and Settegast, 1922 (all Center for American History, The University of Texas at Austin).

Houston, 1909, as photographed by A.L. Barnett

railroad lines: original name (controlling system circa 1920), year built

line abandoned prior to 1927

streetcar lines

major railroad stations

extent of development (street layout shown is modern)

Houston & Great Northern (Missouri Pacific) 1871

Houston East & West Texas (Southern Pacific) 1877

Beaumont, Sour Lake & Western (Missouri Pacific) 1907

Trinity & Brazos Valley (Chicago, Rock Island, & Pacific / Chicago, Burlington, & Quincy) 1907

Houston & Texas Central (Southern Pacific) 1856

Houston Railway (Southern Pacific) 1892

Texas & New Orleans (Southern Pacific) 1861

Missouri-Kansas-Texas 1893

Houston & Texas Central (1914)

Houston North Shore (Missouri Pacific) 1927

Northside Belt (Port Terminal Railroad Association) 1925

San Antonio & Aransas Pass (Southern Pacific) 1914

Houston Tap (Houston Belt and Terminal) 1856

Gulf, Houston, & San Antonio (Southern Pacific) 1880

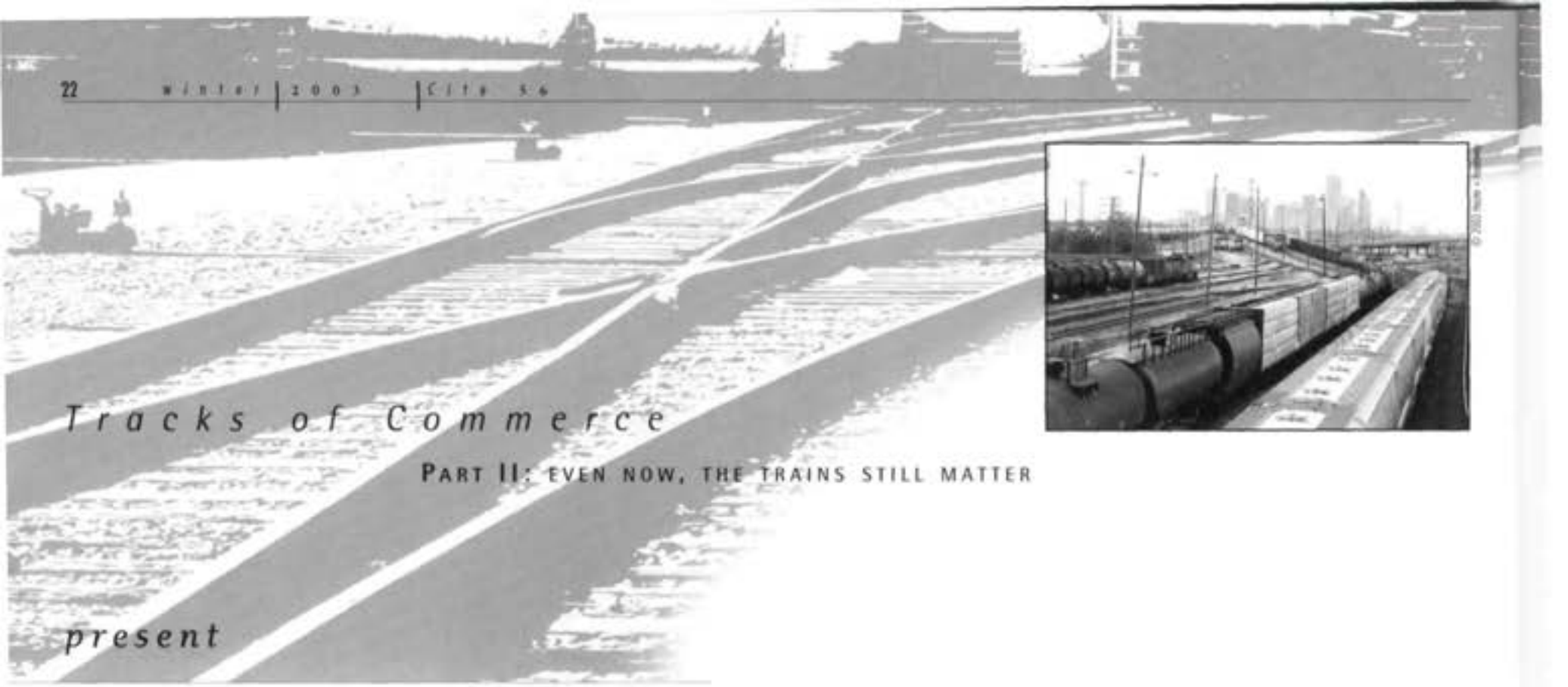
Galveston, Houston, and Henderson (Missouri Pacific / Missouri-Kansas-Texas) 1859

Gulf, Colorado, and Santa Fe (Atchison, Topeka & Santa Fe) 1883

Galveston - Houston Electric Railway (1911)

Buffalo Bayou, Brazos & Colorado (Southern Pacific) 1853

uston Tap and Brazoria (Missouri



Tracks of Commerce

Part II: Even Now, the Trains Still Matter

present

In the 1920s, railroads were the leading means of transportation; now they're one of many. The old carry-everything, go-everywhere railroad system is gone. But in its place is a new system, less pervasive but equally vital, that specializes in a few key commodities.

Rail's inherent advantage is its economy: no other nationwide network can carry goods in such bulk or at as low a cost as railroads. Bulk commodities — coal, chemicals, grain, and ore — make up two-thirds of North American rail tonnage. The coal comes from the Appalachians, Colorado, Utah, and the Canadian Rockies, and above all from the high plains of Wyoming. It goes to steel plants, to export docks, and to power plants. Over one-third of U.S. electricity is generated from rail-borne coal.

Houston is to chemicals what Wyoming is to coal. Railroads don't carry crude oil and gasoline, which move in pipelines. Instead, trains carry the chemical building blocks of industry: tank cars of sulfuric acid, latex, chlorine, and many others, and hopper cars of fertilizer and plastic pellets.

Grain comes in seasonal rushes that stretch railroad labor pools and car supplies. It is loaded at massive elevators across the Midwest and the far West, then moves slowly to mills and dockside export elevators.

Railroads move bulk cargoes with extreme efficiency. A 10,000 ton coal train moves in one piece from a mine-owned loading silo to a utility-owned unloader, requiring only a few two-person engineer crews. This is in contrast to traditional "loose car" boxcar railroading, where a single car requires multiple crews, trains, and yards to be picked up, sorted, re-sorted, probably sorted once more, and finally delivered. Railroads have been trying for 50 years to get out of the "loose car" business, and they have largely succeeded.

Container technology has kept railroads in the merchandise business. The ease of transfer between ship, road, and rail allows railroads use their strengths while more agile trucks handle pickup and delivery. Truckers have trouble beating the railroads' speed over long distances and can't touch the cost. Thus, major trucking firms such as J.B. Hunt and Schneider now use railroads for much of their long-haul traffic, particularly across the West, as does United Parcel Service. Shipping lines have substituted container trains for the Panama Canal. Trains on tightly coordinated schedules meet ships at Pacific ports and move goods to the eastern two-thirds of the continent. "Intermodal" traffic — containers and truck trailers carried by train — will soon overtake coal as the railroads' biggest revenue source.

As the railroads' economic role has been transformed, the railroad network has changed to match. Fifty years of cost-cutting has eliminated 40 percent of railroad mileage and 90 percent of employment. A continuous quest for economies of scale has driven waves of mergers that have left only six huge systems operating almost all the nation's mainline track.

Almost no new lines have been built since the 1920s; profit margins are too thin for that. Instead, railroads have chosen segments from their redundant networks to fit the new traffic patterns. Many once busy lines are gone, but other routes carry more traffic than ever. National traffic flows have been projected onto local networks through the happenstance of history.

Thus, places that once revolved around the railroad have become incidental to it. Railroad landscapes still exist. They are built on a vast, inhuman scale, suited to long trains, broad curves, and yards full of railcars. These places are few, though. The old railroad landscapes — the congested factories and warehouses of the inner city — no longer need rail service. A once dense network of tracks in streets and between buildings has disappeared or is rusting away. Even the industrial parks farther out along the tracks now have far more abandoned rail spurs than active ones. But the trains still pass through, blocking streets and disturbing sleep.

The solution to this problem lies in separation. In the 1920s and 1930s, railroads built elevated tracks, underpasses, and new belt lines to accommodate automobiles. Now the revitalization of the inner city and the realization that railroads are not disappearing have revived the idea, leading to a handful of projects around the country. In Los Angeles, the Alameda Corridor combines three separate rail lines to the port into a double-track route in a ten-mile trench, increasing train speeds and eliminating 200 sets of crossing gates. In Lafayette, Indiana, a new line skirting downtown has replaced a busy freight line that ran down city streets.

Such extensive capital improvements require public funding (the cost of the Alameda Corridor alone exceeds each of the western railroads' capital budgets for 2001), and that requires a new mindset. Unlike every other industrialized nation, the United States never nationalized its freight railroads. Politicians are reluctant to invest public money into private infrastructure, and the railroads — which the government regulated heavily until the 1980s — are reluctant to accept the restrictions that may come with public funds.

One needs only count the trucks on any interstate to see the potential of freight rail. New rail lines, grade-separated from roads and going around cities rather than through them, could increase rail's market share, reduce traffic congestion and pollution, and make highways safer. Texas governor Rick Perry has proposed just that with his "Trans Texas Corridors," a network of combined highways, freight and passenger rail lines, and pipeline corridors. The ambitious scheme faces many hurdles, but it's high time we consider its basic premises — that transportation policy needs to consider freight as much as people, and that railroads have an important place in that policy. Regardless of the proposal's future, Houston's railroads will not go away. Houston is not a city that trains simply pass through; it's a major generator of freight traffic. As long as refineries line the Ship Channel, trains will serve them. Recent history shows how important Houston is to the railroads. In 1997, the Union Pacific tried to consolidate its Houston operations in one rail yard. The yard filled up and could accept no more trains. Trains started backing up on routes leading to Houston, and within days, the entire western railroad system gridlocked. Houston is still a railroad city.

MAP: The area around the Port of Houston is a huge source of traffic for the freight railroads. This is due not to the port itself, but rather to the industrial plants that surround it, particularly the refineries and chemical plants. Houston also serves as regional rail hub; petrochemicals from the rest of the Texas coast move through Houston on their way to the East and Midwest. Houston is also on an east-west transcontinental line, the Sunset Route from Los Angeles to New Orleans. Those traffic flows, though, are secondary. For the most part, railroad traffic in Houston originates locally. The concentration of rail lines on the east side reflects that. Because no rails cross the ship channel, most railroad traffic funnels through a small area immediately to the east and northeast of downtown.

On the map opposite, the concentration of industry to the east and south is clear; it would be more dramatic if the volumes shipped were shown. Many of the industries shown handle only two or three cars at a time, but petrochemical plants may load dozens daily.

Traffic density information is derived from the *National Transportation Atlas Database 2002*, reported by the Federal Railroad Administration. Industries and yards were located by observation from public streets. Industries with tracks that had railcars on them or showed signs of recent use were assumed to be served by rail. Some industries not visible from public streets may have been missed.

UP to Baytown

PTRA to Channelview

UP to La Porte

PTRA to La Porte

UP to Galveston

UP (BNSF) to Beaumont (New Orleans)

UP (BNSF) to Beaumont (New Orleans)

UP to Shreveport

UP to Texarkana (St. Louis), Dallas

BNSF to Dallas (Denver/Chicago), Amarillo (California), Galveston (UP to Victoria)

UP to Parish Generating Station

UP to San Antonio (California)

BNSF to Fort Worth

UP to Dallas

< 1 million tons/year

1.5 million tons per year

5 - 10 million tons per year

10 - 20 million tons per year

20 - 30 million tons per year

30 - 40 million tons per year

rail yards (switching of cars)

intermodal facilities (loading/unloading of containers/trailers)

automobile ramps (loading/unloading of new vehicles)

industries served by rail

Corridors of Opportunity

Part III: Rail lines — even without trains — will shape Houston's future

future

As a city grows, it is constrained by existing property lines. The older the city, the worse the problem. Downtown Boston's intractable traffic jams are the result of a modern highrise downtown served by a pre-industrial street network. But newer cities such as Houston face similar problems. West of the Galleria, Westheimer is built on the right-of-way of a farm-to-market road. The only way to widen transportation corridors or create new ones is to condemn property, an expensive and politically difficult prospect.

In this context, railroads are an invaluable resource. Railroad right-of-ways are at least 50 and usually 100 feet wide. A double-track line occupies only 30 feet of that. In the post-industrial city, many of these lines are little used or abandoned. As the city grew, these strips of land remained intact. To a transportation planner, this is the stuff of dreams.

In Houston, reuse of railroad lines as highways dates back to the 1940s, when the last remnants of the Houston-Galveston Electric Railroad were abandoned to create a path for the Gulf Freeway. Additional land had to be taken on both sides of the tracks for the freeway, but the railroad line still offered the path of least resistance. Outside of cities, early highways such as Old Katy Road and the Hempstead Highway followed railroad lines to connect the towns that had grown up along them. When the interstates came, they followed the same path where possible. At towns such as Katy, where the tracks and the old highway pass through downtown, the freeway curved away, skirting the town and returning to the railroad tracks on the far side. Meanwhile, active railroad lines found additional uses. From the days when the first telegraph lines were built along railroads, railroad corridors have been used for communications lines. Today, railroad right-of-ways carry high-tension electric lines, gas and oil pipelines, and fiber-optic communications cables.

The past two decades have created unprecedented opportunities for the reuse of railroads. Through the 1970s, most abandoned railroad were rural branch lines. But the rapid consolidation of railroads made many main lines surplus, and the deindustrialization of cities has done the same to urban branches. Offered enough money, railroads will gladly reroute traffic and close low-density lines. Such corridors have found a variety of new uses.

Not surprisingly, Houston's highway planners have made much of the opportunity. The Hardy Toll Road was built on railroad right-of-way around a still-active railroad line. This arrangement benefited the railroad as well as the toll road: The road overpasses required to create a limited-access highway also eliminate railroad grade crossings, creating a nine-mile railroad with no crossing gates. Three current Houston highway projects use abandoned rail lines, and if planners get their way, many more will follow. The Harris County Toll Road Authority (HCTRA) has posted a map of such towering ambition that it would make New York's Robert Moses proud. It includes toll lanes on existing freeways, elevated toll roads above streets, and new toll roads along active railroad lines.

Some of the same rail lines have attracted the attention of the Metropolitan Transit Authority, which is trying to make up for Houston's long history of failed rail transit proposals. After proposing subways and monorails, METRO has committed itself to a less expensive technology. "Light-rail" trains are short and powered by an overhead wire, allowing then to cross streets at grade and mix with cars in city streets. Thirteen U.S. cities have opened light-rail lines since 1981, and Houston will join their ranks when METRO opens the Main Street METRORail in early 2004.

The Main Street line is atypical in one important respect: It runs exclusively in city streets. Trains will have their own lane and will be linked to traffic lights so that they will rarely hit red lights. But street speed limits hobble light-rail vehicles: Main Street trains won't go faster than 35 miles per hour; counting stops, they will average only 15. That is faster than a bus, but not good enough for long trips. To get higher speeds, light rail needs its own right-of-way, and abandoned rail lines are perfect. Here, protected from cars by crossing gates, light rail trains can run at highway speeds.

But using only rail lines would hobble a system, too, unless the lines are unusually well located. It doesn't matter how fast a train goes if it doesn't go where the riders are. So most light-rail systems are created by assembling different rights of way: city streets in downtown, rail lines in the suburbs, and tunnels or elevated structures in some congested areas. Particularly in near-downtown neighborhoods, planners face a tradeoff. Using a railroad right of way is cheaper and provides faster trips for suburban riders. Using a city street provides access for inner city residents and has more potential to revitalize neighborhoods. Making the decision is as much a matter of politics as engineering.

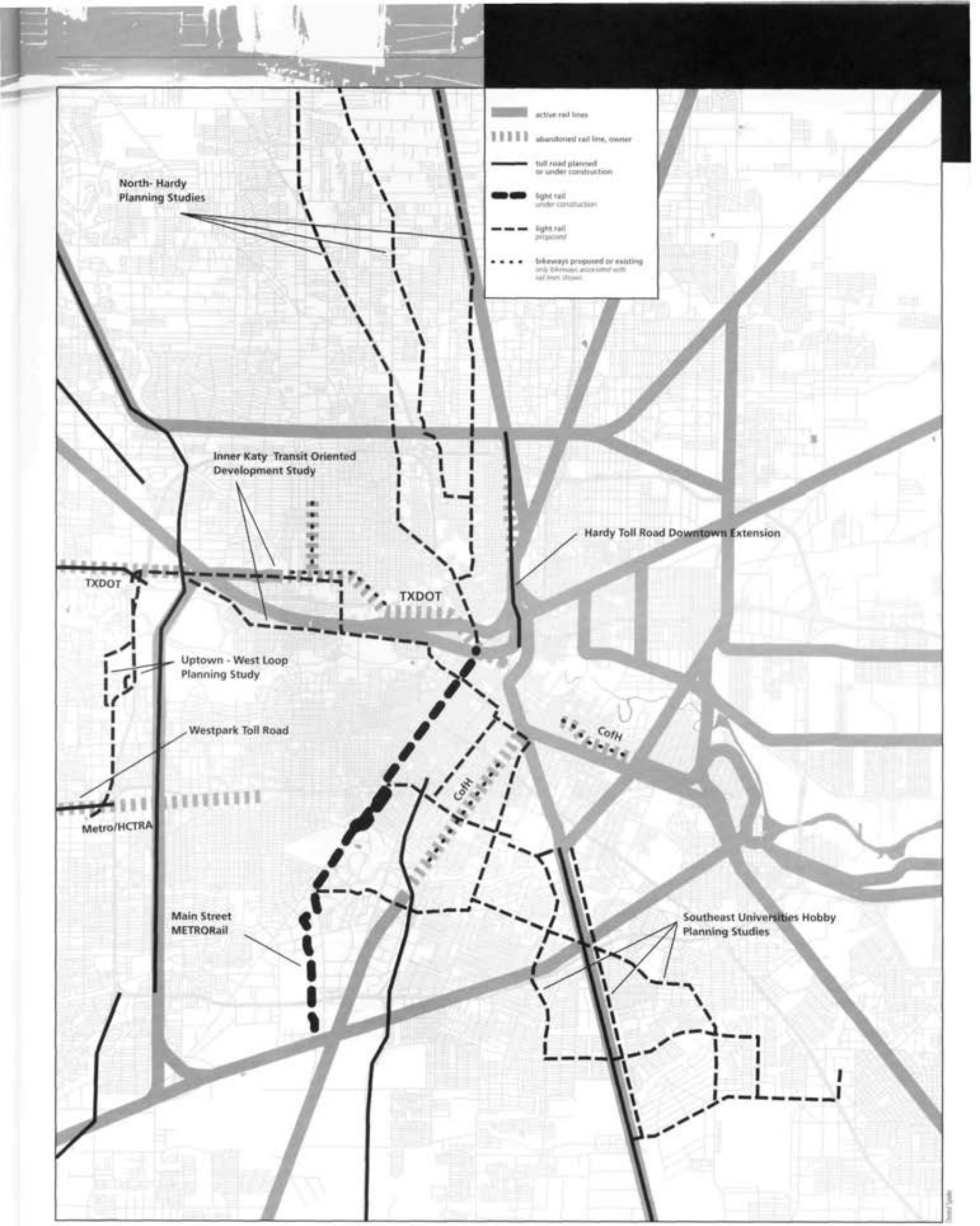
Another potential use for inactive rail lines is more bucolic: A little landscaping and a strip of asphalt transforms an abandoned rail line into a hike-bike trail. The Rails to Trails movement has spread nationwide and includes everything from trails across Montana mountain passes to long, straight trails past Midwestern cornfields to paths for urban bike commuters. Houston's ambitious bike trail program includes several segments of abandoned rail lines that will connect with bayou paths and bike lanes in streets.

All new uses for rail lines have downsides. Homeowners expect that abandoned rail lines will stay that way; people are alarmed to find that the strip of weeds behind the house they bought may become a bike trail, a transit line, or a highway. Perceived threats to property values are the surest way to motivate people to attend meetings, write letters to elected officials, and sue. Never mind that many of those fears are unfounded or at least petty. It's said that light-rail might mean noise (actually, it's quieter than a bus), bring crime (though the morning paper regularly proves criminals can drive), or lower property values (though studies have shown the opposite). Bike trails could attract beer-drinking teens (such as the property owners' kids) or ruin the sacred privacy of the American back yard.

The government is quite capable of fighting with itself, too. METRO and HCTRA have engaged in a sometimes public dispute over custody of the rebuilt Katy Freeway's median. A century ago, rail barons fought each other with lawyers, bribes, and even guns. The guns have been put away, but the new rail battles are just as fierce. ■

MAP: Houston's railroad network remains largely intact. That hasn't stopped government agencies from finding new uses for rail right-of-ways. Conveniently, the only two main lines out of Houston that have been abandoned are on the densely populated west side. The lines that remain active also offer opportunities for re-use, especially those originally built through open countryside on wide rights-of-way.

Tollways are from an undated map entitled "Pooled Projects" formerly posted on the Harris County Toll Road Authority website. Transit options are from four different studies. Three are sponsored by **METRO** and represent the first step in obtaining federal funding. The studies may recommend light-rail or bus; the chosen alternatives will go before voters in November **2003**, along with a schematic plan for a comprehensive system. The fourth study was conducted by the City of Houston to consider development implications and recommend an alignment to **METRO**. Sources: Uptown-West Loop Study fall **2002** newsletter, North Hardy Planning Studies fall **2002** newsletter, Southeast Universities Hobby Planning Studies website, and Inner Katy Transit Oriented Development Study draft report dated October **15, 2002**. Bikeways are from the City of Houston Houston Bikeways Program website.


active rail lines
abandoned rail line, owner
toll road planned or under construction
light rail under construction
light rail proposed
bikeways proposed or existing
North- Hardy Planning Studies
Inner Katy Transit Oriented Development Study
Hardy Toll Road Downtown Extension
TXDOT
TXDOT
Uptown - West Loop Planning Study
Westpark Toll Road
CofH
CofH
Metro/HCTRA
Main Street METRORail
Southeast Universities Hobby Planning Studies

Port of Call

NEVER UNDERESTIMATE THE POWER OF DEEP-WATER DREAMS

BY DANNY MARC SAMUELS

Houston, a city founded in a swamp, has always harbored deep-water ambitions. Even though it's 50 miles distant from the nearest lapping waves of warm Gulf salt water, Houston's founders and fathers always dreamed of it primarily as a port city. And strangely enough, despite being situated in the least auspicious of locations, through political persistence, geographic fortuity, and a few turns of historical happenstance, Houston did eventually become a successful deep-water port, the sixth largest in the world and, in the U.S., first in foreign waterborne tonnage and second in total tonnage. The port and its associated industrial zone, providing trade connections around the world, are the engines that drive Houston's prosperity.

Economic success, however, comes at a cost. Making the port has involved recurrent large-scale restructurings of the landscape and alterations to the environment. A port, like a city, keeps eating the land around it to provide newer, more competitive facilities, which by their nature grow larger and larger. Deeper channels for larger ships require constant dredging. Over a hundred years, a natural watershed and salt-marsh ecology has been transformed into one of the largest, most productive industrial zones in the world.

All this was not apparent in 1836, when Texas settlers, victorious in their war for independence from Mexico, found themselves in possession of a vast undeveloped territory. East Texas was not a particularly rich land, but there was timber to the northeast, soil of adequate fertility to support cotton, rice, and sugar cane cultivation in the Brazos River valley to the southwest, and a fortuitous opening to the Gulf of Mexico at Galveston Bay. Most of the rivers along the Texas gulf coast are seasonal and shifting, impeded by sandbars, without protected harbors. Galveston was the best natural port along the coast, its bay protected but shallow, flushed by a high volume of water flowing through the narrow Bolivar Channel that kept the passage clear of sandbars. Buffalo Bayou, at least up to Harrisburg, formed a broad channel for navigation.

There was considerable competition then to establish the city that would be the successful trans-shipment point, where ox-wagons could transfer their loads of cotton or lumber to barges or steamers. Then, as now, small differentials in the cost of com-

peting modes of transport made all the difference, and aquatic barges, being cheaper than terrestrial ox-carts, won out. The port should be as far up the bayou as free navigation would permit.

In 1836, brothers Augustus and John Allen, a pair of real-estate promoters, pushed far up Buffalo Bayou to their fourth-preferred site to found their dream city. (Their first three choices — at Galveston, Morgan's Point, and Harrisburg — turned out to be already taken or tied up in title disputes.) Even though their site — now Houston — was far from ideal, by sheer entrepreneurial audacity the Allen brothers succeeded in making their paper city a reality. But as it turned out, they went a few miles too far up the bayou.

The Allens were so convinced of their venture that in 1837 they hired the 85-foot steamer *Laura* to make a demonstration voyage up the bayou. Because of sharp bends, sandbars, logs, and overhanging branches, the trip took three days, but their ship nonetheless came in. When skeptics remained unpersuaded, the brothers hired the *Constitution*, the largest steamer then plying those waters. It made the trip up the bayou, but unfortunately there was no room for it to turn around, and, embarrassingly, it had to be backed down the bayou to a wider area eight miles downstream. This became known as Constitution Bend, and later became the site of the Turning Basin — as far as deep-water ships ever made it toward Houston.

Houston then had to be content with the small, shallow draft ships and barges that could come up the narrow, twisting channels of Buffalo Bayou and turn around, and with being, at the Allen's political instigation, the (temporary) capital of the new Republic of Texas. Beginning in the 1850s, there were sporadic efforts to improve the navigability of the upper reaches of Buffalo Bayou by deepening and straightening the channel. Allen's Landing did become a small functioning port, and cotton was loaded right at the bottom of Main Street for shipment to Galveston.

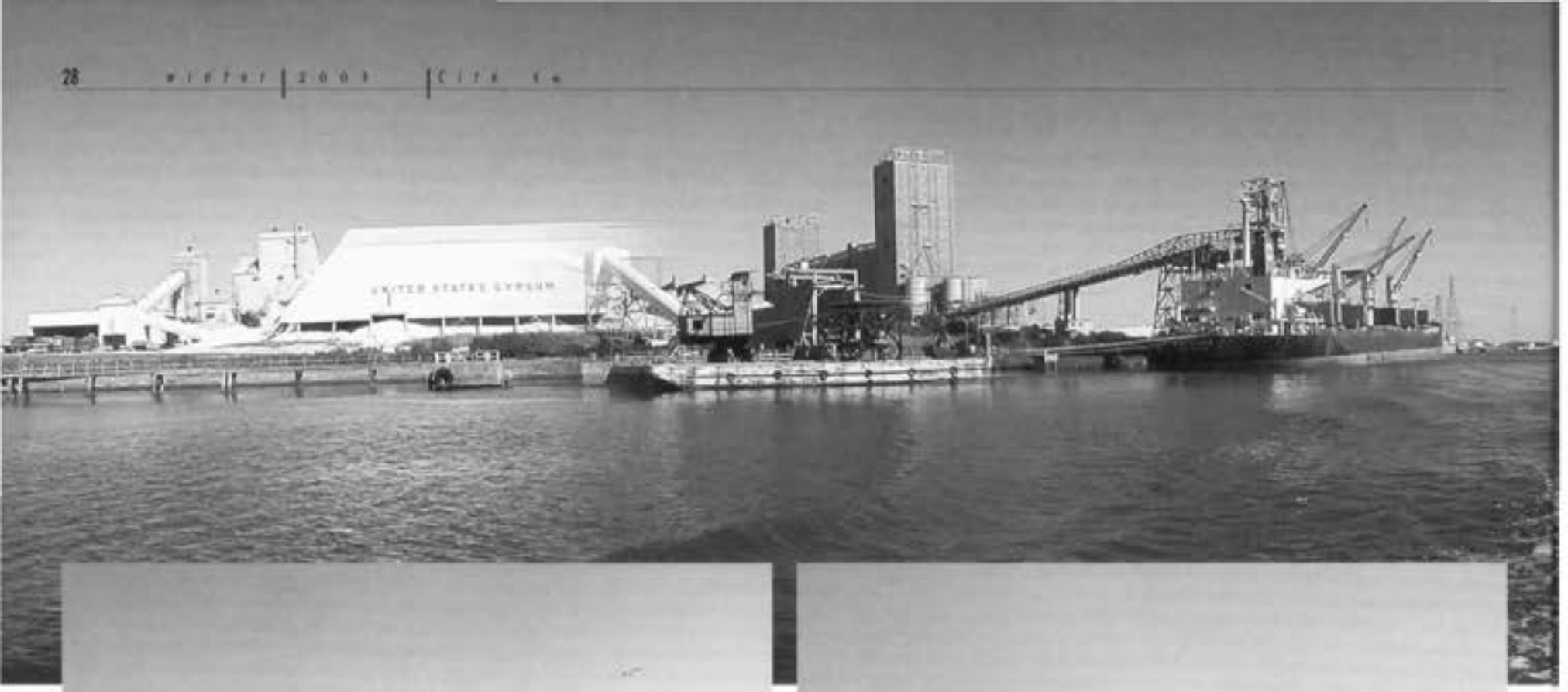
It was Galveston that won the first round of what would become a continuing competition with Houston, and between 1840 and 1900 it became a prosperous and urbane city, the largest in Texas. Cotton was brought to Galveston by barge and loaded onto ocean-going ships moored outside the oyster reefs, bound for the east coast or England. The Strand became the center of cotton export, and new buildings were built with cast-iron parts imported from England on cotton freighters that needed ballast for the return journey to Texas. By 1896, with the support of western states seeking an outlet for their produce, construction of federally funded jetties and dredging to a depth of 25 feet made Galveston a true deep-water port.

With the growth of the railroads in the latter half of the 19th century, Houston's inland location developed an advantageous potential. Lying along an east-west route from New Orleans to Los Angeles, and along a north-south route from St. Louis to Mexico, Houston became a convergence point for rail shipment. Galveston, on an island 50 miles farther away, was not along a major route, and was only tenuously linked by a single line from Houston that crossed the bay on a low viaduct. Now cotton and other commodities could be shipped by rail from Houston or points west to Galveston at less cost and in half the time needed to barge it down the bayou.

Houstonians did not give up their deep-water dreams, however. The possibility of reducing shipping costs even more by avoiding Galveston entirely drove Houston's ambition. The Houston congressional delegation kept trying to get the federal government to pay the cost of dredging a deep channel to Houston. Soon the balance shifted to Houston, but it came at an enormous cost to Galveston.

The Great Storm struck Galveston on September 8, 1900. In a natural disaster of unparalleled destruction, more than 6,000 people were killed and large areas of the city were devastated in the storm surge. It took Galveston 15 years to recover and rebuild. The island focused its efforts on building a seawall, raising the grade level of much of the city, and constructing a new rail/auto viaduct across the bay. With Galveston thus distracted, Houston representatives seized the opportunity to push through Congress a bill to fund the construction of a ship channel, with a compromise provision to rebuild the Port of Galveston.

The construction of the Houston Ship Channel, an enormous engineering project, was begun with federal funds in 1903. The work involved several related parts: first, the dredging of a channel 18.5 feet deep and 100 feet wide for 25 miles north through the shallow waters of Galveston Bay to Morgan's Point, the mouth of the bayou; second, straightening and widening Buffalo Bayou for another 25 miles, north to Lynchburg, then west to Long Reach; and third, construction of a turning basin large enough for ocean-going ships at Constitution Bend. This work went in fits and starts, but was finally completed by 1914, with the channel depth increased to a depth of 25 feet, sufficient for the latest ocean-going ships. Citing budget and engineering considerations, the Corps of Engineers resolved a local controversy by siting the turning basin eight miles east of downtown Houston. Though the city's founding dream of deep water had been thwarted, the city's officials were unshaken. If the deep water would not come to Houston, then Houston would



go to the deep water. It did so by annexing Harrisburg and growing eastward.

Meanwhile, the rebuilt Port of Galveston was one of the most modern facilities in the world, with a 32-foot channel, more than 100 berths, five miles of wharf frontage, and new elevators and warehouses. It recovered quickly, and by 1912 was the second-busiest port (after New York) in the U.S., handling three times more cotton than any other port in the world. But Galveston could not long maintain its lead over Houston. Ultimately, there was simply not enough space along its cramped waterfront for all the services needed for a modern port. Nor could Galveston overcome its disadvantage as a spur to Houston's rail center. The extra cost of shipping to Galveston, known as "the differential," always made its port less competitive than wharves closer to Houston.

So Houston became an international port, connected to the west coast by the Panama Canal (opened in 1915) and to a new system of intercoastal canals along the Gulf coast. The primary cargoes were cotton, fertilizer, lumber from east Texas, and sugar and rice from the coastal plains.

As luck would have it, on January 10, 1901, barely four months after the Great Storm devastated Galveston, and less than 60 miles away, oil gushed out of a hole poked into the ground at Spindletop. There ensued a mad rush for oil, and within a few years fields were discovered all over east, south, and central Texas. World War I demonstrated the utility of the internal-combustion engine and spurred its development, fueling the demand for petroleum products at the same time that new fields were coming on-line all over east Texas.

When the ship channel made 25 miles of waterfront real estate available along each bank in 1914, Houston's ready access to world markets encouraged oil companies to start building refineries here: Sinclair came in in 1918, followed by Deep Water in 1919, Crown and Humble in 1920, and Shell in 1929. By 1930 there were eight refineries on the ship channel, and pipelines from fields in south and east Texas were converging on the new channel facilities. By 1940, 14 ship channel refineries accounted for 11 percent of the gasoline produced in the U.S.

After a slow time during the Depression, World War II provided the next impetus for industrial development along the ship channel. Steel mills, ordnance plants, and shipyards fed the war machine. Most important, the petroleum industry spawned the petrochemical industry, with new refineries processing raw stocks of petroleum, natural gas, and sulfur to produce new chemical wonders such as butadiene for synthetic rubber, toluene for TNT, and high-quality aviation fuel. This enormous expansion of port industries continued after the war. The petrochemical industry readily converted to the production of myriad plastics to supply an ever-expanding domestic market. Synthetic fibers were developed that supplanted the market for cotton.

To maintain an edge over such competitors as New York, Philadelphia, and New Orleans, the Port of Houston Authority (which was established in 1927) has made major investments in dredging, additional wharves, and new materials handling facilities. If you are serious about having a deep-water port, you have to keep making it deeper and wider as ships get larger. The ship channel has been continually deepened and widened: in 1925 from a depth of 25 feet to 30 feet; in 1935 to a depth of 34 feet and a width of 400 feet; and in 1967 to a depth of 40 feet. Currently it is being dredged to a depth of 45 feet and a width of 530 feet, even though this necessitates replacing numerous pipelines, cables, tunnels, and other under-channel infrastructure. The dredging operations have also created new territory, as millions of cubic yards of spoilage have been placed in diked cells similar to Dutch polders. Some of these areas have been used to build new port facilities; more recently, some have been use to create bird habitats and salt marshes.

The Port of Houston now carries more foreign waterborne tonnage than any other port in the U.S., and with about 194 million tons in 2001, ranks second behind south Louisiana in total tonnage. Counted in tonnage, the Houston port's top trade partners are Mexico, Venezuela, and Saudi Arabia. Counted in dollars, total foreign trade is about $45 billion, with the top trade partners being Mexico, Germany, and Brazil. This growth, along with the development of air conditioning, finally allowed Houston to proclaim itself "a world city."

Despite the Port of Houston's economic importance to the city, for most Houstonians the port is a remote and unexplored territory. This is true of most ports in most cities: even when they are located in the center of a city their operations are not public in nature, and all the interesting stuff is hidden behind walls and buildings. But Houston's port, eight miles removed from downtown and far from the Gulf, has its own unique and unknown territory. In general, it can be seen as comprising three parts: the old port nearest Houston, anchored at the Turning Basin; the petrochemical port spread along the banks of the Houston Ship Channel; and the modern specialty ports, exemplified by the container terminal, which is located close to Galveston Bay for easy access by large ocean-going ships.

A slice through the history of the old port may be obtained from a trip on the *M/V Sam Houston*, the Port Authority's public tour boat. The tour goes from the

Turning Basin to the Loop 610 bridge, pretty much the pre-WW II port. At the head of the Turning Basin is a collection of dormant ships: the derelict *Stolt Spirit* of Monrovia, a rusting hulk that burned five years ago, and three Navy roll-on/roll-off ships pre-positioned on ready alert to ship military cargo to the next war zone. A little farther down there is the everyday working port for general cargo: ships wharved next to warehouses, being loaded or unloaded item by item by longshoremen during daylight operations. On a recent day, one could see the *Wilson* of Dover, Delaware, loading pallets of fertilizer sacks; the *Star Elfin* of Panama unloading steel pipe onto a dozen waiting flatbeds, with several giant generators nearby on rail cars awaiting the return trip; the *North Challenge*, also of Panama, taking on petrochemicals by pipe; and the *Tai Kang Hai* of Tianjin being fed bulk grain through conveyor belts.

Viewed from a distance, the scale of everything is enormous: ships, cranes, silos, warehouses, and bridges are all giant elemental forms. Time moves at an adagio tempo, a deliberate choreography of gantries and ships, nothing too fast. Up close, and low to the water, there is another scale of traffic underfoot, one moving at an allegro pace — tugs chugging back and forth, cranes lifting pallets of goods and produce, barges loading and unloading, trains and trucks moving about.

The next section, below Loop 610, is not readily viewed from the water: 25 miles of channel lined with continuous petrochemical and other large-scale industrial facilities. Glimpses of this surreal landscape may be had from nearby roadways such as the 610 bridge (but don't stop there), Highway 225, Clinton Road, and Texas Highway 146. Here are dozens of petrochemical plants, each the size of a medium city's downtown, with hundreds of towers larger than office buildings, structures without skin, spectacularly lit at night. Houston is the second largest petrochemical complex in the world, refining more than 50 percent of the gasoline used in the U.S. Tankers dock at corporate wharf facilities, unloading their crude cargoes from the Middle East and South and Central America directly into the refineries. The eventual refined products are then distributed around the U.S. by pipeline or rail car, or overseas by tanker. A series of industrial towns — Galena Park, Pasadena, Deer Park, Texas City, Baytown, and La Porte — provide home and support foe those who labor in the channel industries.

The third section consists of new specialized facilities, but they are not all in one locale. These facilities exploit new technologies, combining specialized ships and loading equipment, that have completely changed the shipping industry. From the 610 bridge, you can see to the west the roll-on/roll-off — a.k.a RO/RO — port, where ships from Germany disgorge new Volkswagens directly onto enormous parking lots for shipment to the Midwest. To the east, you can see wharf 32, specially designed and built for transferring heavy, oversize, and irregularly shaped cargoes. At Jacintoport, there is a new cold storage and food distribution facility. Offshore, Ultra Large Crude Carriers and Very Large Crude Carriers, the most economical transporters of bulk crude, but too large for any U.S. port facilities, are offloaded to smaller ships for delivery to port facilities. (Off the coast of Louisiana there is an offshore ship-to-pipeline trans-shipment facility for unloading these behemoths. So far, efforts to construct such an offshore port in Texas waters have not materialized.) But the facility that exemplifies the biggest revolution in shipping is the Container Terminal at Barbour's Cut, where Buffalo Bayou meets Galveston Bay.

On April 26, 1956, when the freighter *Ideal X* carried the first load of 58 containers — steel boxes eight feet by eight feet by 35 feet — from Newark, New Jersey, to Houston, it was not, on the face of it, a shipping revolution. But the eventual success of this shipping concept transformed not only the shipping industry but the nature of the global economy as well as the character of port cities around the world. When a producer could load a container in a factory anywhere in the world and ship it directly to a consumer anywhere else in the world quickly, at low cost, and in relative security, the whole equation of supply and demand shifted. Every point of production became directly connected to every point of consumption. A new kind of global commerce was born.

Traditional ports, located centrally in the cities they had helped form, were obsolete overnight. As Deyan Sudjic writes in *The Hundred Mile City*, "The teeming gangs of longshoremen, organized with the intricacy of a medieval craft guild to pack each bale and barrel into the hold, became redundant." Even the customary warehouse sheds that formed part of the shipping infrastructure were no longer needed, because the containers were waterproof on their own.

The modern shipping container was the brainchild of Malcolm McLean, a North Carolina trucker, who imagined that a large standardized container — essentially a trailer without wheels — could be carried by ship, rail, and truck and moved easily between them. McLean tried to sell his idea to the major steamship companies, but they weren't interested. So he started his own company, SeaLand, and built specialized ships and equipment to handle shipping between Houston and New York. The cellular containers turned out to have the advantages of strength and lightness, ease and speed of handling and storage, weather protection, and security. A con-

tainer holds five to 20 times the weight or volume that can be lifted with a conventional crane hook. A container ship can be loaded about 20 times faster than a conventional cargo ship, greatly reducing labor costs. Soon, shippers jumped on board.

By 1965, the International Standards Organization decreed standard sizes for containers: ten, 20, 30, and 40 feet in length; eight feet wide; and eight feet tall (raised to eight feet six inches in the '70s). The most common lengths are 20 and 40 feet. In 1967, a worldwide standard for corner castings defined how the containers could be lifted, stacked, and locked into place. The crux of the modern shipping container is the idea that eight corners are defined at given distances. Many different types of containers, shipping racks, and tanks have developed according to those standards. Special ships, rail cars, truck chassis, and cranes have also developed, a system allowing complete intermodal transfer between trucks, trains, and ships. All these components operate together as a huge machine for shipping. Locked inside the container, not apparent to the observer, may be $10 million worth of computer chips — or toxic waste.

Container ships exist, naturally, to carry containers. Unencumbered by interior decks, their holds can accommodate containers stacked eight high and ten wide. The weather deck provides a second cargo area, with containers stacked three to five high and 13 wide. The third generation of container ships, built in the 1980s and scaled to fit through the Panama Canal had a length of up to 1,000 feet, a beam of about 100 feet, and a draft of about 40 feet, and could carry up to 3,000 20-foot container equivalents (TEUs) at about 19 knots. Later ship designs, too large to pass through the Panama Canal, are wider, but not longer, and have capacities of up to 6,000 TEUs, at 24 knots.

The global flow of container commerce is based on ships that ply regular routes in the Pacific, the Atlantic, or the Carribbean according to strict schedules, visiting a limited number of ports that can then distribute the containers efficiently by rail or truck to their ultimate destinations. Ships and terminals represent enormous capital investments, and as with airlines, it is necessary to keep equipment moving constantly and on schedule. Differentials of days, or even hours, can have a huge effect on how containers are routed. These ships don't mess around with the Panama Canal. Cost and time drive everything.

Virtually all cargo from Asia comes to the U.S. in generally larger ships to west coast ports (Seattle, San Francisco/Oakland, Los Angeles/Long Beach, San Diego), and is distributed, partly by rail, partly by truck, to points eastward, all the way to the east coast. It is this commerce that has been crucial in making Asia a producer for the rest of the world. Somewhat smaller ships sail the Atlantic from Europe to ports on the east coast (Boston, New York/ New Jersey, Norfolk, Charleston), and their cargo is likewise trans-shipped westward. Houston is the last port of call on this circuit. But ships from the east coast of Central and South America come to Houston first, and their cargo may be distributed all over the U.S. from here. However, Houston is generally seen as a unique regional port that serves a mostly Texas market. A container going from, say, Germany to St. Louis could be offloaded at Newark or Norfolk and arrive by rail at its destination a week before the same ship would even get to Houston.

The Port of Houston started a container terminal facility at Barbour's Cut at Morgan's Point (ironically, one of the natural port locations the Allen Brothers were not able to obtain) with two wharves in 1977. The facility has now grown to six 1,000-foot wharves with marshalling yards covering 250 acres, room for more than 21,000 TEUs. The terminal operates 24 hours a day, seven days a week, and 363 days a year (it's closed Labor Day and Christmas). Ships are routinely turned around in eight to ten hours. At the Houston terminal, about 80 percent of the landside traffic is by truck. The 20 percent that goes by train is generally South and Central American loads bound for the West Coast. Houston handles more than one million TEUs each year.

Driving to the Barbour's Cut Terminal is like following worker bees to the hive. The density of trucks on the roads carrying containers increases until finally they line up in 26 rows at the entrances to the facility, an average of 1,600 in or out each day. Each truck yields its load to a rubber-tired gantry crane, and then drives around to pick up another load for its return trip. The gantry stacks the containers in well ordered rows, six across, four high, and many long, on a paved surface that is, essentially, a parking lot. Usually with no more than two moves (by means of assigned yard trucks that continually scuttle back and forth), they are positioned for loading onto ships, separated for different parts of the hold by destination and weight (heavier containers must be placed lower in the hold). Then in a final move from yard gantry to yard truck to giant wharf crane, the containers are loaded aboard. Each ship transacts 500 to 2,000 container movements, which is defined as an on or off operation. All of this is organized by computer inventory controls, but it still takes spectacular coordination between the yard stevedores and a ship's crew to load a ship as efficiently as possible.

The latest effort to reconfigure the landscape comes as the Barbour's Cut Container Terminal has maximized its capacity, and the Port of Houston Authority looks around for an expansion site. The idea is to keep the existing facility as it is, and begin a new one nearby, with a projected 20 year build-out. The site favored by the Port Authority is located five miles south of Barbour's Cut on Galveston Bay, at Bayport. The facility envisioned has 7,000 feet of berth, with seven wharves, 720 acres of marshalling yard (three times as much as Barbour's Cut), and a cruise ship port. The Port of Houston Authority is promoting this as a must-have facility, necessary to maintain Houston's competitive position relative to other Gulf ports.

According to Port of Houston Authority Chairman James T. Edmonds, "Bayport is the right location for the Port's proposed container and cruise terminal, environmentally, financially, and socially." But the site has proven controversial. Environmental activist Jim Blackburn contends that "Bayport is the wrong project in the wrong place. The Port of Houston is determined to put this square peg in a round hole, and they are spending tremendous amounts of money to this end. The sad thing is that this fight did not have to happen. The environmental community would agree to at least two other locations for a container port on the bay." A study commissioned by Blackburn's group, the Galveston Bay Conservation and Preservation Association, notes that many of the assumptions made in the Corps of Engineers' draft environmental impact statement bias the site selection to Bayport. The Association suggests instead placing the proposed container terminal, stripped of its cruise ship port, on one of two dredge spoilage placement areas: at Shoal Point or Spillman's Island, directly adjacent to the existing Barbour's Cut facility. Edmonds disagrees: "There are a number of practical, and financial, reasons that Spillman's Island cannot be developed at this time, including the fact that it would be an imprudent use of taxpayer money. It is a designated dredge disposal site for the next 50 years and would require tens of million of dollars, and an unknown number of years, to bring it to a level where it could be developed."

Whatever the outcome of this current controversy (and there is little doubt what that might be), it is only an episode in a long process of land restructuring for the purpose of channeling and processing a complex network of solid and liquid material flows. A 50-mile reach of land and water is now dedicated to the commerce and industry that is Houston's raison d'etre. This network, as massive as it is, is extraordinarily sensitive to small changes in constraint conditions — distances, modes, costs — that greatly affect the viability and structure of the network. The flow will always occur along the least expensive path. That path, by historical happenstance and entrepreneurial verve, has for the last century flowed through Houston, a city fortuitously founded in the wrong place. But such paths, like the course of a river, can suddenly shift, along with the fortunes of great cities. ■

Country Pride restaurant, Baytown TravelCenters of America: Old-style buffets attract old-style truckers.

Loneliness of the Long-Distance Hauler

NOTES ON TRAVEL PLAZAS, TRUCK STOPS, AND OTHER IN-BETWEEN PLACES

BY LISA GRAY

Peggy Giangrosso manages the Citgo Travelcenter at I-10 and Main Street in Baytown, Texas. It's open 24 hours a day. It sells tattoo magazines, sparkly Confederate flag stickers, and an astounding array of beef-jerky products. A room labeled "Professional Drivers" offers pay phones and free trucking magazines. The establishment looks for all the world like a truck stop, but Giangrosso corrects people who call it that. "When you think of truck stops," she says, "you think of little dives."

More than 80 percent of truck stops now call themselves either "travel centers" or "travel plazas." The phrases mean the same thing: a place that sells diesel to truckers, but at the same time attempts to lure customers in cars, buses, and RVs. Compared to truckers, "four-wheelers" spend freely. But because they have more options on the road — they can park anywhere they please — they're choosier about where they stop. Travel plazas try to assure four-wheelers that they're welcome, that they'll find familiar food, that the place is as safe and sanitary as any other convenience store. At a travel plaza, gas pumps, not diesel, stand in front of the building, and the parking spaces in front can hold nothing larger than an SUV. Truck services — diesel pumps, CAT scales, and parking for the big rigs — are relegated to the back of the building. Truckers enter through the back door.

As travel plazas come to dominate the interstates, even the phrase "truck stop" is disappearing. The largest full-service truck-stop chain in the country used to be called Truck Stops of America. Now it's TravelCenters of America. The industry's national lobbying organization used to be called the National Association of Truck Stop Owners. Now the group identifies itself only as NATSO. The acronym no longer stands for anything.

I wondered whether truckers would mind the disappearance of truck stops — and, in a way, their own disappearance, the destruction of their native habitat, the loss of a place they could claim as their own.

Until recently, the story of truck stops was almost entirely the story of trucking. Long-distance hauling existed in the 1930s and 1940s, but the industry came into its own in the 1950s as new interstate highways made driving fast and cheap, allowing trucks to compete with trains. Food was easy for a trucker to find — he could stop at any cafe with a big parking lot — but fuel was trickier. Because diesel was cheaper than gas, most trucks used the hard-to-find fuel. Fleets opened refueling terminals along their routes, but not every trucker belonged to a fleet. And besides, there weren't terminals everywhere a trucker needed to go.

Pappa Truck Stop, Baytown: Not a trucker in sight.

Service station owners noticed the market. When some added food, a diesel pump, and a truck-sized parking lot to their regular operations, the truck stop was born. Many of those early stops offered truckers a barracks-style bunkroom and group shower — bare-bones amenities of the sort some drivers had known as soldiers during World War II.

Truck stops varied wildly. Some looked like service stations. Some looked like diners. Some were friendly mom 'n' pop places. Some were filthy, crime-infested, and served coffee that had stewed on the burner for days.

Almost all truck stops, though, had similar locations. They hugged the interstates and avoided cities. It's easy to see why. A full-service truck stops needs a giant parking lot — TravelCenters of America now requires at least 20 acres for a new site — and land, of course, is cheapest in the middle of nowhere. Besides, truckers hate cities. Even in sprawling Houston, a car-sized urban scale makes few allowances for an 18-wheeler. Trucks get stuck in parking lots, unable to turn around; on small roads, truckers have to drive for miles out of their way to find a place to turn left or turn around. And since truckers are paid by the mile, not by the hour, city driving pays far worse than freeway driving. A good route is one that doesn't involve stoplights.

Though truck stops exist in rural landscapes, they bring the city with them. Full-service stops operate at all hours, and at night their lights glow on the dark horizon. (The industry calls drivers' attraction to bright-lit gas pumps "the moth effect.") In the parking lot at night, the trucks form a residential colony of their own, more densely settled than many parts of Inner Loop Houston. But in terms of urban *anomie*, cities have nothing on a truck stop. A trucker might know another trucker, a mechanic, or a truck-stop evangelist, but unfamiliar faces always dominate the little settlements. Soon after sunrise, most of the truckers will be gone.

Recently, I read Alain de Botton's book *The Art of Travel*. In it, he describes a harshly lit service station this way: "The chairs and seats, painted in childishly bright colours, had the strained jollity of a fake smile. No one was talking, no one admitting to curiosity or fellow feeling. We gazed blankly past one another at the serving counter or out into the darkness. We might as well have been seated among rocks."

De Botton found a strange comfort in the place: "I felt lonely, but for once it was a gentle, even pleasant kind of loneliness, because rather than unfolding against a backdrop of laughter and fellowship, which would have caused me to suffer from the contrast between my mood and the environment, it had as its locus a place where everyone was a stranger, where the difficulties of communication and the frustrated longing for love seemed to be acknowledge and brutally celebrated by the architecture and lighting."

Such places, he says, serve as balm to the lonely. He invokes Charles Baudelaire's poetry and Edward Hopper's "Nighthawks" paintings. Writes de Botton: "The 24-hour diner, the station waiting room, and the motel are sanctuaries for those who have, for noble reasons, failed to find a home in the ordinary world."

I liked that passage. I wondered how it applied to old-fashioned truck stops and spanking-new travel plazas. I imagined that truckers preferred old-line truck stops as comfortable places to be lonely: Free of cheerful families on vacation, full of fellow truckers. The opposite, I suspected, would hold true at the newer truck stops. Lit by big sunny windows and surrounded by car-driving clientele, a trucker's loneliness would lose its dignity.

"Pappa Truck Stop," announced the bedraggled yellow billboard on the north side of I-10 in Baytown. "Adult Movies." I stopped to see what an unabashed "truck stop" looked like.

Pappo offered diesel pumps and room for a truck or two to park, but at 10 a.m. I was the only customer. A few forlorn picnic tables sat on pavement outside a building that appeared to have grown whenever someone found a few extra pieces of corrugated metal. A sign proclaimed the picnic tables to be an ice house.

One door led to a room for viewing X-rated movies. Feeling particularly female and unwanted there, I tried the convenience store. Dusty boxes of truck parts occupied the prime shelf space. A sign identified a food-prep area as a "Barbecue & Deli," but the refrigerator case held no food, and no one was behind the counter.

I fished a Coke from the drink refrigerator, then realized that I hadn't seen either a cashier or a cash register. "Anybody here?" I called. "Hello?"

Someone knocked. The sound came from what I'd thought was a wall. Over a low-slung counter stocked with Spanish fly and nude playing cards, I saw a thick sheet of Plexiglas so scratched that it was barely transparent. Back there the cashier, a young woman with dark skin and smooth dark hair, was safe from me.

"Seventy-five cents," she said. The Plexiglas muffled her voice. She appeared in no mood to talk.

I left.

I wondered whether I'd caught Pappa at a bad time. The parking lot wasn't big enough for many truckers to spend the night, so I guessed that lunch would be

Pilot Travel Center, Baytown: What it lacks in soul, it makes up for with hygiene.

Pappa's best period. A little after noon, I returned to Pappa, leaving a clean, bright travel center where trucks filled the diesel bays and customers stood in line to order fast food. But Pappa showed no sign of a lunch rush. The parking lot held one other car — the cashier's? — and the deli stood empty. The cashier still didn't smile.

It was, quite possibly, the loneliest place in the world — lonely in a way unlike de Botton's service station, lonely in a way that seemed purely pathetic. And there wasn't a trucker in the place.

In its early days, trucking was a respectable job. Truckers earned roughly twice as much as factory workers, and like railroad workers, they presented themselves as pillars of the community. In the 1940s, some even wore military-style uniforms with marks on the sleeves that indicated years on the job.

By the 1960s trucking still paid well for a blue-collar job, but truckers' reputation had changed. They filled the same slot in the popular imagination as cowboys. They were romantic; they lived outside the law; they were loners. Their laments played on country radio.

In the 1970s truckers expanded their pop-culture dominion to pop music, movies, and TV. Millions of "four-wheelers" installed CB radios in their cars and called each other "good buddy." In 1975, C.W. McCall hit the top of Billboard's pop chart with "Convoy," the CB-inflected tale of a rolling riot in which truckers defied not only "bears" but the Illinois national guard. In the movies, Kris Kristofferson, Burt Reynolds, and Clint Eastwood played truckers who were the macho equivalent of stewardesses: icons of travel, freedom, and one-night stands. Truckers were the kind of outsiders that everyone wanted to be.

But still: You didn't want your son to grow up to be a trucker. And you didn't want your daughter to eat lunch at a truck stop.

By 1970, roughly 700 truck stops dotted America's interstates. Oil companies such as Amoco built some of those truck stops, and in most cases leased them to independent operators. Each truck stop constituted its own little kingdom, with its own rules and business practices.

The chain truck stop was born in 1975. Jack Cardwell had worked for almost a decade at truck stops in El Paso, Texas, and he thought that he could do better. "The most important thing I learned was that no one was giving truck drivers the respect they deserved," he told *Real Answers*, Bridgestone's truck-tire magazine. "No one understood their needs… What they wanted was good food. They wanted clean showers. They wanted ample parking. They needed a place to stop where they felt that they were appreciated."

Cardwell opened his first Petro truck stop in El Paso, and as he expanded his company into a chain he exercised a chain's tight control of each location's day-to-day operations. The strategy succeeded, and Pilot and Truckstops of America quickly followed suit.

The new chains were poised to take advantage of trucking's defining moment: the 1980 Motor Carrier Act that deregulated the industry. After the Motor Carrier Act, federal "rate bureaus" no longer controlled a carrier's minimum fees. Instead, trucking companies were free to negotiate with shippers. As rates dropped dramatically, operating expenses and truckers' pay — once routinely passed to shippers — felt the squeeze.

For truck stops, the good news was that trucking boomed: More trucks carried more goods than ever before. (The American Trucking Associations estimates that professional drivers drove 200 billion miles in 2001 — a 146 percent increase in 25 years.) The bad news was that fierce competition slashed the profit margin on diesel. Truck stops became high-volume, low-profit-margin businesses — a dynamic that favored chains, which could buy in volume and negotiate diesel-fuel contracts with trucking companies. NATSO estimates that of the roughly 4,000 truck stops and travel plazas in the U.S., only half are, like Pappa and the Baytown Citgo, still independently owned.

At the back door of the sparkling new Baytown Pilot, at I-10 and Thompson Road, Larry Lauziere seems happy to talk. He lives in Westlake, Louisiana, and has driven a tanker truck for ten years. Today he was driving from Baytown back to Westlake — a short run. Most truckers hate short runs because they involve more unpaid waiting at loading docks, but Lauziere liked this run. He hates being away from home for weeks on end. His wife used to ride with him sometimes, but then she got diabetes.

When he's on the road, he tries to drive the ten hours daily allowed by federal law. He leaves the truck stop after breakfast, stops for lunch and fuel, then starts looking for another truck stop around 6 p.m. If he waits too long, he risks not finding a place to park for the night.

He prefers the big chains: Petro, Pilot, and TA. He feels safer at those than at rest areas or small truck stops, and at most chains, buying 50 gallons of diesel gets him a free shower and a place to park for the night. Sometimes Lauziere hangs out at a truck stop for days, waiting for a load. Sometimes it's just for the night. For lunch, he keeps Hot Pockets in the DC-current refrigerator in his truck and microwaves

TravelCenters of America, San Antonio: The biggest, most forward-looking travel centers lure "four-wheelers" with food courts, bright lights, and ambitious architecture.

them inside a truck stop. For dinner, he usually eats at a truck stop buffet. He gets sick of chicken — every buffet has chicken — and he thinks the prices are way too high. If he doesn't watch out, he can spend $40 or $50 a day on the road.

In the evening, he might watch a movie in a truck stop's video room, but he usually stays in his truck. He calls home on his cell phone. He watches his DC-powered TV. He used to subscribe to a deal that let him watch cable in his rig at some truck stops, but the company that offered the service went bankrupt. He beds down in a sleeper over his cab.

A few years back he couldn't get a full night's sleep at a truck stop. Girls would be banging on the truck door all night. Lot lizards. You still hear them on the CB, trolling for truckers — "commercial company," they call themselves — but like hitchhikers, truck-stop hookers are a dying breed. They can't survive in the bright-lit, security-guarded travel plazas. Lauziere likes that.

Lauziere obviously had no use for de Botton's kind of lonely place. The difference, I decided, was that de Botton appreciated "Nighthawks" places full of lonely people during those relatively rare times when he was lonely. For him, loneliness was a novelty, with a romance and glamour of its own. He could afford to wallow in the emotion. But for truckers there's no novelty or glamour in loneliness. Like high prices and lot lizards, it's an occupational hazard, something you avoid when you can.

As deregulation changed trucking, it also changed truckers. Just when demand for truckers soared, many old-timers chose to retire rather than tolerate lower wages. To meet demand, big companies such as J.B. Hunt and Schneider looked outside the traditional white, male labor pool and recruited women and minorities.

Decisions shifted from a truck's cab to a trucking company's headquarters. New, just-in-time inventory practices dictated precise delivery times — not sometime "late next week" but "3:48 p.m. Thursday." Large trucking companies negotiate fuel prices for their fleet as a whole, and sometimes use complicated computer algorithms to calculate the cheapest places to buy fuel on any given route. A trucker for one of these companies doesn't stop any place he wants. He stops where the company tells him to stop.

Many companies now equip their trucks with Qualcomm or other satellite communications systems. The systems connect a company trucker tightly to his home base, allowing for far tighter control. Not only can the trucker phone his dispatcher from the truck to ask for better directions, but a GPS beacon might tell the dispatcher where, precisely, the truck is. I expected truckers to resent such spying, but in fact most love the systems. Some satellite systems include cable radio stations that don't fade in and out of range; most systems allow a trucker to send and receive e-mail. Almost all offer cell phones.

In their cabs, truckers are less alone than ever before. Besides the cell phone and satellite systems, they often have actual human companionship. Many of the new women truckers team-drive with their husbands; sometimes gay couples drive together; and everyone talks about the new trend of truckers bringing their kids along for the ride during summer vacation. Trucking is still a lonely business, but it is less lonely than it used to be.

At the shiny new Baytown Pilot you get a clearer picture of the new generation of truck stops. The convenience store sells Christian books — *Experiencing God's Love, Living Water for Those Who Thirst, The Prayer of Jabez*, and *The Power of a Praying Wife*. Greyhound-brand blankets and pillows offer themselves to bus riders. You can rent an unabridged Danielle Steele audiobook and return it at any truck stop participating in the same program. I looked for shiny rebel-flag stickers but found none. Corporate-owned travel centers don't carry that kind of stuff.

The McDonald's next to the convenience store was similarly bright and cheery. Martha Stewart was on the TV, showing the world how to decorate with skulls for Halloween. Two McDonald's workers were launching their own holiday project, taping to the wall the kind of big-eyed cardboard pilgrims that decorate elementary-school bulletin boards.

Through the front window I watched a white-haired man and two bouffanted women exit an RV. Inside, they ordered three cups of coffee and two apple pies. They did not order the advertised special, a "triple-meat Big'N'Tasty with cheese and bacon," which a sign declared to be available only at Pilot McDonald's. But then, the senior citizens were clearly not that burger's target demographic.

Truckers like meat, and they seemed to like this McDonald's. A pudgy, thirty-ish black man with a baggy pants wool cap pulled down on his head entered through the trucker's door and ordered a couple of burgers to go. One trucker, a forty-ish white guy, plugged his laptop into a data port in the booth. A pair of men, apparently truckers, spoke Spanish to each other and ate their burgers in front of the TV. One got up and went to

Gameroom at the Baytown Citgo: Guys in gimme caps shoot video deer.

the bathroom. The other turned, smiled at me, and raised an eyebrow. I held up my left hand and pointed to the wedding ring. He shrugged, still smiling, and turned back to the TV.

We weren't in the "Nighthawks" world; these truckers weren't cowboys on the range. They didn't glare at the four-wheelers surrounding them. They looked glad to be out of their trucks, happy to order their fries at a McDonald's much like any other McDonald's: clean, placeless, and entirely forgettable. What the restaurant lacked in soul, it made up for in hygiene. It was everything Pappa was not. And the truckers liked it.

The TravelCenters of America, at I-10 and Thompson Road, used to be the swankiest place in Baytown where a trucker could buy diesel, but then, about a year ago, Pilot opened that brand-new travel center on the north side of I-10. Since then, TravelCenters of America has "re-imaged" its Baytown location as part of the chain's national spiffing-up campaign. The front building, with the restaurant and convenience store, got a zippy new facade with the corporation's trademark giant red arc under the letters "TA." On the outside, at least, the place looks new.

But Mark Priddy, the manager, is quick to point out that TA's big, brand-new stops put this one to shame. In the mid-'90s, TA faced the problem plaguing its industry: As diesel profit margins slipped, and as more efficient truck engines used less diesel, truck stops could no longer rely solely on fuel sales. TA resolved to change its customer mix — to hold on to its trucking customers, but at the same time attract an equal number of people in cars.

Michael O'Connor, TA's communications director, says that to divine its future the company engaged in aggressive marketing research, and its executives studied corporate "best in class" models: Nordstrom for customer service; Target for store interiors; the then-new airport in Pittsburgh for its mall-like feel; and the Ritz Carleton for bathrooms. TA hired Paul Westlake, AIA, a Harvard-trained principal at the Cleveland firm van Dijk Pace Westlake, to design the company's new prototype.

Westlake has said that he sought "the wow factor" when he designed a roomy place that looks something like a mall with gas pumps out front. A high, high arch forms the convenience store's roof, and the building's front wall is made of glass. The showers are marble. Name-brand fast-food restaurants stand arrayed in a food court. A snack bar sells cappuccino.

When the first of TA's prototypes debuted in Denver in 1999, it made the front page of the *New York Times* — and, more important, it succeeded wildly with both truckers and motorists. The company has since opened 11 full-sized versions of the prototype. More are planned.

Behind the Baytown TA's spiffy new facade you find truck-stop people of the old school. Mark Priddy has managed the TA at I-10 and Thompson Road for six years. He's a talker.

The TA attracts all kinds, he says. Sometimes he'll get one of those extreme examples of the new-generation trucking, a Ph.D., maybe, or a woman driving alone. But mainly, younger truckers prefer the Pilot across the street. They're grab'n'go types who like McDonald's more than the TA's sit-down restaurant, Country Pride. It's the older drivers who like a buffet.

In the evenings, those older drivers sit at the Country Pride's horseshoe-shaped bar and trade stories about the road. They're not travel-plaza material. They're not fond of four-wheelers. They don't want to watch their language because it might offend some blue-haired old lady from an RV. And they don't want some guy in Dockers and a stiff shirt joining the conversation. The old rode-hard-put-up-wet, chiseled, smoking, drinking, cowboy type, says Priddy — that's a dying breed.

And they're dying fast. Trucking isn't the healthiest lifestyle, he notes. When he first got to the truck stop, he saw jeans with a 45-inch waist on a merchandise table. What, he asked, were those things doing there? The guy training him said, Look around. For the first time, Priddy noticed a roomful of walking heart attacks, buffet busters, 400-pound men whose only exercise was waddling from the cab to the restaurant.

Trucking is hard in other ways, too. It's hard being away from your family. Once, when a trucker got word that his wife had died, Priddy arranged for the man to fly home. Three or four weeks later, Priddy picked him up and the airport and drove him back to the TA. The guy got back in his truck, got on with his life.

Priddy has seen a trucker terrified because his granddaughter didn't come home one night. On Christmas, while Priddy is home with his family, he knows truckers are parked in the TA's lot. He knows that they buy knickknacks — shift covers, cab curtains, nut covers — because they're trying to cheer themselves up, to redecorate, to make their trucks into homes.

But the saddest thing, says Priddy, is when a trucker dies in his truck. It happens all the time. You gotta die somewhere. And where else, he asks, is a trucker going to die? ■

Because It's Everywhere

Why Architecture Matters: Lessons From Chicago *by Blair Kamin. University of Chicago Press, 2001. 386 pp., $37.50.*

Reviewed by Terrence Doody

I was born in Oak Park, Illinois, and have known about Frank Lloyd Wright's houses for as long as I can remember. On summer jobs in downtown Chicago, I learned that real Chicagoans are on a first-name basis with their buildings and quite proud of their associations with the Carbide and Carbon Building, the Monadnock Building, Carson Pirie Scott, Marina City, and the Merchandise Mart — which once claimed to be the world's largest office building outside the Pentagon. One summer I worked in an office tower around the corner from Mies van der Rohe's apartments on Lake Shore Drive, and from that building watched the John Hancock Center go up. I saw two hardhats on a girder one day ascending into the clouds. And that same summer I was present when Mayor Richard J. Daley dedicated the magnificent Picasso that stands in front of City Hall on what is now Daley Plaza. The mayor gave one of his few memorably good speeches that day, arguing that the controversial statue would educate Chicago's children to grow up thinking of this masterpiece as a natural part of their heritage.

Today, in carpool, my kids and I often discuss the houses en route to school. Children are quite definitive about "nice" houses, and their favorite is a chateau-style dwelling, guarded by two iron griffins, indigenous to the Loire region of Bellaire, Texas.

When I read Blair Kamin's claim that architecture matters because it is "the inescapable art," I felt at home. Kamin is the architecture critic for the *Chicago Tribune*, and he loves both Chicago and his job. He doesn't boast about the Merchandise Mart, but he does point out that for years Chicago could claim the world's tallest building (the Sears Tower) and the world's largest (and most awful) housing project, the Robert Taylor Homes. He also points out that on a 20-minute stroll down Dearborn, "you can get a short course in the history of the skyscraper."

Why Architecture Matters is a collection of articles Kamin wrote throughout the 1990s when a lot was happening in Chicago and his paper gave him an unusual amount of space. These are not 800-word newspaper columns; they're magazine essays in which he can develop a complete position. And for his six-part series on the Chicago lakefront, its history, sociology, and future, he won a Pulitzer Prize for Criticism in 1999. Kamin's enthusiasm, complex standards, and clear sense of purpose make this book more than a random sampler. And his subtitle, "Lessons From Chicago," means something.

He is very thorough and well-organized: when I finished reading the index and preface I felt I could have written a review from them alone. He lays out his principles and prejudices very clearly, notes that he and Ada Louise Huxtable of the *Wall Street Journal* are not only architectural critics but urban critics as well, and he links himself to Allen Temko of the *San Francisco Chronicle* as an "activist." "Activist criticism," Kamin writes, "is based on the idea that architecture affects everyone and therefore should be understandable to everyone. It analyzes architecture as a fine art and as a social art," and it invites its readers to become activists themselves in the public debate that defines the environment. He reports on the results of these debates in postscripts he adds to the individual pieces, letting us know whether his side won a point or lost it to the forces of politics and money.

These postscripts not only provide continuity, they epitomize the attitude of all Kamin's writing: They are honest, modest, real. When he writes about a local architect named Harry Weese in a section called "Unsung Heroes," he quotes one of Weese's eulogists, who said: "He taught us to follow our senses, even when our intellects objected, and to trust in the abundance of the material world rather than in ideal systems which were distilled from it.... Harry built to adorn human activity rather than to mold or direct it." On the other hand, Kamin also praises and defends the second- and third-generation Miesian architects, who have fallen from grace in the moment of postmodern excess, for the courage of their principled simplicity. And he retails with obvious fondness the crack that Skidmore Owings & Merrill have been called the "three blind Mies."

Why Architecture Matters is divided into four parts. The first and longest is "The Evolving Metropolis" and amounts to Kamin's beat writing. It opens with a strong objection to Mayor Richard M. Daley's plan to redecorate Michigan Avenue with a maypole. (Richard M. Daley is the son of Richard J. Daley, who

was Hizzoner, Da Mare.) Kamin also takes issue with the mayor's plan to thwart crime by turning some city streets into cul-de-sacs, slams the theme-driven architecture of the Disney store and Planet Hollywood, praises the beautiful bridges of Cook County and the mayor's efforts to restore them, and points out how oversized houses in the city and suburbs are devouring green space (which is true as well in the Loire region of Bellaire.)

Part two, "The Art of Architecture," begins with a hymn of praise for the John Hancock Center, which in my eyes is the most beautiful tall building in the world. (And the book's cover, a rakishly cropped photo of the Hancock soaring into the blue, is worth the $37.50 admission by itself.) Kamin, however , also leaves Chicago to celebrate the difficult art of the Holocaust Memorial Museum in Washington, D. C., Frank Gehry's Bilbao Guggenheim (is there anyone who doesn't like it?), and Helmut Jahn's Sony Center in Berlin. It is in this section that Kamin worries Chicago has forfeited its title as the nation's architectural capital and also wonders what effect Rem Koolhaas' plans for a new campus center will have on the sacred grounds of Mies's IIT campus.

The third section, "Architecture as a Social Art," is marked by Kamin's reporting on public housing in Chicago, which has been a killer issue for 50 years. He doesn't rehearse the enormities of the Robert Taylor Homes or of the infamous killing fields of the Cabrini-Green project; for local readers, he doesn't have to. Nor does he tell the story of the blood on the hands of Richard J. Daley that is told so powerfully in Adam Cohen's and Elizabeth Taylor's *American Pharoah* (Little Brown, 2000). Instead, he writes about improvements in city housing, the lessons actually learned; and he explains, to my amazement, how principles of the New Urbanism, utilized for low-income housing rather than the disneylands of the Florida Panhandle, realize Jane Jacobs' principle of the eyes on the street that protect neighborhood children. This section, on what Kamin also calls "defensive architecture," is very good stuff.

"The Lakefront: Democratic Vistas," his fourth and final part, is similarly good. He begins with what's already been done to improve the Chicago lakefront's museum campus, its traffic and parking, and its new public beachhouse. Then he tackles the whole of the lakefront, from the far north to the far south side, and the racist politics that have divided them. He has suggestions for the needs and further uses of Grant and Lincoln Parks and an idea for how unused steel mills could be recycled. It is in this section that Kamin's subplot emerges: its hero is Daniel Burnham, Chicago's great visionary planner, whose antagonist is Mayor Daley, Richard II, whose heart is in the right place, actually, but whose own vision and plans aren't big enough for Kamin. This is activist architectural writing at it fullest, and it is apparently having some success. At least according to my native informants, who think Daley is now doing a good job.

It is possible, I suppose, to live your life without engaging Cezanne or Mozart, Keats or Joyce, but architecture *is* inescapable: ubiquitous, necessary, a second nature to us. It is part of the atmosphere our eyes breathe, the outermost layer of our body's skin, the first field of historical symbols we all ineluctably share.

In his preface, Kamin mentions the first attack on the World Trade Center, February 26, 1993. In the publicity materials that come with the book, the University of Chicago Press mentions the second attack on September 11. Those two buildings were not beautiful, beloved landmarks like the Chrysler Building, the Hancock, or Pennzoil Place, but they are now, and they matter more than ever. ■

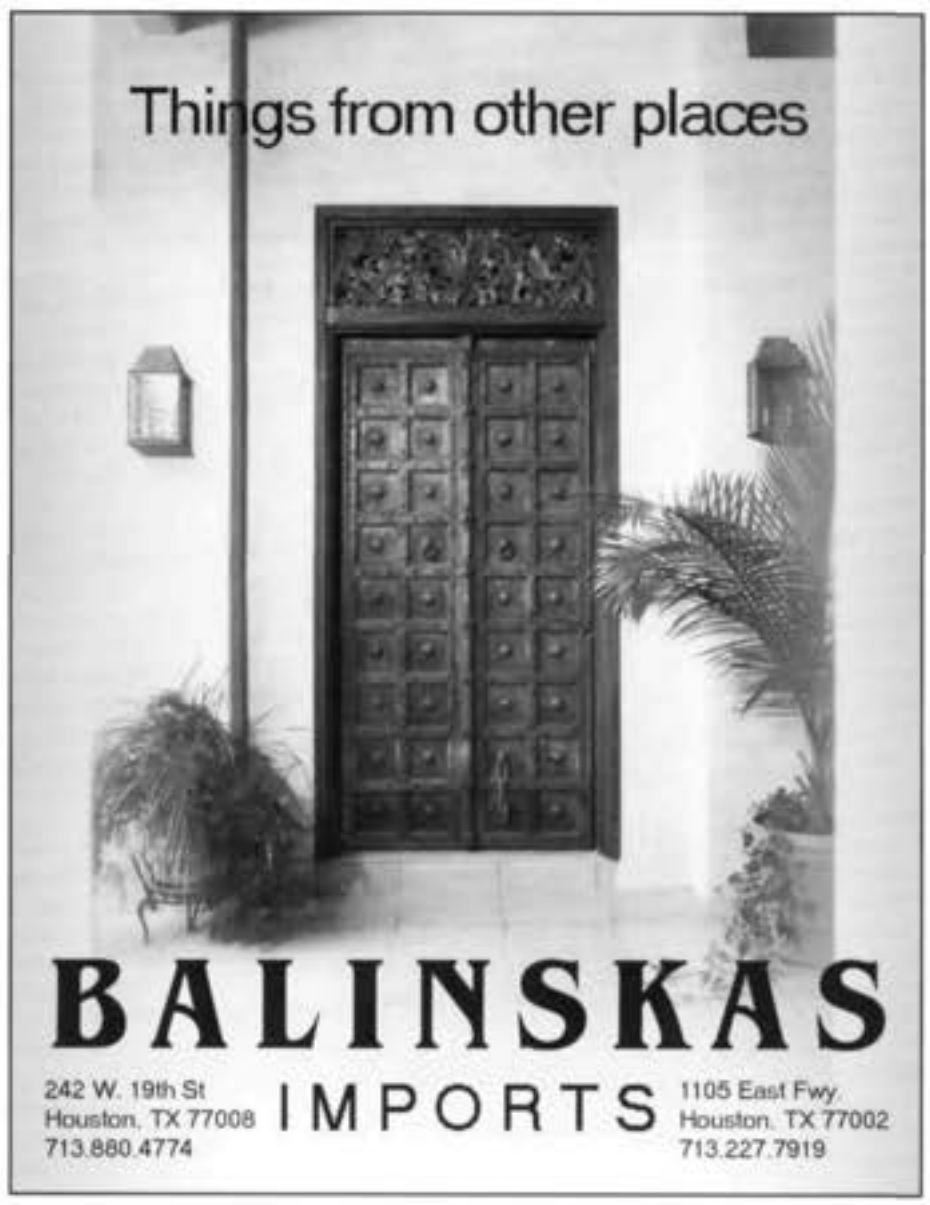
New and Notable

The Light Construction Reader *edited by Jeffrey Kipnis & Todd Gannon. Monacelli, 400 pp., $39.95.* This ambitious collection of 38 essays explores MoMA's 1995 "Light Construction" exhibition, which assembled works made of glass, perforated metal, and other transparent materials. Curator Terence Riley and a host of noted architects and theorists, including Peter Eisenman and Anthony Vidler, examine the work of those included in the exhibition — Steven Holl, Toyo Ito, and Herzog and de Meuron among them — and raise crucial questions about the role of materials, the nature of architectural effects, and the legacy of modernism.

Rammed Earth *by Otto Kapfinger and Martin Rauch. Birkhauser, 160 pp., $65.* An introduction to contemporary building with rammed earth, a phenomenon that fuses ancient knowledge, modern technology, and innovative construction techniques. This volume investigates in particular the work of Martin Rauch, whose work includes the "Church of Reconciliation" in Berlin — the first load-bearing structure to be built with rammed earth in Germany in 90 years.

Great Leap Forward *Harvard Design School Project on the City and Rem Koolhaas. Taschen, 800 pp., $50.* In 1996 and '97, Harvard's graduate students studied China's Pearl River Delta, five cities with a population of 12 million. The establishment of Special Economic Zones —"laboratories for the contained unleashing of capitalism"— hastened an unprecedented experiment in urbanization on an astonishingly large scale. *Great Leap Forward* contains essays by Rem Koolhaas and others that explore the results of this rapid modernization, which has produced an entirely new urban substance.

— *Michael Kimmins*



Working Together

BUILDING (COLLABORATING) THINKING

BY JEAN KRCHNAK

COLLABORATIONS, AS EVERY artist or architect knows, can be hazardous — which may be why the second definition of the verb form collaborate is "to cooperate with the enemy."

But the risk is often worth it; the players add to each others understanding and energy and something remarkable results that couldn't have happened if they had all been acting alone. That was the case with the unique collaboration that created the "Bamboo Roof" installation unveiled in mid-November in the University Art Gallery Plaza on the Rice Univesity campus. Designed by Japanese architect Shigeru Ban, with engineering assistance from Ove Arup, the project was fabricated and erected over a six-month period by architecture students from Rice and the University of Houston. The energy exuded by the student teams, their faculty, and coworkers from the Ban and Arup offices at the completion celebration could probably have made any structure stand up, no matter the weight or load.

"Bamboo Roof" is Ban's second project in the United States, the first being a paper arch constructed in the Sculpture Garden of New York's Museum of Modern Art two years ago. Commissioned by the Rice University Art Gallery, "Bamboo Roof" was conceived by the Ban office as a student construction project. The piece was to span the gallery plaza with an open-weave canopy of bamboo flooring boards supported on wooden columns.

Rice Gallery director Kimberly Davenport assembled a construction team last spring, beginning with Professor Nonya Grenader from the Rice School of Architecture. Grenader enlisted fellow architecture faculty members Danny Marc Samuels and Mark Oberholzer and a group of architecture students. The Rice contingent was joined by 13 UH graduate students and their professors, Donna Kacmar and Bill Price. Greg Bruegger took on the role of steel fabricator, and Grant Suzuki of Shigeru Ban Architects and Cecil Balmond of Ove Arup and Partners rounded out what came to be known as the "Ban Team."

Work on the project began in May 2002. The Rice students wove the bamboo lattice while the UH students constructed the steel columns. Ban's design was very schematic and left much of he construction detailing to be worked out by the team members, who ran them by Ban's office for approval, a process the students took to calling "the guessing game." Like musicians working with a John Cage musical composition or playing an unfinished score, the construction team was asked to not just to fabricate the project, but to engage in creative interpretations and extrapolations.

Thus the team was in essence building a theory; as they worked, they discovered that what they were constructing was neither a totally rigid nor a totally flexible system, but a hybrid that included qualities of both. "Bamboo Roof" is a simple free-form construction with nearly an infinite number of complex geometric possibilities. It was built from simple, readily available elements that included laminated bamboo flooring boards, bolts, steel poles, and metal plates, and also from more unusual construction materials such as bowling balls and bags of sand. The light, transparent construction appears to float over the ground. Since it was not possible to bolt the structure to the plaza floor, the bowling balls and sandbags were employed to hold it down.

Since 1986, Ban has experimented with construction methods that use renewable, natural materials such as paper tubes. His experiments with temporary structures led him to environmentally sound strategies using low-tech recyclable materials and foundations that dematerialize when the structure is dismantled. In Ban's philosophy, the function of a structure is "to improve people's lives while celebrating and enjoying the inherent beauty of earth."

Unlike most of Ban's architectural projects, "Bamboo Roof" lacks the purposeful utility that gives such urgency to his emergency earthquake shelters in Kobe. Nor does it have the metaphorical eloquence of his classically formal Curtain House, the Wallhouse, or the Studio for Vocalists. Instead, "Bamboo Roof" is a celebration of a collaboration: a designer from Japan, engineers from Europe, and American students and faculty from two schools of architecture only five miles apart who probably see too little of one another. This confluence of energy, creative problem solving, and artful crafting reveals the collaborative nature of any architecture project, where many hands and minds always play a part — and here, not as Rice students or UH students, but as builders and makers. ■

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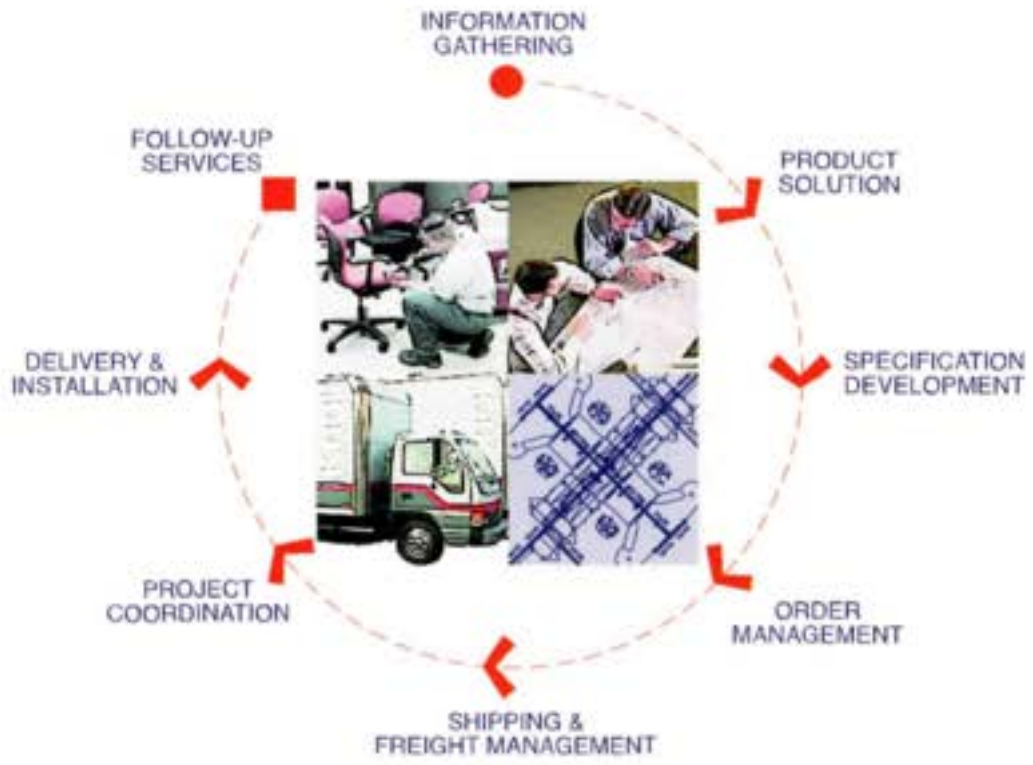

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