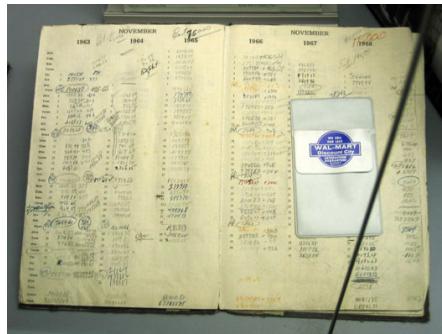


All Those Numbers: Logistics, Territory and Walmart

How can architects adapt Walmart's logistical expertise to make better-performing environments?

JESSE LECAVALIER

MAY 2010

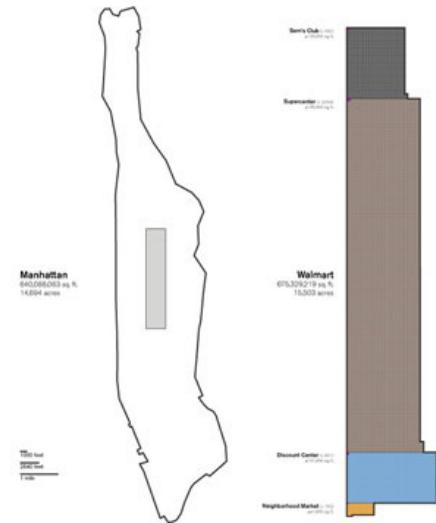


Sam Walton's ledger, Walmart Visitors' Center, Bentonville, Arkansas. [Images courtesy of the author except where noted.]

Walmart Stores, Inc. is a discount retailer based in Bentonville, Arkansas.

In 2008 it earned 400 billion dollars and had a combined floor area larger than the island of Manhattan.

If Walmart were a country, it would be the world's 26th largest economy, just behind Austria. Walmart is also the largest private employer in the United States, with a workforce of over 1.4 million, second only to the federal government. Charles Fishman, in *The Walmart Effect*, describes the company as "carefully disguised as something ordinary, familiar, even prosaic. But in fact, Walmart is a completely new kind of institution: modern, advanced, potent in ways we've never seen before . . . Walmart has outgrown the rules — but no one noticed."¹ Charlie Rose, before introducing Lee Scott, then Walmart's CEO, as a guest on his talk show, proclaimed Walmart "the most powerful company ever to exist."² It is, in fact, the company's specialization in logistics — borne out through obsessions with efficiency, information and distribution — that has made it the sophisticated corporation Fishman describes. Given that Walmart's operations are fundamentally concerned with territory, examining them closely yields insight into some of the mechanisms now at work shaping cities.



Total area of Manhattan compared to
total floor area of Walmart stores in the
U.S. [Click Image to Enlarge.](#)

Walmart has built its empire by deploying a selection of pre-designed, proprietary building types and adapting these to local requirements. Individually these big boxes, surrounded by acres of parking and suburban commercial landscaping, have limited impact; but their cumulative effect – multiplied across almost 4,300 U.S. Walmart stores – is considerable indeed. According to a study by Matthew Zook and Mark Graham, geographers at the University of Kentucky, “Fully 60 percent of the entire U.S. population lives within 5 miles of a Wal-Mart location and 96 percent are within 20 miles.”³ What is more, Walmart has nearly saturated its rural and suburban markets and is now focusing on cities. Yet so far the retailer has struggled to successfully build in urban areas.⁴

Herein lies an opportunity to investigate the design possibilities latent not only in Walmart’s building types but also in the organizational practices – especially its unparalleled expertise in logistics – that have made the company ubiquitous in the American commercial landscape.⁵ What might the field of architecture learn from Walmart? What new research avenues, urban forms, building types and spatial conditions might emerge?



Premiere of Walmart Television at
07:30 on January 11, 1988.

Logistics

Sam Walton (1918–1992) founded Walmart in 1962 in Rogers, Arkansas, based on a low-price/high-volume business model. By selling things cheaper, Walton could sell more of them and generate profit through volume rather than through high markup. This approach has proven spectacularly successful — yet it relies on narrow margins that must be vigilantly maintained and constantly improved. As a result Walmart strives constantly to reduce costs. The company negotiates relentlessly with suppliers and its leadership puts tremendous pressure on store managers to achieve maximum profitability. Much of this has been driven by Sam Walton’s obsession with individual stores’ weekly performance data, which he would review every Saturday morning with his executives and managers in order to root out inefficiencies, either within their own operations or those of suppliers. Through this sort of detailed and obsessive scrutiny, Walmart’s leaders concluded that they themselves could handle most external operations better, cheaper and faster.

It was this early realization that led the company to develop its multilayered distribution system and to identify logistics — the branch of management concerned with moving supplies from point to point, and which relies upon information to enhance speed, efficiency and control — as its primary expertise. The field of logistics, of course, is rooted in the military; historian James Huston describes logistics as “the application of time and space factors to war.”⁶ Unsurprisingly, there is a martial fervor to the company’s campaign to achieve total coordination of its worldwide operations.

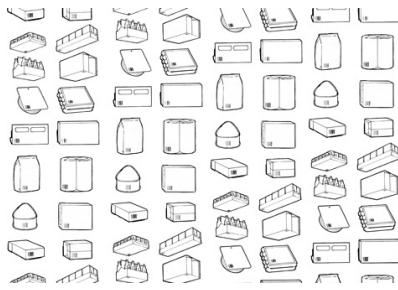
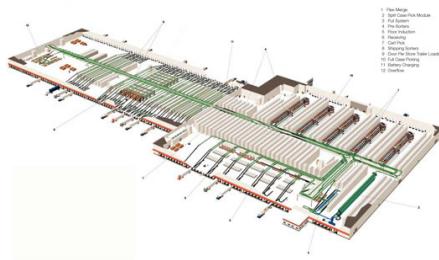


Diagram illustrating the recommended location of barcodes on various products. [Credit: Lawrence Hicks, *The Universal Product Code* (New York: Amacom, 1975)]

To bring about such extraordinary coordination, Walmart devotes significant resources to the development, maintenance, refinement and synchronization of its distribution and data networks.⁷ The company keeps track of every item every customer buys for two years and stores this information in two data centers near its headquarters in Bentonville. Walmart uses this massive amount of information — only the U.S. Department of Defense collects more — to monitor consumer behavior and develop predictive purchasing and distribution models.⁸ The transmission of this data is then enabled by Walmart's large satellite network and its proprietary intra-net, RetailLink. Walmart was also an early proponent of the Universal Product Code, and one of the first retailers to insist on compulsory adoption by its suppliers, which enabled the company to substantially increase the amount and quality of the data it tracked. Furthermore, the UPC, or barcode, serves in a sense to abstract the items moving through Walmart's supply circuits: they are registered and tracked as numbers rather than things. This process — the quantification of qualities — is apparent in an illustration from 1975 that advises manufacturers on barcode placement: the products themselves are shown as blank forms because, from the merchandiser's viewpoint, the truly relevant information is contained in the string of binary digits that make up each UPC. For Walton however, this logistical capacity was largely a means to an end. The founder remained focused only on how logistics affected performance — measured in profit. About the company's extensive data network, he wrote: "What I like about it is the kind of information we can pull out of it on a moment's notice — *all those numbers.*"⁹

In recent years Walmart's logistics strength — its expert use of "all those numbers" — has allowed it to exert an increasingly large influence in areas beyond the typical concerns of a discount retailer, especially in environmental regulation and emergency response. In 2005, CEO Lee Scott laid out an ambitious plan to reduce the company's energy consumption. The goals were "to be supplied 100 percent by renewable energy, to create zero waste, and to sell products that sustain our resources and environment."¹⁰ Walmart has approached this challenge with its characteristic rationalism, discipline and zeal; it has understood that given the sheer size and scale of the enterprise, small improvements would have big impacts.



Schematic diagram of distribution similar to those used by Walmart. [Click Image to Enlarge](#). [Credit: "Supply Chain Management, Inc. System Overview," Brochure, Dematic Corporation, 2008]

The company calculated, for example, that an increase in fuel efficiency of just one mile per gallon would save more than \$7,000 in fuel costs for a single truck; multiply that by the fleet's 7,200 tractors and the annual savings is \$52 million. Or, for another example, the company has started stocking milk in "case-less" plastic containers that require no crates or racks for shipping. With this minor modification in the packaging of one item, trucks carrying milk can hold nine percent more volume. This means fewer trips, less gas, less packaging and — most important to Walmart — a price reduction of up to \$0.20 per jug. Similarly, a few years ago Walmart decided to replace the fluorescent lights in its refrigerated cases with high-efficiency LEDs. When it learned that no existing LEDs had the performance characteristics it sought, the company challenged lighting manufacturers to develop a better product — whoever designed the most efficient and least expensive fixture would get the contract.¹¹ Naturally, manufacturers devoted significant resources to meeting the challenge; only one got the job but industry-wide standards were raised. And since then Walmart has expanded its LED program to include the produce and electronics departments and has awarded CREE — producers of the brightest and most efficient LED in the industry — an account for 650 stores. These kinds of calculations and practices have led one columnist to suggest that Walmart "could drive the climate debate faster than years of congressional bloviation."¹²

Walmart's ability to communicate quickly and directly with suppliers and to rigorously implement new programs has been essential in its recent efforts to create a worldwide "Sustainable Product Index." The program will have three phases. First, suppliers will assess their products in terms of energy, resources, efficiency and social costs, based on a standardized form generated by Walmart. Next, through a "consortium of universities that will collaborate with suppliers, retailers, NGOs and government," Walmart will develop a global database with lifecycle information for all its merchandise. Third, the database will be used to generate a ratings system that will allow customers to access information about the sources and production of any item. Because Walmart is the

largest customer for many of its suppliers, it can use this power to ensure cooperation with such an initiative. “It is not our goal to create or own this index,” asserts Mike Duke, the current CEO. “We want to spur the development of a common database that will allow the consortium to collect and analyze the knowledge of the global supply chain. We think this shared database will generate opportunities to be more innovative and to improve the sustainability of products and processes.”¹³ Given the intent to create the index in the public eye and with the cooperation of NGOs and universities, Walmart seems here to be positioning itself not simply as a discount retailer but also as a kind of de facto regulatory agency.



Walmart trucks delivering relief supplies after Hurricane Katrina.

[Credit: Walmart Annual Report, 2006]

Another of Walmart’s recent extra-commercial activities underscores its capacity and growing ambition. In the aftermath of Hurricane Katrina, the retailer mobilized its logistics expertise to facilitate relief efforts in the Gulf Coast region. Even before the storm made landfall, the company had anticipated supply shortages and had trailers loaded and ready in their Brookhaven, Mississippi, distribution center. Right after the storm, Walmart dispatched trucks stocked with supplies to affected areas in Louisiana and Mississippi – often ahead of the National Guard. As one local church official noted, “If the American government would have responded like Walmart has responded, we wouldn’t be in this crisis.”¹⁴ Since then, and with its logistics network as a model, the retailer has built nine “Disaster Distribution Centers,” and stocked them with relief supplies and processing equipment in preparation for future calamities.¹⁵

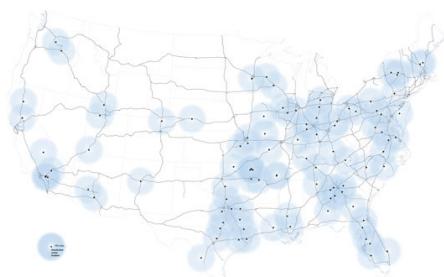
Such efforts to improve product efficiency, supply chain transparency, and disaster response suggest that this large private organization could significantly influence public policy. They also underscore how deeply Walmart has insinuated itself into the American cultural and economic landscape. In 2005, 2007 and 2008, Walmart occupied the top spot on the Fortune 500 list (in 2006 it was a close second to ExxonMobil). Its annual revenues are staggering (\$288 billion, \$316 billion, \$351 billion, \$379 billion, in the last four years); but what is also notable is that Walmart has been jockeying for position on the Fortune list not with rival retailers but rather with petroleum companies, multinational banks and auto makers. And just as its business differs from those of its corporate peers, so do its architectural ambitions. Walmart’s reliance on logistics has generated a far-reaching and ever-growing enterprise made up of information systems,

land holdings, buildings and infrastructure; yet Walmart's overall physical presence is less strongly discernible – more diffuse – than were the traditional spatial manifestations of major corporations of the past. In the last half of the 20th century, many of the world's most successful companies hired established architects to design pedigreed works – signature buildings – symbolizing the company's culture and success.

¹⁶ In contrast, the architecture of Walmart, if you can call it that, is at once under-designed and ubiquitous. The company's approach to its built products also represents the apotheosis of an increasingly common development model that remains somewhat under-scrutinized.¹⁷

Territory

Walmart's generic buildings and the environments that result have saturated the United States. Nationwide its network comprises five retail categories: 861 discount stores sell variety goods; 2,664 supercenters sell variety goods plus food; 153 neighborhood markets sell only food; four "marketside" stores are being tested (as a version of the convenience store); and 602 Sam's Clubs operate as members' only warehouses, similar to Costco. The total area of these almost 4,300 retail locations is over 675 million square feet, or about 15,500 acres. (Manhattan, by comparison, encompasses 14,694 acres.) Each individual store is modeled on one of a collection of company prototypes, which are then modified according to commercial considerations such as size, layout and program, and to local conditions such as building codes, zoning ordinances, traffic access, etc. But no matter the retail type, the Walmart environment includes not only the commercial enclosures themselves but also the environs they produce: the parking lots, street lights, traffic lanes, median strips, freeway exits, drainage systems, retaining walls, grass berms, gutters, sidewalks, curbs, fire lanes, etc., that characterize the suburban commercial landscape – and in fact have come to dominate it.



Map of U.S. Interstate Highways and
Walmart Distribution Centers. [Click](#)
[Image to Enlarge](#).

At each location, if all works as planned, inventory cycles through several times a day. In this sense the stores are designed to function more as valves regulating flow than as

reservoirs capturing it: they are containers, to be sure, but they are also conduits. And because the distribution system is so tightly coordinated, the store designs can minimize areas for stock and maximize floor space for retail. And not only are the products themselves always on the move: Walmart's system itself is also always transforming — at different scales and speeds — as new stores are built and (sometimes) existing ones vacated.¹⁸ For Walmart, real estate too is a *logistical* practice. The stores and distribution centers are strategically located to optimize the flow of goods; they form a dynamic and expanding network whose locations are calculated in miles and minutes. Walmart executives thus abstract territory much as barcodes abstract merchandise. In other words, the nation's largest company sees its territory essentially as a data field over which "all those numbers" are monitored, tracked, allocated and redirected in pursuit of market coverage.

Walmart's distribution centers, which are as important as their stores, are hybrid structures — part architecture, part infrastructure — whose locations are determined by corporate growth strategies. By the end of 2008, Walmart's domestic distribution network consisted of more than 100,000 suppliers, 147 distribution centers, two data centers, the U.S. transportation infrastructure (mostly the publicly funded highway system), 7,200 tractors, 53,000 trailers, 7,950 drivers, and more than 85,000 employees.

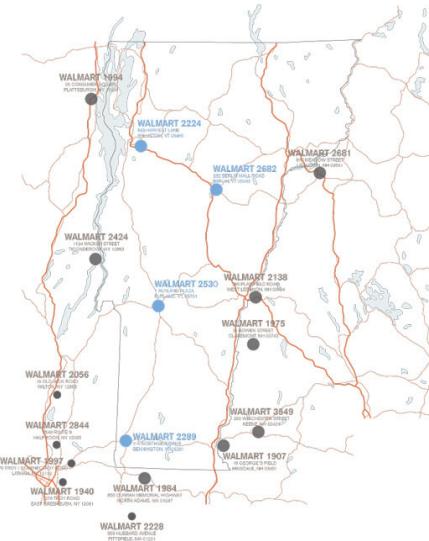
¹⁹ The largest centers comprise the core of this system — DC 6094 outside Bentonville, for example, covers more than 1.2 million square feet and turns over 90 percent of its contents every 24 hours. They are also highly automated, with goods in constant motion, guided by electronically controlled actuators and conveyors, and monitored by employees wearing earpieces and scanners connected to central computers in Bentonville. The DCs are often the first structures built in new market areas — colonizers of sorts whose location is timed to correspond with the construction of new retail centers. And just as one part of the network reaches capacity, a new distribution center will open to relieve the pressure and to prepare the area for yet more stores.



Interior of an automated distribution center. [Credit: "Systems Technologies Overview," Brochure, Dematic Corporation, 2007]

Walmart's strategic encumbering of territory in pursuit of market dominance — its application of “time and space factors to war,” as it were — is evident in how it came to build in Vermont. The last state to permit Walmart to do business, Vermont did so only after waging a vigorous battle in the 1990s to keep the retailer out. Vermonters had feared that Walmarts would increase traffic, threaten local businesses and contribute to sprawl. In the town of Williston, for example, the Williston Citizens for Responsible Growth contested Walmart’s proposal on the grounds that it had considered neither its local nor regional impact. In alliance with the state environmental board, the local group also challenged Walmart on qualitative issues such as proposed signage and lighting.

Through this kind of persistent marshalling of municipal bureaucracies and citizen values, Vermont managed to delay Walmart for several years. At one point Howard Dean, then governor, was concerned enough to fly to Bentonville to negotiate in person with Walmart’s CEO. The National Trust for Historic Preservation listed the entire state on its annual “Most Endangered Places in America” list — twice. The story of small towns resisting the country’s largest corporation generated its share of headlines, many with military imagery: “Battle of Vermont: Walmart Plots its Assault on Last Unconquered State”; “Walmart Lost Battles, Won the War: Vermont Store Opens”; “Waging War on Walmart”; etc.²⁰



Walmart locations within 20 miles of
the state border of Vermont. [Click
Image to Enlarge.](#)

These martial allusions were not just journalistic histrionics; they reflected the company's strategic response. For while Walmart made serious efforts to accommodate the state's demands and dutifully submitted to long approval processes, it simultaneously proceeded to systematically surround Vermont by constructing stores in adjacent states. By the time Walmart received official approval to build on Vermont soil, the real "battle" had been won — it had already opened stores in border towns in New Hampshire, New York and Massachusetts, effectively covering the targeted market. A map of the region shows the precision with which Walmart selected locations in neighboring states — to seal the border, so to speak. Some cases are especially flagrant: Supercenter 1907 is located in New Hampshire right on the state line — it is even connected to Vermont directly by bridge. The case of Vermont underscores the criteria Walmart deploys to draw its expansion maps. Real estate catchment areas, sales tax rates, energy costs, distribution radii: these are some primary factors that determine store locations — and which can turn state boundaries into mere technicalities.

Now that the company has locations in all 50 states and has inundated rural and suburban America, Walmart has set itself the challenge of moving into urban markets. But as the retailer has been learning, cities pose new challenges: they are often more complicated politically; land, labor and construction costs are higher; the logistics of accessing sites and moving merchandise are tricky. Designed for the greenfield parcels of suburbia, Walmart's logistical operations quickly break down when confronted with the scale and density of urban spaces.

Residents also tend to be better organized and more resistant. In 2002, for instance, in Inglewood, California, Walmart's plan to construct a supercenter was consistently thwarted. With the strong support of labor unions, which opposed Walmart's hiring practices, the Inglewood City Council adopted an emergency ordinance that would

prevent construction of retail spaces over 155,000 square feet. Walmart quickly gathered enough signatures to force a public vote, if necessary, and threatened to sue the city. The city repealed the ordinance but continued to resist the company's advances. In 2004 the retailer successfully lobbied to put a measure on the ballot to allow them to proceed without public hearings or environmental impact reports. The measure's resounding defeat — by a 20 percent margin — was a major victory for the diverse, pro-labor community. Yet ultimately Walmart appeared unfazed; as spokesperson Bob McAdam asserted: "If we win, that's all it means. If we lose, it will have no implications beyond that. We're still going to meet our goal of building the stores we predicted we'd build."²¹ Walmart gave up on Inglewood, but McAdam's statement is a reminder that the numbers-driven, logistics-focused company sees territory in terms not of place but of performance; the individual site — singular and unique to locals — is to Walmart more or less interchangeable.



Top: Walmart Supercenter 1907 in Hinsdale, New Hampshire. Bottom: Entrance to Walmart's Logistics Headquarters, Bentonville, Arkansas.

Still, Walmart continues to struggle to enter urbanized places, especially in the Northeast and on the West Coast. Within the limits of New York, Los Angeles and Chicago — the country's three largest cities — residents will find only two Walmarts — something the retailer is trying to change. Walmart's data-driven approach helps account for the friction generated when Walmart runs up against incompatible systems like cities, and to date the company has tended to resort to superficial alterations — cosmetic changes in the appearance of stores — to placate resistant communities. Yet there is potential to develop more than just better boxes. Indeed, my goal in examining Walmart is to spur the

kind of inquiry that will not merely produce different-looking stores but rather identify new possibilities in the company's logistics-heavy approach. Given Walmart's size, reach, impact, and reliance on actual architecture, what might some of these possibilities be? Consider some scenarios.

Same but different

Walmart is likely to keep trying to build in cities (it has redoubled efforts to open a second Chicago store). And various stakeholders are likely to continue debating and disputing the proposed stores — especially the physical designs of the building enclosures. The result of this sort of appearance-focused debate, however, will be urban Walmarts that are fundamentally similar to their suburban counterparts, with the retailer making minor concessions to differences in scale, orientation, programming and exterior design, but otherwise proceeding according to well-developed plans. And in fact, because the buildings' looks are so frequently a target of community critique, the company has become adept at cosmetically modifying its prototypes, and can do so with minimal disruption.²² The unintended result is a tacit endorsement of Walmart's larger operations. But if communities and critics focused less on what the stores *look* like and more on what they *do* — less on form and more on performance — it's possible that genuinely new formats might emerge, formats that would optimize urban settings in their handling of public space, infrastructure access, program mix, and so on.



Loading Dock, Wal-Mart Supercenter
2056, Saratoga Springs, New York.

Radicalize and experiment

Walmart could become a vital site for architectural experimentation, both within the company's own operations and beyond. Over the years Walmart has produced a series of experimental stores — most recently in McKinney, Texas, and Aurora, Colorado, where new supercenters have become test sites for energy-efficient technologies. But while localized efforts to produce more sustainable buildings, products and fleets are admirable, these efforts do not really influence the overall business model. Walmart

remains heavily reliant on personal automobile use — the assumption is that customers will be motorists. Or at least, this is the assumption in the United States. In China, Walmart has taken over and adapted existing stores whose configurations differ dramatically from their American counterparts. Often multilevel, well served by public transit, and integrated into their urban surroundings, Walmart's Chinese stores could become models for its U.S. city stores — maybe even lively testing grounds for new architectural ideas.

In fact, in American schools of architecture, big box stores in general and Walmart in particular have been the focus of recent design studios. Roger Sherman's *Duck and Cover* project, for instance, uses the logic and iconography of big-box retail to develop new forms of suburban public space. Similarly, the University of Arkansas Community Design Center's *Walmart Is an Urbanism All Its Own* explores the big box site as a series of nested "eco-tones" that in turn allow designers to systematically consider the potential at each layer.²³ Further collaborations between design studios and Walmart could yield innovative proposals grounded in the company's logistical imperatives. Such investigations might also produce incentives for Walmart to make more than just cosmetic modifications in its bids to gain purchase in urban areas.²⁴



A sign that's become familiar.

Transfer of techniques

Beyond different types of Walmarts, there are still more frontiers to explore. That Walmart understands its stores less as designed structures than as parts of vast infrastructural systems suggests an expanded field of architectural potential. What might result from a logistics-driven approach to design in other contexts? What would happen if we approached architectural design as Walmart does? How might its operational techniques influence the design and deployment of infrastructure? Walmart's repeatable but nimble prototypes suggest an approach to architecture that favors the generic and performance-based over the singular and formal: what-it-does rather than how-it-looks. The retailer's hybrid approach to constructed environments — its deployment of buildings as fungible components of distribution networks — dissolves certain well-worn distinctions and results in buildings and landscapes that operate in both architectural and infrastructural registers. The company's pragmatic approach to territory — its use of

buildings as political tools to circumvent narrow legislative constraints — suggests that architecture can acquire a new potency when coordinated skillfully, and in sufficient quantity. In other words, serious research into Walmart's architecture could yield more than better boxes: all those numbers could add up to real change.

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EDITORS' NOTE

"All Those Numbers: Logistics, Territory, and Walmart" has been peer-reviewed.

NOTES

1. Charles Fishman, *The Wal-Mart Effect: How the World's Most Powerful Company Really Works — and How It's Transforming the American Economy* (New York: Penguin, 2006), 221. ↩
2. *The Charlie Rose Show*, PBS, August 1, 2006. Lee Scott was CEO from January 2000 to January 2009. ↩
3. Matthew Zook and Mark Graham, "Wal-Mart Nation: Mapping the Reach of a Retail Colossus," in *Wal-Mart World: The World's Biggest Corporation in the Global Economy*, ed. Stanley Brunn (London: Routledge, 2006), 20. ↩
4. Jonathan Birchall, "Walmart eyes urban expansion in US," *Financial Times*, November 1, 2009. According to the article, "Walmart has stepped up efforts to mobilize local political support for new store openings in US cities and urban areas," but has struggled for years to gain purchase in major metropolitan areas. For an account of Walmart's attempt to open a store in Los Angeles, see Abigail Goldman and Nancy Cleland, "An Empire Built on Bargains Remakes the Working World," *Los Angeles Times*, November 23, 2003. ↩
5. For a recent account of Walmart's practices from an economic and sociological perspective, see Nelson Lichtenstein's *The Retail Revolution: How Wal-Mart Created a Brave New World of Business* (New York: Metropolitan Books, 2009). Bethany Moreton's *To Serve God and Wal-Mart: The Making of Christian Free Enterprise* (Cambridge: Harvard University Press, 2009) examines the emergence of the corporation within its specific regional culture. *In Sam We Trust: The Untold Story of Sam Walton and How Wal-Mart is Devouring America* by Bob Ortega (New York: Times Books, 1998) is the result of years of investigative journalism and offers an indicting account of Walmart's impact on the American economy and society. For a more direct business history, see *Walmart: A History of Sam Walton's Retail Phenomenon*, by Sandra

- S. Vancae and Roy V. Scott (New York: Twane Publishers, 1994). Two scholarly publications include: *Wal-Mart World: The World's Biggest Corporation in the Global Economy*, cited in footnote 3, and *Wal-Mart: The Face of Twenty-First Century Capitalism*, edited by Nelson Lichtenstein (New York: The New Press, 2006), which contains essays from various fields. ↩
6. James Houston, *The Sinews of War: Army Logistics 1775-1953* (Washington D.C.: Office of the Chief of Military History, United States Army, 1960), viii. Huston refers to a statement attributed to Otto von Bismarck. For the military origins of logistics, see Antoine-Henri Jomini's *Précis de l'art de la guerre*, originally published in 1838 and often credited as the source of the term. See also Antoine-Henri Jomini, *The Art of War*, trans. Capt. G.H. Mendell and Lieut. W.P. Craighill (El Paso: El Paso Norte Press, 2005). This was based upon an 1862 translation of the original. ↩
7. Jay Fitzsimmons, Walmart's former Senior Vice President and Treasurer, has asserted: "The misconception is that we're in the retail business, [but really] we're in the distribution business." Andrea Lillo, "Wal-Mart Gains Strength from Distribution Chain," *Home Textiles Today*, March 24, 2003. ↩
8. This is a common approach in retail, but Walmart's operational scale sets it apart. ↩
9. Sam Walton with John Huey, *Sam Walton: Made in America: My Story* (New York: Bantam 1992), 272. Emphasis added. ↩
10. Lee Scott, "21st Century Leadership," October 24, 2005, accessed Nov. 06, 2009. ↩
11. Don Moseley, interview with author, Bentonville, Arkansas, July 31, 2006. ↩
12. Michael Grunwald, "Warming to the Inconvenient Facts," *Washington Post*, July 23, 2006. See also, Jared Diamond, "Will Big Business Save the Earth?," *New York Times*, December 5, 2009.
- ↩
13. Walmart press release, "Walmart Announces Sustainable Product Index," July 16, 2009, accessed Nov. 06, 2009. ↩
14. Michael Barbaro and Justin Gillis, "Walmart at Forefront of Hurricane Relief," *Washington Post*, Sept. 6, 2005, accessed Nov. 06, 2009. ↩
15. Walmart fact sheet, "Disaster Relief at Walmart," accessed Nov. 06, 2009. ↩
16. In *The Coming of Post-Industrial Society* (New York: Basic Books, 1976), Daniel Bell writes: "One can say, without being overly facile, that US Steel is the paradigmatic corporation of the first third of the twentieth century, General Motors of the second third of the century, and IBM of the final third. The contrasting attitudes of the corporations toward research and development are a measure of these changes." High-profile architectural commissions attended each of these corporations' growth. For example, Saarinen's GM Technical Center in Warren, Michigan, and his Thomas J. Watson Research Laboratory in Yorktown Heights, New York, gave form to the respective aspirations of General Motors and IBM. See Reinhold Martin, *The Organizational Complex: Architecture, Media, and Corporate Space* (Cambridge: MIT Press, 2003). Walmart might well take its place in this line as the paradigmatic corporation of the early 21st century, at once for its size, reach, cultural impact and technological innovations. This applies as well to its architectural contributions. ↩
17. Urban design as related to corporate organizations and logistics has been the focus of some books. See Charles Waldheim and Alan Berger, "Logistics Landscape," *Landscape Journal*

- (27:2-08, 219-246); Clare Lyster, "Landscapes of Exchange: Re-articulating Site," *The Landscape Urbanism Reader* (New York: Princeton Architectural Press, 2006), 219-238; Keller Easterling, *Organization Space: Landscapes, Highways, and Houses in America* (Cambridge: MIT Press, 1999); and Alfred Chandler, Jr., *The Visible Hand: The Managerial Revolution in American Business* (Cambridge: Belknap Press of Harvard University Press, 1977). ↩
18. For more on aspects of Walmart's real estate approach, see Ellen Dunham-Jones, "Temporary Contracts: The Economy of the Post-Industrial Landscape," *Harvard Design Magazine*, Fall 1997. ↩
19. This network extends beyond national borders, of course, but here I have confined the discussion to the United States. ↩
20. These articles include Frederic M. Biddle, "Battle of Vermont: Wal-Mart Plots Its Assault on Last Unconquered State," in *The Boston Globe*, July 18, 1993; Malcolm Gladwell, "Wal-Mart Encounters a Wall of Resistant in Vermont," in *The Washington Post*, July 27, 1994; John Greenwald, "Up Against the Wal-Mart," in *Time*, August 22, 1994; Ross Sneyd, "Wal-Mart Lost Battles, Won the War: Vermont Store Opens," in *St. Paul Pioneer Press*, September 20, 1995; Pam Belluck, "Preservationists Call Vermont Endangered, by Wal-Mart," in *The New York Times*, May 25, 2004; George F. Will, "Waging War on Wal-Mart," in *Newsweek*, July 5, 2004; and Alex Beam, "Wal-Mart and the Battle of Vermont" in *The Boston Globe*, September 12, 2007. ↩
21. John M. Broder, "California Voters Reject Wal-Mart Initiative," *New York Times*, April 7, 2004. ↩
22. According to Walmart architect Bill Correll, one of the first things local residents ask about a proposed Walmart is, "Well, how's it going to look?" (Interview with author, July 31, 2006). In the town of Hercules, California, for example, Walmart went through a lengthy approvals process and was required to make significant changes, including the addition of a grocery store and the modification of its exterior to "fit" into the New Urbanist development. ↩
23. So-called big-box architecture and urbanism have also the subject of design studios in other architecture schools including Princeton, MIT, Columbia, USC, Syracuse, Arizona State and ETH Zürich, to name a few. Alexander d'Hooghe at MIT has especially focused on the architectural potential of large shed buildings, as exemplified by Walmart's supercenters. ↩
24. Walmart has shown an openness to experimentation. This past winter it opened a few "drive-thru" stores for the holiday shopping season. See Miguel Bustillo and Geoffrey Fowler, "Walmart Uses Its Stores to Get an Edge Online," *Wall Street Journal*, December 15, 2009. Former CEO Lee Scott even asserted in his address about the 2005 sustainability initiative: "We became Wal-Mart by being different, radically different." See Lee Scott, "21st Century Leadership," October 24, 2005, accessed November 6, 2009. ↩

❑ CITE

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