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Logistics Landscape

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ABSTRACT Economists and geographers have distinguished between three historical configurations of North American industry: concentrated in the late 19th and early 20th centuries, decentralized in mid-20th century, and distributed at the end of the 20th century. Each of these eras constructed distinct spatial organizations and shaped urban form in particular ways. The shifts between these modes of production are evident as ruptures in the urban form that preceded them, leaving previous spatial modes obsolete and abandoned in their wake. The first of these shifts, from the dense concentrated industrial model to a decentralized model, is closely associated with the decentralization of urban form in the second half of the 20th century. The second shift, currently underway, transforming industry from a nationally decentralized organization to an internationally distributed one, has produced a new form of landscape, a landscape of logistics. This *logistics landscape* is among the more significant transformations of the built environment over the past decade. It is characterized by new industrial forms based on global supply chains and vast territories given over to accommodating the shipment, staging, and delivery of goods. This paper offers a provisional theoretical framework and describes three emergent categories of logistics landscape: distribution and delivery, consumption and convenience, and accommodation and disposal. The aerial photographs, diagrams, maps, and other visual representations included here are an initial attempt to describe these spaces, to make them available for reading as landscape, and to begin the longer term project of their critical cultural appraisal.

KEYWORDS Landscape, logistics, infrastructure, economy, globalization

Cities are historically bound up in economic processes. Many accounts of the origins of the city in Western culture cite transitions from nomadism to agriculture, a division of labor between agricultural and artisanal, and the accumulation of surplus labor as necessary preconditions for dense human settlement. Equally significant in these accounts are the invention of the money economy, the articulation of banking systems, and the emergence of markets.

This complex set of social and economic processes have corollaries in the physical transformation of natural environments into built environments (or indigenous into artificial), the colonization of territories, and the construction of cities. In the West this pattern produced the classical military encampment and trading port, the medieval village, the enlightenment city, and the industrial metropolis. Recent accounts of the history of urban form in the West have stressed the dependence of settlement patterns on particular forms of exchange. The increasing scale and scope of those patterns of exchange, fueled by liberalized market economies and democratic forms of governance during the Industrial Revolution, produced unprecedented densities in European and American cities simultaneous with unprecedented concentrations of private wealth, social pathologies, and environmental contaminants.

The construction and development of these metropolitan conditions in the late 19th and early 20th centuries depended upon systems of transportation and communication that facilitated and fueled their explosive growth in urban form. An early sociologist of that modern city, Georg Simmel, attributed the psychology of the metropolitan experience to the impersonal money economy, anonymous social relations, and the repetitive labor associated with industrialization (1903). For Simmel, and many of his readers, the anonymity experienced in the modern metropolis came at the expense of more proximate familial and social relations of the smaller settlements of rural and agrarian life. In the modern era this psychological condition came to be associated with a sense of alienation and loss of personal identity, largely as a result of migrations of rural populations to urban centers. These conditions of human subjective experience were formed in response to industrialization and the growth of the city as a dense collection of diverse populations. This traditional understanding of metropolis is unthinkable absent the migrations, rural and transoceanic, that fueled it with relatively cheap labor.

It has become commonplace within contemporary design culture to associate the metropolitan with this specific form of the industrial city. The industrial metropolis of the late 19th and early 20th centuries has informed contemporary understandings of the city and its experience of social alienation and anonymity. These subjective psychological conditions associated with the metropolitan experience persist, outliving the specific physical and spatial arrangements that were associated with it. With the rise of contemporary, post-Fordist

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economies based on information, education, and entertainment, North American cities now find themselves competing for population, not through expanding industrial employment, but rather through the delivery of services, experiences, and quality of life. Increasingly, these intangible issues form the counterpoint to increasingly flexible employment arrangements (Harvey 1990; Soja 1989).

Rather than a sense of alienation and anonymity, the urban territories constructed in response to these contemporary economic and social conditions intend to produce the reassuring familiarity of reliable brands, known commodities, and reproducible routines. As the prosperity of metropolitan regions has come to depend upon the attraction of increasingly mobile capital and markets, two tendencies have become evident in North America: the ongoing decentralization of metropolitan urban form and the identification of themed districts distilling the commodified experiential qualities of the industrial metropolis, absent the historical ills attributed to it. These zones, aimed equally at tourist and immigrant alike, constitute much of the contemporary urban realm. Among the salient qualities of contemporary metropolitan life in these districts are the collapse of historical distinctions between the tourist class and the immigrant class, private capital and public space, culture and commerce, and education and entertainment (Harvey 1990, 1994; Soja 1989, 2000).

The role of contemporary landscape architecture in staging and decorating these destination environments for consumption has been well documented (Corner 2006; Weller 2006). The role of contemporary landscape architecture in the remediation and redemption of abandoned industrial sites left in the wake of deindustrialization and disinvestment has been equally well documented. However, little attention has been given to the new landscapes necessitated by the growth of logistical networks and their attendant infrastructure.

The recent shift to an internationally distributed economy has produced a new form of landscape, a landscape of logistics. This logistics landscape is among the more significant transformations of the built environment over the past decade. It is characterized by new industrial forms based on global supply chains and vast territories given over to accommodating the shipment, staging, and delivery of goods. This paper offers a provisional theoretical framework and describes three emergent categories of logistics landscape: distribution and delivery, consumption and convenience, and accommodation and disposal. Each category involves a logistical mechanism and a corresponding landscape type. The aerial photographs, diagrams, maps, and other visual representations included here are an initial attempt to describe these spaces, to make them available for reading as landscape, and to begin the longer term project of their critical cultural description.

A BRIEF ACCOUNT

Geographers, planners, and urban historians have distinguished between three distinct historical configurations of industry in North America: concentrated in the late 19th and early 20th centuries, decentralized in mid-20th century, and distributed at the end of the 20th century (Brenner and Keil 2005; Bruegmann 2005; Schumacher and Rogner 2001). Each of these eras constructed distinct spatial organizations and shaped urban form in particular ways. The shifts between these modes of production are most evident as ruptures in the urban form that preceded them, leaving previous spatial modes obsolete and abandoned in their wake. The first of these shifts, from the dense concentrated industrial model to a decentralized model, took place in the mid-20th century and is closely associated with the decentralization of urban form. It has been described as a shift from an early concentrated Fordism to a mature decentralized Fordism. The second shift, currently underway, is transforming industry from a nationally decentralized organization to an internationally distributed one. The first transition was characterized by the growth of national highway systems, suburbanization, and the depopulation of many urban centers. Although decentralized from traditional urban centers, this period was characterized by national markets, heavily reg-

ulated economies, and relatively stable labor relations. The more recent second transition to a global economy could be characterized by its increasing reliance upon international trade and neo-liberal economic policies (Brenner and Keil 2005; Schumacher and Rogner 2001).

Among the geographers articulating the relations between industrial economy and the space of contemporary urbanization, none have been more influential in contemporary design culture than David Harvey. Harvey is best known in the design disciplines for his canonical book, *The Condition of Postmodernity* (1990), in which he describes the impact of economic and political conditions on cultural production. In this work, Harvey locates the origins of postmodern cultural tendencies within the larger structural collapse of the Fordist economic regime in the early 1970s. For Harvey, rather than the superficial stylistic concerns of design, the shift to postmodernist architecture and urbanism correlated directly to a new regime of what he calls "flexible accumulation" characterized by neo-liberal economic policies, "just-in-time" production, outsourcing, flexible or informal labor arrangements, and increasingly global capital flows (Harvey 1990, 147). It would be hard to overstate the impact of Harvey's work on architectural discourse and design culture over the past 15 years as his work stands among the most durable accounts of the postmodern cultural condition and its relationship to contemporary urbanism.

Harvey's neo-Marxist reading of the economic underpinnings of postmodern cultural conditions has been appropriated by the design disciplines, most recently by landscape architecture (Corner 2006; Reed 2005). Harvey's accounts are particularly effective in articulating the relationships between the themed destination environments that characterize contemporary urban development and the mass industrial economies of production, consumption, and exchange that enable them. Although Harvey's *The Condition of Postmodernity* focused on urban design projects in the 1970s and '80s as a cultural response to the transformations of American industrial economy, his more recent work articulates the role of landscape architecture over the past decade as an element of contemporary urban redevelopment (Reed 2005). Harvey argues that in the second half of the 20th century, a global restructuring of the industrial economy and the construction of new infrastructures of mobility, communication, and exchange, realigned patterns of urbanization across North America. His work implies that landscape architecture has recently supplanted urban design and architecture as the design discipline of choice through which new economic arrangements are being constructed in spatial and material form.

Harvey's formulation of flexible accumulation describes the new modality of urban consumer culture fed by post-Fordist networks of global integration, flexible labor relations, and neo-liberal economic policies. Following the oil shocks of 1973, 1974, and 1979, the deregulation of many sectors of the US economy indicated a breakdown of the Fordist era. This era was associated with a high level of state regulation, infrastructural development, and social investment through the mechanisms of the welfare state. The end of this period of stability marked the greatest crisis in industrial economy, with the near collapse of the US automobile industry in the face of growing international competition. The effect of these transformations on urban form are complex and still unfolding. They include the ongoing abandonment of industrial sites, with remnant residential populations left in their wake. They also include the branding of destination tourism, recreation, and entertainment venues in cities, as well as the ongoing gentrification of particular urban neighborhoods within an increasingly diffuse fabric of the former city (Harvey 1990, 1994).

This shift to a distributed model depends upon global systems of transportation, communication, and capital. One aspect of the distributed model is its reliance upon just-in-time production models. Many of these strategies are intended to reduce the overhead costs associated with keeping large inventories of raw materials or parts in advance of their integration into finished goods. When combined with competitive global markets for labor, materials, and capital, these

cost-saving measures have fueled the internationalization of industrial production. These tendencies have had three direct consequences. First, it has become commonplace for the components of any industrial process to come together from various locations across the planet, arriving just-in-time for their integration into a final product that is itself only ordered when sold to the customer. Second, industrial concerns are increasingly interested in storing materials or components of the final assembly in the shipping system or supply chain. Third, the final product itself is shipped out as quickly as possible after manufacture. Taken together, this system places more materials, components, and products in a global shipping system for longer and longer journeys between increasingly remote locations (Levinson 2006; Cudahy 2006).

The impact of these transformations includes cheaper consumer goods and the entrance of many emerging labor markets into the global economy. It also includes the abandonment of many industrial sites made redundant by these transformations, and the construction of new industrial forms increasingly dependent upon global supply chains. Consequently, they have produced a *logistics landscape* in which more land area is given over to accommodate the shipment, staging, and delivery of shipped goods. This landscape is arguably among the most significant transformations in the built environment over the past decade, one that has yet to be fully described or theorized. It is not surprising that two of the authors who first published on the subject of logistics for audiences in the design disciplines each claimed landscape as having a particular relevance to the discussion of logistics. Both authors have also contributed in significant ways to the discourse surrounding landscape urbanism. Alejandro Zaera Polo's "Order Out of Chaos: The Material Organization of Advanced Capitalism" (1994) was one of the first attempts to articulate the relationship between otherwise opaque aspects of globalization and their all too visible impacts on urban form. Citing the work of David Harvey as a primary referent, Zaera Polo's essay attempts to theorize the spatial implications of Harvey's economic analysis. Unfortunately, Zaera Polo's otherwise serviceable effort is not fully realized, particularly as it takes a perplexing tangent toward a discussion of chaos theory and scientific models for complexity that were fashionable in 1994. Susan Snyder and Alex Wall's "Emerging Landscapes of Movement and Logistics" (1998) offers a much clearer argument that has held up quite well over the past decade. As the first essay to deal specifically with the increasing role of logistics within advanced capitalism, the article anticipates the spatial and disciplinary implications for these new conditions and offers an underappreciated argument that helps to structure future lines of work on the topic. This was certainly the case with Wall's subsequent "Programming the Urban Surface" (1999), which has come to be regarded as seminal in its anticipation of current discussions of landscape and the material economy of contemporary urban form.

Zaera Polo and Wall effectively anticipated contemporary interest in the organization of global capital, its flows and forces, as well as the increased relevance for discussions of landscape in the wake of those capital flows. Among the more significant shifts this work implies is the priority afforded to sites of transportation and network infrastructure, the space of the flows of material goods, information, and capital. These sites are privileged in Wall's and Zaera Polo's accounts and have displaced the sites of material production, which had figured prominently in discussions of urbanism over the previous century. While those sites persist in various states of abandonment, disinvestment, and decay, contemporary interest focuses more fully on the sites of highway infrastructure, intermodal exchange, and logistical staging. Among the clearest example of these sites are the ports that accept, redirect, and stream the contemporary flow of consumer culture. The transition from a Fordist regime of mass consumer goods to a post-Fordist regime of flexible accumulation has witnessed a new scale of port operation, one that has left many historical ports vacant. This transition

Figure 1. Ports of Los Angeles/Long Beach, California. (Photograph by Alan Berger, 2003–2006)

has also revealed new forms of urbanization. Each of these transformations bears distinct implications for the landscape medium.

Port Landscape

The year 2006 marked the 50th anniversary of two fundamental components of this new spatial order. The first of those was the US Interstate and Civil Defense Highway System. The second was the standardized shipping container (Cudahy 2006; Levinson 2006). In 1956, the first such shipping containers left the New York/New Jersey Port Authority bound for the Panama Canal. They were the invention of a North Carolina trucker and shipping innovator, Malcom Purcell McLean. His conception of a single container that could be easily transferred between modes, from ship to train, from train to truck, and back to ship, came to be among the most significant transformative technologies in the shipping industry in the second half of the 20th century. What had been the backbreaking work of longshoremen and stevedores, the so-called break bulk method of cargo transfer, was replaced with an internationally standardized transfer by crane from the hold of a ship to a tractor trailer in a fraction of the time. This saved much of the time, expense, and inefficiency associated with the individual transfer of countless items from a ship to the port docks, to a warehouse, and into individual train cars or trucks (Cudahy 2006; Levinson 2006).

In place of that ancient model of port activity, McLean's new container afforded a more or less seamless continuity from point to point, irrespective of mode. This innovation greatly speeded port operations, increased volumes, decreased costs, and drastically cut the time required for international shipping. This newfound ease of transfer opened international markets

Figure 2. Fort Worth Alliance Airport, Alliance, Texas. (Photograph by Alan Berger, 2003–2006)

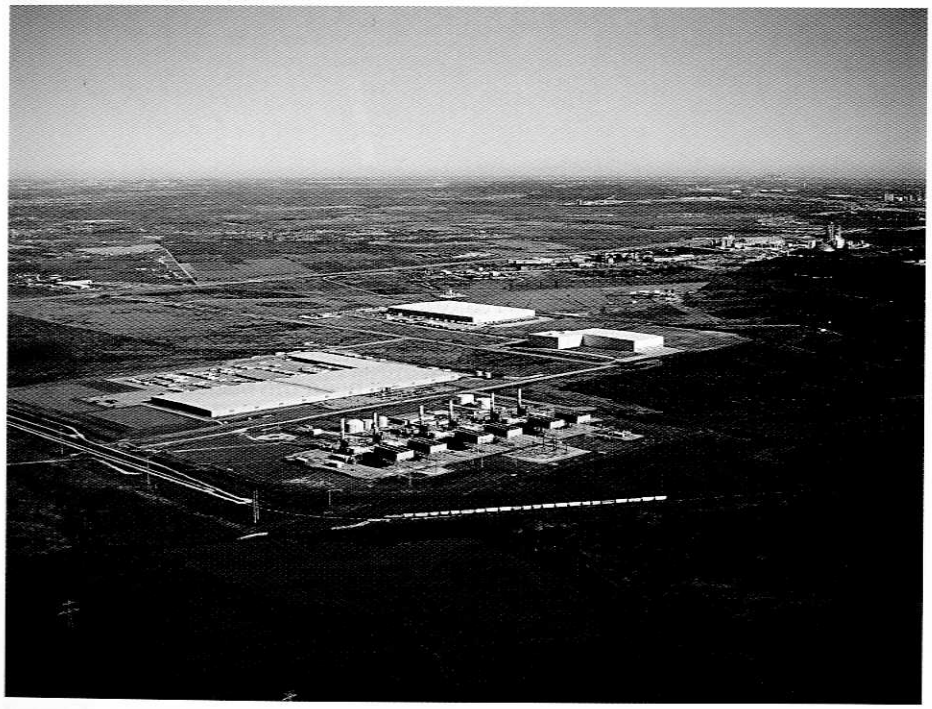

Figure 3. Midlothian Railport, Midlothian, Texas. Downtown Dallas can be seen in the distance. (Photograph by Alan Berger, 2003–2006)

for consumer goods deeper into foreign continents and shaved the friction costs associated with getting them there. It also eased the identification and security of goods, reduced pilferage, and ultimately changed the culture of port operations. It had equally profound impacts on the size, organization, and spatiality of ports, effectively accelerating the growth of East and West Coast superports (Cudahy 2006; Levinson 2006). The Port of Los Angeles/Long Beach, California is representative of these tendencies (Figure 1). This superport includes an on-site Foreign Trade Zone (FTZ), established in 1994. The Los Angeles/Long Beach FTZ comprises about 2,700 acres including warehousing facilities compatible with global distribution and shipping operations. The United States has over 230 such FTZs in 50 states.

The shipping container also greatly accelerated the growth of interstate trucking as the primary means of connecting East and West Coast seaports with inland markets and sources. It increased efficiency as well as both the size and number of ships. The new economies of scale attendant to international shipping through the use of standardized shipping containers led to the development in the United States of new inland ports serviced by private international airports, typically surrounded by new industrial parks within foreign trade zones, for example, as found in Alliance, Texas (Figure 2). The Fort Worth Alliance Airport is an 11,600–acre, master-planned, international trade and logistics complex built for handling new, globalized, flexible manufacturing and distribution. It is a 100 percent industrial airport, including intermodal hub facilities and status as a Triple Freeport Inventory Tax Exemption and Foreign Trade Zone. This new mode of inland airport and logistical operations facility facilitated the development of free trade routes within North America under the North American Free Trade Agreement (NAFTA). They also played a significant role in the articulation of border town industrial networks such as along the US-Mexico border in Texas and California.

In addition to putting untold numbers of longshoremen out of work, the shipping container and the practices it privileged effectively hastened the demise of many older, smaller ports that the new system found inefficient, inconvenient, or simply unnecessary. This was particularly the case with ports in traditional city harbors or waterfronts that lacked the necessary space for expansion in the new era. Equally, it hastened the redundancy of ports that lacked the necessary capital-intensive investment in new technologies. It also facilitated the demise of ports that were left in old cities where populations had long ago dispersed. Taken together, these factors had enormous consequences for shipping, ports, and cities across the Great Lakes in particular. Shipping historically had made the long journey up the St. Lawrence River from the North Atlantic, into the interior of the continent through the Great Lakes and the complex system of locks forming the St. Lawrence Seaway. This added significantly to the length of any international shipping. Thus, among many other forces, the shipping container and the new era of super container ships hastened the redundancy of many ports in the region. In the older economy of break bulk loading and unloading, the extra length of voyage was compensated by the fact that unloading and warehousing occurred at or near the final market for many goods. In the new era of standardized shipping containers, it was much more efficient to simply transfer containers at East Coast ports to train or truck for the remainder of their journey to interior destinations. The easy transfer from ship to train or truck with one or two crane operations consolidated the industry into a smaller number of larger ports, while simultaneously feeding trucks and trains to increasingly decentralized markets far from traditional city centers. It also necessitated the development of so-called intermodal sites, for the orderly transfer of containers from one mode of transport to another, such as train to truck or vice versa. This new model of intermodal freight and logistics facilities can be found just outside the largest US metropolitan areas including New Rochelle, Illinois (outside Chicago), and Midlothian, Texas (outside Dallas). The Midlothian Railport

in Midlothian, Texas serves as an intermodal logistical support facility incorporating train-truck intermodal connections and its own electrical plant (Figure 3). The Midlothian Railport presently accommodates distribution facilities for Target, Toys "R" Us, and Kehe Food Distributors. Plans for future development include a 1.5 million square foot distribution facility for Solo Cups.

EMERGENT LOGISTICS NETWORKS AND LANDSCAPE TYPES

The contemporary post-industrial economic regime as described by Harvey, its attendant infrastructures, and the new social relations they afford also manifest themselves in the built environment as landscapes of infrastructure and logistics. These logistical zones are hardly recognizable as city forms, yet produce and provide a base for the economic activity that supports contemporary urban development (Zaera Polo 1994; Snyder and Wall 1998; Wall 1999).

In the context of the post-Fordist economic era, landscape has been found uniquely useful in addressing the vacancy and toxicity of former industrial sites abandoned as production moves offshore. The inverse of those post-industrial brownfields, the sites that capital continues to flow through, "irrigated" with new potentials and economies, have received less critical attention in discussions of contemporary landscape, yet they are equally helpful in clarifying the relations between industrial economy and urban form. In this sense, logistics landscapes might be profitably thought about as the inverse of the abandoned post-industrial brownfield site. Both are the result of global economic restructuring, and both are more legible as forms of landscape than as either urban or architectural forms.

Some theorists have proposed these contemporary economic networks and their infrastructures as capable of offering symbolic meaning to spatial forms in times of indistinguishable "generic" urban landscapes (Castells 1999, 2000). When revealed to their public constituents, infrastructural networks make a connection between provision and consumption, use and neglect, waste and conservation, on an everyday scale and on a monumental region-wide experience. Rather than a marginal absence, vacancy, or undervalued void, these surfaces are among the most productive, efficient, and specific, albeit generic and reproducible of places.

These landscapes, the spaces of the new logistics economy, are designed and built. Rather than being the unconscious byproduct of economic development or the unconsidered remnants of preceding generations of inhabitation, these landscapes are among the most engineered and optimized of places. As a provisional schema, the following accounts describe three emergent categories of logistics landscape: distribution and delivery, consumption and convenience, and accommodation and disposal. Each of these provisional categories implies a range of landscape types that are themselves the subject of the representations and descriptions included here. These cases are by no means exhaustive, nor even completely contextualized. Rather, they pose an initial introduction and multiple lines of future research into the specifics of each logistical mechanism and corresponding landscape type.

Landscapes of Distribution and Delivery

Distribution and delivery refer to the basic functions of the supply chain, fundamental infrastructure, and organizational ideology of the new economy. They are among the first and most ubiquitous material activities of the new economy. Easy access to international intermodal transportation networks and the communication infrastructures that enable them has become a central assumption of the new economy (Hanley 2003; Graham and Marvin 1995, 1996, 2001). Ports and telecommunications networks occupy privileged positions in this new organization, with international aviation and cell phone networks enjoying explosive growth following deregulation of a formerly Keyensian welfare state system of control. Post-deregulation, airports and cell phone networks grew rapidly and have come to serve as fundamental transportation and communication networks in the post-Fordist economy of logistics and distribution. The deregulation of the US commercial air-

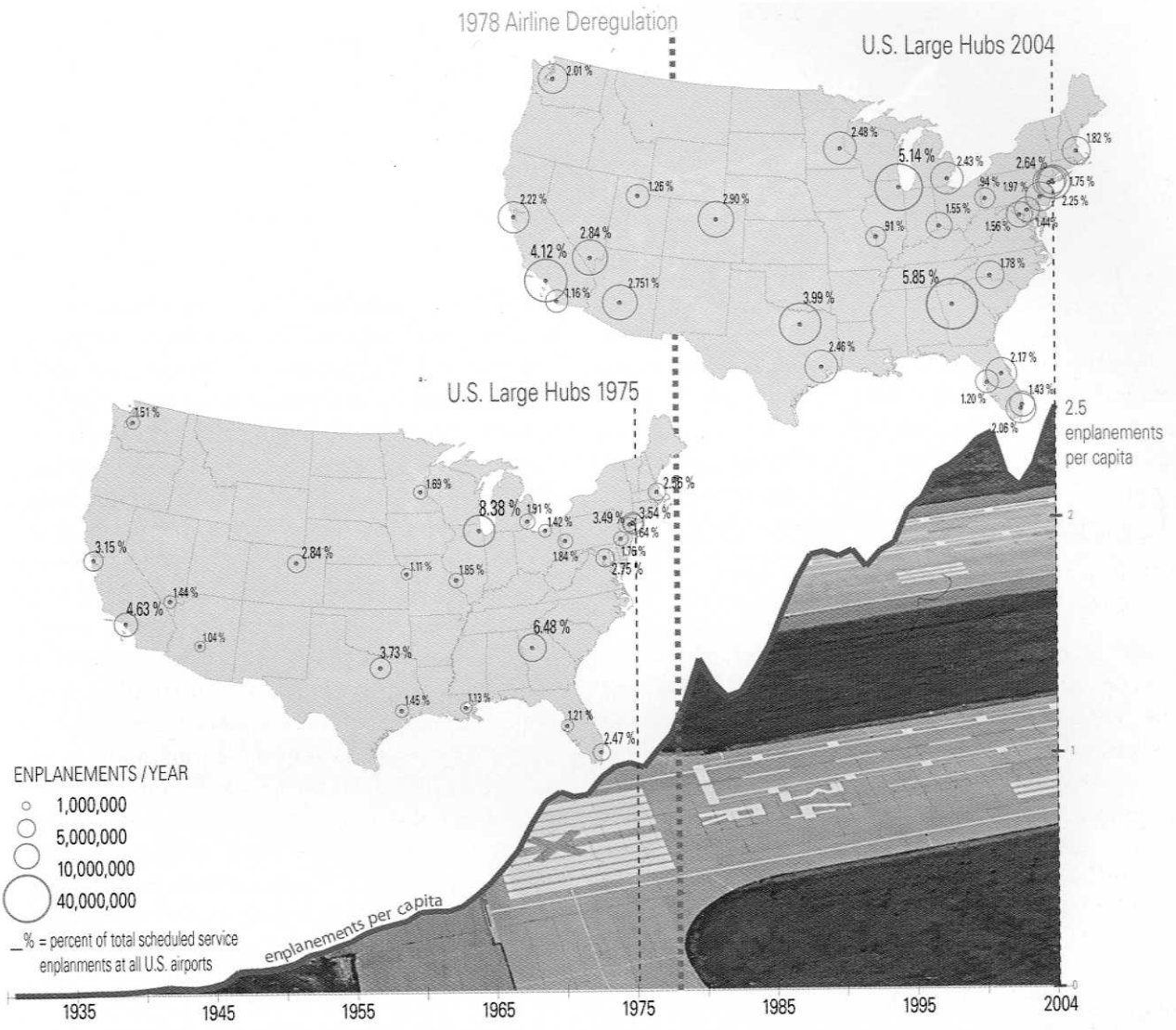

Figure 4. US hub airports and airplane enplanements per capita 1975–2004. (Photomontage by Alan Berger; see Figure Source list)

line industry in 1978, and the corresponding increase in the number of enplanements per capita, has placed cities in greater competition to serve as hubs in the traditional hub-and-spoke model of air travel. The resultant mobility of hubs and the desire for airlines to reduce costs post-deregulation have resulted in fewer city-to-city direct flights, where population density is low, and more hub-and-spoke flights through higher-density major metropolitan areas (Figures 4 and 5).

The speed and surety of a global distribution system has fostered larger economies of scale in the selling of consumer goods, as evidenced by the phenomenon of the big-box retail store. More significant than the size and shape of these retail outlets are the vast digital infrastructures of communication and control that facilitate their existence. Among the clearest of these systems is the symbiotic partnership between Dell Computer and United Parcel Service (UPS). Dell and UPS have integrated operations to effectively deliver parts from Dell suppliers just-in-time to the Dell factories producing computers. These completed consumer goods are then shipped through UPS with components of a consumer's order being streamed together mid-shipment. Often UPS stores one component, say monitors, at its own warehouses near major markets, bringing them together with the computers they are sold with just prior to delivery. This pushing of material and inventory up into the supply chain shortens waiting and production times, reduces costs, and effectively outsources much of the warehousing functions into the distribution

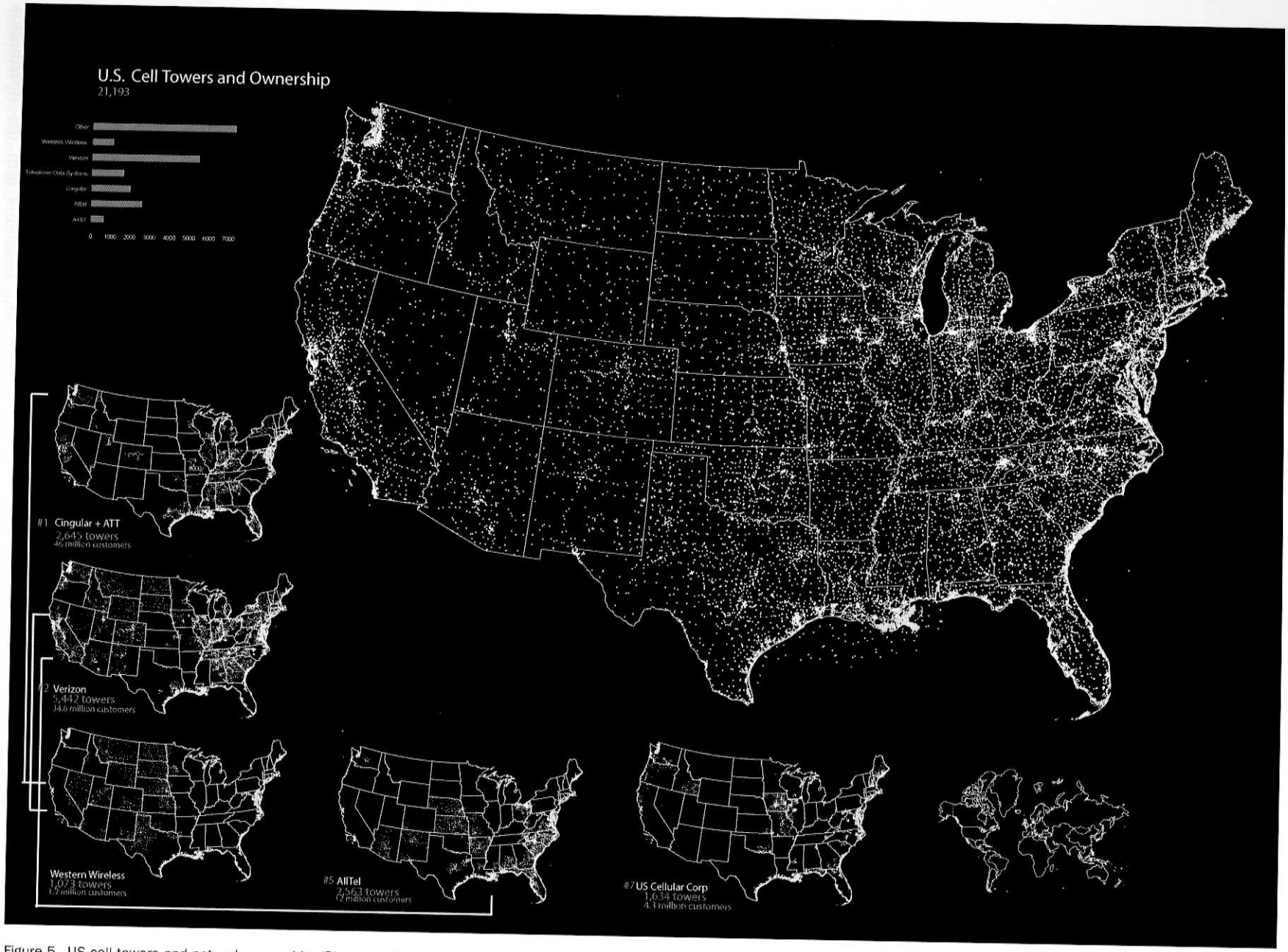

Figure 5. US cell towers and network ownership. (Photomontage by Alan Berger; see Figure Source List)

chain itself and onto public infrastructure. This parallels a broader trend to reclassify what had historically been understood as costs of production, into "externalities" to be offloaded onto the consumer, a supplier, a strategic partner, or the public sector. One aspect of this transformation has been increased demand for public investment in transportation infrastructure. Another aspect of this trend has seen companies shifting the costs associated with their buildings and grounds from capital assets to considering them as annual operating expenses. This shift, implicit in the concept of treating overhead costs as externalities, has the effect of rendering formerly valuable buildings and grounds semidisposable. The corollary, of course, is that these semidisposable buildings and grounds require less of an initial capital investment in construction as they are considered only an ongoing annual expense that can be written off and abandoned at any moment. This trend has equal impact on reducing the investment made in design services attendant to those buildings and grounds. Wal-Mart and Home Depot are illustrative of many of these trends and have become basic building blocks of the new post-urban consumer landscape (Figures 6–11). While most critiques of this form of development regard it as chaotic, without order, or even unplanned, these spaces are highly engineered and continually reconfigured around shifting organizations of capital and material.

Landscapes of Consumption and Convenience

Consumption and convenience represent the easy abundance and cheap calories of strip retail urbanism and the fast-food culture it is organized to serve. The economies that fuel retail development of this sort depend upon enormous, unseen off-site operations of resource extraction, harvesting, and staging that are embedded in natural environments. These often out-of-site operations afford "standing reserve" for the ready appearance of consumable products into the supply chain. The convenience of this environment is organized around the ready, cheap availability of a verifiable and reproducible product. *Economist* magazine has developed its own "Big Mac index" as a global cost-of-living index, arguing that the Big Mac aspires to be a global commodity, available at once, everyway, for all, and that the price difference between this integer of fast-food retail consumption in various markets is a telling indicator of the general costs-of-living differential (Economist 2007, 82).

The logistics landscapes that organize natural resources for this convenience are themselves organized around transportation infrastructure; highways in the case of beef, and the vast prairie feed lots in which the beef is fattened while still in cow form. While the cows carrying that beef may begin life in any number of US locations, they will inevitably converge by truck and train upon the enormous feedlots of the central plains of Oklahoma, Nebraska, Kansas, and Iowa (Figures 12–18).

The corn-based agricultural economy of Iowa offers a case study in the industrialization of a formerly natural process. What appears to the naked eye as a carbon-fixing economy transforming sunlight into sugar is in reality a petroleum economy whose economies of scale depend completely upon unsustainable agricultural practices. This ironic condition has led to the recent conundrum expressed by Michael Pollan that one is increasingly left to choose between foods that are organic, yet come from enormous distances and produce negative environmental consequences, and food that is not organic per se, but is grown locally (Pollan 2006).

The retail fronts of the global food supply chain, the locations where the various agriculturally derived and preprocessed products converge, whether it is McDonald's or Whole Foods, is primarily conceived as a speculative real estate investment. As such, it depends upon the generic, universal availability of its commodities and functions as an anchor tenant to strip development surrounding it. The spatial organization of McDonald's restaurants within new strip developments, the distribution of organic foods to retail outlets, and

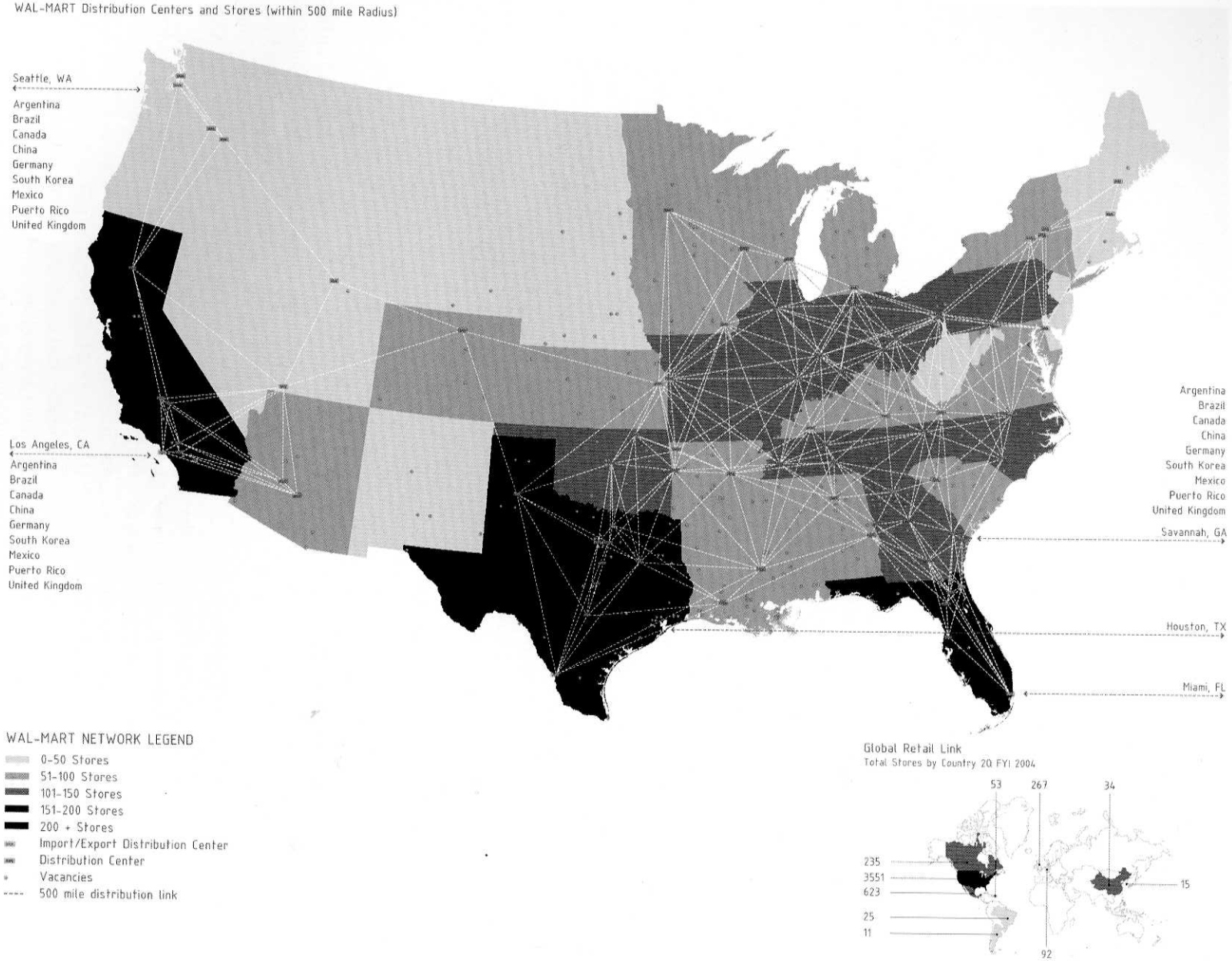

Figure 6. Wal-Mart distribution centers and stores. (Photomontage by Alan Berger; see Figure Source List)

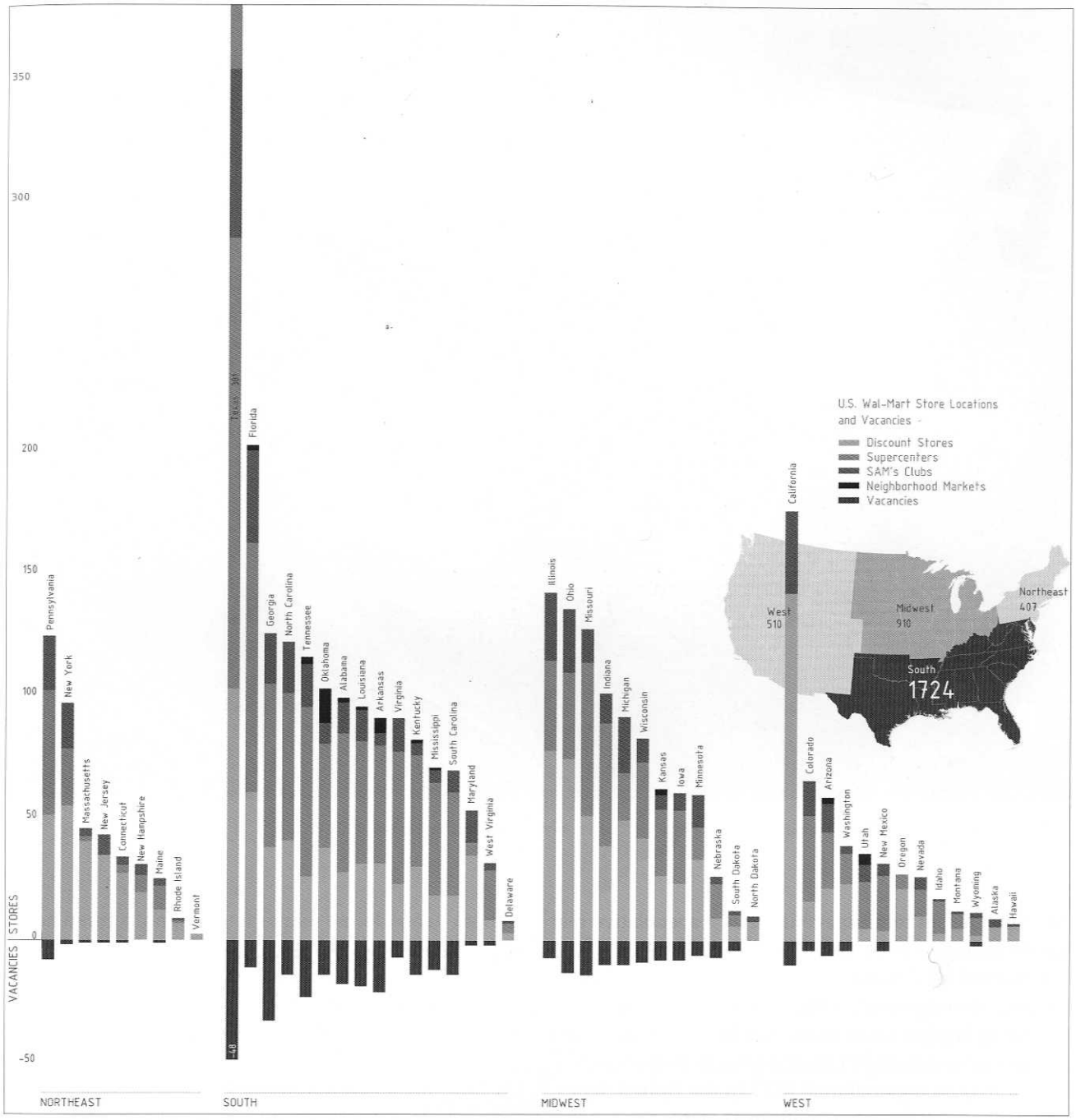

Figure 7. US Wal-Mart store locations and vacancies. (Photomontage by Alan Berger; see Figure Source List)

Figure 8. Wal-Mart Distribution Center, Phoenix, Arizona. (Photograph by Alan Berger, 2003–2006)

the "malling" of retail space itself as a speculative real estate investment by Real Estate Investment Trusts (REITs) are all examples of these conditions. Typical of these developments is the Stonebriar Mall and surrounding big-box retail stores outside of Dallas, Texas. Stonebriar is owned by General Growth Properties, the second largest regional mall REIT in the United States, which manages shopping malls in 41 states.

Landscapes of Accommodation and Disposal

Accommodation and disposal describe the staging, storage, and disposal of the increasingly short-lived consumer goods that constitute much of the contents of the distribution systems we are describing. The houses we live in are growing larger and larger, accommodating more consumer goods, more waste, and more space per capita than at any time in US history. Home ownership is equally trending upwards, as are new housing starts in both luxury home markets and manufactured housing. Manufactured housing now accounts for a larger percentage of US housing starts than at any time in history and most manufactured houses (formerly mobile homes) will be mobile only once in their existence, in the move from the factory floor to the site where they are installed. Manufactured housing is also getting bigger, the industry more segmented to address diverse markets, and going upscale. Like fast food, these consumer goods begin life as embedded energy and raw materials harvested at industrial scales across the country. The attendant networks of industrial softwood lumber harvesting and replanting are essentially agricultural operations, feeding an insatiable demand for the raw material of housing. The interlocking networks of manufactured housing plants, industrially managed forest-farms, and land for manufactured housing communities reveal much about this economy dependent

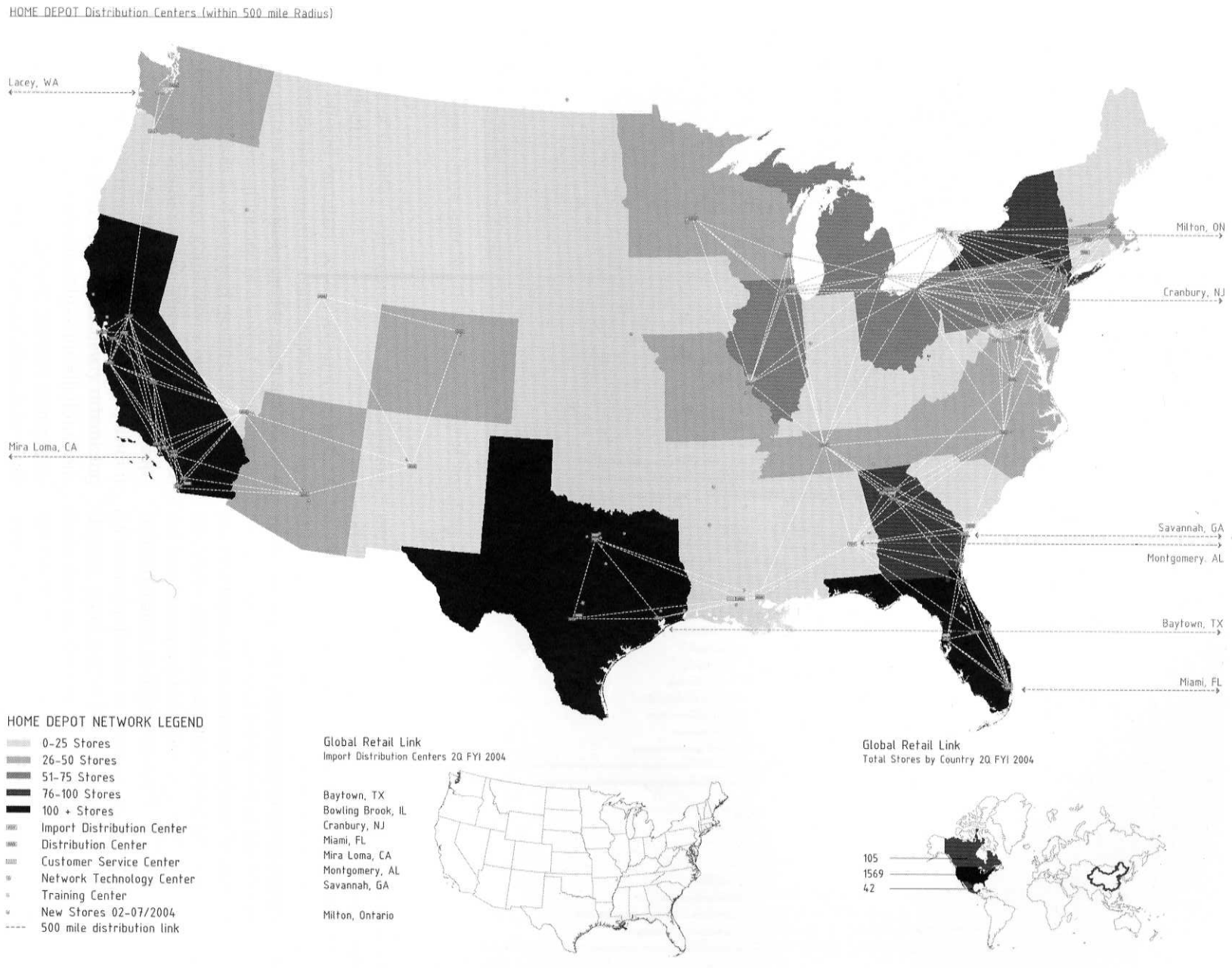

Figure 9. Home Depot distribution centers and stores. (Photomontage by Alan Berger; see Figure Source List)

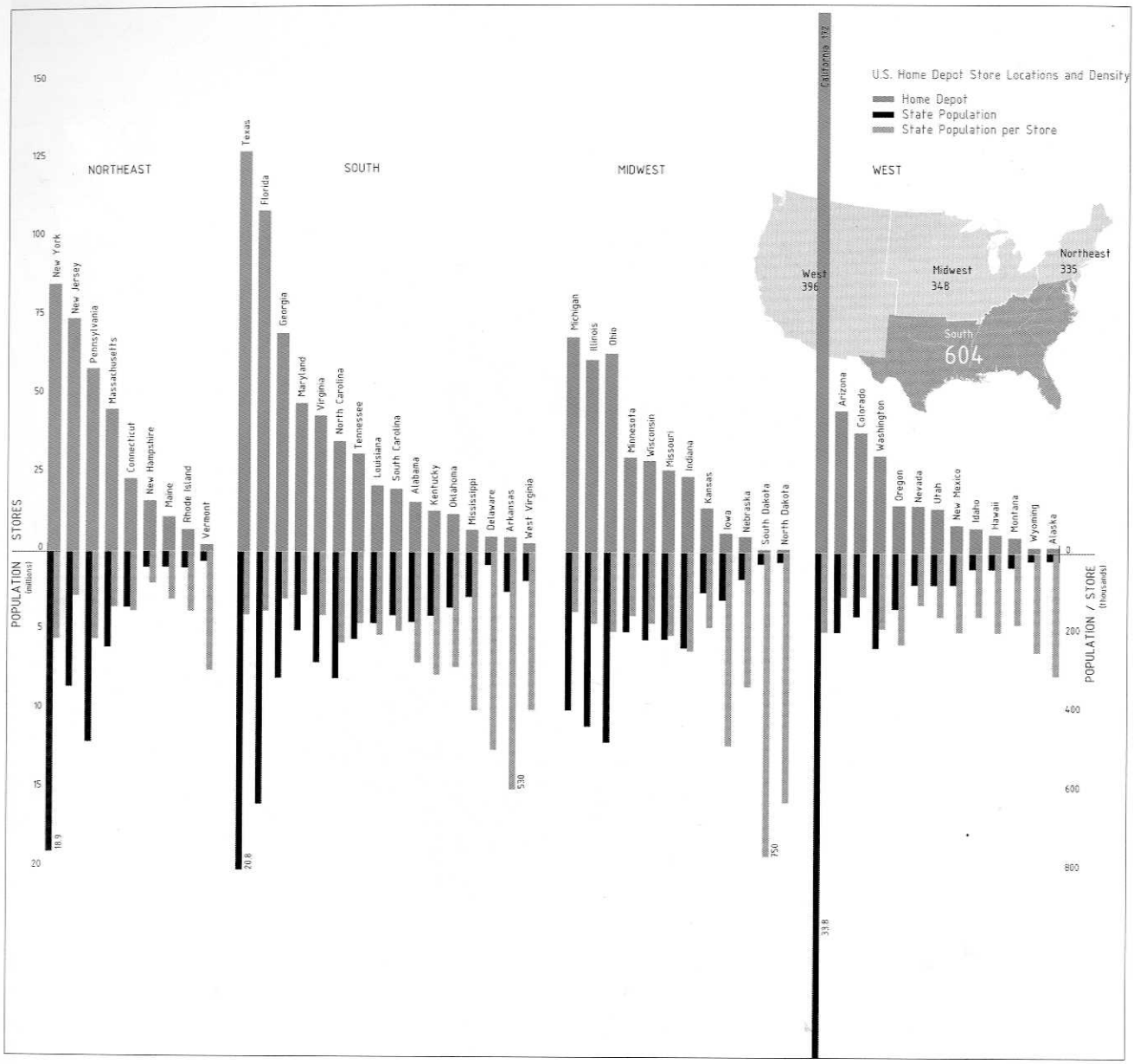

Figure 10. US Home Depot store locations and density. (Photomontage by Alan Berger; see Figure Source List)

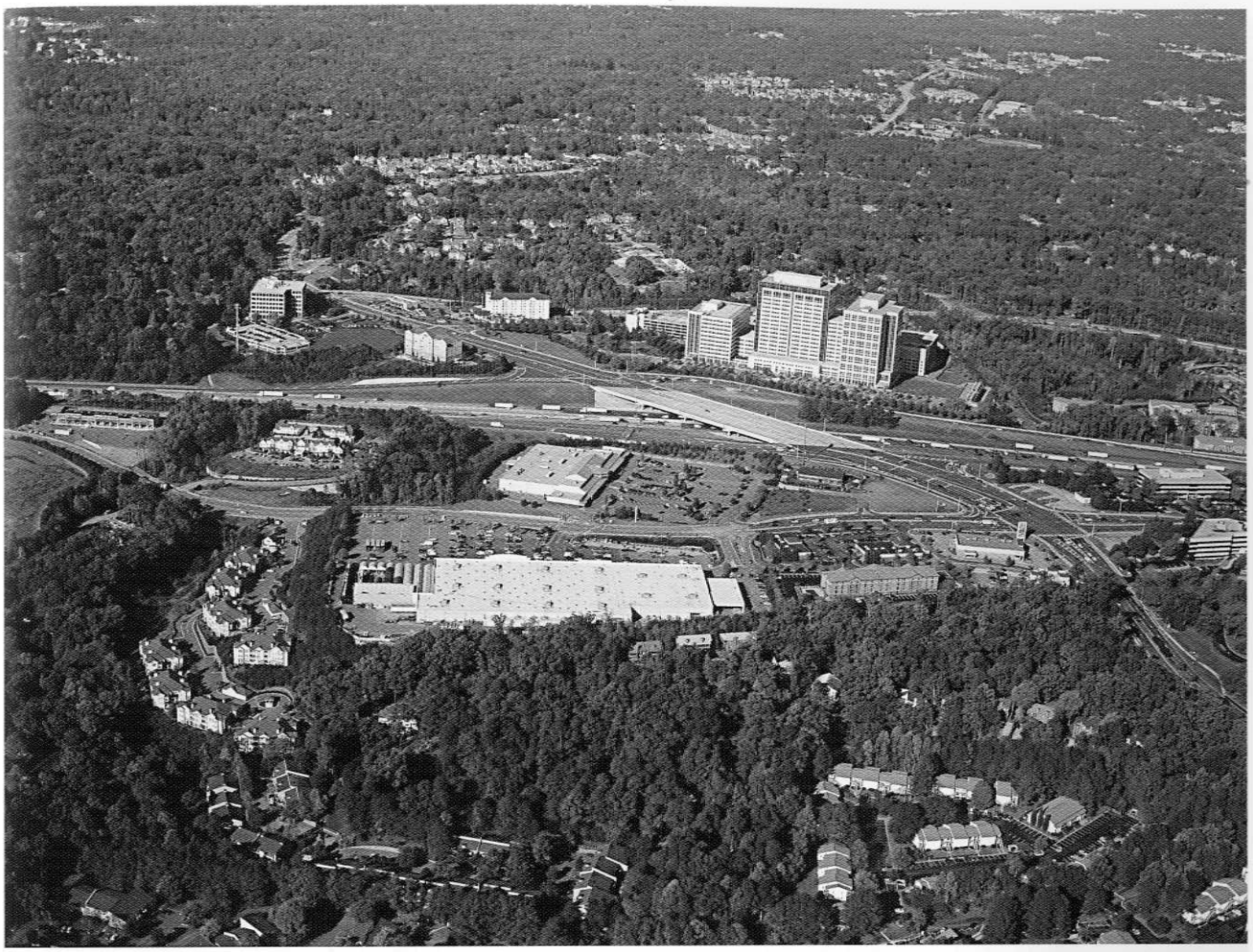

Figure 11. Home Depot World Headquarters and Retail Store, Cobb County, Georgia. (Photograph by Alan Berger, 2003–2006)

upon ease of mobility and economies of distribution (Figures 19–21).

The off-site corollary to our expanding houses and appetites for consumer consumption is the by-now ubiquitous self-storage facility. Accommodating the excesses of our affluence in a sort of purgatory for impulse purchases and outdated models, these highly profitable yet temporary ghost towns occupy the periphery of every major market. They have come to be quite effective low-cost markers of low-stakes development, allowing REITs to cover costs of land acquisition and maintenance while waiting for newly urbanizing areas to increase in land value. These installations converge on the same easy access to regional transportation infrastructure and low-cost land that draw retail strip malls, McDonald's, Home Depot, and Wal-Mart. Each of them depends equally upon access to public high-speed highways providing access for both consumer goods and consumers themselves. This can be understood as off-loading transportation costs from producers to consumers, as more Americans spend more time driving longer distances to regional big box stores.

Of course the end of this food chain is equally significant here, that is the disposal of the waste streams of contemporary consumer culture. As the volume of this waste increases, as the waste originates at residential locations spreads further and further across the urbanized region, as the waste travels further distances to its accommodation in landfills, incinerators, or other dumps, more and more trash is spending more and more time on the road. This suggests that not only are the raw materials, consumer products, and consumers themselves dependent upon networks of distribution and communication, but also that the ultimate disposal of those materials and products are equally and increasingly dependent upon them.

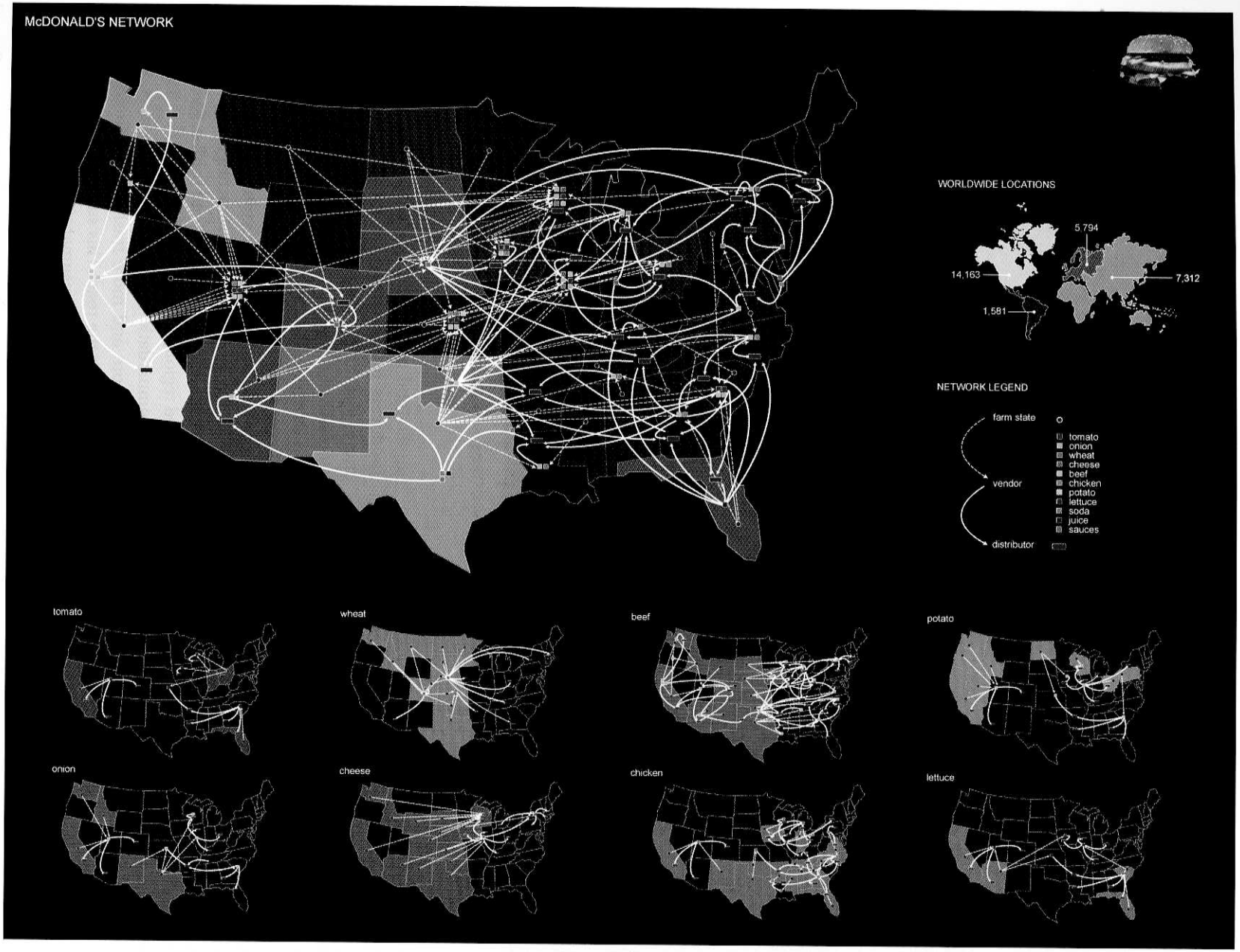

Figure 12. McDonald's network. (Photomontage by Alan Berger; see Figure Source List)

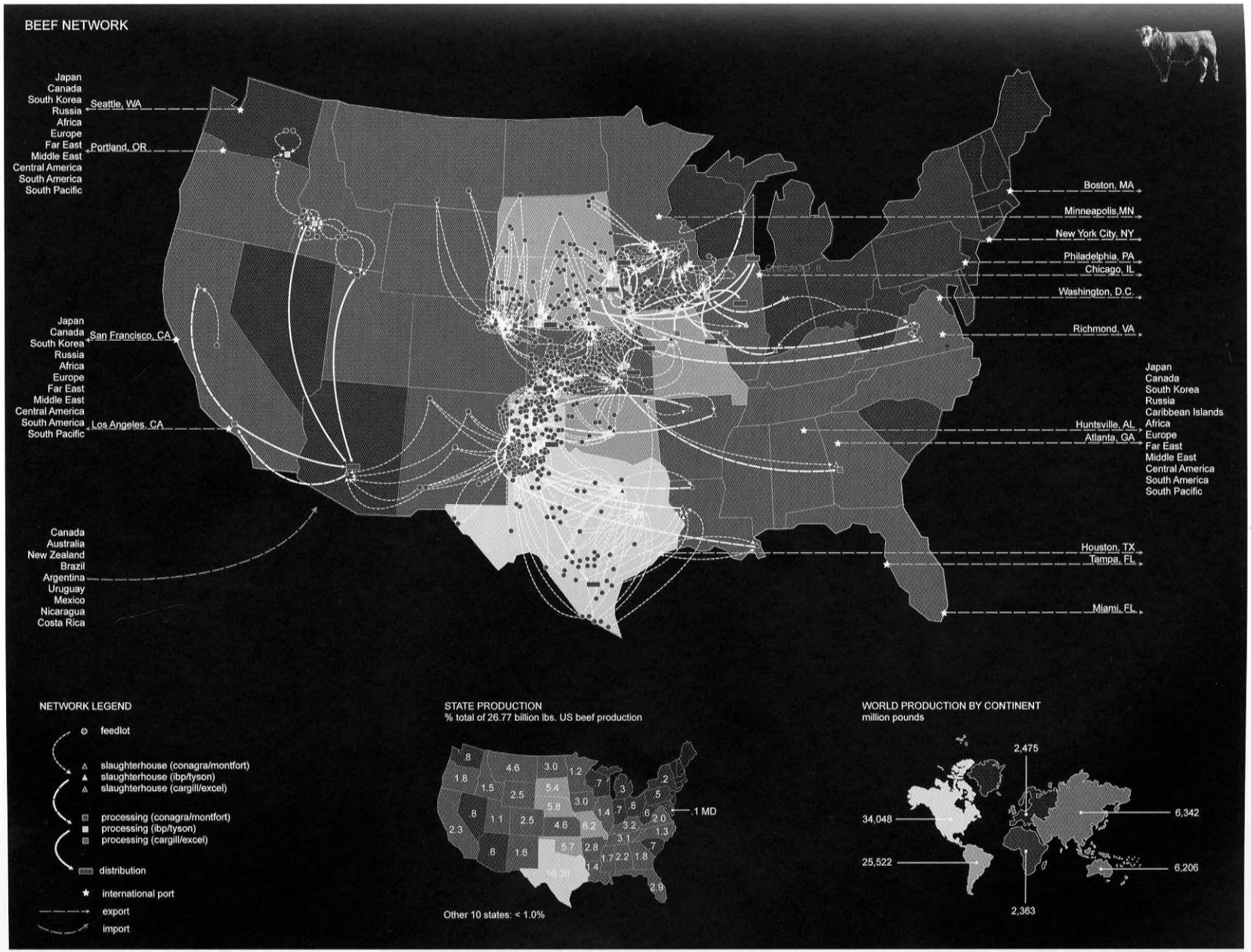

Figure 13. Beef network. (Photomontage by Alan Berger; see Figure Source List)

Figure 14. Cattle feed lot, northwest of Longmont, Colorado. (Photograph by Alan Berger, 2003–2006)

CONCLUSION

This brief theoretical sketch, while necessarily general and provisional, attempts to describe a newly formed and quickly growing landscape in the North American context. While much of that landscape and the logic of the logistics that organize it are shaped by speculative capital, private interests, and individual choices, the environment that it produces is, for better and worse, the contemporary North American urban realm. By describing this logistics landscape in spatial and economic terms, it may be possible to apprehend the forms that it takes, to anticipate the priorities that it pursues, to understand the hyper-rationality behind its seemingly unconscious construction, and to acknowledge our embeddedness in the culture it represents.

What might be gained by claiming this new space of industrial economy for landscape? What is at stake in making this distinction, and how might this claim inform future scholarship or design research? By way of a conclusion and indication of direction for future research, the most immediate utility of this work is simply a form of literacy regarding the economic and industrial imperatives informing urbanization in contemporary culture. Beyond simple literacy, this body of knowledge (if sufficiently developed and articulated in future work) could offer academics and design professionals some traction on the issues of social justice and environmen-

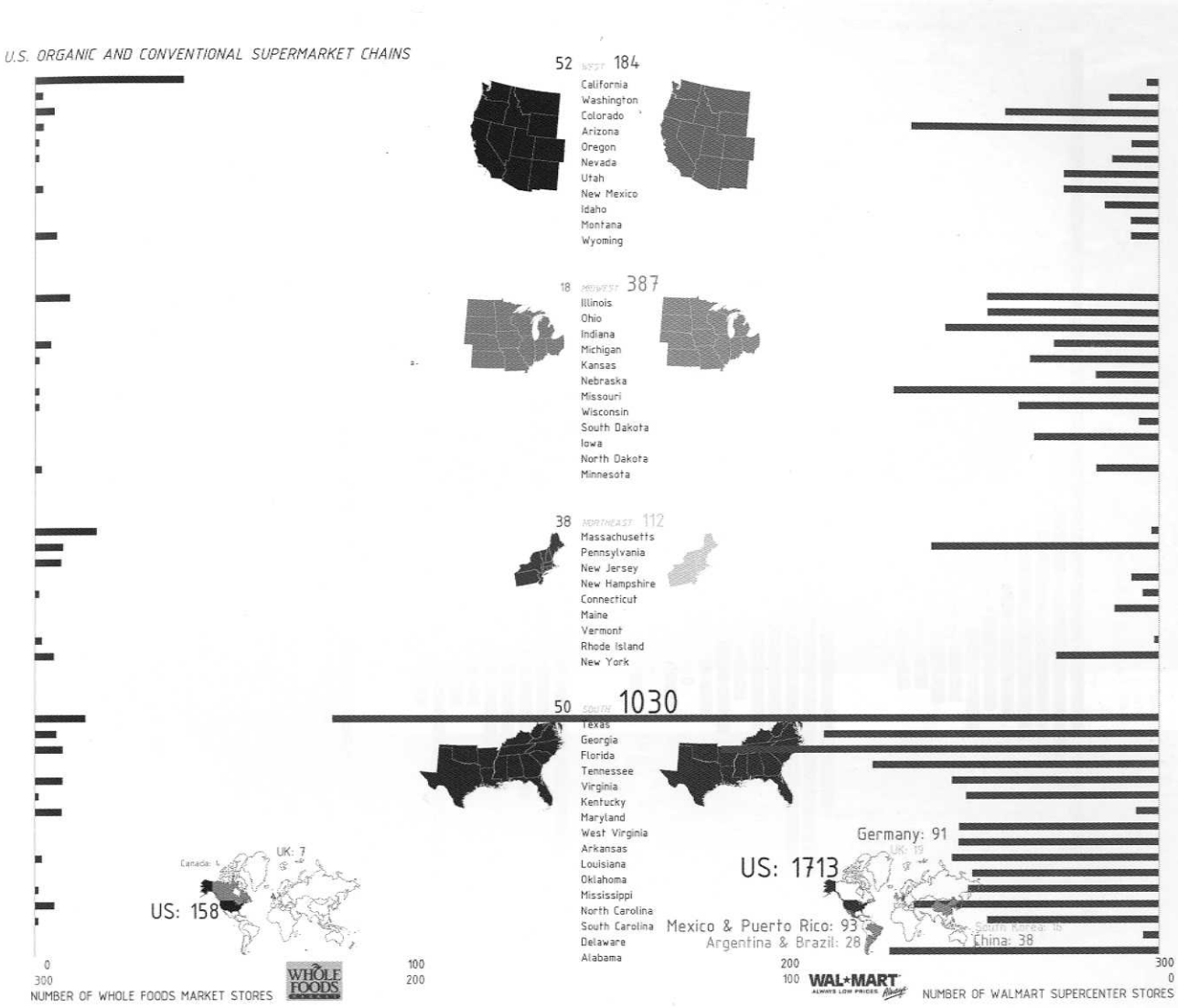

Figure. 15. US organic and conventional supermarket chains. (Photomontage by Alan Berger; see Figure Source List)

tal sustainability that are raised by this form of development. While the sites and subjects of these logistics landscapes do not immediately or necessarily pertain to questions of design, the claiming of this subject for landscape necessarily implies that the landscape academic or landscape architect might play a role as advocate on the range of social and environmental issues raised by those sites and subjects.

Of course claiming the spatial formation of advanced capitalism as manifest through logistics as a form of landscape holds the potential to diversify and make more resilient the very discipline of landscape architecture itself. By claiming subjects and sites traditionally associated with economics, geography, and urban planning as the appropriate subject of landscape scholarship or practice, this work seeks to articulate a more relevant and more engaged discipline of landscape architecture, one capable of simultaneously representing and reconceiving the primary spatial dimensions of contemporary North American culture.

Finally, claiming the space of logistics as a space of landscape architecture has the potential to inform design culture more broadly. Landscape's recent ascendancy as a design medium might benefit from a close reading of the contemporary spatial and material forms emerging in the space of logistics. These studies of the spatial and material manifestation of advanced capital might inform design on traditional sites of cultural

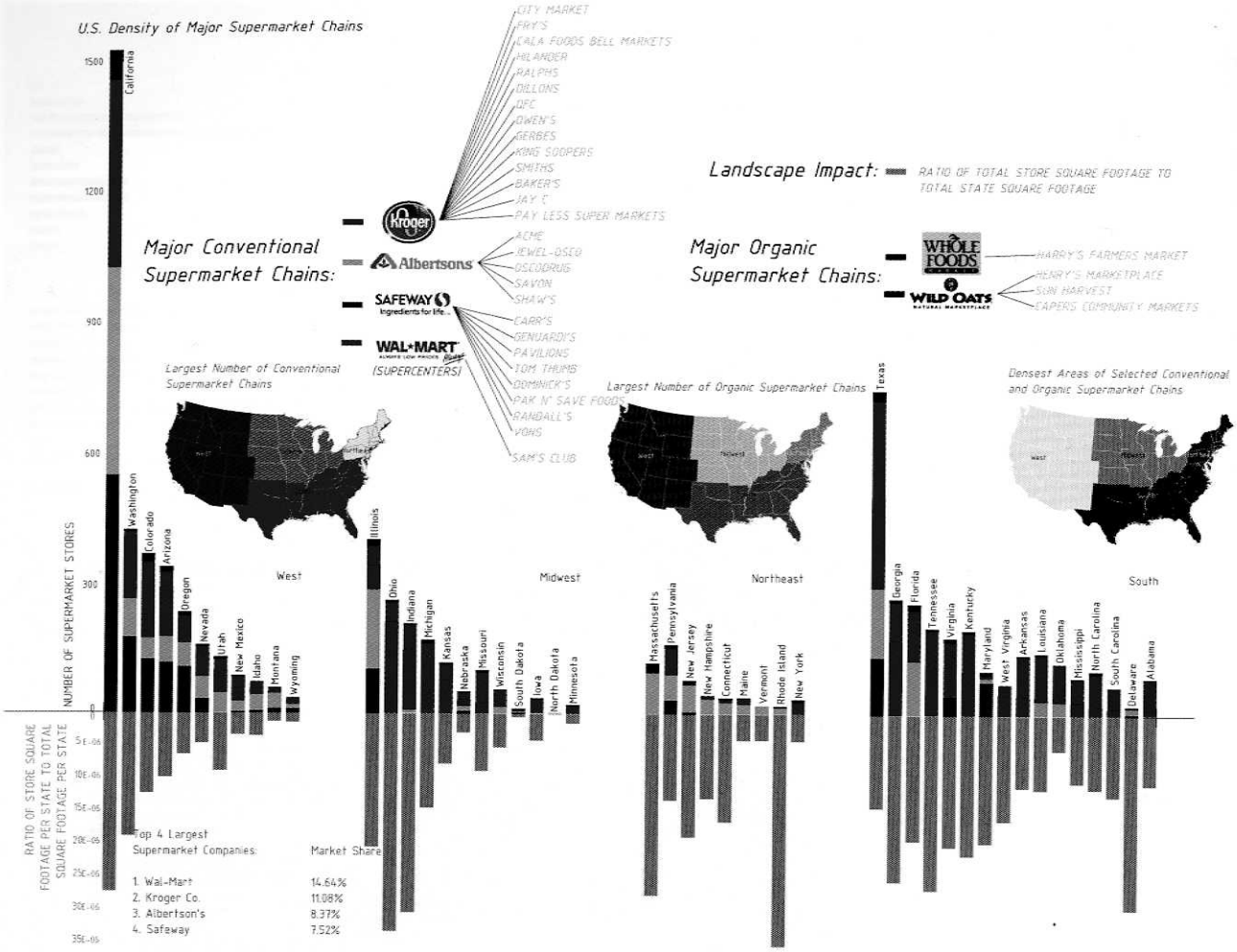

Figure 16. US density of major supermarket chains. (Photomontage by Alan Berger; see Figure Source List)

Figure 17. Safeway Inc. Distribution Center, along Interstate 70 in Denver, Colorado. (Photograph by Alan Berger, 2003–2006)

Figure 18. Stonebriar Centre Mall and surrounding big-box retailers, Frisco, Texas. (Photograph by Alan Berger, 2003–2006)

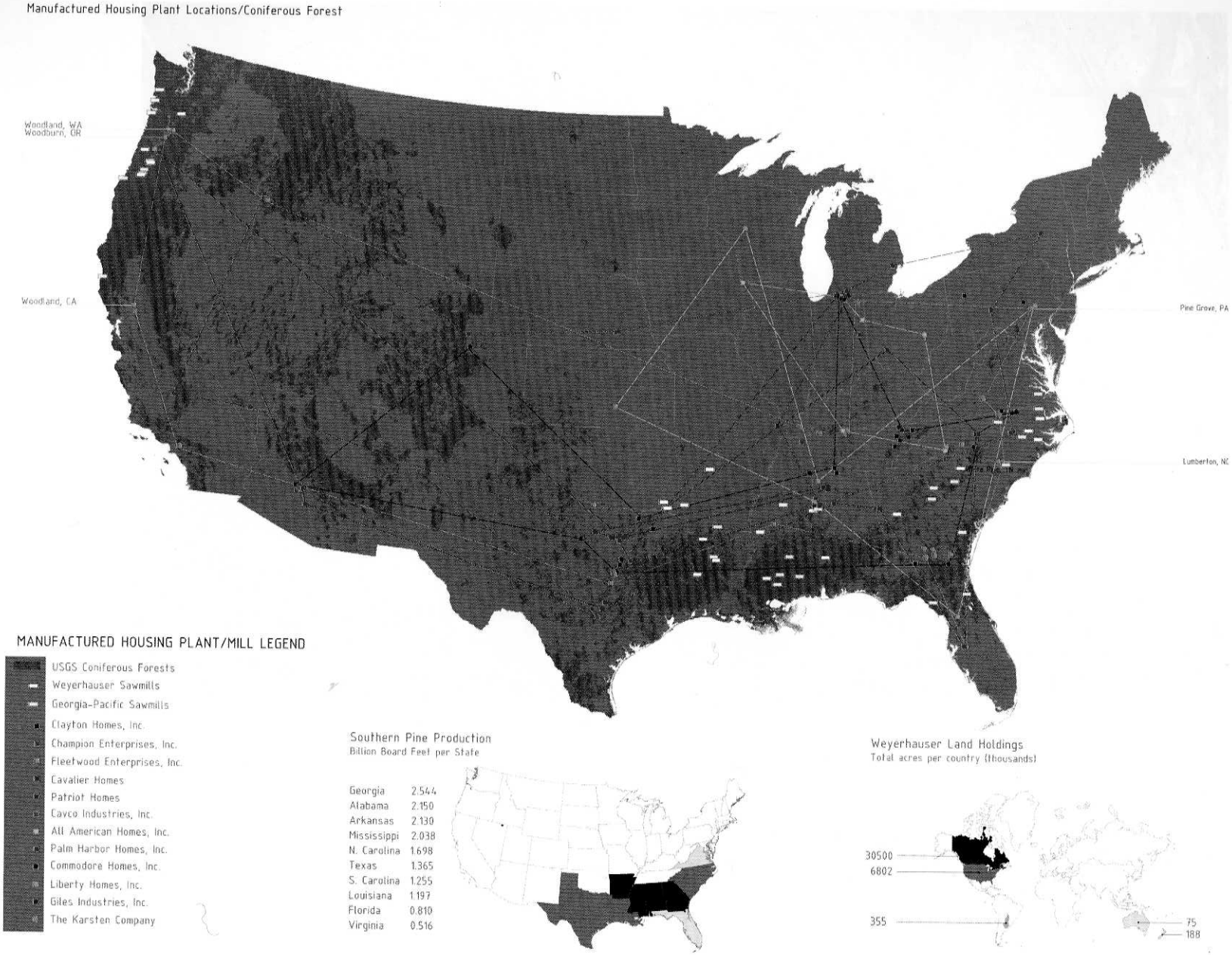

Figure 19. US manufactured housing plant locations. (Photomontage by Alan Berger; see Figure Source List)

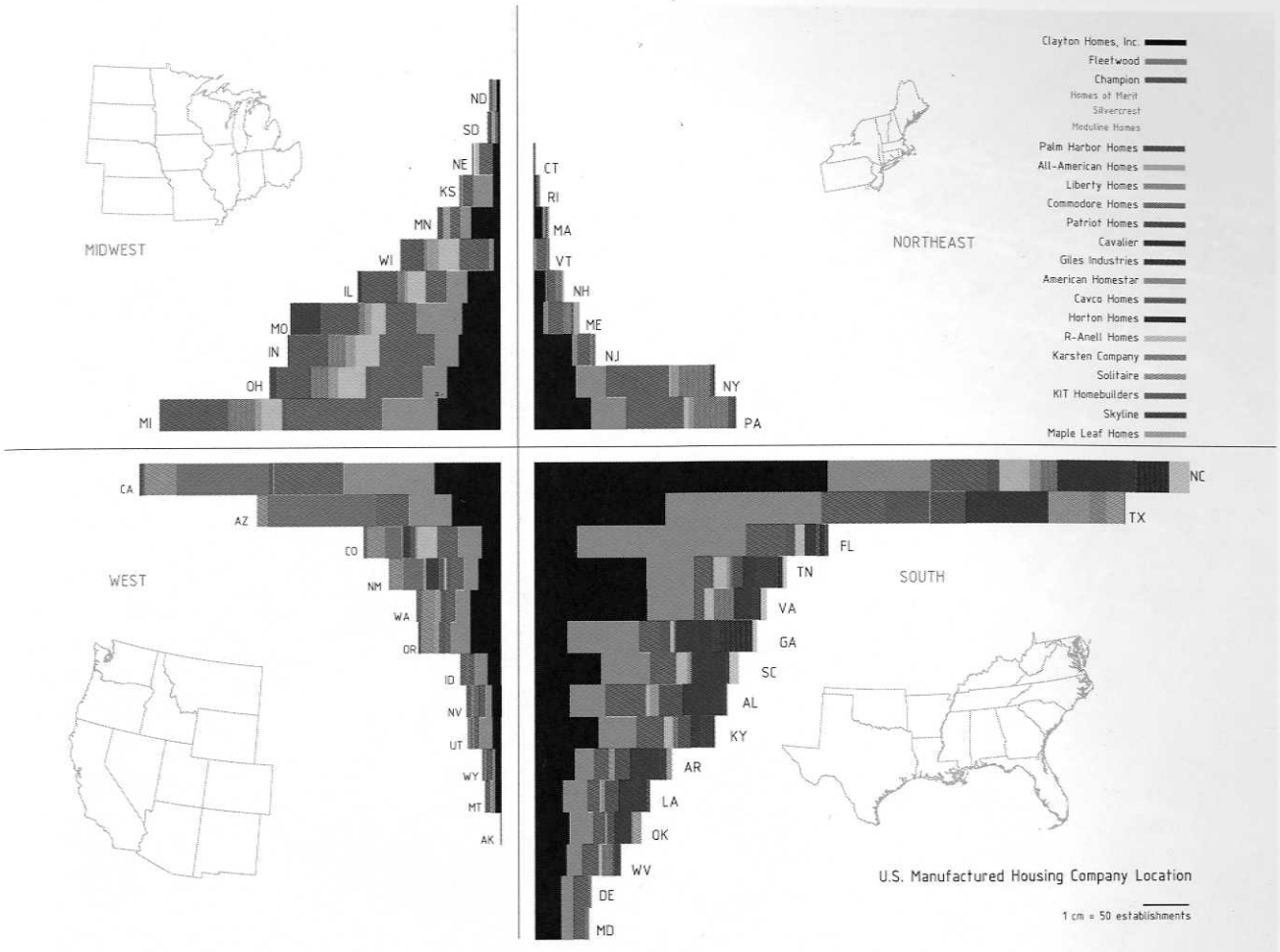

Figure 20. US manufactured housing company locations. (Photomontage by Alan Berger; see Figure Source List)

production, far afield from the logistics zones that informed them. Equally, this knowledge could shape the design of those logistical zones themselves, simultaneously claiming a new territory for design and planning of the built environment. Ultimately, the most ambitious project is one that aspires to the design and planning of both realms, a practice in which both the emergent landscape of logistics and the traditional cultural landscapes that they support might be drawn together through shared spatial and material languages. This holds out the possibility of a modest rapprochement between the self-consciously designed centers and unconsciously engineered peripheries of our contemporary urban environments.

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REFERENCES

Brenner, Neil, and Roger Keil. 2005. Introduction: Global city theory in retrospect and prospect. In *The Global Cities Reader,* ed. B. Neil and R. Keil, 1–16. London: Routledge.

Bruegmann, Robert. 2005. *Sprawl: A Compact History.* Chicago: University of Chicago Press.

Castells, Manuel. 1999. *The Informational City.* Oxford: Blackwell Publishers.

———. 2000. *The Information Age: Economy, Society and Culture, Volume I: The Rise of the Network Society.* Oxford: Blackwell Publishers.

Corner, James. 2006. Terra fluxus. In *The Landscape Urbanism Reader,* ed. Charles Waldheim, 22–33. New York: Princeton Architectural Press.

Cudahy, Brian J. 2006. *Box Boats: How Container Ships Changed the World.* New York: Fordham University Press.

Economist. 2007. Finance and economics: Sizzling, the Big Mac index. July 7, 82.

Figure 21. Manufactured housing subdivision, near Red Oak, Texas. (Photograph by Alan Berger, 2003–2006)

Graham, Stephen, and Simon Marvin. 1995. More than ducts and wires: Post-Fordism, cities and utility networks. In *Managing Cities: The New Urban Context,* eds. P. Healy et al.,169–190. New York: John Wiley & Sons.

———. 1996. *Telecommunications and the City.* New York/London: Routledge.

———. 2001. *Splintering Urbanism: Networked Infrastructure, Technological Mobilities and the Urban Condition.* New York/London: Routledge.

Hanley, Richard, ed. 2003. *Moving People, Goods and Information in the 21st Century: The Cutting-Edge Infrastructures of Networked Cities.* New York/London: Routledge.

Harvey, David. 1990. *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change.* Cambridge, MA: Blackwell Publishers.

———. 1994. Flexible accumulation through urbanization: Reflections on "Post-Modernism" in the American city. In *Post-Fordism: A Reader,* ed. A. Amin, 361–386. Malden, MA: Blackwell.

Levinson, Marc. 2006. *The Box: How the Shipping Container Made the World Smaller and the World Economy Bigger.* Princeton, NJ: Princeton University Press.

Pollan, Michael. 2006. *The Omnivore's Dilemma: A Natural History of Four Meals.* New York: Penguin.

Reed, Peter. 2005. *Groundswell: Constructing the Contemporary Landscape.* New York: Museum of Modern Art.

Schumacher, Patrik, and Christian Rogner. 2001. After Ford. In *Stalking Detroit,* ed. G. Daskalakis, C. Waldheim, and J. Young, 48–56. Barcelona: Actar.

Simmel, Georg, 1903. The metropolis and mental life. In *On Individuality and Social Forms,* ed. D. Levine, 324–339. Chicago: University of Chicago Press.

Snyder, Susan Nigra, and Alex Wall. 1998. Emerging landscapes of movement and logistics. *Architectural Design Profile* 134:16–21.

Soja, Edward. 1989. *Postmodern Geographies.* New York: Verso.

———. 2000. *Postmetropolis: Critical Studies of Cities and Regions.* Cambridge, MA: Blackwell.

Wall, Alex. 1999. Programming the urban surface. In *Recovering Landscape,* ed. James Corner, 232–249. New York: Princeton Architectural Press.

Weller, Richard. 2006. An art of instrumentality: Thinking through landscape urbanism. In *The Landscape Urbanism Reader,* ed. Charles Waldheim, 71. New York: Princeton Architectural Press.

Zaera Polo, Alejandro. 1994. Order out of chaos: The material organization of advanced capitalism. *Architectural Design Profile* 108: 24–29.

FIGURE SOURCE LIST

Figure 4. US Hub Airports and Airplane Enplanements per capita 1975–2004, chart. Airline Transportation Association Annual Reports 1975, 1990, 2000, and 2004. See http://www.airlines.org/econ/d.aspx?nid=8156 (accessed July 20, 2006). See data for 2004 airport locations from the US National Atlas SDC Feature Database. US Map layers from ESRI GIS Database, http://www.esri.com/ (accessed August 2004).

Figure 5. U.S. Cell Towers and Network Ownership, map. See http://wireless.fcc.gov/geographic/fcc_db.html (Federal Communications Commission Wireless Telecommunications Bureau FCC Universal Licensing System Database). See http://www.transtats.bts.gov/MappingCenter.asp (NTAD Download 2003 nation, Bureau of Transportation Statistics). See http://quickfacts.census.gov/qfd/states/53000.html (US Census Bureau: State and County QuickFacts. Data derived from Population Estimates, 2000 Census of Population and Housing). Also see: http://www.publicintegrity.org/telecom/contacts.aspx?action=top; http://www.teletruth.com/docs/unauthbiocomplete.pdf; http://www.bellsystemmemorial.com/table_of_changes.html; http://www.qwest.com/about/investor/faq/index.html; http://www.southernstudies.org/reports/mci.pdf; http://www.keepmedia.com/Register.do?oliID=225; http://www.libertycommunications.com/history.html; http://www.mobiletechnews.com/info/2001/11/17/020412.html; http://www.motorola.com/seamless_mobility/; http://www.fcomcast.com/ccinfo/history.html; http://www.qualcomm.com/about/history.html; http://www.dailyherald.com/archives/tds.htm; http://company.monster.com/omnipoint/; http://pigseye.kennesaw.edu/~jboye/Telecommunications%20report.htm; http://wireless2002.ctsg.com/keynotes/keynote.cfm; http://www.dobson.net/dealer.cfm; http://www.bizjournals.com/philadelphia/stories/1999/01/25/weekinbiz.html; http://www.bellsouth.com/investor/history_bellsouth.html; http://encyclopedia.thefreedictionary.com/ATT (accessed August 2004).

Figure 6. Wal-Mart Distribution Centers and Stores, map. Data derived from 2004 Wal-Mart Stores, Inc. Annual Report at http://investor.walmartstores.com and the Wal-Mart company websites. See: http://www.walmartstores.com and http://www.wal-martrealty.com (accessed August 2004).

Figure 7. U.S. Wal-Mart Store Locations and Vacancies, chart. Ibid fig. 6. Geographical regions represent US Census Bureau standard statistical divisions of the United States. See http://www.census.gov/; http://www.walmartstores.com; http://wal-martrealty.com; http://www.mapquest.com (accessed August 2004).

Figure 9. Home Depot Distribution Centers and Stores, map. See http://www.homedepot.com; http://www.mapquest.com; http:www.yellow.com (accessed August 2004).

Figure 10. US Home Depot Store Locations and Density, chart. Population data derived from US Census Bureau Census 2000. Geographical regions represent US Census Bureau statistical divisions of the United States. See http://www.census.gov/; http://www.homedepot.com; http://www.mapquest.com; http://www.yellow.com (accessed August 2004).

Figure 12. McDonald's network, map. From conversations with McDonalds Corporation Senior Director of Social Responsibility, Bob Langert, 2002–2006 describing McDonalds purchase of beef from J.R. Simplot Company, Keystone Foods, Golden State Foods, Lopez Foods, Smithfield Foods, OSI International Foods, Conagra Foods. See www.mcdonalds.com (accessed August 2003).

Figure 13. Beef network, map. For information on beef production, exports, imports, and shipping, see: http://www.ncagr.com/agscool/commodities/beefkind.html#Shipping; http://www.beef.org; http://www.ams.usda.gove/tmd/livestock/airlines2.html; http://www.fas.usda.gov (accessed August 2003).

Figure 15. US Organic and Conventional Supermarket Chains, map. See http://investor.walmartstores.com/phoenix.zhtml?c=112761&p=irol-sec; http://www.wholefoodsmarket.com/company/facts.html; http://www.wholefoodsmarket.com/stores/index.html (accessed June through September, 2004).

Figure 16. US Density of Major Supermarket Chains, map. See http://www.wholefoods.com/stores/index.html; http://shop.safeway.com/superstore/default.asp?brandid=1; http://www.kroger.com/financialinfo_reportsandstatements.htm; http://www.albertsons.com/abs_investorinformation/companyinfo/annualreport_2003/intro.html http://www.wildoats.com/u/DetailLocator/; http://quickfacts.census.gov/qfd/ (all accessed June through September, 2004).

Figure 19. US Manufactured Housing Plant Locations, map. Data derived from individual company websites, see: http://www.claytonhomes.com/index.cfm?include=findaretailer.cfm; http://

www.fleetwood.com/index.asp; http://www.championhomes.net/; http://www.palmharbor.com/; http://www.allamericanhomes.com/; http://www.libertyhomes.com/; http://www.commodorehomes.com/index.php; http://www.patriothomes.com/; http://www.cavalierhomebuilders.com/; http://www.gilesindustries.com/; http://www.americanhomestar.com/; http://www.cavco.com/default.asp; http://www.hortonhomes.com/; http://www.thekarstenco.com/; http://www.solitairehomes.com/; http://www.kitwest.com/index.html; http://www.skylinehomes.com/; http://www.mapleleafhomes.net/; www.rebelhome.net/index.html; www.sfpa.org/Industry_Statistics/SP_prod_by_state.htm; www.weyerhaeuser.com/aboutus/facts/2.1_TimberlandsOverview.pdf (accessed August 2004).

Figure 20. US Manufactured Housing Companies Location, chart. Data derived from individual company websites, see: http://www.claytonhomes.com/index.cfm?include=findaretailer.cfm; http://www.fleetwood.com/index.asp; http://www.championhomes.net/; http://www.palmharbor.com/; http://www.allamericanhomes.com/; http://www.libertyhomes.com/; http://www.commodorehomes.com/index.php; http://www.patriothomes.com/; http://www.cavalierhomebuilders.com/; http://www.gilesindustries.com/; http://www.americanhomestar.com/; http://www.cavco.com/default.asp; http://www.hortonhomes.com/; http://www.thekarstenco.com/; http://www.solitairehomes.com/; http://www.kitwest.com/index.html; http://www.skylinehomes.com/; http://www.mapleleafhomes.net/; www.rebelhome.net/index.html; www.sfpa.org/Industry_Statistics/SP_prod_by_state.htm (accessed August 2004).

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