

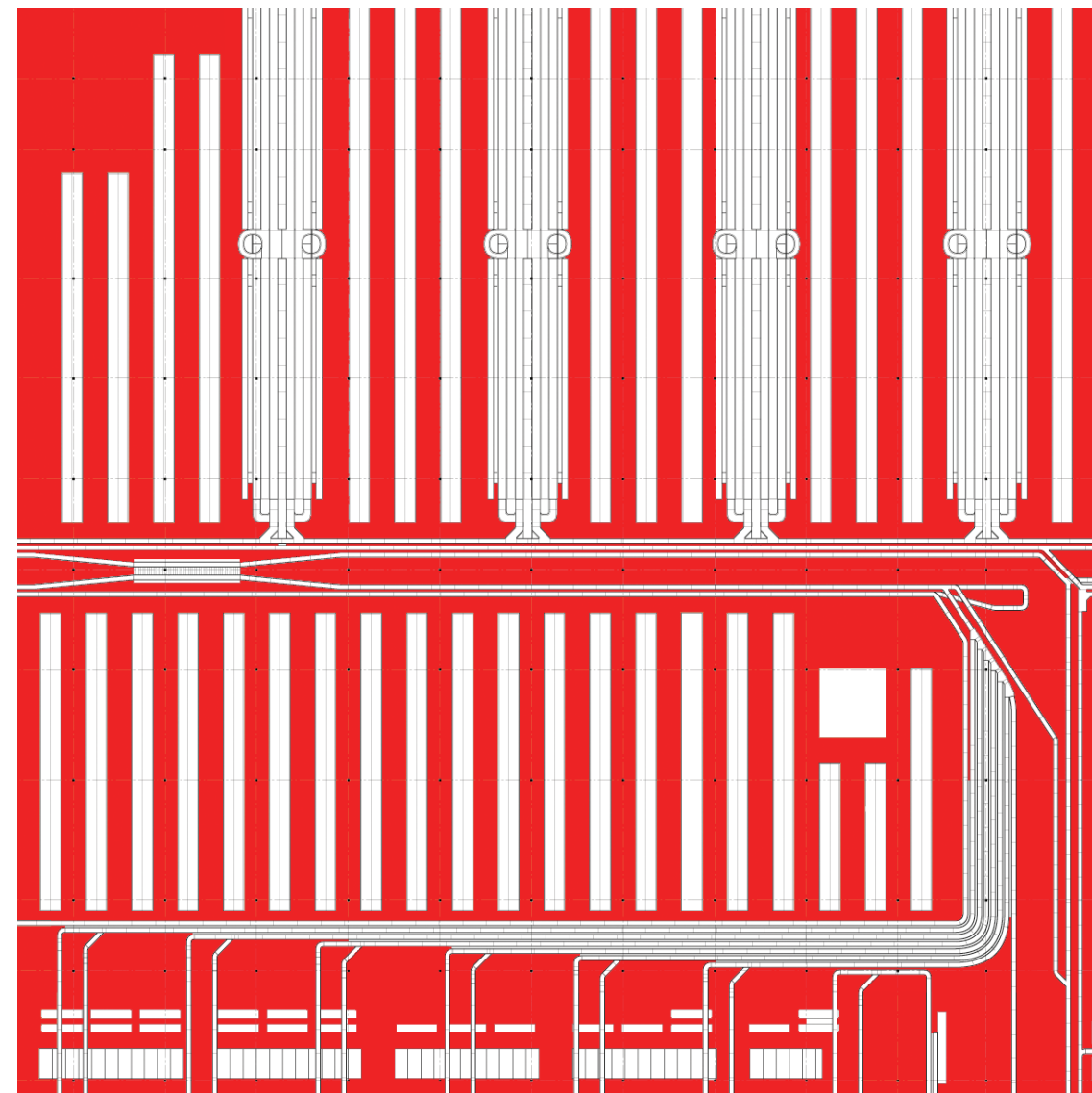
EMPIRE OF EFFICIENCY  
THE URBAN IMPACT OF RETAIL LOGISTICS  
USING WALMART STORES, INC. AS A CASE STUDY

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EMPIRE OF EFFICIENCY



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presented by  
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# ABSTRACT

## GERMAN

Die vorliegende Arbeit beschäftigt sich mit den architektonischen und städtebaulichen Auswirkungen der Geschäftstätigkeit von Walmart, einer global agierenden Discountmarktkette mit Hauptsitz in Bentonville / Arkansas. Ihr liegt die Prämisse zu Grunde, dass die Beschäftigung mit diesem Fallbeispiel allgemeine Erkenntnisse über Mechanismen bringen kann, die derzeit Einfluss auf die Stadtentwicklung haben. Der Fokus der Betrachtung liegt auf Walmarts Tätigkeit in Nordamerika. Doch insofern der Discountriese permanent international expandiert, und weltweit andere Firmen vergleichbare Ziele verfolgen, könnten die Ergebnisse auch in anderen Zusammenhängen relevant sein. Ziel ist es, zu verstehen wie Walmarts Expertise im Bereich der Logistik sich auf ihre Bauten auswirkt: Wie findet die Struktur ihrer Logistik eine Entsprechung in Architektur? Wie werden Standorte ausgewählt und wie die Bauten bewirtschaftet? Diese Mechanismen zu begreifen bietet die Chance, am Beispiel einer der weltweit grössten Firmen ein grundlegendes Wissen darüber zu erlangen, welche Einflüsse ihre Geschäftstätigkeit auf die gebaute Umwelt haben. Die Studie zeigt auch Ansätze zur Stadtentwicklung auf, die von Walmart selber – direkt oder indirekt – verfolgt werden. Diese basieren auf dem Glauben, dass die zeitgenössische Stadt und Siedlungen neu erdacht werden könnten. Doch sind die meisten der Akteure derzeit mehr an Gewinnoptimierung, als an sozialen oder ethischen Fragen interessiert. Die von Walmart initiierten (Stadt-) Landschaften reflektieren diese Haltung. Obwohl zu Walmart bereits viele Forschungsarbeiten vorliegen, soll die Möglichkeiten genutzt werden ein noch umfassenderes Verständnis über dessen Einfluss zu gewinnen. Dabei darf dies weder als Versuch einer Rechtfertigung für Walmarts Vorgehensweisen missverstanden werden, noch sollen dessen wirtschaftliche Erfolge gefeiert werden. Es geht auch nicht darum die Geschichte der Discountmärkte nachzuzeichnen, oder eine rein technische Beschreibung von Walmarts Strukturen zu verfassen. Vielmehr soll die Arbeit helfen, Walmarts logistische Strukturen und deren Effekte auf verschiedensten Ebenen zu verstehen. Die Auseinandersetzung mit Walmarts territorialer und architektonischer Praxis fügt sich als Sammlung von Momentaufnahmen zu einem Gesamtbild, und damit zum Portraits eines der wichtigsten zeitgenössischen Akteure der Stadtentwicklung.

# ABSTRACT

## ENGLISH

This project concerns the architectural and urban manifestations of Walmart Stores, Inc., a discount retailer based in Bentonville, Arkansas. It focuses on these subjects based on a conviction that within them there is insight to be gained regarding the forces and mechanisms at work shaping contemporary metropolitan conditions. The focus here is on Walmart's operations in North America but as the company continues to expand—and as it shares common approaches with commercial enterprises worldwide—the findings are increasingly relevant to a number of different contexts. The goal is to understand how Walmart's logistics expertise informs its organization in general, and specifically how that influences the way it develops, deploys, and operates its architecture. One of the reasons to do this is to contribute to a fundamental body of knowledge related to the workings of one of the world's largest corporations that, through its mere existence and sheer size, is profoundly affecting the built environment. The study is also concerned with opportunities to engage the issues raised by Walmart, either directly or indirectly. Such a motivation stems from a belief that there is the capacity to substantially re-imagine the nature of contemporary cities and settlements. However, many of the actors involved in the production of territory are motivated by profits more than civic or ethical duty and the landscape they produce reflects these values. Though Walmart has been the subject of much research, given the retailer's size and reach, there remain opportunities to contribute to a better understanding of its impact. However, this project is not an apology for Walmart nor does it celebrate its business practices. This project is also not a history of discount retail nor is it a technical description of Walmart's workings. Rather, it takes Walmart's logistics operations and examines their effects at a number of different levels. In this regard, the account of Walmart's territorial and architectural practices will remain a collection of moments that, through their aggregation, form a portrait of a major actor currently at work shaping cities.



# 01

## INTRODUCTION

*General claims*

*Methods*

*Goals*

*Underlying assumptions*

*Sources*

*Walmart literature review*

*Walmart overview*

*Logistics overview*

*Walmart beyond retail*

*Walmart and other large corporations*

*Walmart and architecture*

*Chapter structure*

This project argues that Walmart’s desire for efficiency and total coordination causes it to produce a range of buildings, systems, and spaces that reflect these requirements while often superseding other planning values. The retailer increasingly renders qualities into quantities by conceptualizing its merchandise, employees, buildings, and land holdings as data to be optimized and reallocated as necessary. While this is a common trait of many management operations, Walmart’s scale and its use of buildings make it particularly relevant to discussions of architecture and urbanism. Walmart’s repeatable but nimble prototypes present a kind of generic architecture concerned more with performance than with form. Such an emphasis, combined with the organization’s transmission system, produces hybrid buildings that operate in both architectural and infrastructural registers. Moreover, Walmart’s buildings acquire political functions as they are used to override constraining legislative conditions. In order to articulate and analyze these issues, Walmart’s operations are examined at a range of overlapping scales—from body to building to city to network—and in terms of each scale’s attendant technological aspects, including the UPC symbol, material handling systems, construction details, communications satellites, and real estate software. All these elements can be assembled into a “techno-spatial” apparatus by which we can gain a more effective understanding of the company’s workings and, in turn, what it suggests about architecture and urbanism more generally, especially in terms of shifting relationships to information, technology, and infrastructure. While it is perhaps an overstatement to say, “As goes Walmart, so goes the world,” it is fair to say that the retailer is a significant indicator of certain contemporary trends related to consumption patterns, public space, architectural understanding, and urbanization.

### METHODS

This research adopts an opportunistic approach to Walmart and probes specific moments within the organization. In doing so, the aim is not to provide a comprehensive portrait of the corporation but rather to illuminate the mechanisms that support its operations, particularly as they relate to its expansion efforts.<sup>1</sup> These probes will be arrayed in terms of scale, based on Walmart’s own condition of multi-scalar functionality.<sup>2</sup> While no single scale will be completely disentangled from the others, attempting to isolate them will allow for a more complete understanding of the system as a whole.<sup>3</sup>

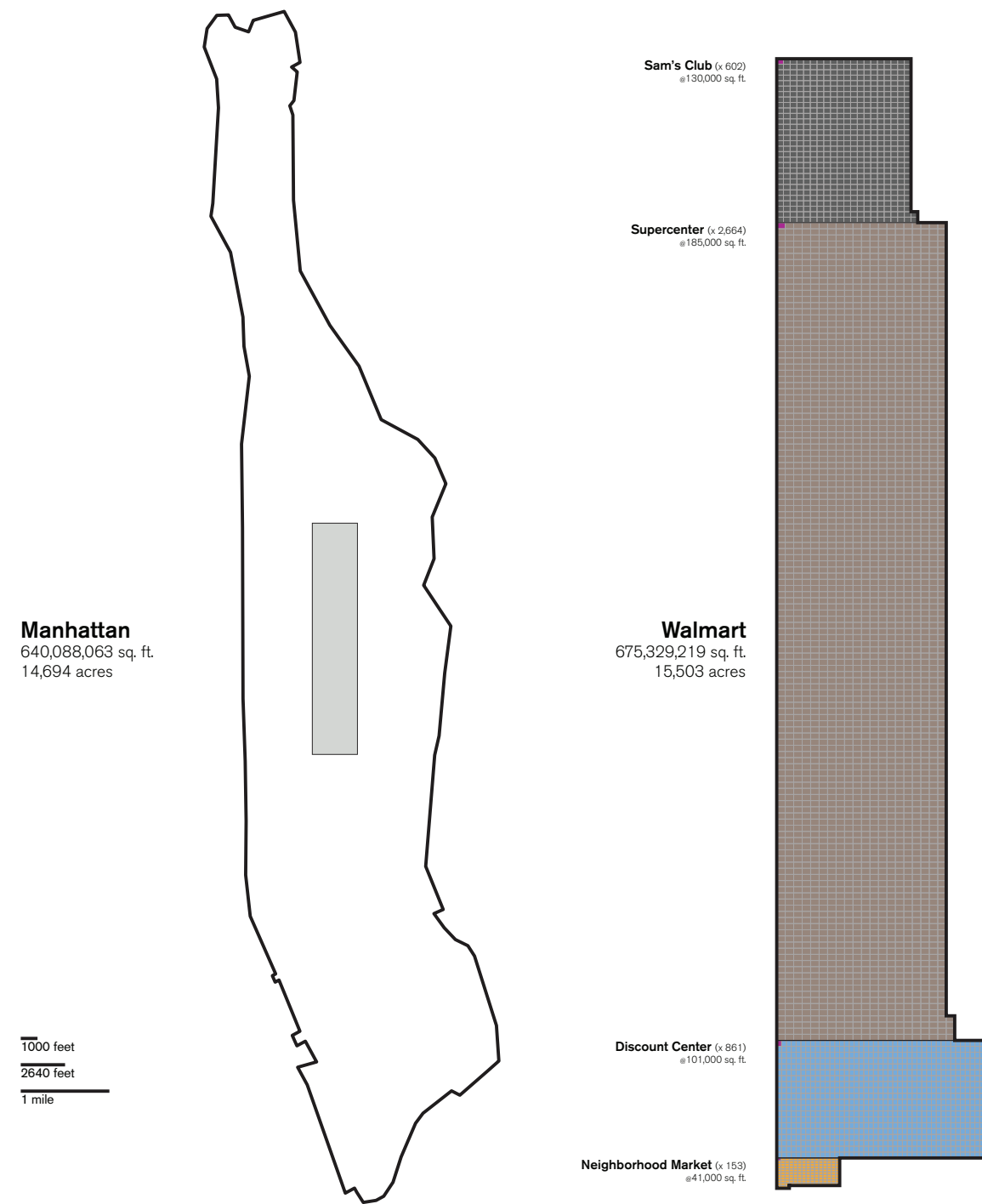


FIGURE 01: The interior area of domestic Walmart stores at the time of writing compared to the island of Manhattan. Inclusion of parking areas would more than double the territory.

Specifically, Walmart's operations at body, building, and territorial scales will be used as reference points to collect a range of material most relevant to the scale in question. This effort to address Walmart in these terms takes some cues from David Harvey's assertion that, "How we understand the production of scale under capitalism is a crucial question... One thing is clear: the dominant geographical scale at which accumulation occurs has been changing over time. A hierarchy of scales (often depicted as local, regional, national and global, though these are arbitrary designations in themselves) exists through which the circulation of capital works at the same time as it produces its own distinctive scales of organization."<sup>4</sup> In this sense, an examination of Walmart in a scalar register does so with awareness that such an approach can unwittingly reinforce distinctions that may be arbitrary or irrelevant. However, the evidence suggests otherwise and, in spite of approaching the topic through discrete scales, their limits tend to increasingly dissolve. Indeed, Walmart's buildings are so connected to the retailer's large networks of transmission that they cannot be treated as separate entities. Furthermore, the company's territorial operations suggest ways of seeing that abandon fixed municipal boundaries for elastic regional ones, and the relationship of distribution center employees to the technology they wield serves to increasingly entangle them in the retailer's extensive information network. Thus, while separating the contents by scale serves as an initial mode of organizing the material, such divisions are not fixed and blur as a result of their analysis.<sup>5</sup> At each level of organization there are technologies that are more active than others. These range from specific technical artifacts to more general "organizational technologies."<sup>6</sup> Though their presence and effects are more legible in certain registers, they nonetheless appear throughout the network of Walmart's operations: scanning technology; the internal technologies of the buildings themselves; the infrastructural system of store locations; the technologies related to transportation formats, and Walmart's communication network.<sup>7</sup> The notion and use of scale is subject to debate, particularly in the field of Human Geography as described in Roderick Neumann's 2009 article, "Political Ecology: Theorizing Scale." While contributing directly to this discussion is not the aim here, it should be noted that the use of scale to organize the aspects of the research is not meant to imply a hierarchical division, in which one system is nested in the other. Examining the putative "architectural" scale first is an effort to

avoid this tendency to place telescoping scales within each other. Rather, to use Neumann's phrase, scale here is understood as "socially constructed, relational, contingent, and contested."<sup>8</sup> By emphasizing the interrelated scalar organization of the subjects in question, the goal is to understand how these various systems interact, sometimes bypassing one scale for another.

The structure of this research and the choice of material are deliberate and in turn influence the findings. Equally, there are numerous other approaches that could have been adopted. As logistics is the organizing theme of the research, and as logistics is at the core of Walmart's operation, there is not one obvious realm in which it is most apparent. In that sense, by claiming for this project a multi-scalar register in which we can witness the impact of logistics in a range of contexts outside of what might be considered the field's "native" soil, the claim is that logistics amounts to more than questions of supply chain management and efficiency optimization. By setting out to look for evidence of logistics in, for example, Walmart's real estate decision making process, or in the design of their building facades, or in the hardware worn by workers in distribution centers, a more complex version of logistics can be articulated. While discussions of logistics often remain technical in nature, they nonetheless affect every aspect of Walmart's operations. Thus by privileging this issue in particular, the approach is different than other scholars of retailing and urbanism who have emphasized social, economic or political issues at the expense of the physical and technological aspects of the company. Similarly, by emphasizing the socio-technical nature of Walmart's network, the goal is to maintain an overview of the effects of the corporation, even while addressing certain moments in more detail. Walmart is one of the largest companies in the world, yet it remains highly centralized. It also remains physically rooted in its original region. Similarly, the focus here is not on shopping, per se. This has been treated elsewhere and informs this study while remaining in the background.<sup>9</sup> Additionally, certain aspects of the company are generalized in favor of a larger view of its various mechanisms, especially in terms of logistics. For example, rather than the specific product mixture that Walmart tailors for each store, the more significant area of emphasis is on the process by which the company develops these inventory assessments. The research refrains from directly addressing questions of labor or of the politics

of Walmart's pricing and sourcing policies. These are serious issues and while the intent is not to overlook them, they have been treated extensively elsewhere. By bracketing them, Walmart's operations can be seen from new angles, especially as they relate to the company's logistical, technological, and spatial aspects.

### GOALS

By focusing on the logistical operations of Walmart and by understanding the company as a large socio-technical system organized through a range of scales and technology, the objective is to better understand how the world's largest retailer operates but also to illuminate previous aspects that might have been overlooked; to develop ways of understanding the effects of logistics from an architectural, urban, and spatial point of view; and to highlight possible linkages to design by prying open new points of access within some of the contemporary mechanisms that are producing and shaping territory. Indeed, it is astonishing that Walmart has arrived at the top of the Fortune 500 list as the highest grossing company in the United States and has remained there for several years. How did this happen and what does it mean for cities? This project is especially curious about these seemingly overlooked actors like Walmart who are nonetheless quietly and steadily transforming the landscape.<sup>10</sup> It is therefore also assumed that Walmart's operations are fundamentally spatial (Figure 01). Mass retailing, the kind in which Walmart specializes, has been referred to by Sanford Kwinter and Daniela Fabricius as being among "the most powerful forces shaping the American landscape today"<sup>11</sup> In their essay "Generica" for the American City section of *Mutations*, the authors go on to describe the landscape in which Walmart is one of the primary builders.<sup>12</sup> Without declaring it, they are describing the contemporary landscape of logistics. The work here attempts to contribute to these early discussions by burrowing into Walmart's large socio-technical system and reporting back on its findings.

### UNDERLYING ASSUMPTIONS

The field of Large Technical Systems Studies has produced a substantial body of work related to the questions at hand, especially those of scale and infrastructure. In their introduction to *Shaping Technology / Building Society: Studies in Sociotechnical Change* editors Wiebe Bijker and John Law identify three approaches often applied to Large Technical Systems including systems theory, actor-network-theory, and social-constructivist approaches.<sup>13</sup> Other

relevant approaches include those from social sciences including human geography, urban geography, economic geography, urban sociology, ethnography, etc. However, the methodological effort here is not to simply cobble together different aspects of other research fields but to examine the possibilities of developing a suitable methodology for urban research on contemporary topics that could be assessed on its own terms, neither from the perspective of history and theory fields, nor from contemporary urban research reportage. Rather, a field of "urban scholarship" could emerge that would absorb necessary discipline and rigor to make its findings traceable and applicable but that would remain concerned with the direct engagement of contemporary issues. This report is not claiming to offer an example of this necessarily, but is an effort to build a step toward it.<sup>14</sup> While the research argues for a certain way of understanding Walmart that in turn illuminates larger issues, it is not setting out to prove a hypothesis with extensive data. Instead, it induces principles based on information gathered and synthesized from a range of sources.

This work rests on a number of underlying assumptions related to technology, infrastructure and logistics that in turn inform the ways in which the material is approached and analyzed. As Walmart has largely defined itself through its timely and advantageous deployment of technological innovations, it is helpful to clarify how such terms are being used and what they are used to describe. Technology is understood less as a collection of objects or artifacts but as a factor that has a direct influence on our daily lives.<sup>15</sup> In this sense, Walmart, as a whole, is a kind of technology that also contains and deploys a number of discrete technological artifacts. Such elements within the retailer's operation—through their aggregation—can have significant impact on larger arenas. These "modest things of everyday life," as Siegfried Giedion puts it, "accumulate into forces acting upon whoever moves within the orbit of our civilization...The slow shaping of daily life is of equal importance to the explosions of history; for, in the anonymous life, the particles accumulate into an explosive force."<sup>16</sup> The technologies at work in Walmart "slowly shape life" both at the consumer level but also in less discernible ways. Thus, attempting to examine Walmart at a larger level is an effort to make some of these effects more legible. In this sense, even though the specific machinery of Walmart's operations is investigated, the more abstract "machinic" qualities of the company subsequently produce a certain way

of understanding the world. In the words of Lewis Mumford, "Mechanization and regimentation are not new phenomena in history: what is new is the fact that these functions have been projected and embodied in organized forms which dominate every aspect of our existence."<sup>17</sup> Furthermore, technology need not simply occupy a physical register. As Daniel Bell points out, "Technology... 'is the use of scientific knowledge to specify ways of doing things in a reproducible manner.' In this sense, the organization of a hospital or an international trade system is a social technology, as the automobile or a numerically controlled tool is a machine technology. An intellectual technology is the substitution of algorithms for intuitive judgments."<sup>18</sup> Cornell Capa's 1959 photograph of the 7,000 engineers who worked on developing the Ford Falcon illustrates this point (Figure 02). With the automobile in the foreground, a sea of "orgmen" in the middle ground (all dressed alike), and the Ford headquarters in the background, the image ostensibly documents a single technological artifact while in fact, captures an entire socio-technical system comprised of the thousands of engineers, the buildings in which they work, and the products they develop. Paul Edwards extends this notion to ideas of infrastructure as well: "As historians, sociologists, and anthropologists of technology increasingly recognize, all infrastructures (indeed, all 'technologies') are in fact sociotechnical in nature. Not only hardware but organizations, socially communicated background knowledge, general acceptance and reliance, and near-ubiquitous accessibility are required for a system to be an infrastructure."<sup>19</sup> Seen from this point of view, Walmart, as both institution and organization, operates as a dynamic infrastructural system.

Infrastructure is a fraught concept and one that evades simple definition. For the purposes here it is understood as a socio-technical system like the different concepts of technology described above. Some historical events help to illustrate this more inclusive approach to the category. One occurred on September 03, 1967, at 04:50. At that moment, all the automobile traffic in Sweden stopped for ten minutes, switched directions and resumed traveling at 05:00, only this time in the opposite direction (Figure 04). Drivers were prepared for the change thanks to a sustained media campaign as part of the government's efforts to improve national navigation and trade connectivity.<sup>20</sup> Such an instance serves as a reminder that the infrastructural artifacts we encounter on a daily basis—roadways in this case—offer a range of

possible uses and interpretations. It demonstrates that infrastructure is made up of more than just its physical manifestations but also of a shared understanding of how to use them. Sweden's ability to collectively alter its infrastructural behavior is evidence that such large systems are malleable entities whose use is not prescribed but available for renegotiation and refashioning. Infrastructure, it seems, is what we make of it.

Much earlier, on April 19, 1891 in Kipton, Ohio, there was a fatal collision between the Lake Shore and the Michigan Southern lines. The accident occurred because one of the engineers' watches had stopped for 4 minutes and that lag was enough to place one train in the path of the other. Even though the United States had adopted Standard Time in 1883, coordinating the extensive rail network remained a challenge. As a reaction to the Kipton collision, the US Naval Observatory adopted stringent standards for all railroad timepieces. They commissioned a Cleveland watchmaker to be their Chief Time Inspector and to develop a reliable system of standards and enforcement protocols for railroad chronometers. The name of the watchmaker was Webb C. Ball and his watch design became the industry norm. Thus to be "on The Ball" meant to have both a standard time piece and to be synchronized with the large system of railroad traffic management (Figure 03, 05). Without the Naval Observatory's regulatory oversight and without standardized technology, the railroad system would have become increasingly unsafe, inefficient, and less profitable. Infrastructure, it seems, is only as good as the systems and technology that support it.<sup>21</sup>

We can understand Walmart as such an infrastructural system and doing so helps to avoid fixating on its localized manifestations, i.e. its buildings. After all, one cannot address a municipal water system, for example, by merely studying hose bibs and kitchen sinks. Placing Walmart's stores and real estate operations in an infrastructural register also serves to de-familiarize them to some extent. Rather than keeping them in predictable or conventional categories, such an assignment shifts the value of its collection of artifacts away from its more legible architectural features and instead prompts another set of questions related to performance and network connectivity. Walmart, correspondingly, operates as a pervasive and ubiquitous infrastructural network of transmission. This system is doing much to build the contemporary American landscape but in ways





FIGURE 02: "Seven thousand Ford Motor Company engineers who worked on developing the Ford Falcon," Cornell Capa, 1959.

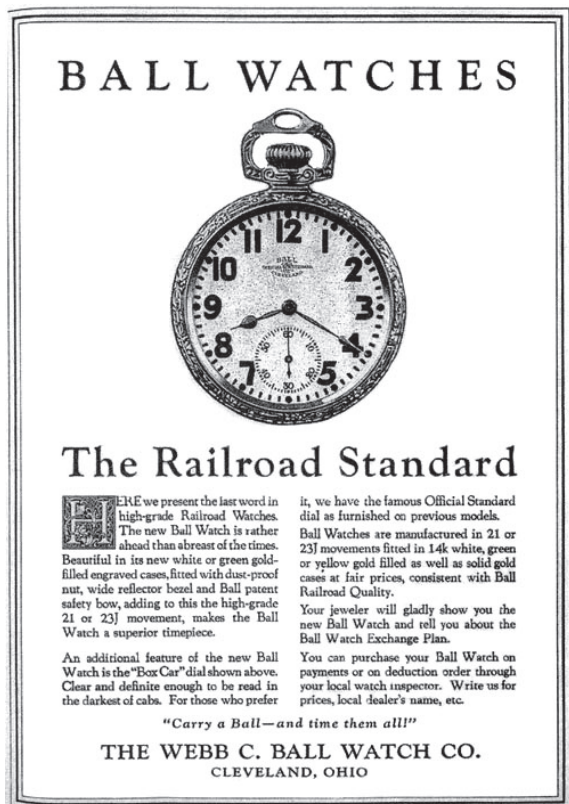


FIGURE 03: Advertisement for The Ball Railroad Chronometer.

different than previous industrial or commercial entities, whether the automobile manufacturers of the mid-twentieth century or the railroad companies of the late 19<sup>th</sup> century.

## SOURCES

The multi-scalar approach to Walmart's spatial and technological practices adopted here raises questions of research sources. As there is no single "archive" that contains the necessary material, it is assembled from a range of sites. It is occasionally drawn from more conventional sources but, because of the nature of the material, much of the relevant information is contained in various corporate documents and ephemera. Including, for example the company's annual reports, architectural construction documents, real-estate maps, urban planning reports, design review guidelines, city council meeting minutes, interviews, technical specifications, press releases, public relations material, trade journals, promotional film footage, news coverage, site photographs, satellite photographs, historical maps and drawings, demographic information, economic statistics, and so on. This will not be an exhaustive archive but will be a vessel for collecting and comparing the diverse range of material evidence surrounding Walmart's practices. Furthermore, the subjects in question are rarely the focus of the document in which they are addressed. For example, discussing Walmart's satellite system requires a kind of peripheral vision when examining available material. For example, a portrait of a Walmart executive might be in front of a new receiving dish, even if the dish itself is not the point of the image. Extracting and combining these kinds of materials produces an initial collection of material related to Walmart's techno-spatial enterprise.

Addressing these sources is also related to assumptions that architectural analysis, through the close reading of visual documents like drawings and physical artifacts like buildings, can bring a disciplinary background to bear in order to develop certain insights.

## WALMART LITERATURE REVIEW

While there is an ample body of literature concerning Walmart, little of it is dedicated to architecture or urban issues. However, numerous sub-categories exist that help to round out a review of Walmart research to date. As the retailer emerged in the early 1990s as a major corporate entity, its former executives wrote a number of books that profess to share the secrets of Walmart's success. The most informative of these, and one that is treated as a primary source in this

research, is Sam Walton's autobiography *Sam Walton, Made in America: My Story* published in 1991, just before his death. Walmart's former vice president and Walton's heir as cultural figurehead, Don Soderquist, wrote *The Walmart Way* (2005) to offer insight into the corporation's management and organizational practices. The retailer has prompted a number of "Walmart friendly" accounts that, though written by authors with less direct affiliation with the company, nonetheless have penned works unabashed in their support. These include books like Robert Slater's *The Walmart Decade* (2003) and Michael Bergdahl's *What I Learned from Sam Walton: How to Compete and Thrive in a Walmart World* (2006). A number of journalists have also compiled research into books like *In Sam We Trust: The Untold Story of Sam Walton and How Wal-Mart is Devouring America* (1998) by Bob Ortega of the *New York Times*, Anthony Bianco's *The Bully of Bentonville: How The High Cost of Wal-Mart's Everyday Low Prices is Hurting America* (2006), and *The Walmart Effect: How the World's Most Powerful Company Really Works—and How It's Transforming the American Economy* (2006) by the editor of *Fast Company*, Charles Fishman. These three share their concern with the economic and social impact that Walmart is having on the United States and tell their stories through a collection of firsthand accounts of Walmart's actions by both people from Walmart and from the communities affected by it. The accounts describe a grim situation in which the apparent low prices offered by the company are the result of a number of external and collateral costs that are not immediately apparent but whose long-term drawbacks will far outweigh the immediate savings benefits. Some authors see this as the logical conclusion of a free market system while others are more willing to indict Walmart for their role in producing the global asymmetries brought about by the company's supplying and sourcing practices. At this end of the spectrum, books like John Dicker's *The United States of Walmart* (2005), Bill Quinn's *How Walmart is Destroying America (and the World) and What You Can Do About It* (2005), and the film *The High Cost of Low Prices* (2005) adopt sharper and more urgent critiques of the company's practices. Whether spurred by such publications or not, Walmart has undertaken a significant and high profile campaign aimed at changing their image and demonstrating their commitment to become a leading corporate citizen.

Within the academy, Walmart is studied frequently in fields like sociology, economic geography, labor



FIGURE 04: Central Stockholm on September 03, 1967 as traffic changes direction.



FIGURE 05: The Ball is ascribed the capacity to protect rail passengers from danger.



relations, and public policy. Business historians Sandra Vance and Roy Scott's *Walmart: A History of Sam Walton's Retail Phenomenon* (1994) provides a thorough account of the company's growth, development, and model. Two recent volumes, Marjorie Rosen's *Boom\*Town: How Walmart Transformed an All-American Town into an International Community* (2009) and Bethany Moreton's *To Serve God and Walmart: The Making of Christian Free Enterprise* (2009) focus on the specific context of Northwest Arkansas. The former, a kind of sociological and ethnographic study, examines the emerging "post-colonial" settlement of Bentonville by a global population, brought together by their shared relationship to Walmart. Moreton's book examines the particular culture out of which Walmart grew and argues that the merging of beliefs in both Christianity and capitalism have produced the retailer's specific culture, have allowed it to thrive, and can also account for some of the cultural dynamics of the Middle South.

The volume of essays edited by Stanley Brunn called *Walmart World: The World's Biggest Corporation in the Global Economy* (2006) offers an extensive array of scholarly work on topics related to sociology, urban geography, economics, labor theory, cultural studies, business history, and globalization. Two essays are especially significant because they address Walmart's spatial strategy as an aspect of its business practice. "The Geostrategy of Global Business: Walmart and Its Historical Forbears" makes a case for the connection between space and corporate power while "Wal-Mart Nation: Mapping the Reach of a Retail Colossus" deals directly with mapping the company's territorial growth within the United States. By cataloging Walmart sites relative to US population centers and to a range of political boundaries the study shows both the ubiquity of Walmart stores and the precision with which they chose to locate new outlets. Holly Barcus's "Wal-mart-scapes in Rural and Small-Town America" is a helpful case study of the retailer's architectural manifestations but concludes by reinforcing the well-worn binaries between Walmart and traditional small American towns.

In a similar vein, *Walmart: The Face of 21st Century Capitalism* (2006), edited by Nelson Lichtenstein, assembles a range of scholarly contributions and complements the material in *Wal-Mart World*. The book's twelve essays address the history and culture of the corporation, its global influence, and

its relationship to labor. Hoopes's essay "Growth Through Knowledge: Walmart, High Technology, and the Ever Less Visible Hand of the Manager" examines the specific management practices of the retailer and the role that technology plays in abetting them. While not specifically concerned with logistics, it hints at the dominant role that information technology plays in the corporation. Bonacich and Hardie do focus directly on Walmart's logistics operations but from the point of view of labor, not space or technology, much less architecture and urbanism. Lichtenstein went on to publish *The Retail Revolution: How Walmart Created a Brave New World of Business* in 2009, which offers a thorough account of many aspects of the company's operations. Lichtenstein is a business historian and sociologist with an interest in labor and politics and while he addresses the dominant role that logistics plays in the company, his interests lie elsewhere and thus logistics remains anecdotally engaged. Lichtenstein is correct to emphasize the role of the shifting politics of the United States in accounting for Walmart's astonishing growth and success. And while it is also true that "the retail revolution was a lot more than bar codes and satellite uplinks, good roads, powerful trucks, and distribution center conveyor belts," these technological systems contribute to the formation of a larger socio-technical system that when dealt with more fully, help to illuminate ways of understanding the contemporary city.<sup>22</sup>

Other scholars have focused on spatial or urban aspects of Walmart's practices but from the perspective of other disciplines. Holmes's paper "The Diffusion of Walmart and Economies of Density" analyzes the company's growth patterns and attempts to account for the economic benefits that accompany its strategies of saturation and density.<sup>23</sup> As the focus is on economic aspects, it pays less attention to the physical, architectural, or social implications that such an approach might have. Paul Ingram's paper "Trouble in Store: Probes, Protests, and Store Openings by Walmart: 1998-2005," follows the process by which Walmart decides to open stores in contested regions.<sup>24</sup> The paper shows how the company has developed a range of techniques for assessing the likelihood of store acceptance and modifies their growth plans accordingly. Walmart sends out probes to many possible sites and automatically pursues those not met with protests. Sites that do encounter resistance are then evaluated for likely profitability. If the cost of trying to open a store is too high, Walmart will abandon the project. While not addressed specifically,

this approach helps illuminate the ways in which Walmart understands territory as a set of fungible locations that can be exchanged or substituted within a certain range. It concludes that protests against Walmart are consistently successful, either directly or indirectly (e.g. through larger community contributions, etc.). However, the success of a protest in either case is defined in specifically local terms and thus remains a narrow definition. In some cases, Vermont for example, locally successful protests did take place even though the region still became saturated with store locations. Walmart, through its precise real estate strategies, can in fact supersede local resistance through regional coordination.

Within the realms of architecture and urbanism, Walmart and other big box retailers have been the subjects of limited scholarly engagement and theorization.<sup>25</sup> That the format itself is a relatively recent phenomenon perhaps accounts for the apparent reluctance to address it more thoroughly. The projects that do engage such things tend to sort into three broad categories: one is concerned with the specific architectural potential of the building type itself, another focuses the organizational systems at work, and the third more on urban and social implications, mostly of retail real estate. Within the first category, early examples of architectural experimentation include the series of BEST showrooms designed by James Wines of SITE. Informed by the work of Venturi and Scott Brown, SITE self-consciously manipulated the outer skin of the showrooms to various spatial effects including walls that peel away, double, or appear to be crumbling. For much of the 1970s and even on through the late 1990s, the design of large format retail was given only limited consideration by the architecture academy. Relegated to service-oriented design firms, such projects were perhaps loosely influenced by postmodern historicism or regionalism and would make token gestures to a material palette or the local architectural idiom. Most commonly however, the projects would be influenced by cost-savings imperatives and would revert to the most minimal of resolutions. Many of the Walmart stores built during this long period were constructed of cinder blocks and painted "battleship grey" – of which neither attribute produced much sympathy for the corporation. The big box type is also one of the key symbols of runaway consumerism in Branzi's project for No-Stop City. In his famous model, an undistinguished large rectangular volume is surrounded by parking lots and lawns and is placed

in a box with mirrors on the four vertical surfaces, lending the appearance that these boxes are repeated endlessly.

Whether prompted by negative publicity or by an increased awareness of the economic value of architectural investment, large format discount retailers have become increasingly willing to invest in design. While Walmart is less vocal about its promotion of architecture compared to Target or IKEA, it has shifted its approach considerably since 2000 and the effect is a greater variety of exterior manifestations. This has happened in conjunction with a new scholarly interest in the theorization of envelope within architectural circles. Alejandro Zaera-Polo's "Politics of the Envelope" for example, argues, "The envelope has become the last real site of architectural power, despite the discipline's inability to articulate a theoretical framework capable of structuring its renewed importance."<sup>26</sup> While the envelope does indeed present a significant opportunity for design investment, there remain others within the realm of big box retail. Alexander D'Hooghe locates the potential of the big box not in its enclosure but in its underspecified conditions. In "The Case for the Big Box: Joys of a Non-Expressionist Architecture," D'Hooghe argues for the potential of the big box form: "Ultimately the big box is a large platform protected from the rain and wind. As a bounded platform it is exactly that: a stage. The point is that it can only act as such by refusing to participate as an actor."<sup>27</sup> In a manner similar to Zaera-Polo's conclusion that—given the characteristics of very large sheds—the only choice is to focus on the envelope, D'Hooghe's celebration of the neutrality of the big box also limits the potential of such a design engagement. Roger Sherman has developed a group of big box prototypes called "Duck and Cover" that focus neither on the vertical surfaces or the interior but rather on the roof. A riff on the distinction made by Venturi and Scott-Brown, the project investigates ways to make both the corporations and their constituents happy by using the logic and iconography of big box retail to develop new suburban public spaces.

Another trajectory in architectural and urban research related to big box retail could be referred to as "organizational" for its interest in logistics, infrastructure, and corporate management practices. Some of this falls within the interests of landscape urbanism as in the work of Charles Waldheim and Allan Berger. Keller Easterling's work also focuses on

these aspects with an eye to their political implications and new forms of production and engagement that they might offer or suggest. Design proposals emerging from these interests are also becoming more common. For example, the work of Lateral Architecture has taken on questions of retail logistics not in pursuit of novel building forms but rather in an effort to indentify the potential to fold a range of other uses into the more stubborn tendencies of such organizational landscapes. Martin Pawley's *Terminal Architecture* (1998) attempts to theorize such spaces that result from concerns with utility and efficiency and emphasizes the role that technology will play in future architectural development.

In a third category, some authors have addressed the architecture and urbanism of big box retail in terms of its effects on urban communities. Julia Christensen's book *Big Box Reuse* (2008) examines a range of projects that demonstrate different ways to reprogram large retail spaces once the original tenant has moved on. Through interviews and photographic documentation, Christensen's focus is primarily on the different community groups, rather than the architecture itself (the reuse projects themselves offering few improvements over the original buildings). Ellen Dunham-Jones is similarly interested in large retailers' practice of vacating their stores for more optimum locations. With her essay "Temporary Contracts" (2001) she uses this habit to speculate about its implications for property, the city, public space, and citizenship.

Given the work described above, what questions remain? What do we not yet know? On one hand, this study hopes to contribute to this conversation by synthesizing a range of information and material. Though much of Walmart's operations have been accounted for in some format, and though logistics and its relationship to urbanism has been addressed to some degree, there remain opportunities to explore these intersections. If it is true that, as Waldheim and Berger put it, "this logistics landscape is among the more significant transformations of the built environment over the past decade," then understanding one of the key protagonists in its development could inform a range of design practices. More specifically, both the history and effects of Walmart's technological operations remain somewhat unaccounted for. While the condition of its distribution system is acknowledged as a key to the company's success, the physical pieces of that

system can be explored further. Both the distribution centers and data centers demonstrate radical shifts in architectural understanding and challenge the way that buildings are understood and deployed. Similarly, though it is acknowledged that Walmart has a precise set of tools that allow it to locate its stores, the actual histories, mechanisms, and technologies remain somewhat unarticulated. Similarly, the history of Walmart's relationship to technology and its sustained deployment is not directly told. This study hopes to contribute to this in some fashion by pulling together various strands from other fields and other accounts. Likewise, as logistics operates at a fine grain within the workings of Walmart's distribution system, there remains space to probe more deeply and to understand just *what kinds* of technologies are at work and how they might be affecting their users. While this information exists in fragmented states, one goal of this study is to work to close these gaps in knowledge. However, the hope is also that even though this research putatively concerns the logistics operations of Walmart Stores, Inc. and their relationship to architecture and urbanism, the issues that it raises and the discoveries that it makes can, in turn, become relevant to a set of larger discussions related to the future of architecture and cities.

The remainder of the introduction will shift from a discussion of sources and methods to a more specific overview of Walmart, logistics, and the intersection between the two before outlining the structure of the chapters.

### WALMART OVERVIEW

Walmart grossed 405 billion dollars in 2009 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 domestic workforce of over 1.4 million, second only to the United States 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."<sup>28</sup> 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."<sup>29</sup> 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. 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, "Fully 60 percent of the entire U.S. population lives within 5 miles of a Walmart location and 96 percent are within 20 miles."<sup>30</sup> 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.<sup>31</sup>

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 such detailed and obsessive scrutiny, Walmart's leaders concluded that they themselves could handle most external operations better, cheaper and faster.

### LOGISTICS OVERVIEW

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 on information to enhance speed, efficiency and control — as its primary expertise. The field of logistics is rooted in the military (Figure 06) and described by historian James Huston as "the application of time and space factors to war."<sup>32</sup> Unsurprisingly, there is a martial fervor to Walmart's campaign to achieve total coordination of its

worldwide operations. For example, in a "Logistics Primer" sent to Army personnel, the author writes:

No single industry in the U.S. economy equals Army logistics activities in scope and magnitude. Army logistics activities cover the complete spectrum of a business activity from construction of a manufacturing plant to supplying a pencil. Logistics activities are performed worldwide, but depend primarily on national resources found with in the U.S. Because the Army logistics system is so big, it must be as efficient as possible as a matter of economy. However, economy must not take precedence over responsiveness and effectiveness because in war the first 'runner-up' is the loser.<sup>33</sup>

If you were to substitute the word "Army" with the word "Walmart", the above passage could be lifted from the pages of a Walmart training manual. Logistics has also become a major corporate sector, as the global economy is becoming increasingly networked and connected. Within management circles, the term is commonly used to describe "the organization, planning, and realization of the total flow of goods, data, and control along the entire product life cycle."<sup>34</sup> As more and more entities need more and more things sooner and faster, the business of enabling these efforts is booming. Within logistics as a broad category are several instruments that help its operations. These include different standardization systems (e.g., ISO, DIN, EDIFACT) or more concrete technology like the UPC symbol or the RFID transmitter. These systems and devices are small when seen in isolation but gain traction when seen collectively and in terms of their implementation.<sup>35</sup> Always the main goal of any logistics operation is to increase efficiency but with the ubiquity of internet-driven data transfer, logistics operations have moved from being opaque, linear and sequential to being transparent, simultaneous and parallel.<sup>36</sup> Through these drives for speed, efficiency and standardization, logistics affects all the territories that it encounters.

The rise of information and communications technology (ICT) has enabled logistics to become increasingly significant in global business practices. Manuel Castells's *The Information Age: Economy, Society and Culture* (1996) examines the implications of ICT from a specifically urban point of view. In *Volume I: The Rise of Network Society*, he makes a distinction between the space of flows and the space of places. He argues that contemporary space is constructed via a negotiation between these two poles in which "cities are structured, and destructured simultaneously by the competing logics of the space of flows and the space of places. Cities do not disappear in the virtual networks. But they are transformed by the interface between electronic communication and physical interaction."<sup>37</sup> The practices of logistics are



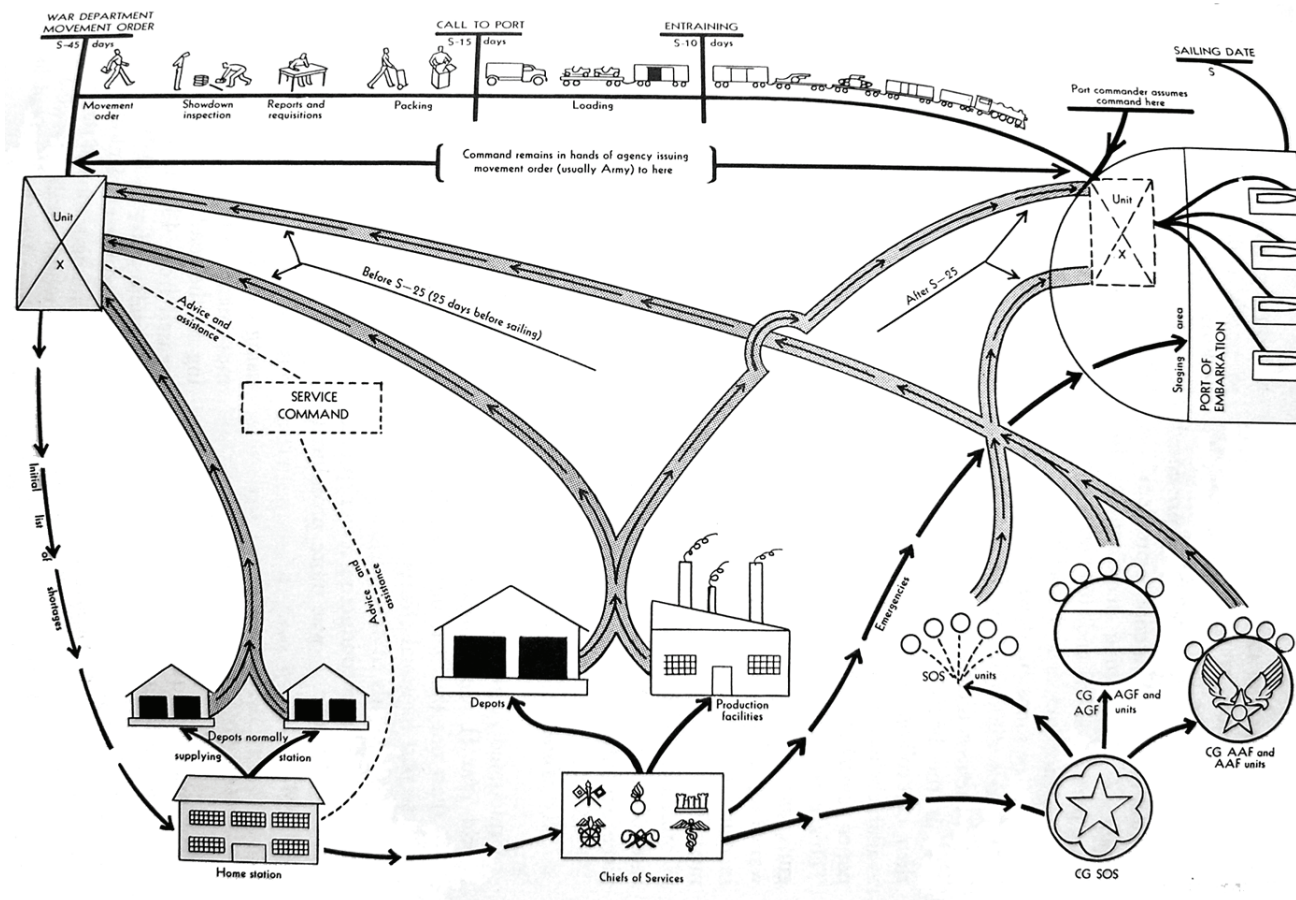


FIGURE 06: Military supply chain diagram explaining the transport of materiel from land to port.

fundamentally linked to spaces of flows and, as such, are implicit throughout Castells's text. This project hopes to extend this work by bringing the impact of retail logistics on space more to the foreground.

It attempts this only because it can stand on the shoulders of other contributors to the field. An early text on the topic is Susan Snyder's and Alex Wall's essay "Emerging Landscapes of Movement and Logistics" from 1998 in which the authors describe some of the features of this field. Wall and Snyder refer to the "front-stage / back-stage paradigm" and claim that "new consumption needs new distribution. However, much of the consumption in evidence at a place like Walmart is nothing new, only perhaps in its continually increasing magnitude. The two authors go on to assert that:

distribution and consumption are altering traditional urban form in four ways: at street scale, by filling our roads with trucks working via electronic control on schedules that lead to intense traffic volume and accidents disrupting the daily urban system of every large city; at an urban scale, by transforming the front- and back-stage areas of cities; at a regional scale, by creating new urban structures that will provide the armature for the growth of new communities; and at a continental scale by re-ordering the hierarchy of cities in a country's commerce.<sup>38</sup>

This project builds on this statement in different ways. At one level, it bores more deeply into the workings of one actor that has been particularly influential in developing the landscape they are describing. At another, it attempts to articulate and develop further dynamics of change wrought by this logistics landscape. While they are correct to point out the numerous physical changes that occur as the result of the development of a distribution landscape, this project hopes to show that these transformations reach even further. Indeed, with the onset of a logistics landscape, we can witness more fundamental realignments that suggest not just new forms of architecture but also new ways of understanding it. Similarly, this logistics landscape also suggests new ways of conceptualizing territory as it is increasingly abstracted in pursuit of optimization. Likewise, the workers who populate this new terrain are coupled with a broad array of technological developments that suggest new relationships to information and technology, not just more traffic and more buildings.<sup>39</sup> The identification of changing urban hierarchies as a result of the demands of logistics operations is especially astute. The authors write, "Slowly, national, regional, and city maps are being redrawn as the hierarchy of cities changes. What appears to be emerging is a back-stage group of cities—service cities driven by distribution—that serves, at a regional and national scale, the front-stage cities that

are the centers of business, culture, entertainment, and leisure."<sup>40</sup> However, such a claim also serves to reinforce certain existing binaries between types of cities and remains bound to certain consumption patterns, namely high-profile urban shopping environments like their example of Times Square. Walmart serves to complicate this claim somewhat because of its relationship to the "front-stage cities" the authors highlight. Walmart's distribution network is not concerned with providing the support for a concentration of high-profile consumption experiences, but forms a much more pervasive and extensive condition.

The project is influenced by the work of Keller Easterling, whose books *Organization Space: Landscapes, Highways, and Houses in America* and *Enduring Innocence: Global Architecture and Its Political Masquerades* are two of the central works in the discussion of urbanism and logistics. Likewise, "The New Orgman: Logistics as an Organizing Principle of Contemporary Cities" concisely articulates the impact of global logistics regimes and makes a case for investing in this avenue of research.<sup>41</sup> Related investigations into logistics and urbanism include Clare Lyster's essay "Surfaces of Exchange" in *The Landscape Urbanism Reader*, which analyses the role of interface within contemporary urban systems. Lyster develops the claim that:

the development and striation of territory includes a greater emphasis on performance and organization, such that it has become a valuable high-performance membrane – a composite that operates both as information receiver, infrastructure, and superstructure, but at the same time is none of these alone and so falls between traditional typological and morphological perceptions of space. It is a subspace, a territory that structures/servers/hosts multiple possibilities of interchange and occupation across its organization.<sup>42</sup>

In "Logistics Landscape," Charles Waldheim and Alan Berger develop the themes of Snyder and Wall's earlier essay. While broader in its inquiry, the claims remain similar as the authors set out to describe what they see as a current shift from "a nationally decentralized organization to an internationally distributed one" and the new "logistics landscape" that has emerged as a result. This landscape 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" contained within the categories of "distribution and delivery, consumption and convenience, and accommodation and disposal."<sup>43</sup> The essay is positioned as an initial step to "begin the longer term project of (the) critical appraisal" of this landscape. Berger and Waldheim's text is especially productive in its efforts to acknowledge the global



context of logistics and to rightly assert that many of the manifestations of transmission networks apparent in the North American context are often only the final portion of a much longer chain. However, they remain focused on the specific and concrete sites of these logistics operations, namely the “land area given over to accommodate the shipment, staging, and delivery of shipped goods.” While this “landscape” is significant in its own right, it has implications beyond the boundaries of the ports, distribution centers, and free trade zones that constitute it. This work here then also hopes to build on the solid foundation laid by Waldheim and Berger and their assertion that their case studies “pose an initial introduction and multiple lines of future research into the specifics of each logistical mechanism and corresponding landscape type.”<sup>44</sup> The results of Walmart’s logistics enterprise, if not its entire operation, show up in all three of Berger and Waldheim’s categories and are an apt site for more in depth investigation and theorization.

Walmart’s logistics operations are fundamental to its success and its ability to continue to grow (Figure 08, 09).<sup>45</sup> Because the company earns money by maintaining profit margins, it attempts to improve efficiency across all of its levels. And while it is clear that logistics plays a significant role in Walmart’s business practices, the impact that such a large operation has on larger contexts is less clear. Walmart’s growth has also prompted its competitors to adopt similar strategies of logistics operations and while they do not yet have the same scale, they will likely have significant impacts as well. To bring about its extensive coordination, Walmart devotes significant resources to the development, maintenance, refinement and synchronization of its distribution and data networks.<sup>46</sup> 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.<sup>47</sup> 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 (UPC), 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 to abstract the items moving

through Walmart’s supply circuits: they are registered and tracked as numbers rather than things. For Walton, this logistical capacity was largely a means to an end. The founder remained focused only on how logistics affected performance — measured in profit (Figure 07). 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.”<sup>48</sup>

#### WALMART BEYOND RETAIL

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.”<sup>49</sup> 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.

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.<sup>50</sup> 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, the company that produces 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.”<sup>51</sup>

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.”<sup>52</sup> 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.

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.”<sup>53</sup> 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.<sup>54</sup>



FIGURE 07: Sam Walton's ledger containing “all those numbers.”



FIGURE 08-09: Walmart Logistics in Bentonville, before and after the company's rebranding.



### WALMART AND OTHER LARGE CORPORATIONS

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 (\$316 billion, \$351 billion, \$379 billion, \$405 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 carmakers. And just as the Arkansas-based retailer's business practices differ from those of its corporate peers, so do its architectural practices. Walmart's reliance on logistics has generated a far-reaching and ever-growing enterprise made up of information systems, land holdings, buildings and infrastructure (Figure 11); yet Walmart's overall physical presence is more diffuse than were the spatial manifestations of major corporations of the past.

Walmart's incursions into affairs of state—be they energy regulation, policy making, or disaster relief—recall a similar moment in the early 1950s when Charles Erwin Wilson, president of General Motors and Eisenhower's nominee for secretary of defense, was asked if he would be able to make political decisions that might negatively affect GM—then the largest and most profitable corporation in the nation. Wilson answered affirmatively but added that he could not imagine such a scenario because “for years I thought what was good for the country was good for General Motors and vice versa.” In retrospect this widely quoted sentiment—usually reduced to “what is good for GM is good for the country”—foreshadows the increasingly intertwined relationship between the interests of the nation and those of private corporations.<sup>55</sup> Furthermore, in the last decades of the 20th century, many of the world's major corporations retained established architects to design pedigreed works that aspired to reflect each company's culture and success.<sup>56</sup> Walmart's architecture, on the other hand, is strikingly austere and remains apart from the branding efforts that have served other corporations. Compared to other companies that were either the largest in the country, or the largest in their sector—IBM or GM, for example—Walmart makes

little effort to reinforce its position or authority with architecture. In contrast to GM's significant architectural presence within its own corporate world and within the world of the popular imagination (with such things as Futurama at the 1939 World's Fair) or the restrained but still deliberate use of internationally renowned architects for IBM's enterprises, Walmart makes no such efforts. Saarinen's GM Technical Center of 1956, for example, was designed as a signature building for the car manufacturer that gave form to the aspirations of the automobile age (Figure 10). Similarly, and more relevant because of its sector, the Sears tower in Chicago is one of the city's landmarks and forever associated with the catalogue merchant and retailer.

Continuing the comparison to GM's Technical Center, the Walmart Corporate Headquarters in Bentonville is decidedly nondescript. While such large companies reinforced a belief in architecture's capacity to give form to their ideology by commissioning high-profile designs for their facilities, Walmart has not. One reason for this could be the ethic of thriftiness espoused by its executives in which signs of unnecessary spending are thought to be counter to the company's mission of saving customers money. In this sense, Walmart's unembellished corporate architecture, though without pedigree, does reflect the attitudes of the corporation. This is significant because, though Walmart is the largest company in the world, it has adopted no architectural form, has commissioned nothing from recognized practitioners and seems to have no interest in doing so. While Walmart—like GM before it—is devoted to research and innovation, the retailer does little to demonstrate that through the designs of its corporate housings. This changing relationship to architecture also suggests changing ideas of corporate representation. GM is a company concerned with technical innovation and almost *had* to reinforce that pursuit through its corporate imagery. Walmart, on the other hand, while similarly bound to technological development, is reluctant to demonstrate that to its public and instead opts for branding that favors the generic or the traditional.<sup>57</sup>

### WALMART AND ARCHITECTURE

Though Walmart seems to direct few resources to its own corporate architecture, it has invested considerable resources and design intelligence into its collection of building types. Walmart's generic buildings are the foundations of its empire, and the environments that result have saturated the United



FIGURE 10: Walmart takes its place amongst Daniel Bell's “paradigmatic” companies of the 20th Century.

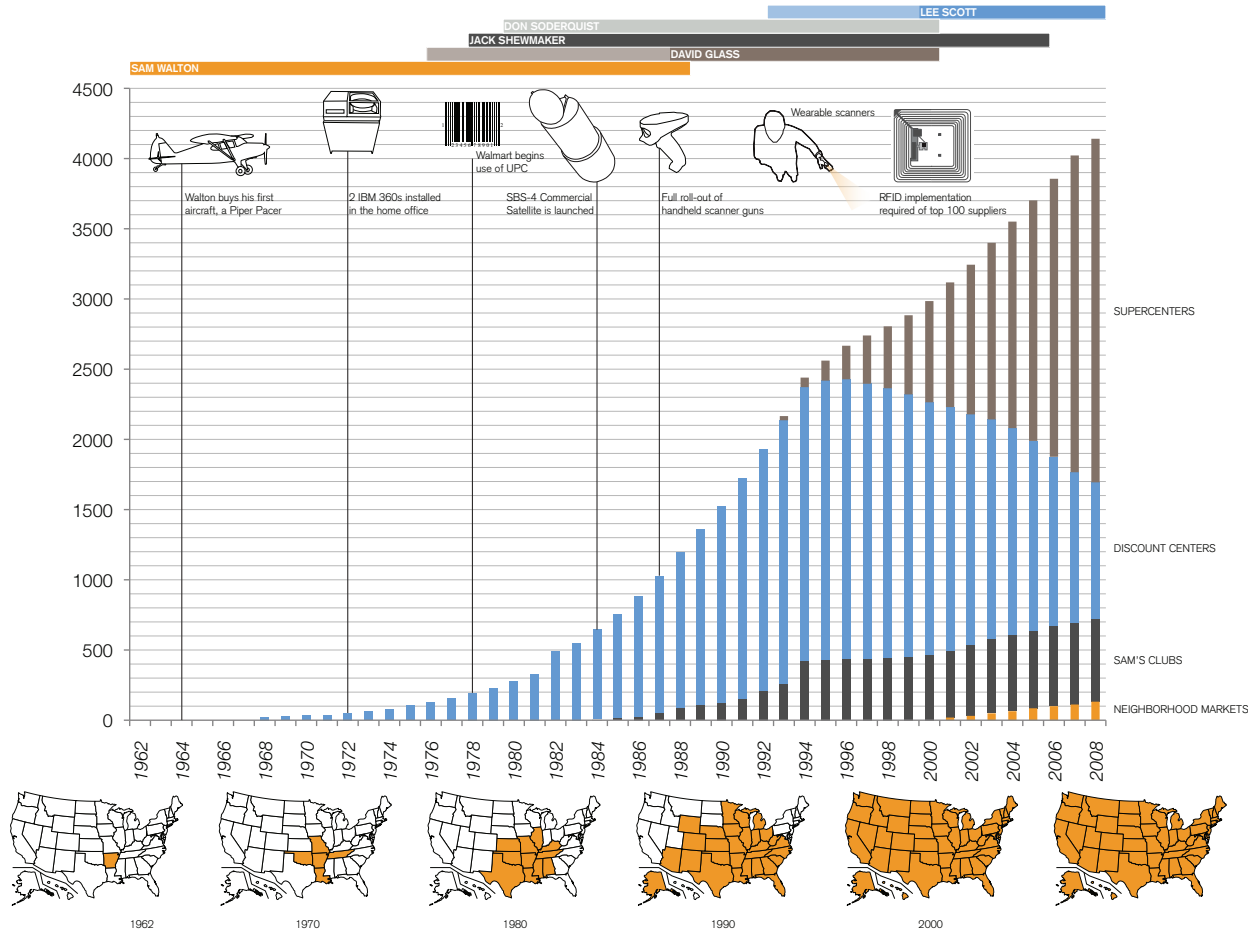


FIGURE 11: The number of Walmart stores over time, organized by format. Significant technological milestones are also indicated.

States. Nationwide this network, at the time of writing, comprises five retail categories: 861 discount stores sell variety goods; 2,664 supercenters sell variety goods plus food; 153 neighborhood markets sell only food; 4 “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 venues 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.<sup>58</sup>

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 entire system is also always transforming — at different scales and speeds — as new stores are built and (sometimes) existing ones vacated.<sup>59</sup> For Walmart, real estate too is a logistical practice in which the stores’ spatial and temporal positions are critical to success. Strategically located to optimize the flow of goods, the stores and distribution centers 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.<sup>60</sup> The largest distribution 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.<sup>61</sup> 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.

CHAPTER STRUCTURE

In order to connect various aspects of a large enterprise such as Walmart, the company is addressed at a range of related scales with logistics as the common denominator and with the chapters structured accordingly (Figure 12). While each level of inquiry is related to the others, isolating them in this manner allows certain aspects to become more apparent. Likewise, attendant to each scale are a set of technologies that the company has managed to use in innovative or hyperbolic ways. At a predominantly architectural register, Walmart’s collections of building types are examined more closely in terms of their relationship to technology and infrastructure. These constructions form the building blocks of the company’s extensive and ever-expanding empire and yet are modeled after only a limited set of prototypes developed in their Bentonville home office. Furthermore, the buildings themselves, especially those that play support functions to the ubiquitous supercenters are increasingly automated and thus offer an image of architecture designed almost purely as infrastructure. This collection of building types is fundamental in the company’s expansion efforts as they are used to secure new territories through coordinated deployment to specific locations. This is the focus of the section concerned with the urban scale as it examines the processes and technologies

by which Walmart identifies new market locations. The collections of buildings also play host to a variety of technologies developed to aid in logistical efficiency. The workers who operate Walmart’s increasingly automatic architectures of transmission and distribution wield many of these technologies and are the focus of the chapter concerned with the scale of the body. The concluding chapter returns to Bentonville in an effort to understand Walmart’s global position from the perspective of its point of origin. As Walmart has announced its plans to become an increasingly global company, it remains all the more surprising that its power is still concentrated in a relatively remote corner of the country. Though not apparent at first, Bentonville is a global city and its diffuse metropolitan conditions are the result of a range of intersecting conditions. The conclusion will also address further avenues of research, especially as Walmart continues to devote energy to development in the so-called BRIC countries of Brazil, Russia, India, and China. In fact, some experts have predicted that, given Walmart’s current growth rates, there could soon be more stores in China than there are the United States.

Additionally, these encounters with Walmart have opened onto other trajectories that, while not immediately connected to the company’s efforts, nonetheless remain relevant to its approach and complement a broader understanding of the effects and links of the organization. These moments will not constitute chapters unto themselves but, as they are relevant to the company’s operations in general, are interspersed throughout the text in the forms of short interludes. One is a discussion of Piggly Wiggly, Keedoozle and other retail experiments by Clarence Saunders that, when taken together, form a kind of pre-history of the automatic retail we can find in Walmart. There is also an account of the 2010 annual retail real estate convention organized by the International Council for Shopping Centers in Las Vegas, Nevada, known simply as “ReCon.” The last looks at one conflict amongst many in Walmart’s efforts to grow its empire; unique because it concerns both New Urbanism and the inventive deployment of property rights legislation in the town of Hercules, California. Taken together, these additional stories will fill in some of the gaps between the various chapters.



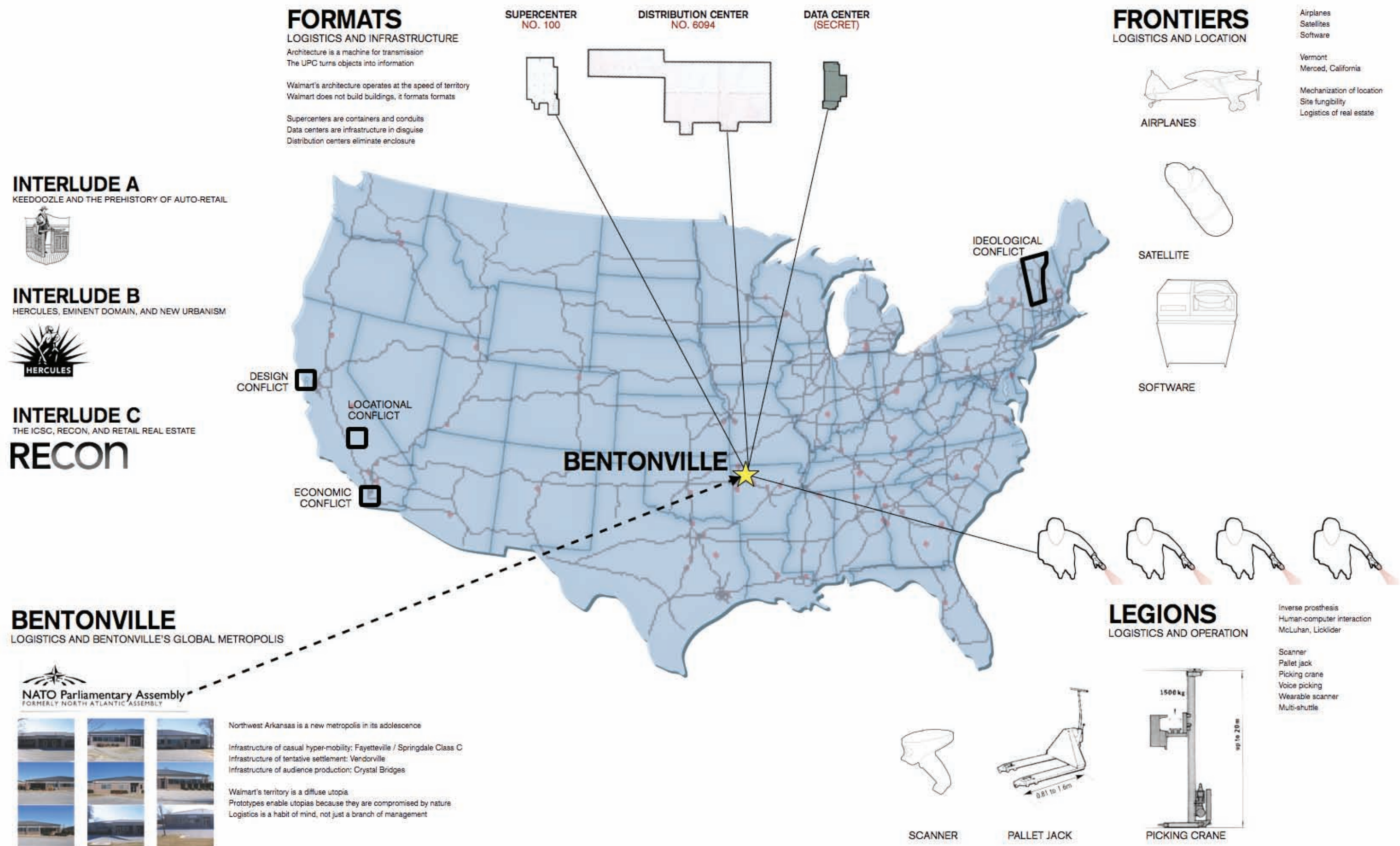


FIGURE 12: Outline of chapter structure.

And of course she had studied the civilization that had immediately preceded her own – the civilization that had mistaken the functions of the system, and had used it for bringing people to things, instead of for bringing things to people.

E.M. Forster, “The Machine Stops,” 1909

# 02

## IT NEVER STOPS...

### Logistics and Infrastructure

*Architecture is a machine for transmission*  
*The UPC turns objects into information*

*Walmart’s architecture operates at the speed of territory*  
*Walmart does not build buildings, it formats formats*

*Supercenters are containers and conduits*  
*Data centers are infrastructure in disguise*  
*Distribution centers eliminate enclosure*

This chapter focuses on the architecture of Walmart in order to show that the company’s buildings function within an infrastructural register as much as an architectural one. While discussions about Walmart’s built artifacts center around the design of their envelopes (i.e. how they *look*), what is more significant for the purposes of this project is how the buildings *work*. By focusing on Walmart’s three main building types, this section will demonstrate how an emphasis on transmission of both material and information has led to the company’s understanding and use of architecture as just one aspect of its broad logistics system. Thus, to fixate on the details of individual locations or buildings—as much of the discourse still does—is to miss the point of a much larger territorial network that never stops transforming.

Walmart is one of the largest corporations in the world and in spite of an apparent indifference to architecture, relies on a system of standardized buildings in pursuit of a territorial agenda. Walmart depends on the location, coordination, and performance of its expansive network of built artifacts but displays a set of design priorities more focused on information systems and logistics technology than on symbolic forms or dramatic spatial configurations. Though the company’s success is closely linked to its far-flung network of buildings, the actual architecture of this network remains relatively unaccounted for. In the hopes of closing this gap, an analysis of Walmart’s buildings illuminates parts of their operation related to territory, infrastructure, and media. The buildings deployed perform as nodes within Walmart’s steady stream of merchandise flow and in order to handle this enormous amount of material, Walmart understands it as immaterial *data* as much as physical *stuff*. Consequently, the buildings become implicated in a larger network of information transmission in which the architecture’s boundaries are less significant than the interconnection and calibration of their interiors. Furthermore, the buildings in question are “automatic” in many regards and frustrate efforts to understand them in terms of more conventional criteria like space, form, inhabitation, etc. Thus, to address the formal articulation of the individual buildings (whether in terms of program or communicative enclosure) is to only get part of the picture. Understanding the role of Walmart’s buildings as part of a larger infrastructural system has implications at the territorial level because it exposes the instrumentality of these structures and their capacity for geo-political agency; rather than architectural surfaces to which information is applied,



these buildings are vessels through which information is transported and transformed. Furthermore, their presence in the landscape serves to reinforce Walmart's territorial agenda; trading symbolic content for symbolic presence. This is significant because it demonstrates architecture's agency at larger scales and could open up possibilities for future design directions. This section will make a case for this by looking at Walmart's supercenters, data centers, and distribution centers more closely.

Walmart's architectural manifestations demonstrate that the company is concerned as much, if not more so, with the transmissive capacity of its buildings than with their communicative capacity. However, the organization dedicates significant energy, in both word and deed, to promoting the symbolic function of its buildings, thereby obscuring the ways in which its collection of structures act in unison as an infrastructural network. This chapter will establish this by examining Walmart's terminology, promotional material, and architectural documents in order to discuss its system of supercenters in more detail. This is necessary in order to subsequently suggest additional understandings of the company's built forms that only become apparent by examining the three buildings formats together. Walmart's supercenters, data centers, and distribution centers are not just containers for machines or merchandise but are also buildings that occupy a realm between both architecture and infrastructure and are therefore implicated in networks of transmission. They are conduits as well as containers. Part of this argument relies on a claim that Walmart, because of its emphasis on data management and logistics, understands the merchandise it circulates as both physical material and immaterial "data." In the case of the data centers, the buildings act as infrastructure dedicated to transmitting and storing digital information. In the distribution centers, even though the buildings are responsible for handling physical merchandise, the goods they process are abstracted by necessity. This ambiguity between the physical and the ephemeral produces an architecture whose limits become equally difficult to discern. The case for this will be made using architectural evidence from Walmart and its materials handling subcontractors.<sup>1</sup> To do that, though, it will first be helpful to contextualize the development of these building types by addressing some technological and programmatic antecedents that have enabled the company's growth – specifically the concept of "self service," retail automation, and the

Universal Product Code. These three elements have worked together to enable the modern discount retail formats with which we are familiar.

*ARCHITECTURE IS A MACHINE FOR TRANSMISSION*

Walmart's architecture developed in changing context in which new technologies and new habits prompted new forms of organization. The concept of "self service," early ideas for retail automation, and the Universal Product Code all worked together to allow Walmart's retail operations to expand as they have. While there are numerous historical sources that have contributed to the formation of large-format discount retail, these three are especially helpful in understanding the aspects of the architecture discussed below. Similarly, the first half of the 20<sup>th</sup> century, in retail terms, was characterized by rapid transformations enabled by mass production and mass distribution. The former general stores and specialty stores were superseded by mass merchandisers who took advantage of more efficient systems to reduce costs and eliminate price increases accumulated along their merchandise's path from production to consumption (Figure 02). Out of these developments emerged three main types of retail operations: the department store, the chain store, and the mail-order house.<sup>2</sup> Of these, Sam Walton got his start as a franchisee of the Ben Franklin chain but was interested in developing new ways of selling merchandise more cheaply.

Self-service is one such way and is, in fact, a specific piece of intellectual property patented in 1917 by Clarence Saunders, the founder of the Piggly Wiggly chain of grocery stores (Figure 01). He opened his first location in 1916 in Memphis, Tennessee and referred to its organization as "self-service" because customers could move freely through the shop once they passed through the controlled entrance turnstile. Customers would take a shopping basket with them, select the desired items themselves, and pay for them all at once at a single point before exiting the store. While the prevailing arrangement had store clerks choosing items for the customers or assisting them at counters with cash registers, this new format gave shoppers more freedom to choose and, even though the merchant was still responsible for selecting the products to include, customers could assert their needs based on what they purchased. This in turn shifted the responsibility of marketing to the manufacturers themselves for they were now in direct competition

with their rivals as their products sat side by side on the shelf. This also created a need to brand products in a more legible and aggressive way. Since the price was marked on every item, customers could also easily compare costs. This method of pricing objects individually to then be controlled at a single point-of-sale at the exit was also a first with Piggly Wiggly and laid the foundation for later automated forms of inventory management and checkout. Saunders was motivated by a desire to lower costs and increase profit and the brilliance of his scheme is that, under the guise of increased freedom and control, the customers actually did the work of what would be a paid position at his competitors' stores. The reduction of overhead that this produced allowed Piggly Wiggly to lower its prices in general based on the wager that customers would prefer to shop themselves if they could save money. While early department stores were primarily urban and depended on a steady stream of pedestrian traffic, the smaller scale self-service stores lent themselves well to areas with smaller populations and proved to be especially compatible in rural, and later suburban, locations. Though a ubiquitous format now, self-service was slow to catch on. For example, in 1952, when Sam Walton opened his second Walton's 5 -10 in Fayetteville, Arkansas, it was one of the first self-service variety stores in the nation.<sup>3</sup>

Saunders also patented a system designed to allow others to transform their existing stores into "self service" stores (Figure 03). These inventions demonstrate an approach to store design based on deployable components and standardized modules that would allow the store to be redesigned through its interior configuration. In his 1917 patent application, Saunders describes the system as:

Furniture in the form of portable units adapted to be readily arranged for use or collapsed for shipping or closing purposes, the same being designed for use in a store room, or other place, and to be arranged in such a manner that the customers will be able to serve themselves and, in doing so, will be required to review the entire assortment of goods carried in stock, conveniently and attractively displayed, and after selecting the goods desired, will be required to pass a checking and paying station at which the goods selected may be billed, wrapped and settled for before leaving the premises [...] The store furniture disclosed in the present application is characterized in that the same is made up of standardized units, whereby stores adopting the system may be equipped with portable units readily set up for business and disassembled or collapsed as occasion requires, and wherein the units themselves may be constructed at a central point and all after the same pattern in construction and appearance, insuring a uniformity of stores employing my invention.<sup>4</sup>

Significant within this description are the architectural aspects that will later characterize much of discount retail architecture including standardized systems of production, access, and display and the

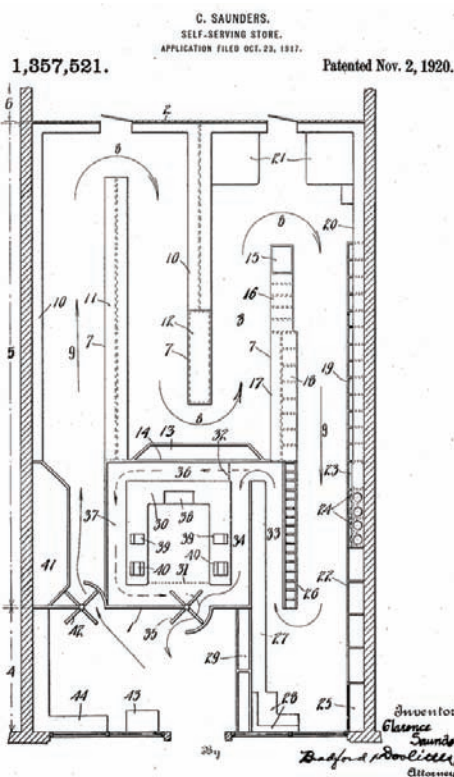


FIGURE 01: Plan from patent for "self-serving store" showing turnstile, circulation route, and checkout.

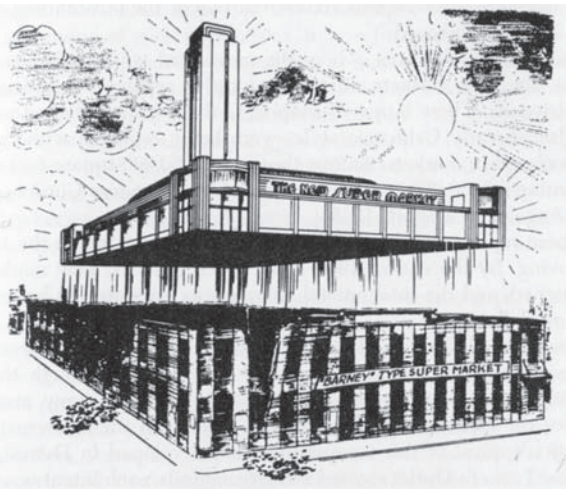


FIGURE 02: The emergence of a new kind of retail format is attached to a specific kind of architecture.

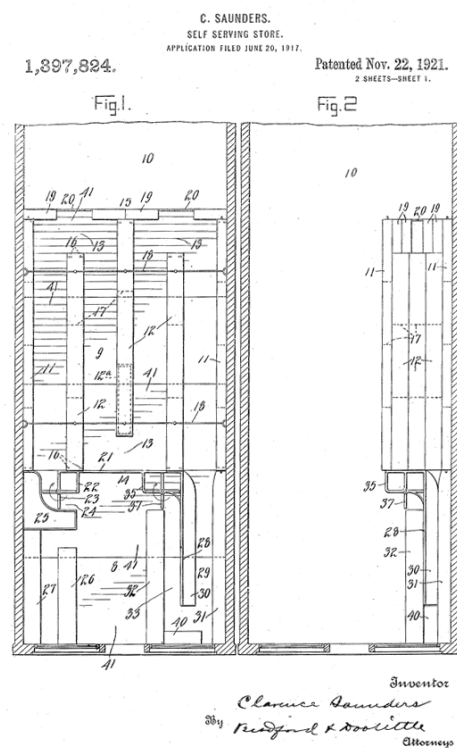


FIGURE 03: Subsequent patents of a modular system that could be expanded and contracted.

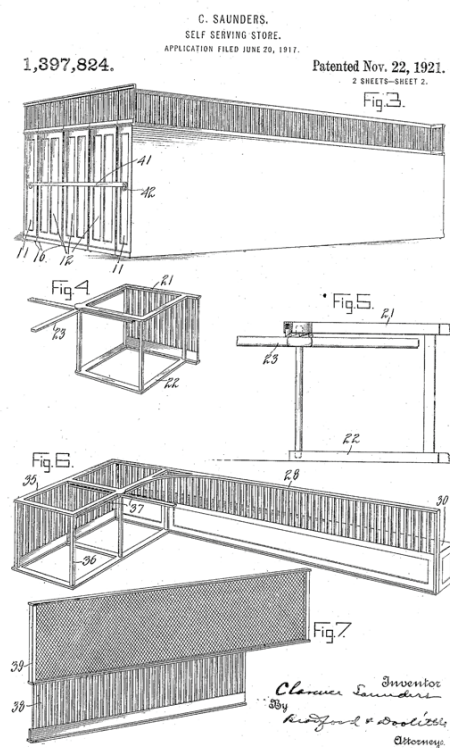


FIGURE 04: Anatomy of a symbol.

implicit temporariness of such installations. The standardization allows the interiors themselves to become effective copies of each other and to remain familiar to customers. “Self service” is worth singling out as an invention because it is a concept more than an artifact. While objects like the shopping cart or the cash register have been instrumental in the success of self-service shopping, they are useful only insofar as they support the broader innovation of “self-service.”

### THE UPC TURNS OBJECTS INTO INFORMATION

This transformation of shopping habits and mechanisms is linked to developments in technology that enabled automatic coordination of information, command of larger distribution networks, and subsequent “spatialization” of information, largely as a result of the widespread implementation of the Universal Product Code (UPC). In contemporary retail practice, the UPC has made the task of monitoring inventory more error-free and faster because it allows the automatic registration of items as they enter and leave the warehouses, distribution centers, and retail outlets. The UPC is a means of encapsulating a product’s pertinent information in an array of parallel bars (hence the term “bar code”) that contain a 1-dimensional data string (Figure 04). Each black bar is attached to its adjacent void to form a sequence of binary digits that can be easily read by a laser scanner. The combination of these digits is unique for each product and is scanned at significant nodes along its journey. The UPC creates a more efficient way of managing information that reduces input errors, standardizes formats, and allows the monitoring of inventory with a higher degree of scrutiny. Through this mechanization of inventory control, suppliers and shippers become more accountable for the manner in which they manage their goods. Likewise, the inventory levels of the various outlets can be controlled and calibrated to reduce the risks of overstocking or selling out of merchandise. Every item for sale is scanned when it is placed on display and then subsequently scanned to tabulate the price and register its purchase and ultimate removal from the store. This information feeds into overall supply protocols and alerts the warehouses and distribution centers that more stock will be needed soon.<sup>5</sup>

The rise of the UPC allowed, if not demanded, a more extensive and responsive distribution network. Once merchandisers had the possibility of monitoring



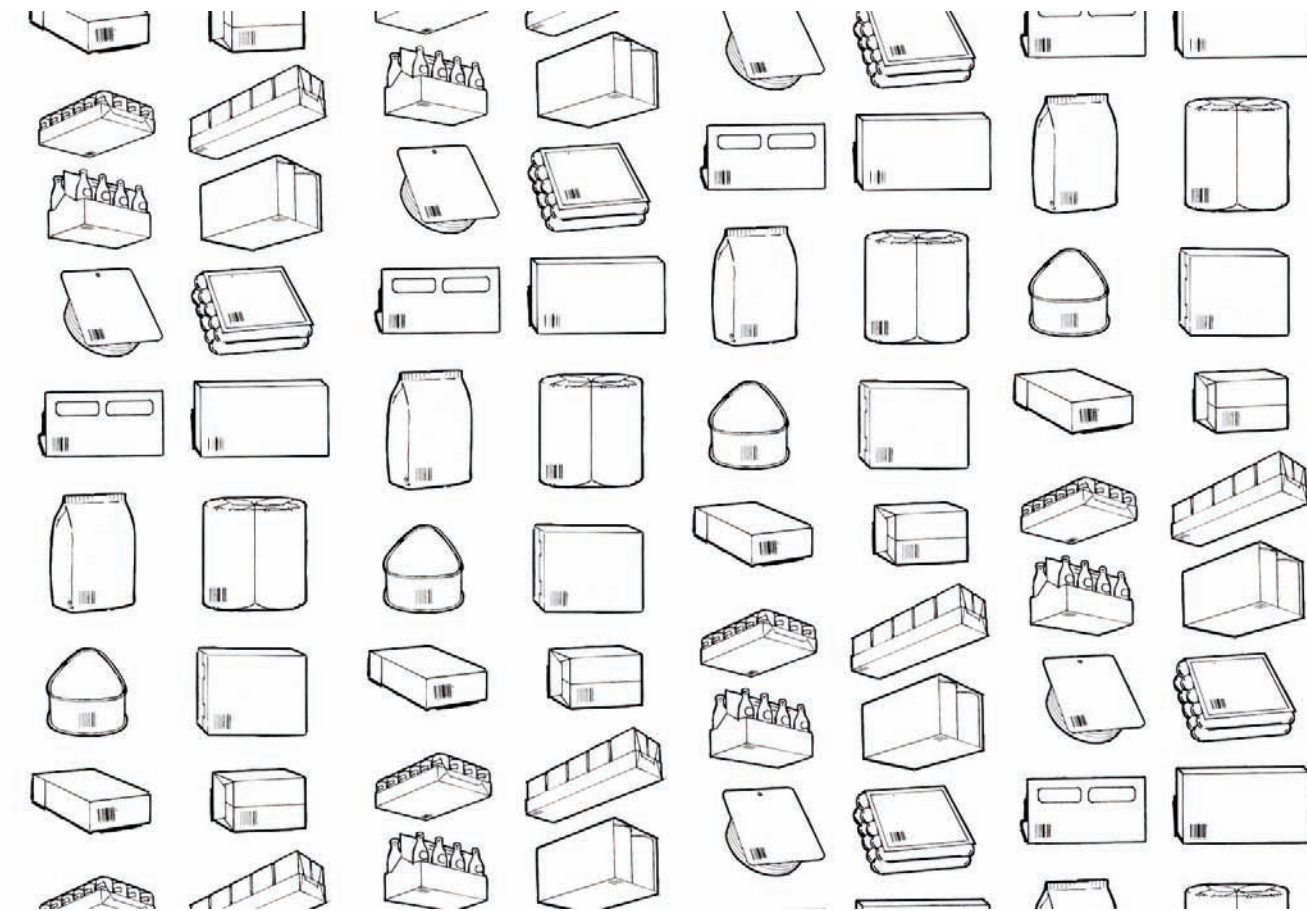


FIGURE 05: The UPC at work.

their material stocks at a higher resolution, it became easier to calibrate their distribution requirements. The UPC's capacity to contain information allowed the material in question to be understood, and subsequently imagined, in abstract terms – as bits more than boxes. In the time of the first Piggly Wiggly, for example, inventory was logged manually, thus reinforcing the materiality of items through their physical manipulation. With contemporary inventory control and with the increasingly large areas of operation, the goods in question become more easily conceptualized as data. As corporate logisticians struggled to maintain the right inventory balance, the items' qualitative identities became less important than their quantities. Though the merchandise maintained its stubborn materiality and still needed to be physically moved, it was understood more as pure information. An illustration from an implementation manual from the early days of the bar code reinforces this point (Figure 05). The diagram indicates where one should locate the UPC but in doing so, omits all other information about the products.<sup>6</sup>

To summarize, Saunders's invention of "self-service" produced a new approach to retail organization with spatial consequences at multiple scales. Subsequent speculations about automated shopping environments borrowed techniques from industrial manufacturing and distribution and applied them to spaces of retail circulation to produce buildings that would perform many tasks historically performed by humans. These impulses were aided by the innovations in information management including the development of the UPC; a technology that transforms objects into data and takes concrete things and renders them abstract. These developments provide some context for the following discussion of Walmart's supercenters, data centers, and distribution centers.

#### WALMART'S ARCHITECTURE OPERATES AT THE SPEED OF TERRITORY

Walmart links its success to its vast empire of stores, of which its supercenters are the most publicly visible. However, the supercenters are just one element of an entire system of spatial products that Walmart deploys in precisely calibrated ways. Compared to the other companies with whom Walmart often shares the top of the Fortune 500 list, the physical manifestations of Walmart's corporate practices are expansive and diffuse.<sup>7</sup> Given the ubiquity of Walmart's retail outlets, their utilitarian disposition, and their often-unfavorable aesthetic perception, how

can we understand the company's architecture? One way is to place Walmart in the context of other large corporations during the 20<sup>th</sup> century. In *The Coming of Post-Industrial Society*, 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.<sup>8</sup>

Each of these emblematic companies is bundled with their deliberate, pedigreed, and concentrated architectural programs.<sup>9</sup> It is the contention here that Walmart can take its place after IBM in this lineage for its size, reach, cultural impact, and technological innovations. However, compared to the other three, Walmart's corporate identity is not positively constructed through investment in its architecture. Whereas U.S. Steel, GM, and IBM all commissioned high-profile buildings as part of a carefully choreographed strategy, Walmart has pursued low profile, non-pedigreed buildings in which performance within their territorial agenda takes precedence. These generic buildings are nonetheless essential to the construction of the company's expansive empire and, consequently, are the keys to its growth. Walmart has achieved its success largely through the location and delivery of its stores; i.e. the rapid deployment of architecture at a territorial level. Thus, while Walmart devotes significant resources to its architecture, such expenditure is not apparent in materialization, form, or envelope but instead in the logistics technologies that enable the buildings' coordinated operation and expansion.

By comparing Walmart to large corporations like US Steel, GM, and IBM, the specificities of the corporations themselves are less significant than the categorical differences that are reflective, in Bell's formulation, of the production "paradigms" of a given era. US Steel is concerned with the production of a commodity and is significantly attached to its geographical location because of both industry and raw material. General Motors is emblematic for its production of rationalized and industrialized products in the form of personal automobiles. In their case, the material comes from numerous locations to be assembled in GM's factories – the location of which is dependent on several factors including the availability of an existing labor force and, to some extent, circumstance. After commodities and industrialized products, IBM can take its place with the "business machines" it makes and sells. Though IBM is responsible for producing things, it might be more accurately said that they deal with information and

its management. Nonetheless, all three corporations remain within a paradigm of *production*.<sup>10</sup> Walmart fits within this lineage of emblematic corporations but is set apart by its emphasis on *circulation* over production. US Steel produced a commodity from raw material, GM assembled raw material to produce mobility technology available to the public, and IBM produced machines capable of delivering information to that public. Though Walmart traffics in items produced from raw materials, it produces very little itself. While this dynamic is perhaps somewhat typical in an advanced capitalist market, it does present some puzzles when it comes to architecture. For example, Walmart’s buildings are, to varying degrees, fully automated.<sup>11</sup> Like factories or power plants, there is little human input needed to make them operate. Unlike factories and power plants, however, Walmart’s collection of architecture produces neither things, nor commodities, nor energy because the buildings’ main task is the circulation of merchandise and information. Rather than trying to understand Walmart’s architectural contribution as an isolated series of buildings, the company’s spatial products function in unison as part of a system of territorial control and transmission. This suggests an expansion in the corporate use of architecture away from its symbolic content and toward its symbolic presence and instrumentality. The “meaning” of the buildings is not to be read in the applied decoration on the stores’ enclosures or in their tectonic articulation but instead at the territorial level.

*WALMART DOES NOT BUILD BUILDINGS,  
IT FORMATS FORMATS*

In Walmart’s corporate lexicon, buildings are not referred to as buildings but as formats and prototypes. One reason for this is that the objects that the company’s architects design often lack a site (Figure 06). New stores are developed for generic conditions with highly specific interior configurations. The features of the new location combined with Walmart’s research about demographics and real estate help determine what prototype to chose. However, while the interiors are highly specified, aspects like the buildings’ exteriors, their site orientation, their access to infrastructure, and so on, all need to be modified “in the field” by a local architect or contractor. As a result, the task of design has more to do with developing an interface with an unknown condition and playing out scenarios of transformations for a given situation and its myriad contingencies. Since this is the case, describing their buildings as formats is faithful to the manner in which they are conceived.<sup>12</sup>

Understanding the term format itself is illuminating, as it is both a noun used to describe a generic condition but also a verb for the process of creating that condition.<sup>13</sup> The origins of the word have to do with the preparation and production of books as the format designated both the size and the shape of the publication. Traditional book formats, e.g. the folio, quarto, octavo, or duodecimo, were designated by the number of times an original sheet would need to be folded to form the individual leaves of the publication. The term has been taken up by numerous other media to describe additional ways to store data beyond ink on paper. One example is audio recording and, more recently, digital storage. In the latter category, the verb and noun often intersect as one is prompted to “format” a storage device and thereby erase all previous data to make way for new input. Similarly, one of the dictionary definitions of the word is “a defined structure for processing, storage, or display of data.”<sup>14</sup> This definition is revealing in combination with Walmart’s use of the word to describe its buildings because it lays out three of the key roles the company expects its architecture to perform: *processing*, *storage*, and *display*. Significantly, a format’s relationship to its form is somewhat slippery. In most cases, the *form* is in fact secondary to the *performance* of the artifact in question, thereby prompting a reassessment of design criteria. Walmart emphasizes its buildings’ *display* of information and symbols (primarily in the form of its applied facades) but such an emphasis hides the complex architectural machinations related to *processing* and *storage*.

This privileging of display is reinforced by the tendency of groups of local affiliation to challenge Walmart’s entry bids on aesthetic, and often visual, design criteria. By directing attention to issues of external image, discussions are allowed to remain fixated on issues of surface, representation, and envelope. By doing this, Walmart’s practices reinforce an existing discourse about surface and representation popularized initially by theorists in the 1970s like Robert Venturi and Denise Scott Brown and developed more recently by Alejandro Zaera-Polo. However the mechanisms behind the symbolic surfaces offer additional ways to illuminate the company’s operations.

*SUPERCENTERS ARE CONTAINERS AND  
CONDUITS*

The supercenter is Walmart’s most common building type and consists of a general merchandise discount store and a large discount food store. (Figure 07)

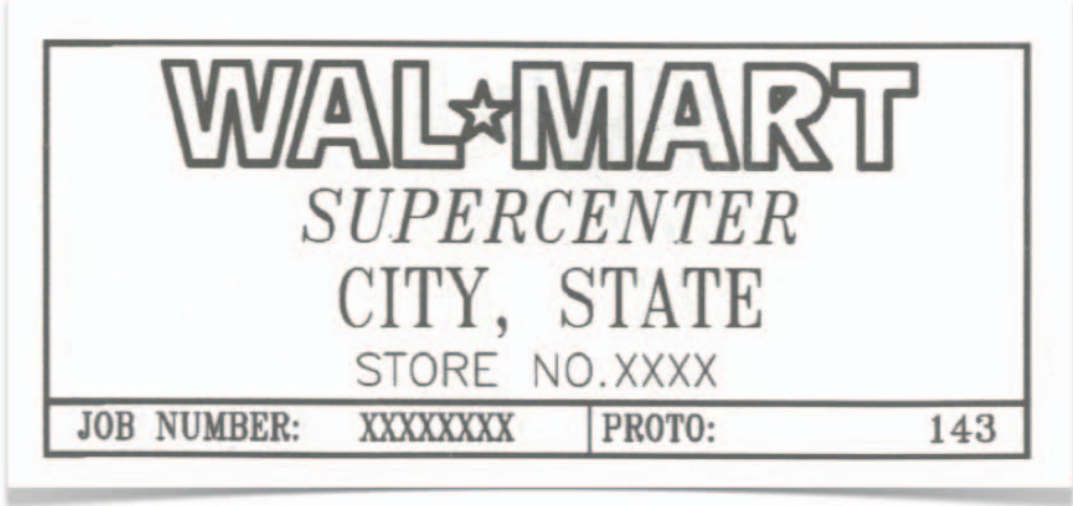


FIGURE 06: Title block for Walmart Prototype 143, Store No. XXXX for City, State.



These buildings are the primary territorial instruments used by Walmart as it expands its real estate holdings. As such, they can be understood not only as large—and often decorated—shed buildings but also as automatic outposts and manifestations of a vast infrastructural system of transmission. This system, formed in conjunction with Walmart’s data centers and distribution centers is a constantly transforming network of calibrated and interconnected interiors. Understanding it in this way presents opportunities to move beyond certain established architectural categories and suggests possibilities for developing architecture in expanded registers that might engage its agency at social and geopolitical levels.

The design of Walmart supercenter prototypes is reflective of the company’s pursuit of expediency and cost reduction. By having only a small number of prototypes, the process of site selection and construction happens much more quickly than if Walmart had to design a new store for each new location. This has been part of the company’s approach even from its early days. According to Sam Walton, “We just started repeating what worked, stamping out stores cookie-cutter style. The only decision we had to make was what size format to put in what market... I think our main real estate effort should be directed at getting out in front of expansion and letting the population build out to us.”<sup>15</sup> This statement is telling in its emphasis on the stores’ location rather than their individual design. For Walton, building new stores amounted to simply selecting the appropriate format and adapting to the location as quickly as possible. For this process, the Walmart real estate division and architects partner with local companies to perform what is referred to as “site adapt.” This process includes taking the generic prototype drawings and modifying them to ensure their compliance with local building codes and to work through the specific interfaces between the new building and its context, including access roads, sidewalks, drainage, fire safety, and so on.

If we take Walton at his word, the design of the buildings themselves is secondary to their specific placement within a territory. This is perhaps also a reflection of Walton’s view of his operations “from the air” in the pilot’s seat of the small airplane that he would use to survey new sites. According to former Vice Chairman and Chief Operating Officer Don Soderquist, in order to locate new stores:

We started by looking in a general area on a map and identifying potential towns. A real-estate associate then visited all of the

sites and recommended a few possibilities. We considered the demographics involved, and then senior leadership flew out to look at the potential locations from the air—Sam liked to look at the road systems and traffic flow from that vantage—before driving around the area to take an up close look.<sup>16</sup>

This consistent aerial view of his operations reinforced Walton’s territorial understanding of his buildings and suggests that the specifics of their design was less important to him than their performance and position.<sup>17</sup> Through this implicit suggestion that the buildings are not as important as their location, Walton tacitly dismisses any kind of architectural deliberateness. However, it is on these very grounds that local groups often challenge his crew of architects, real estate planners, and public relations specialists. From the view of corporate decision makers, architecture is a luxury to be dispensed with but for those concerned with the approval of new buildings, architecture is one of the primary reasons communities resist the entry of a new Walmart store.<sup>18</sup>

This conflict between corporate directive and populist demand is perhaps partly responsible for the version of architectural design established and promoted by the Walmart architecture division. The buildings’ designs and the manner in which they are discussed and presented suggest that architecture is primarily concerned with surfaces and thus reinforces a definition predicated on envelope and enclosure. This is significant because it emphasizes certain aspects of Walmart’s built forms while disguising, overlooking, or neglecting others. It also helps to understand the different ways architecture is understood and subsequently marshaled in pursuit of Walmart’s corporate agenda. By promoting the role of architecture as communicative surface, its role as territorial instrument is obscured. While this is perhaps not intentional on the part of Walmart it is nonetheless a significant result of their approach. Bill Correll, the head of Walmart’s architecture division, reinforces this attitude:

From a social and cultural standpoint, we deal with the buildings’ exteriors all the time. That’s literally a daily issue. Once folks know that a Walmart store is coming to their location, they ask, “Well, how’s it going to look? How’s it going to look when I drive up to it? I’ll be driving back and forth from this place for years and years to come and my children will grow up walking in and out of its doors. Is there a way to make it feel like it fits in?” We have architects, engineers and real estate people who are out looking at the surroundings and are working with local jurisdictions to build a consensus of what the exterior design should be.<sup>19</sup>

Though not declared, part of the reason the emphasis remains on the exterior is because the interior layouts of the prototypes are very rigid. These configurations are determined in part by the architects but mostly by the company’s inventory and logistics experts.

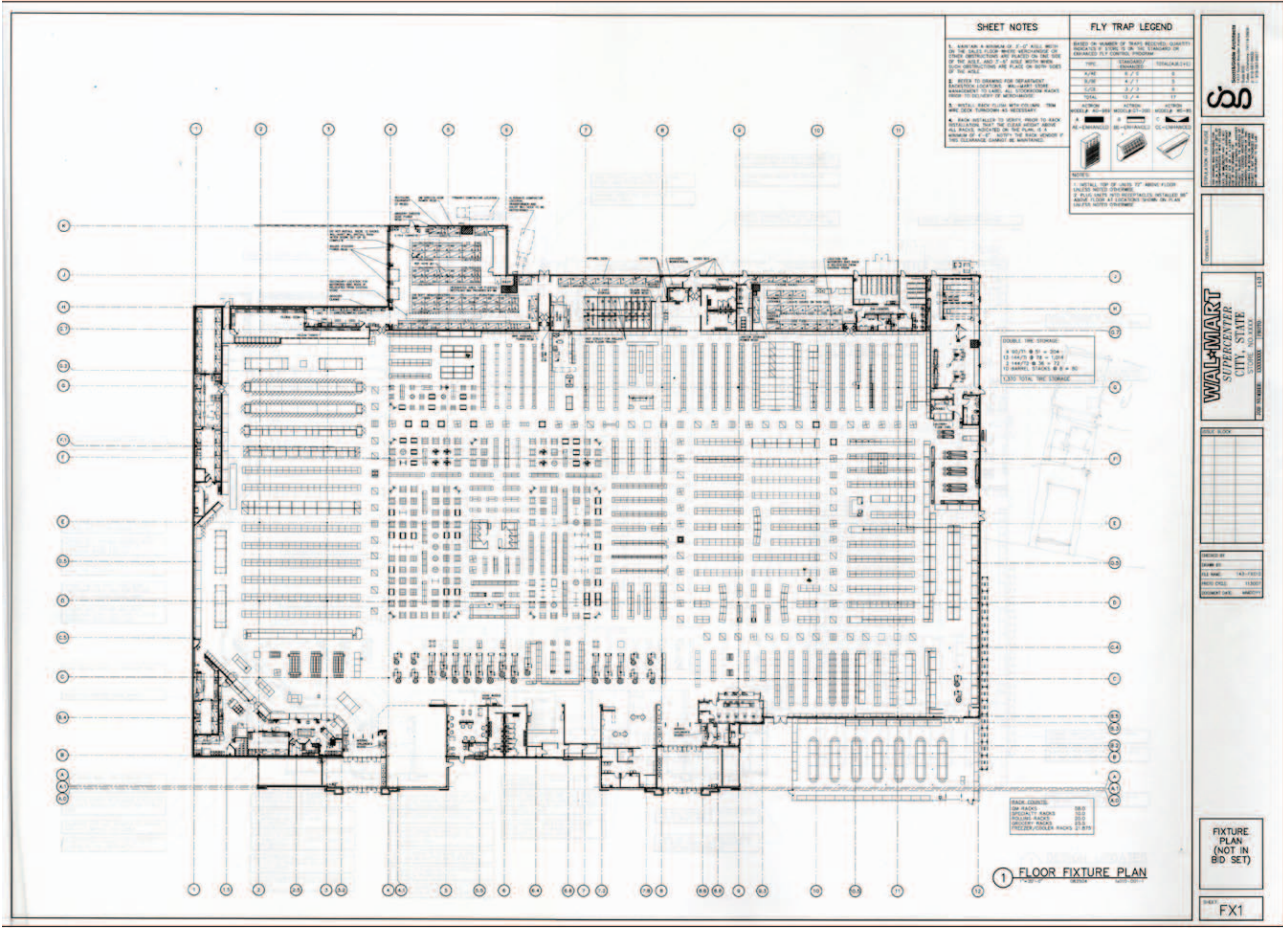


FIGURE 07: Fixture plan for Prototype 143 showing field of racks and shelves, all carefully laid out.



They also remain relatively inflexible. As a result, the architects are indeed left with little space for design. In response to this challenge, Correll went on the say: Productivity and efficiency are at the very center of what we're trying to accomplish in order to keep the prices low for customers. It all comes right back to that. However, when you are looking with an open mind, you start to see things that have been established over time that may not be so applicable anymore... Some things must absolutely stay the way they are – and there are very serious reasons why they are the way they are – but other things have a little flexibility to them.<sup>20</sup>

Walmart's preferred standardized design proposals are often challenged at the local level. In an effort to make buildings that “fit in,” Walmart will often attempts to adapt its buildings to individual sites. From the company's point of view, this often amounts to modulating the buildings' surfaces to reflect some kind of abstracted or generalized architectural semantic of the region. According to Karrie Jacobs in the journal *Metropolis*: Correll's team met with a coalition of civic groups in a Fort Worth neighborhood and asked them about their favorite buildings in the area and the characteristics “they would like to see reflected” in the future store. A number of people cited a 1930s high school as a favorite. “So,” Correll says, “we took many of the elements—including some arched windows, clay tile roofs, brick, and other material—and put these colors and materials together as part of the design of the Walmart Supercenter. Does this defuse public opposition? I'm sure it does. But the real drive for us is to be good neighbors.”<sup>21</sup>

This kind of attention to local inflection, however superficial, is costly and time consuming for the company. In response to this, the architecture division has developed a new set of guidelines in an effort to streamline their architectural production while raising the overall quality of their buildings. Rather than offering only the bare minimum building and then modifying the design only when necessary to appease public concern, the new plan attempts to raise the standard of the common denominator in order to avoid having to customize local outlets. Walmart's current architectural priorities, listed from “critical importance” to “flexible importance” are:

1. Store Identity
2. Entry Vestibule
3. Iconic Tree and Landscape
4. Pedestrian Amenities (e.g. Benches, Lighting)
5. Base building architectural<sup>22</sup>

Significantly, all five of these categories relate to the exterior of the building. In fact, the diagram attached to “Base building architectural” is a hollow rectangular enclosure made of a thin continuous surface and used to illustrate the surface articulation of the building. The drawing's caption simply says “architecture.”

While these guidelines are general, looking more carefully at the construction documents of a specific design, Supercenter Prototype 143 in this case, helps to reinforce the company's focus on the surface

treatment of its buildings. This emphasis on surface also reinforces certain discursive trajectories linked to architecture, especially those promoted by the work of Robert Venturi and Denise Scott Brown with the development of the “decorated shed” in *Learning from Las Vegas: The Forgotten Symbolism of Architectural Form*. According to Venturi and Scott Brown, a decorated shed occurs when “systems of space and structure are directly at the service of program, and ornament is applied independently of them.”<sup>23</sup> In many respects, Walmart's buildings would seem to be obvious decorated sheds because the layout and form of a typical supercenter is highly restricted and reflective of a predetermined set of performance criteria that establish the organization of the building and its volumetric form, while the exterior is interchangeably “contextualized” through the application of essentially graphic architectural finishes (either through the literal signage of the company or through surfaces meant to signify a local specificity). The emphasis placed on the design of enclosure by the company, by the architects, and by an attendant theoretical apparatus have managed to screen another set of characteristics demonstrated by these buildings, i.e. that of an infrastructural network deployed to secure territory. However, an insistence on describing these buildings as “big boxes” serves to perpetuate an understanding of their architecture as one concerned with surface instead of interface, and with form instead of performance, thereby locating architectural agency only in the communicative possibilities of ornamentation. This attitude has an air of resignation and diminishes the architecture's abilities to act more broadly, or even to imagine those abilities.

Supercenters are often referred to as “big boxes” yet the phrase itself has no precise definition. However, two authors have recently attempted to develop one. Julia Christensen, in her book *Big Box Reuse* defines it simply as “a large, freestanding, one-story warehouse building with one main room, ranging from 20,000 to 280,000 square feet, used initially for retail purposes.”<sup>24</sup> Her definition is linked to size and to program (or at least the initial sponsoring program). A more precise definition is laid out by Alexander D'Hooghe in “The Case for the Big Box: Joys of a Non-Expressionist Architecture” that uses the structure and construction of the building. For D'Hooghe, a big box has a contiguous floor plate, a repetitive structure and façade, a primarily horizontal form with no innate limitations, and a structural system designed to minimize columns, and to provide

protection from wind and rain.<sup>25</sup> While D'Hooghe rightly points out the need for updating the work of Venturi and Scott Brown, he nonetheless reinforces the notion that such structures are independent entities and possess a certain degree of neutrality when he writes, “Ultimately the big box is a large platform protected from the rain and wind. As a bounded platform it is exactly that: a stage. The point is that it can only act as such by refusing to participate as an actor.”<sup>26</sup> Implicit in such a statement is a claim that these large shed buildings are somehow “neutral” – in D'Hooghe's case, blank “platforms” to support public display and participation. However, such a claim can cause the agency of their forms and organization to be overlooked. In this sense, Christensen is right to identify the structural residue that informs any subsequent re-inhabitation of large shed buildings: “Although it is entirely possible, moving a church, say, into a big box store is almost as surprising as moving a church into a building shaped like a duck.”<sup>27</sup> By this, she seems to be implying that the “neutral” form of a big box is in fact highly informed by its retail logic and spatial organization and will therefore have an impact on whatever programs follow. While D'Hooghe is primarily discussing the design potential of the big box type for design of new buildings (especially in terms of its horizontality and structural flexibility), the critique of the type's tacit agency remains relevant. Christensen also reminds us, in reference specifically to the roads and parking lots used to access large retail stores, “we must not forget that this is an infrastructure designed for retail, and our future navigations upon the land will be in circuits developed for shopping.”<sup>28</sup> Implicit in this statement is an important recognition that these spaces are not neutral but are the results of a carefully calibrated process. Unspectacular as these results may be, they nonetheless conform to specific organizational protocols. In spite of an awareness of the effects of the buildings' organizational residue, Christensen continues to reinforce the duck-versus-shed binary by arguing that a “big box” is a duck as well because “the decorated-big-box-shed has collected a context, the building itself now stands for an activity—shopping. The big box is a cultural symbol; it is a duck.”<sup>29</sup> Though reductive, the observation astutely recognizes the ubiquity of these retail formats and the ways in which they are often associated with retail, consumption, and leisure.<sup>30</sup>

One reason to dwell on this point is to show the persistent currency of the binary distinction between duck and shed and the convenience with which it is used to develop architectural approaches within retail

(e.g. SITE's showrooms for Best) but also to suggest the need to find other ways engage these buildings. The work of Venturi and Scott Brown helped provide a foundation for the development of post-modern historicism, an impulse invested in reasserting architecture's disciplinary autonomy. However, buildings' surfaces have resurfaced discursively as relevant sites for political agency. In an article titled “The Politics of the Envelope: A Political Critique of Materialism,” Alejandro Zaera Polo writes:

The envelope has become the last real site of architectural power, despite the discipline's inability to articulate a theoretical framework capable of structuring its renewed importance. Mobilizing a political critique of the envelope capable of addressing its multiple attachments and complexities may enable us to frame architecture not merely as a representation of the interests of a client, of a certain political ideology or an image of utopia, but as an all-too-real, concrete, and effective political agency able to assemble and mediate the interests of the multiplicities that converge on the architectural project.<sup>31</sup>

Such a demonstration of the prevailing insistence on engaging buildings as if they were only enclosures and by doing so, continues to reinforce an understanding of buildings predicated on isolated exterior envelopes and spatial boundaries. Referring to the envelope as the “last” site of architectural agency also surrenders to a very narrow definition of architecture. This in turn aids in foreclosing other possibilities of architectural investigation.

The drawings for Prototype 143 illustrate these tendencies in Walmart's store designs as well. Within the corporate description of Walmart's architecture, the emphasis is undoubtedly placed on surfaces – more specifically on the *front vertical* surface. It is this that receives most of the decorative effects as part of Walmart's efforts to build the “Store of the Community.”<sup>32</sup> The other three vertical surfaces often perform service roles as they receive delivery trucks, cars to be repaired, and are punctured with numerous fire exits. The buildings are built mostly of concrete masonry units and either painted or clad with prefabricated panels as part of an Exterior Insulation and Finishing System (EIFS). This system allows Walmart to adapt their facades to the demands of different constituencies quickly. The flexibility of this exterior system seems to support the common perception of this building type as a “blank” or “neutral” one that is capable of having any given “content” applied to it.

To focus only on the four vertical surfaces of a typical Walmart supercenter (as the company itself does in its own guidelines) fails to account for the other two crucial surfaces to the building's operation: the



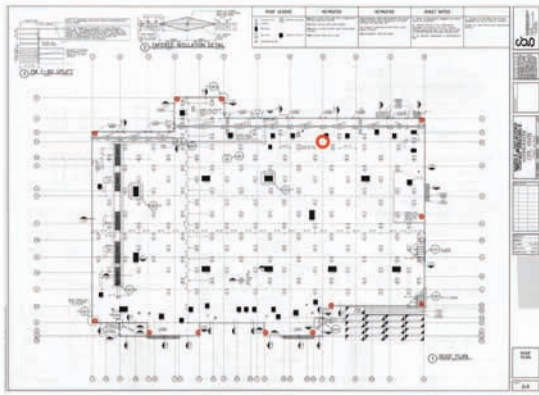


FIGURE 08: The roof is Prototype 143's primary means of connecting to the outside world.

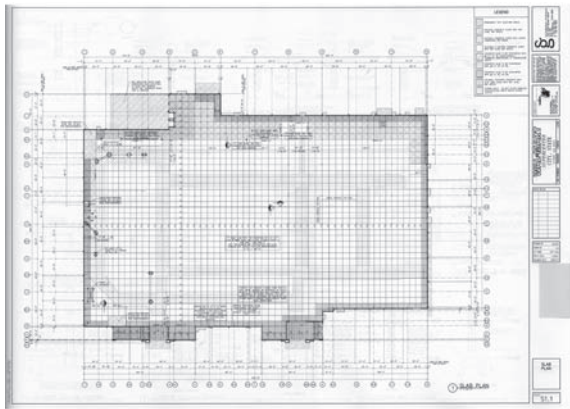


FIGURE 09: The floor slab is another primary site of connection for Prototype 143.

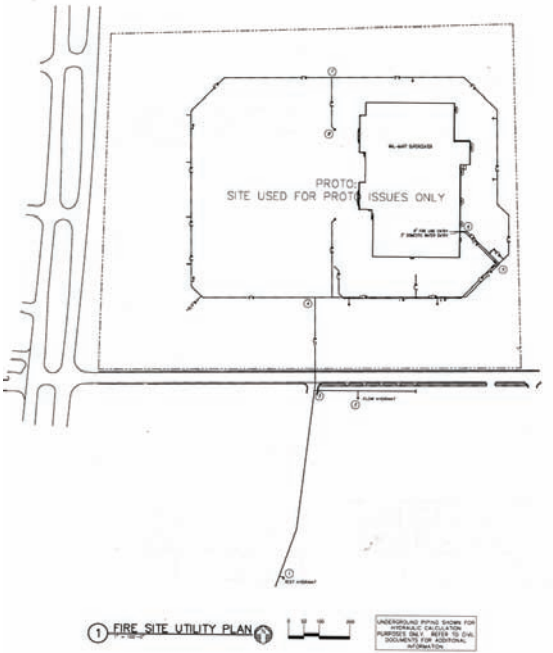


FIGURE 10: Speculative site plan.

roof and the floor. These surfaces are significant because they have no symbolic obligations. As they are effectively invisible, there is no opportunity for them to “communicate” through architectural symbols (e.g. pediment, dormer, pilaster, “materials,” and so on). However, these surfaces are communicative, or more precisely, *transmissive*, in a literal sense because Walmart receives much of its essential material through them.

A closer examination of the roof plan indicates that the surface’s duty is not only to let light in, exhaust air, and keep water out. It is also is a membrane that plays host to the communications infrastructure including several banks of security cameras and the store’s satellite dish (Figure 08). The dish is the primary connection to Walmart’s private satellite network and affords the store a sustained connection with the company’s headquarters. The floor slab is one of the key steps to formatting a site for a new store and a significant interface between larger infrastructural systems like electrical, plumbing, and drainage (Figure 09). These examples are reminders that a Walmart supercenter is both wrapper and volume. While the vertical surfaces act as membranes for people passing in and out of the building, the horizontal surfaces enable the store’s infrastructural connectivity and perform as membranes through which water, power, light, heat, and most importantly, information, pass (Figure 10).

Understanding the building in such a way illuminates the fact that buildings like this accommodate significant material flows, including a constant stream of inventory. It is delivered by trucks from the local distribution center, brought to the shelves, and then transported out of the stores by customers. An image of the floor plan of Prototype 143 shows the small amount of storage space in the building itself (Figure 11). This is because the distribution system is responsive enough to not require a significant inventory supply. As a result of Walmart’s command and control of its inventory through its advanced information management system, it is able to replenish its shelves quickly with a minimum of storage space at each location. This means that the system of distribution and restocking is calibrated so that as certain items are depleted, suppliers are told to ship more to the distribution center that in turn anticipates their arrival and forwards them to the specific store. Prototype 143’s floor plan indicates a large receiving area but then only two relatively

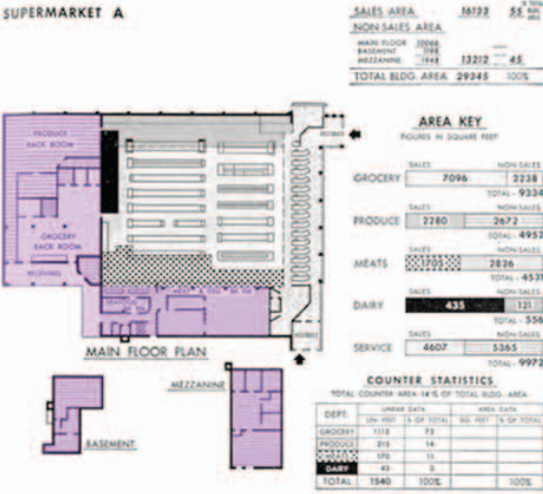
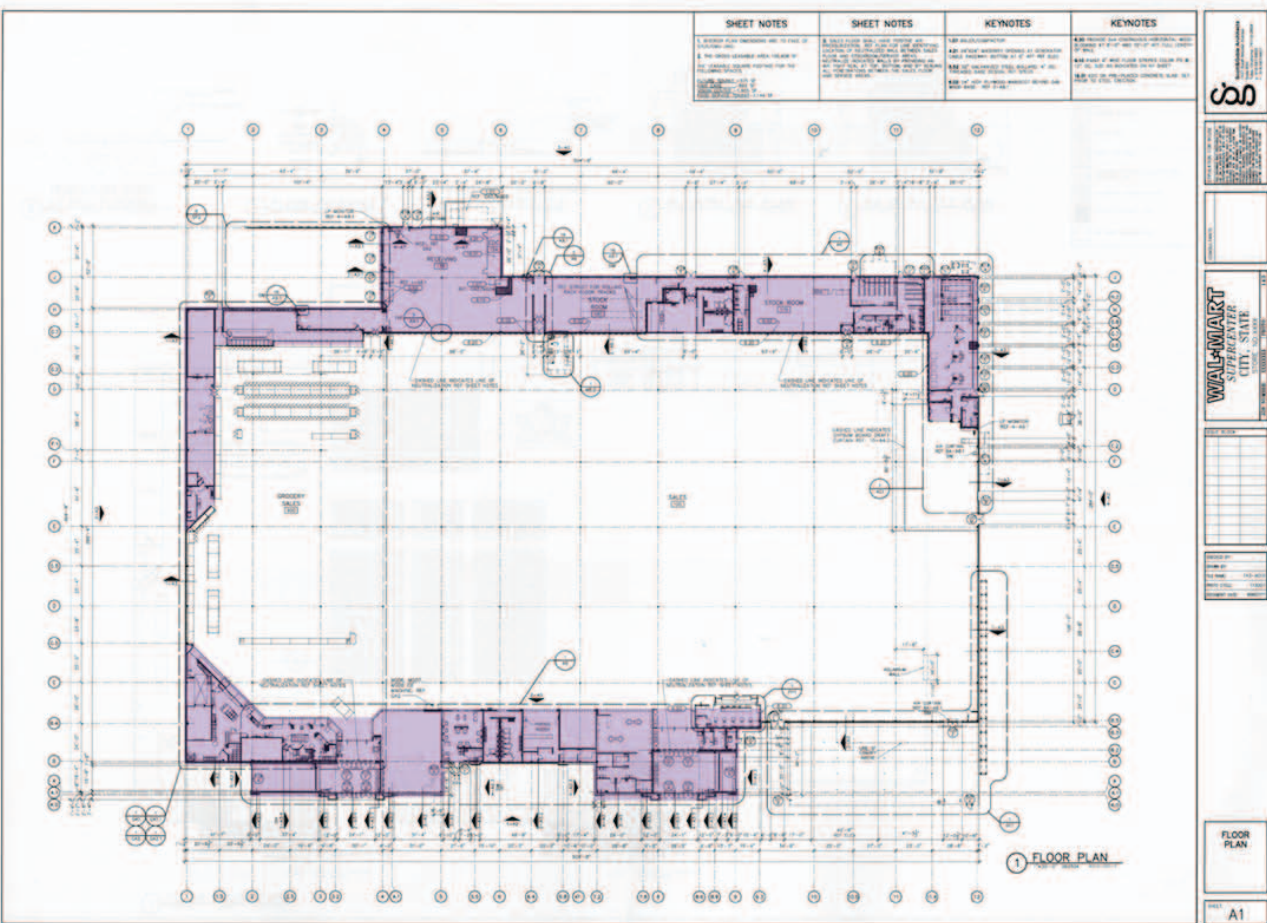


FIGURE 11: Walmart’s coordinated distribution system allows the company to reduce its on-site storage needs at each location.

FIGURE 12: This is substantially different than the earlier model in which great quantities of merchandise were warehoused in each store location.



small stock rooms. If one were to include all the areas off the sales floor, they account for roughly 25% of the total floor area of the store. By comparison, a prototypical supermarket layout from the 1955 manual *The Super Market* has 45% of its total area allocated to “non-sales” space and 55% for the sales floor (Figure 12).<sup>33</sup> This change in amount of floor area dedicated to storage versus that dedicated to sales is significant because it helps to emphasize the shift in the function of the buildings. In the past, the retail outlets were designed to receive goods they would sell in excess of what they could sell each day. The stores were shops and warehouses together whose stocks would be replenished by the warehouse or supplier on a regular, if infrequent, basis. By contrast, Walmart’s supercenter is designed to evacuate its goods as quickly as possible. It is detrimental for the company to have excess stock in its retail outlets because it signals inefficiencies in their information and logistics networks.

Walmart’s entire inventory system is designed to be as fluid as possible. Ideally, the merchandise in question is never sitting still. In this light, referring to the supercenters as “stores” is in fact misleading because they are designed to do the opposite. The etymology of the term is telling however because it originates in the Old French *estorer* and in turn from the Latin *instaurare* – “to renew.” Presented thusly, the “stores” performance becomes clearer. They are not designed to accumulate material but to cyclically amass and dispense it. To manage this material, the layout of the sales area of a typical supercenter is highly specific and constrained. In this sense, as will be described in more detail below, Walmart supercenters operate in an infrastructural register as conduits and valves, capable of renewing and modulating the “flow” of material.

The supercenters’ locations are determined by a number of factors but one thing they all share is a direct relationship to a local distribution center. In an effort to understand the growth patterns of the company, University of Minnesota economist Thomas Holmes mapped the locations of Walmart’s retail outlets over time in order to show the expansion of the company outward from its headquarters in Bentonville. One important aspect of this is the concentric growth: new stores are always built adjacent to existing ones and the new locations are largely determined by the proximity of Walmart’s distribution centers. Walton describes this process by writing, “We figured we had to build our stores so that our distribution centers, or warehouses, could

take care of them, but also so those stores could be controlled... each store had to be within a day’s drive of a distribution center.”<sup>34</sup> From the outset, this mode of conceptualizing Walmart’s territory as concentric, calibrated, and, above all, controlled, dominated the company’s expansion. Rather than identifying receptive markets, regardless of their relative position to corporate headquarters—as most of their competitors were doing—Walmart grew steadily outward from Bentonville in an effort to avoid exposing itself without first developing adequate logistical support mechanisms. Holmes’s mapping project makes this very apparent and visualizing the stores throughout the United States in such a way amounts to reinscribing the nation’s transit network. For example, the store locations in North Dakota follow the route of Interstate 94, located at a consistent interval, each roughly half a day’s drive from the next. The location of these retail outlets conforms to a modified real-estate logic in which Conrad Hilton’s maxim of “location, location, location” is supplemented by “delivery, delivery, delivery.” The location of the distribution centers then becomes key to securing these delivery channels. David Glass, Sam Walton’s successor as CEO, acknowledges that this strategy was seen as counter-intuitive by many of Walmart’s competitors:

We drew a circle two hundred miles around Bentonville, and we said we can put stores in that circle. We recognized that if you wanted to grow the business rapidly, you would need another distribution center, and so we decided to put up a second one. There was conjecture on the part of Wall Street analysts on whether we could operate these centers away from Bentonville. We built one in Searcy, Arkansas, in 1978. We drew a circle around it and made it work.<sup>35</sup>

Glass goes on to describe the process by which he and Walton would decide where to locate the company’s first stores:

For years and years we just simply expanded those circles out by strategically locating DCs. There was a tremendous flight from the inner cities to suburbs, and so our strategy was to go to Dallas or wherever and build stores in the suburbs; not because we wanted to be in small towns closest to Dallas but because that’s where the population growth was.<sup>36</sup>

Location and delivery—logistics, in other words—have been a key component of Walmart’s expansion strategy from the beginning.

Though Walton’s and Glass’s accounts present a seemingly unscientific, if not intuitive, process, the company’s real estate operations have developed into a highly rationalized approach. In order to locate new stores and in order to manage their inventory, Walmart relies on an expansive network of data capturing and data management systems. These efforts essentially provide the “intelligence” for the company’s logistical operations. Walmart has one of the largest

private satellite networks in the world and uses it to communicate directly with its many branches.<sup>37</sup> As the company’s headquarters are in Bentonville only, the centralization demands ways to ensure the constant openness of transmission channels. Similarly, Walmart has developed proprietary software that it uses to record and process consumer data. This program, called Retail Link, is available to all the company’s suppliers and allows them to make adjustments their inventory levels. All this data naturally requires a great deal of server space for which Walmart relies on data centers, one of which is just over the Missouri border.

### DATA CENTERS ARE INFRASTRUCTURE IN DISGUISE

Walmart’s data center is connected to the company’s entire infrastructure network but built to disappear. Buried in the ground and hidden from view, the highly secured building is more legible as one moment in a network of transmission rather than as an isolated building. Its location, form, program, and use all present a version of architecture characterized and determined by the logistical system in which it plays a crucial role. As an automated structure that serves primarily as a relay station, few provisions are made for its human occupants. Instead, its design is aimed at optimization and the seamless merging of building, infrastructure, and information.

Roughly the size of a standard supercenter, the anonymous data center is located in McDonald County, Missouri, almost literally on the Arkansas border. Benton County, on the Arkansas side, prohibits the sale of alcohol except at licensed stores. As a result, there is a wholesale “Liquor-mart” and a Walmart able to sell beer and wine, just over the border at Missouri’s first exit off the interstate – the same one used to access the data center (Figure 13).

The building is surrounded by the rolling hills of the Ozarks, but the pastoral image is at odds with the heavily secured and fortified site. Four security cameras cover its manned entry gate and two layers of chain link fence capped with razor wire surround the entire complex. While the security cameras are presumably linked to an internal control room, it is the McDonald County sheriff’s department that is dispatched when suspicious activity is recorded.<sup>38</sup>

There is no “front” to the building but only a face of the enclosure where it is most efficient to provide a human entrance. There is also an opening for large trucks that allows them to dock with the building

and unload their cargo, the object entrance. Data presumably “enters” the building through a series of subterranean conduits connected to the large satellite enclosure in one corner of the site. The interior itself is almost completely surrounded by insulating earth berms. Flanking the flat expanse of the roof are two large ventilation arrays, though conspicuously, any signs of air-handling units, chillers or exhaust vents are artfully disguised (Figure 14).

Compared to another data center, the one belonging to Google Inc. outside of Portland, Oregon, Walmart’s version is considerably more discreet. The Google version is located to reflect the thirst for cheap power next to a hydroelectric dam. However, unlike Walmart’s version, the design of the Google data center emphasizes the assembly of metal-clad cooling components atop the mute container of servers (Figure 15).

While both versions of the data center conform to similar requirements, the difference between the two illuminates certain features of Walmart’s spatial operations. The Google complex is rendered discrete and autonomous, legible as a building in a very conventional sense. Its mechanical features are even architecturalized and decorative. Conversely, the Walmart datacenter through camouflage and fortification has been designed to disappear or to become absorbed into the infrastructural network to which it is connected. It is difficult to understand the Walmart data center using visual criteria. In fact, Walmart’s data center, though a ‘big box,’ is designed completely outside of any visual regime. Would it be possible to introduce another term that would be capable of acknowledging the ambiguous conditions evident in a building like Walmart’s data center?

As a starting point, a term like “transbuilding” could be a way to describe constructions like these that are automatic and whose physical limit is ambiguous. Because the Walmart data center and other buildings like it are integrated into significantly larger systems, their territorial influence expands beyond the limitations of their built enclosure. Likewise, each of these systems are composed and constituted from the “inside-out” in the sense that their ultimate configuration reflects the specific requirements of information and material transmission.

As they act as information pathways, transbuildings could also be understood as media within a network of communication. In *Understanding Media: The Extensions of Man*, Marshall McLuhan never





FIGURE 13: Walmart's data center is just over the border.

specifically addresses architecture as a medium but by understanding it as such, the role of the transbuilding as a conduit becomes clearer.<sup>39</sup> According to McLuhan, “the ‘content’ of any medium is always another medium. The content of writing is speech, just as the written word is the content of print, and print is the content of the telegraph.”<sup>40</sup> Though a simplification, the concept clarifies the manner in which Walmart’s architecture is deployed – not just as isolated instances, but also as part of a broad infrastructural regime in which the buildings act as markers intent on securing positions in what is perceived to be hostile territory.<sup>41</sup>

The image of Walmart’s architecture is produced in the popular imaginary by its supercenters and their common presence in the suburban and exurban landscape. Moreover, this architecture is constrained to an 18-inch zone between the edge of the parking lot and the interior of the store. In this sense, information is attached to the exterior walls of the buildings and plays a communicative role. These encrusted facades also serve to reinforce the boundary of the building itself. However, understanding that any given building is also the local manifestation of Walmart’s vast organizational network suggests that the architecture is not only an information *receptacle* but is also an information *conduit*. Information is *applied to* the building in the form of decoration but information also *moves through* the building in the form of material and data. This is then especially evident in a building like the data center because the former category, i.e. the symbolic function of the building, is eliminated completely. In this sense, the term transbuilding—even as a placeholder—is useful because these buildings are also not purely infrastructural in the way a roadway or substation might be. As neither one nor the other but both simultaneously, transbuildings could offer alternative modes of deploying architectural intelligence.<sup>42</sup> Rather than insisting on designing objects and enclosures, what would happen if architects sought to design conduits and orchestrate connections? As a final case study, Walmart’s distribution centers suggest some preliminary answers.



FIGURE 14: Walmart's data center maintains a low profile.



FIGURE 15: Google's building is more legible and embellished with screens around its air-handling units.



*DISTRIBUTION CENTERS ELIMINATE ENCLOSURE*

The lynchpins of Walmart’s logistics regimes are its distribution centers, or DCs. These large processor-buildings are used to first establish new market centers and are key to the company’s expansion efforts. While the supercenters are the most legible of Walmart’s built artifacts, the distribution centers are the most important. These structures can also be understood as transbuildings because not only are they automated in pursuit of optimized transmission, they also serve to eliminate building envelopes altogether.

DC 6094 outside of Bentonville, for example, has an area of over 1,200,000 square feet and turns over more than 90% of its contents *every day*. Trucks bearing containers full of merchandise from suppliers unload their contents onto conveyors that sort it into short-term, high-density storage shelves. Workers connected to the Walmart database inhabit these corridors to pick and assemble supply orders for the local supercenters based on the information supplied by the company’s computers and stored in its data center.

The building itself is situated outside of Bentonville and built to serve the region. In addition, the company uses it to demonstrate its expertise in logistics and distribution technology. Its rural location, though gradually being surrounded by new housing developments, presents no constraints for the building’s size. It is oriented almost exactly on a north-south axis and is accessed via State Road 12, also known as SW Regional Airport Boulevard. Trucks have a dedicated entrance and exit controlled by staffed checkpoints. Cars for employees or visitors use a separate entrance and parking lot. To emphasize the importance of distribution, Don Soderquist writes:

The development of a warehouse system to receive, store, and ship merchandise to our stores was basically a necessity. Our stores were in small, rural markets, and the store manager could order only limited quantities of thousands of items of merchandise...it was almost impossible to maintain a continuous flow of merchandise to our stores.<sup>43</sup>

As the company matured, this warehouse system developed into a distribution system whose primary purpose was to move goods as quickly as possible to where they were needed by the company.

The site of DC 6094 itself is as much for the trucks as it is for the building. Almost half the area is dedicated to trucks and trailers that are unloading their contents, receiving a new shipment, or waiting for pick-up or delivery. One of Walmart’s logistics innovations is a practice known as “back-hauling” in which delivery

trucks, after dropping off a shipment, will be reloaded with another shipment on their return journey.

Soderquist describes this process in the following way:

Computers are a vital link in dispatching trucks to the store and add to our efficiency in moving freight. Onboard computers are used for communications with all drivers while they are on the road. Since we already have so many outbound trucks driving down the highway and delivering merchandise to our stores, it didn’t make sense to haul empty trailers back to the distribution centers on the return trip. Since we drive right by many of our suppliers’ manufacturing plants, we decided to have our truckers stop and pick up that merchandise and bring it back with them, which saved significant costs on inbound freight. The onboard computers made this possible... Today, our own trucks deliver over 50 percent of our inbound merchandise to our distribution centers.<sup>44</sup>

Though described as if the decision were simply one of common sense, the implementation of it relies on Walmart’s extensive communication systems. Since the company owns its trucking fleet completely and since at any given time a significant portion of the company’s merchandise is held in its trucks’ trailers, in a way, the vehicles themselves become part of the buildings. Furthermore, these trucks operate on predictable and stable circuits; making the same trip back and forth over and over again. Like a network of nimble freight elevators, the computer-controlled trucks play a crucial role in Walmart’s spatial enterprise and are as much a part of its architecture as the supercenters.

The layout of DC 6094 is also highly specific and tailored to Walmart’s precise materials handling needs. Trucks unload their material in the larger lower portion of the building. Once the merchandise has been unloaded, it is broken down and sorted to different storage areas based on type and quantity. DC employees roam these storage areas and, via their earpieces and scanners strapped to their arms, are told when to put what where. Once this task of “picking” is completed, the building does the rest by moving the container of picked goods along its path and, through electronically controlled actuators, routing it to the appropriate docking bay that corresponds to the correct Walmart store. This is also where Walmart’s “cross-docking” operations take place:

We tested the concept by building a long, narrow, extended arm on one of our new distribution centers and putting multiple doors on either side of the extension. A driver backed his truck into one of the doors on one side. As the merchandise was unloaded from that truck, some of it was moved to another truck on the opposite side bound for another distribution center. The merchandise was moved directly between trucks without any additional handling ... Cross-docking became the pattern for all new distribution centers.<sup>45</sup>

Significant in this passage is the malleability of the company’s built products. While this process of optimization described above is seen more as a problem-solving venture, it nonetheless has architectural and territorial consequences. It also

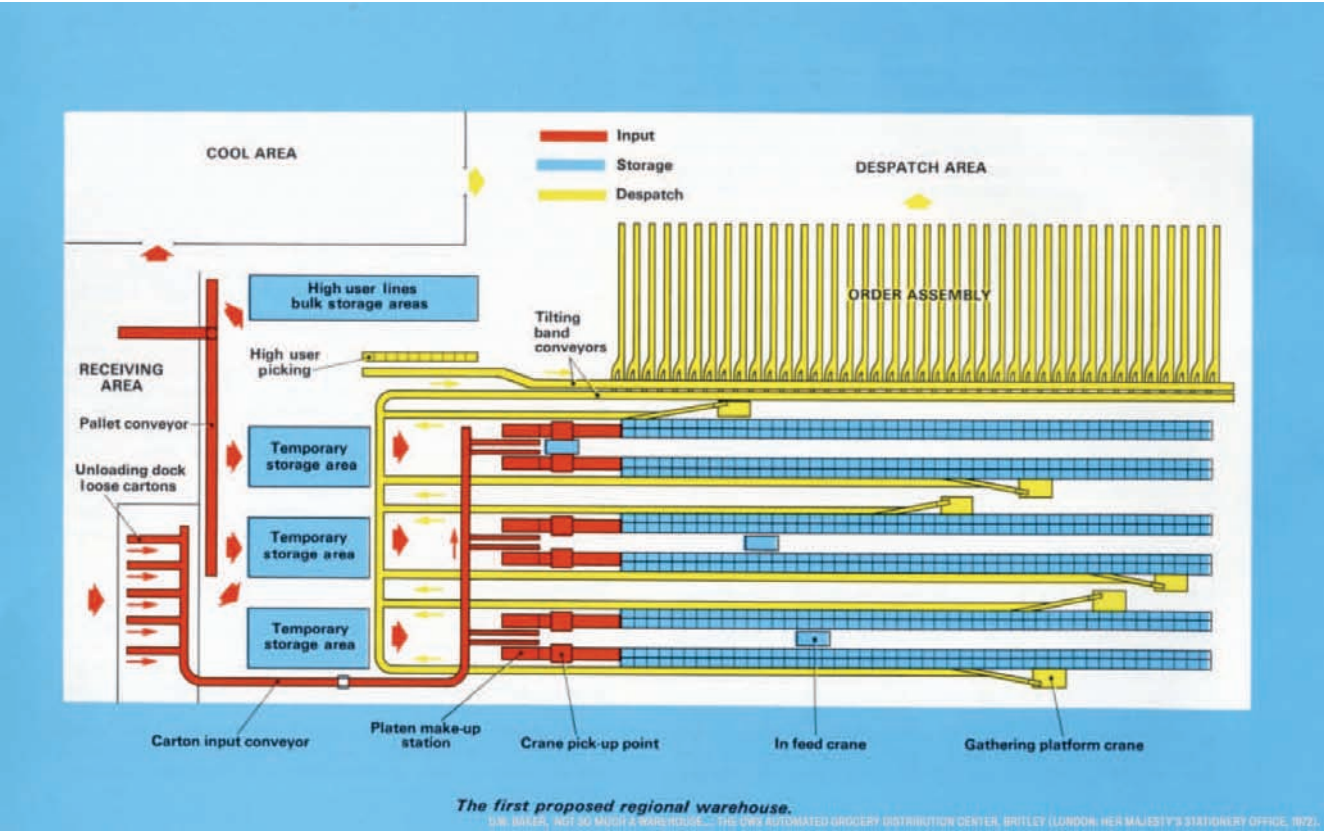


FIGURE 16. The CWS Automated Grocery Distribution Center, Britley, UK.



reinforces the way in which the company sees its architecture: not as built enclosures but as interconnected systems of movement that can be managed and calibrated. In fact:

Throughout the day, all distribution center managers monitor the production process on their computer screens to see how the work is flowing and where any bottlenecks may be developing. They can move associates from one area of the distribution center to another at a moment's notice in order to keep the merchandise flowing. This is incredibly important, as the staggering volume of merchandise that each center receives and ships each day makes maintaining the highest level of efficiency a crucial priority. This type of process flow analysis is quite common in manufacturing but is has been revolutionary for distribution centers.<sup>46</sup>

Apparent here is the conflation of the workers with the merchandise they are handling. In Soderquist's account, managers can "move" people to areas that need more attention in the same way that they would move merchandise from one truck to another. His acknowledgement of Walmart's appropriation of management techniques from manufacturing is also telling for its understanding of Walmart's role within regimes of production and circulation. However, these buildings are not just providing the armature for the automation of information and material management, they are automatic themselves, neither producing nor containing but, as described by Soderquist, *circulating*. Furthermore, the performance of these buildings is sustained and continuous. According to Walmart's former Vice President of Logistics, Rollin Ford, "This is a fluid process, it's just constant, it never stops."<sup>47</sup>

If the merchandise in constant circulation is conceptualized as data as much as physical material, as "media" in fact, and if we can accept that the content of one medium is another, then understanding architecture as a medium can recast it to productive ends. If its duties can expand from enclosure to include transmission, how might it affect the way it is designed? What does it mean when buildings become less concerned with inhabitation and containment and instead function more as processing devices? In the case of Walmart, its buildings are not isolated objects but are local manifestations of a dispersed network and the space they enclose is part of a continuous set of interiors connected, as it were, by the dynamic network of distribution.

This connection to and dependence on Walmart's distribution network complicates the identification of the buildings' physical limits. Even though this is especially legible in the case of DC 6094, it is apparent in earlier representations of similar building types. For example, in a schematic plan of an automated distribution center outside London, the building's

edge is acknowledged but not given any architectural definition. The primary criterion seems to be that of simply difference: inside is white and outside is blue (Figure 16). But we should recognize that the white interior is connected to numerous other "interiors" through the distribution network. Thus, while the envelope defines a physical limit of the building, its lack of depth in this image is revealing because in it we can read a shift to an architecture of circulation rather than that of enclosure.

In the distribution centers of Walmart and their materials handling subcontractor Dematic, this tendency to dissolve the envelope is rendered more plainly (Figure 17). In a series of images taken from the company's promotional material, Dematic presents diagrams of various projects (Figure 18). While a physical envelope, i.e. a "building," ostensibly surrounds each of these materials handling systems, it is consistently ignored or removed in the renderings. Though there is a pragmatic explanation for these visualizations—one has to remove the roof and walls to see the interior—it is also indicative of a larger attitude toward the buildings themselves. For example, in one illustration, the building's conventional edge is not shown *but the trucks are*. This is significant because though the immediate enclosure is removed, the vessels that connect one interior with the next are included (Figure 19). The physical limit of the building is thus difficult to discern. In light of the fact that the primary role of these built forms is the circulation of goods/information, then this image is evidence of an expansion of the local instance of a building into a larger network of transmission. One might even say that the logistical system begins to absorb the architecture.

Rollin Ford's statement that the Wal-Mat distribution system "never stops" helps to cast the operations of the company in a different light. Beyond the fact that the contents of the system never stop moving, it is more significant that the system *itself* is constantly transforming at different scales of time. If one follows a single object along its path, one misses the larger picture of millions of objects moving simultaneously within a dynamic and expanding organization. The single barcode is monitored at an instantaneous time scale, the containers carried by the trucking fleet change their position on a daily period, and new destinations in the form of new Supercenters are added to the system weekly (requiring more trucks and in turn more distribution centers that then allow

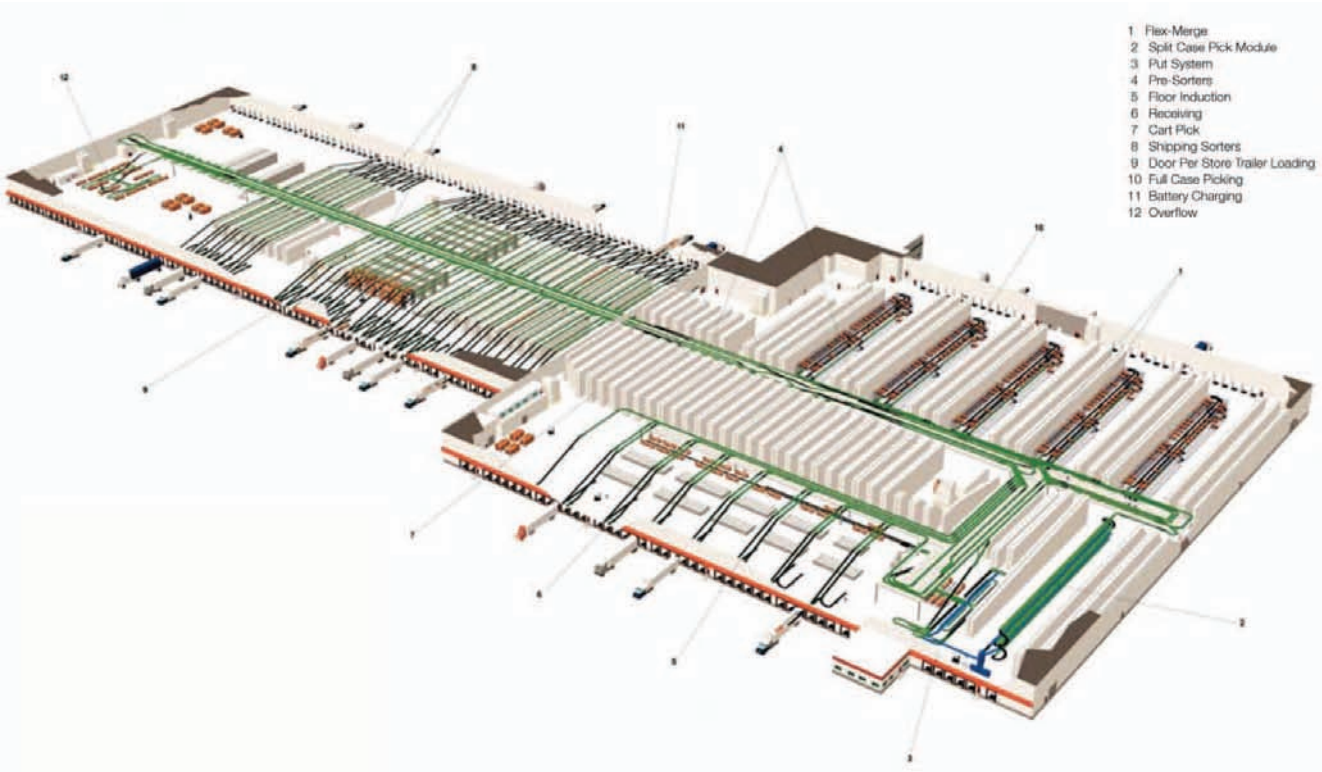


FIGURE 17: Diagram explaining the components of the sorting facility.

for more stores to be built, etc...). Distribution begets distribution as the interconnected interiors continue to propagate.

The contents of the medium no longer exist in any one place, they only register as echoes within an ephemeral geography of circulation – as soon as their location is fixed, they are already somewhere else.

It never stops.

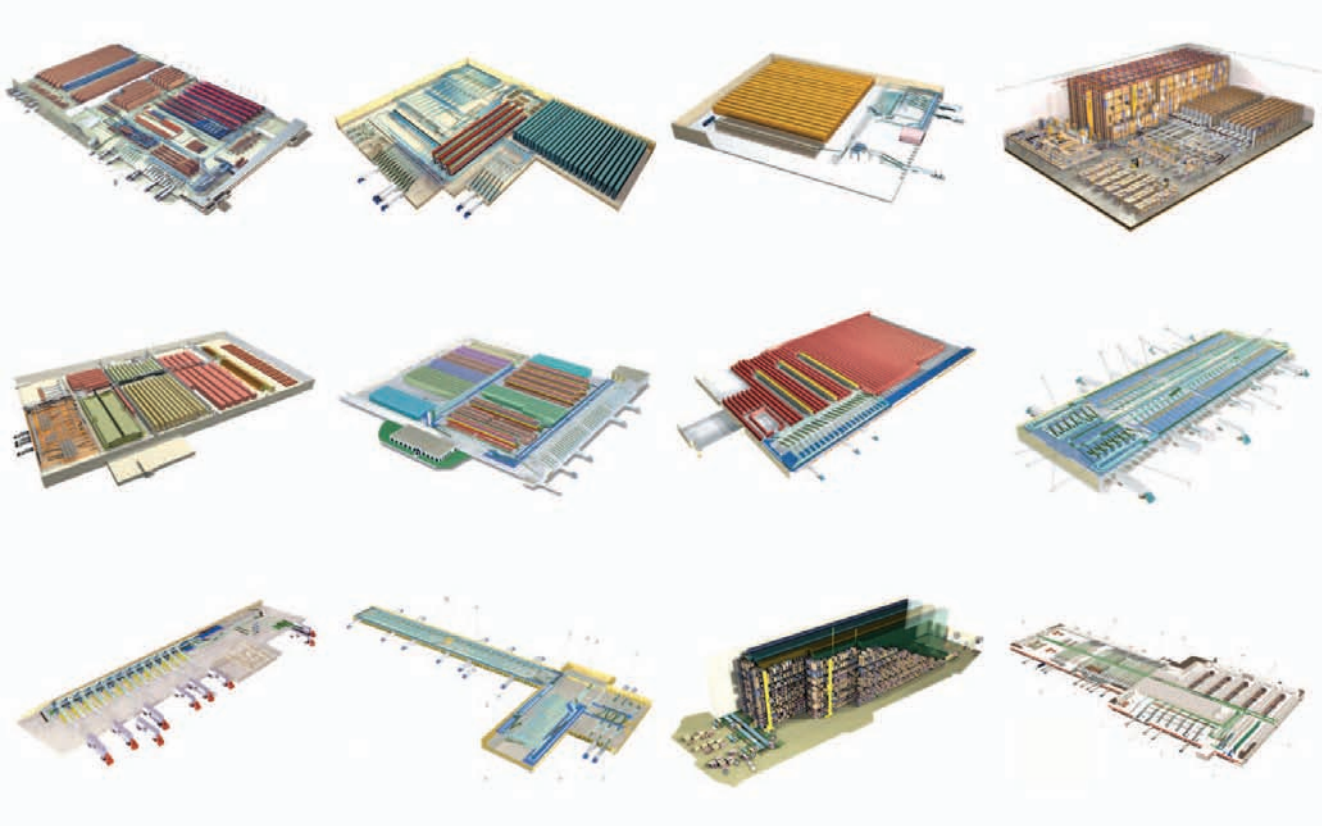


FIGURE 18: Dematic designs custom configurations for each of its clients.

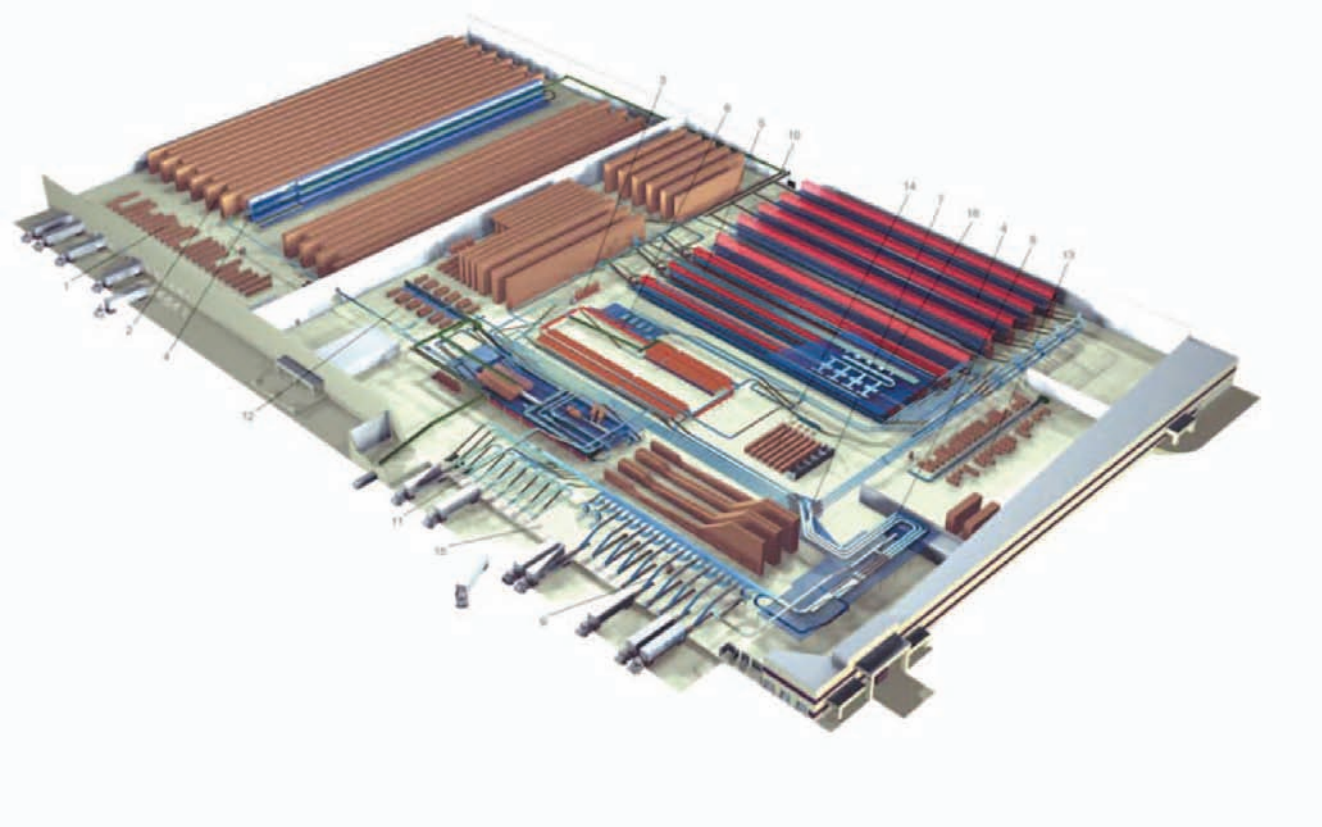


FIGURE 19: Distribution center detail in which walls are omitted but both internal organization and external connections are indicated.





FIGURE 01: Promotional material for Saunders’s new venture. He often referred to his stores as a family and would describe openings as births.

## INTERLUDE A

### THE NEW ELECTRIC BABY

The Keedoozle is a cross between an automat, a shooting gallery and an automatic printing machine.<sup>1</sup>

The Keedoozle is the biggest thing that ever hit the grocery business...

It can’t miss.<sup>2</sup>

Clarence Saunders was convinced that his third attempt at getting rich was fail-safe. And he stuck with it. On and off for the last 20 years of his life, he worked on developing a project for an automatic shopping environment that he called “Keedoozle.” The name was always a big thing for Saunders having founded the “Piggly Wiggly” grocery chain as well as the “Clarence Saunders: Sole Owner of My Name” stores. Keedoozle is derived from a contraction and modification of the phrase “Key Does All” in reference to the device customers would use to select their merchandise. Saunders (1881-1953) was convinced that having a sample of each item for sale behind glass would increase efficiency, increase hygiene, and reduce theft (Figure 04). Patrons (or patronesses as was more likely the case in the 1930s) would survey the available goods and then register their selection by attaching the key—often described as a cross between a camera and a gun—and pulling a lever that would in turn perforate a strip of paper (Figure 06, 07). That strip, after accumulating a list of all the desired items, would then be brought to a cashier where it would be fed into a “translator” that would in turn trigger a series of belts and trip switches to automatically direct items into a tote that would momentarily and miraculously appear through a small door next to the cashier. The registration process of the items also tabulated their cost thereby eliminating the time needed to check out. Customers would pay the total while their items were being retrieved and would then be on their way. This format is different than an “automat” because in the latter, items are purchased one at a time and the item on display is the one the customer will buy. In the early Piggly Wiggly stores, customers acquired the labor-role of the clerk through the process of serving themselves. In the Keedoozle stores, customers took on the role of the inventory manager by effectively notifying the store of what merchandise was being depleted and what needed to be restocked.<sup>3</sup> The automatic stores themselves functioned liked miniature distribution centers with automated conveyors and “trip shelves” that would allow workers in the storeroom to “pick” the orders placed by the customers and their keys (Figure 05). An examination of the plan shows the division of display room and stock room but is effectively two buildings in one – a showroom open to the public and a small-scale automated distribution center (Figure 08).

Accounts of Saunders’s new venture in popular media did their best to promote it, even if they acknowledged the complications of its baroque mechanism. Saunders





FIGURE 02: The stores were built in easily extendable Quonset Huts.

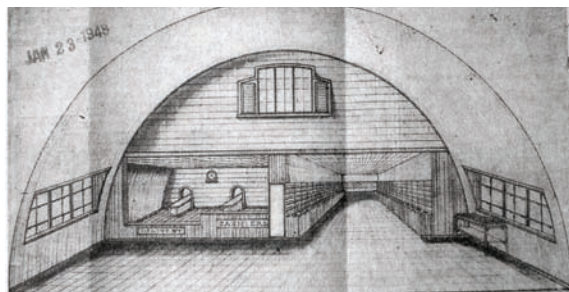


FIGURE 03: The image of the interior shows the dual-nature of the space; part shopping area, part distribution center.



FIGURE 04: Shopping is an aesthetic and hygienic experience.



FIGURE 05: Stocking the feeders manually.

was a bit of a local hero and, though eccentric and stubborn, it seems the community was pulling for him. In spite of such popular support, the technology of Keedoozle that was meant to vault shopping into the future proved erratic and costly. While Saunders managed to open three of the stores and had ambitious plans for expanding his empire of automatic stores, the system never developed as he hoped.<sup>4</sup> However, in Keedoozle we can locate several tendencies and aspirations that remain legible in the contemporary geo-politics of discount retail including an early form of a retail prototype and a system that prefigures contemporary automated distribution systems.<sup>5</sup>

In Figure 45 of U.S. Patent 2,661,682, Saunders includes a drawing of a generic territorial condition that suggests he was thinking beyond the prototype put forth in the plan (Figure 09). In the center of the drawing is a small square at the intersection of two roads and a railroad. The square is labeled “Distributing Store and Display Room” and is surrounded by a larger square simply labeled “City.” The roads leading from the central intersection lead to other smaller squares labeled only “Display Room” and each is in a different context: one is isolated along the arterial, one is surrounded by an eroded ellipse designated as “Village,” another by a rounded square also called “Village,” and a fourth set in a square with sharp corners labeled “Town.” Saunders’s proposal here is that the showroom and distribution hub would act a territorial level – customers would visit the store, use their key to punch in their order, and place it with the cashier. Their request would automatically be forwarded to the local “Distributing Store” to be consolidated with other orders and delivered to the store from which the order was placed. The communication amongst the display rooms in the local network would ensure that the distribution hub was kept well stocked. This local hub-and-spoke system suggests a much larger interwoven network of distribution centers and display rooms spread across the country and anticipate the model of territorial control adopted by Walmart.

The Keedoozle model was presented as a deployable prototype, it was infinitely extendable along one axis, 20 feet at a time (Figure 02). Saunders and his contractors evidently saw the capacity for these new projects to occupy in-fill sites. Keedoozle was designed as a format: deployable, extendable, and refined through wartime use. According to the contractor

hired to build the first store in Memphis:

The all-steel buildings come in 20-foot sections, and we have eight different widths... The Keedoozle will be 40x160 feet, and there won't be a piece of wood in it. It's been improved since the war. It's fireproof. We recommend concrete floors. All we need is to get vacant lots... These buildings standardize the stores and they will be exactly alike wherever they are put up. This means all the electric connections and plumbing will be alike.<sup>6</sup>

Significant in the description of the consistent formatting is not that the buildings are of the same design but that all the *connections* are standardized. The Keedoozle format is really a matter of infrastructural connection and signage; of engineering and marketing. The focus on concrete floors further reinforces this attitude. Rather than foregrounding the shape of the buildings or their vertical surfaces, the prototypes are described in terms of the required formatting processes necessary to enable their deployment.

The deployability of the stores was part of Saunders’s specific expansion agenda. Having already gone through two multi-million-dollar cycles of boom and bust—the first with Piggly Wiggly and the second with Clarence Saunders: Sole Owner of My Name—he put a great deal of energy into the Keedoozle project in the hopes that it would succeed again. His first fortune was the result of the Piggly Wiggly chain and a patent on self-service. Through a gutsy maneuver to corner the Piggly Wiggly shares, Saunders risked much of his fortune and lost almost all of it. He insists that the Board of Trade changed the rules on him—an outsider to the New York financial world—and had they not done so, he would have become incredibly wealthy. Saunders did not get over this easily and his development of a “fleet” of Keedoozle formats in order to mount an “invasion” of the Northeast seems as much expansion strategy as revenge opportunity.<sup>7</sup> The ambitions of the company demonstrate Saunders’s optimism in his new enterprise. His new store format would allow him to expand his territory in a dramatic fashion: 40 stores a year over five years for a total of 200. Up from 2 in 1949. Saunders had an earlier version of Keedoozle that he tried to get off the ground in 1938 but various technical difficulties made it far too expensive to keep open.

Saunders’s patrons saw his price policies as political acts of resistance against an overbearing set of regulatory policies. While the low prices were an affront to the business community, they were a boon for his customers. According to the chairman of the Memphis Consumers’ Advisory Committee,



FIGURE 06: Using the key to select desired items.

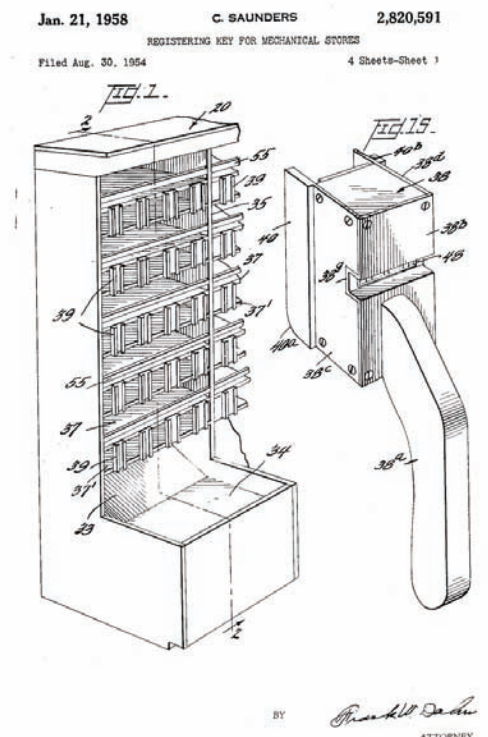


FIGURE 07: Selection and storage tools included in the 1954 patent application.



Dec. 8, 1953

C. SAUNDERS  
AUTOMATIC STORE

2,661,682

Filed Aug. 30, 1945

24 Sheets-Sheet 16

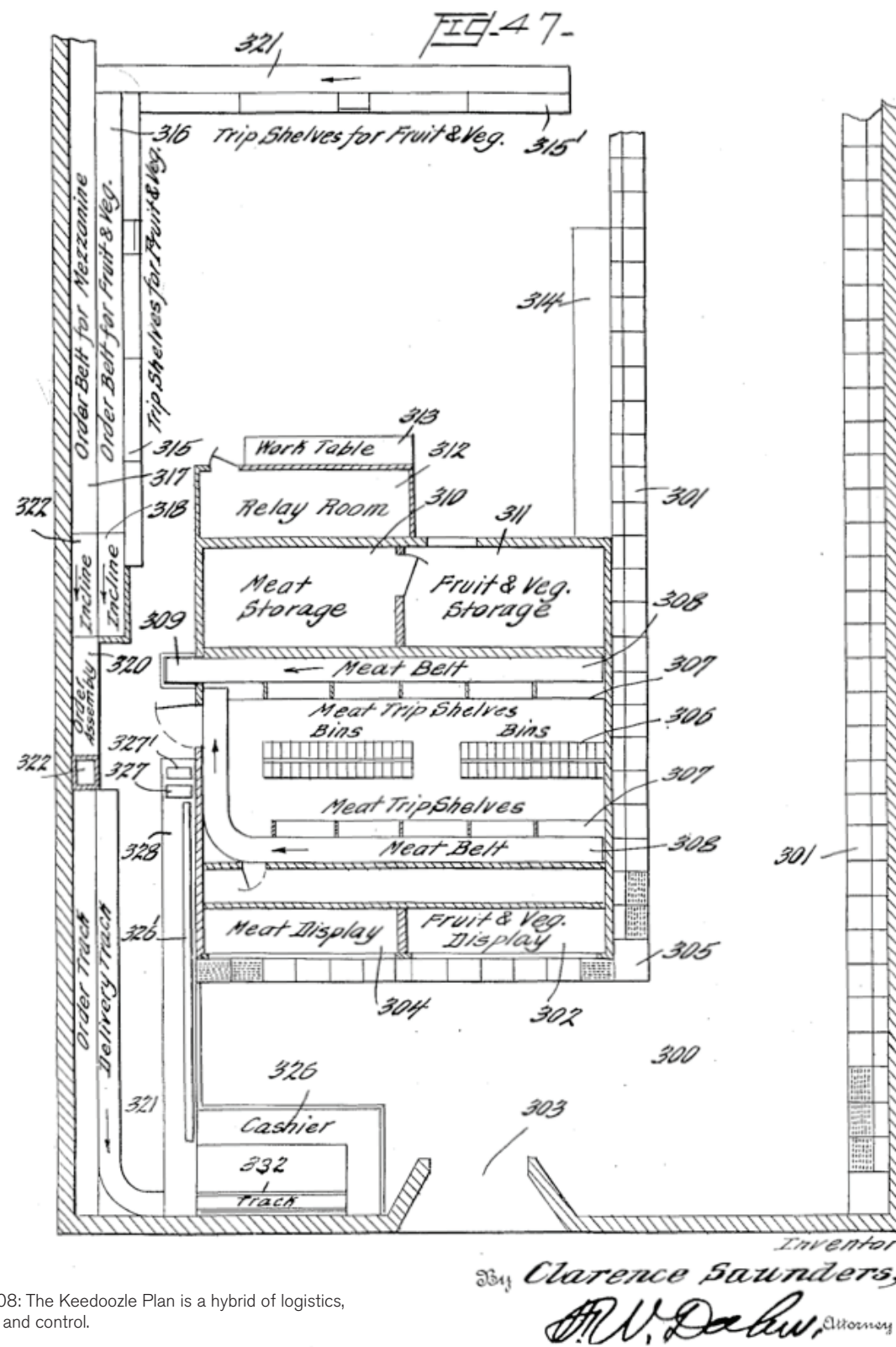


FIGURE 08: The Keedoozle Plan is a hybrid of logistics, shopping, and control.

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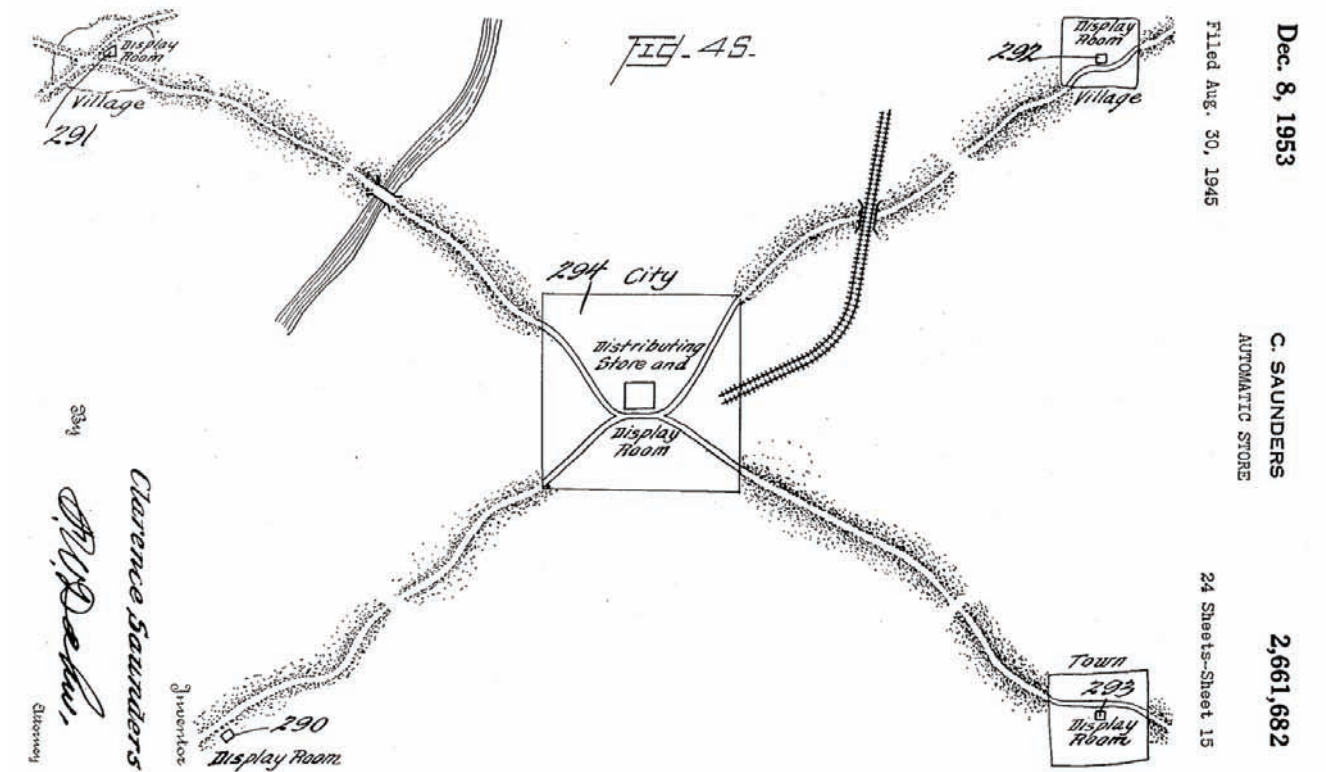


FIGURE 09: Saunders planned Keedoozle to operate at a regional level.

9

“Members of the committee and other housewives of Memphis highly approve of any methods that will bring down prices of their groceries.... The new Keedoozle system seems to do this. To us, Mr. Saunders’s efforts seem more truly American, than any blanket law which protects business from losses caused by its own inefficiencies.”<sup>8</sup> In this case, it is not the business model *per se* that is being praised but rather the store itself. Automation was not just a way to save money on groceries, it was a path to freedom.

Saunders surely only saw such support as more evidence of the righteousness of his cause. This was reinforced as well in the advertising copy that he produced to promote the opening of Piggly Wiggly. Large type at the top of the page heralds the arrival of “The New Electric Baby” that Saunders describes thusly:

You will find enchantment—real joy at Keedoozle. Mysterious it is, yet so beautiful your eyes will sparkle and your cheeks will glow with the excitement of the Keedoozle miracle—for a miracle it is... a miracle of brain and heart.

Of the brain in its ceaseless struggle to achieve. Of the heart that the achievement will unshackle the high cost of distribution and thereby lower prices to the millions whose groans at excessive costs are daily heard around the world. Of the heart that food will no longer be contaminated by the touch of a diseased hand to start a germ on its way into some home to strike down with pain and suffering a loved one, and sometimes more than that...down even to the grave.

None of this happens in Keedoozle. You see everything with your own eyes, but you don’t touch or smell anything till it belongs to you; and nobody else does it, either.

No basket ‘toting’... just a ‘key.’ No bumping into you by grocery clerks. They do their work in another room.

No dress or stockings torn. No slipping down on waste spilled on the floor, for there is none. You can shop in an evening gown with no chance of being ‘mussed’ up.

No worry about overcharging or ‘gipping’ at the checking stand. You pay exactly according to the price mark which is plainly seen in front of each item—no more and no less, for electricity does it all for you like lightning, even to the adding machine, without the touch of a human hand till you are ready for the merchandise to be wrapped.

Not self-service, but electric service.

This is Keedoozle.<sup>9</sup>

While Keedoozle never flourished the way Saunders hoped, the ideas that it materialized have maintained some currency. His efforts to tighten inventory control while offering consumers an entertaining shopping experience after which a parcel would appear, as if out of nowhere, seems to prefigure many contemporary modes of shopping. Catalog merchants had been around for sometime before Saunders but, as a grocer,

ordering from the catalog was less practical than going to the market. It also hints at the transformations that would arise as the result of the invention and implementation of the bar code. By placing his merchandise and perishables behind glass, Saunders prevents his patrons from handling them, thus abstracting the item to a certain extent. Patrons would select a representative of a thing, not the thing itself. While the bar code condenses information about a product in a more extreme way, Keedoozle patrons would produce their own codes to then be processed and to fill the order. But most interesting to this discussion are the nature of the building format itself and its implied geo-political aspirations apparent in Saunders’s plans for an aggressive invasion of northern states. The Keedoozle stores were highly mechanical and semi-automated. They were also designed be identical and to then be relentlessly deployed.

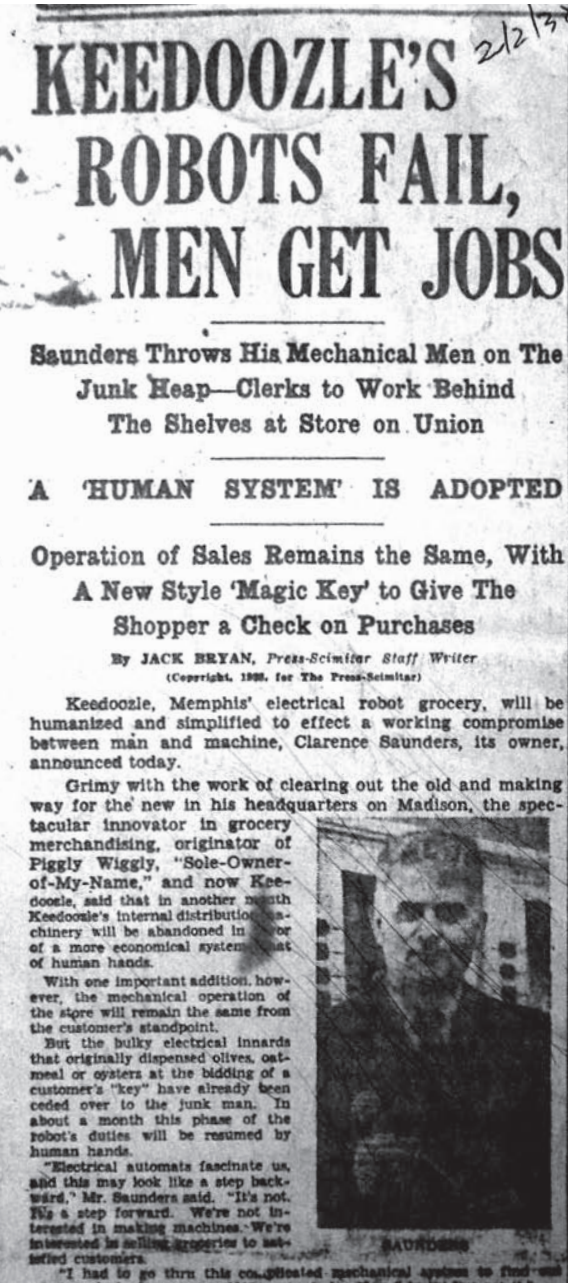


FIGURE 10: The end of Keedoozle.



Enhance 224 to 176.  
Enhance, stop.  
Move in, stop.  
Pull out, track right, stop.  
Center and pull back.  
Stop.  
Track 45 right.  
Stop.  
Center and stop.  
Enhance 34 to 36.  
Pan right and pull back.  
Stop.  
Enhance 34 to 46.  
Pull back.  
Wait a minute, go right, stop.  
Enhance 57 to 19.  
Track 45 left.  
Stop.  
Enhance 15 to 23.  
Give me a hard copy right there.

- Ridley Scott, *Bladerunner*, 1982

03  
LOCATION  
LOCATION  
LOCATION  
*Logistics and Real Estate*

*Airplanes override terrestrial infrastructure*  
*Satellites collapse distance*  
*Software turns everything into points*

*Surrounding Vermont*  
*Redrawing Merced*

*Mechanization takes command of location*  
*Sites are fungible*  
*Real estate is a logistical operation*

This chapter focuses on the technologies used by Walmart as part of its real estate practices. The process the corporation uses to decide where to build stores—when played out across its empire—suggests an understanding of territory as a field of data to be manipulated, and in turn offers insight into the mechanisms at work both shaping and producing significant portions of settlements in the United States. It addresses some of the corporate, cultural, and technological contexts in which Walmart took shape in the mid-1960s in an effort to make links to cold war planning protocols, network theory, and mastheads of free enterprise in order to show how Walmart’s executives, in spite of their geographic isolation, were highly engaged in industry discussions of technology and ideology. Furthermore, the company’s leadership understood their growth efforts not only as something good for business but as nothing less than a crusade for freedom. This belief in free enterprise manifests itself spatially through the development of Walmart’s network of architecture and logistics.

After establishing this context, specific methods the company uses for determining the locations of its new stores are described in more detail. By tracing the shift from site selection on the ground (by car), to the air (by personal aircraft), to outer space (by satellites), and finally to digital networks (by software), it will be argued that this process renders the sites in question—and territory more generally—in increasingly abstract terms. This shift from seeing space multi-dimensionally and directly to seeing it one-dimensionally and remotely allows Walmart to operate as it does but also suggests the need to reassess the ways in which territory might be understood and articulated. In an effort to illustrate these claims, two case studies related to Walmart’s expansion are examined: the first is a set of stores in and around the state of Vermont and the second is a proposed a distribution center in Merced, California. The chapter concludes with speculations about the significance of these issues relative to territory and urbanism.

Logistics produces certain ways of understanding area: the process of location is increasingly mechanized and choices that impact urban development informed by machines with a set of criteria based on performance and delivered by the company’s centralized command system; the manner in which real estate is moved, supplied, and deployed amounts to a logistics of territory; this in turn produces sites understood in increasingly fungible terms, as resources to be

amassed, hoarded, and liquidated if necessary.<sup>1</sup> Walmart's success in the retail industry is linked to a group of executives who were committed to exploiting technology that precipitated from a flurry of investment as a result of Cold War build up and from a commitment to defending free enterprise in the face of the perceived threat of communism. Walmart's commercial communications, satellite networks, redundant information management systems, heavy investment in telecommunications technology and space-based policies that combined decentralized and distributed coverage have all been translated from military and economic discussions of which Walmart executives were well aware.<sup>2</sup>

Walton was notoriously conservative with investments in new technology but was always searching for ways to increase the company's efficiency. In 1966 he traveled to IBM's headquarters in Poughkeepsie and enrolled in a retail-training seminar.<sup>3</sup> One of the speakers at the seminar was Abe Marks, the first president of the National Mass Retailer's Institute, a trade association for discount retail. Marks invited Walton to join the institute and he quickly became an active participant, even serving on the board for 15 years. According to Walton, Marks "shared with me how he used computers to control his merchandise."<sup>4</sup>

According to Marks:

What we helped him with in the early days was really logistics. It's like in the Army. You can move troops all over the world, but unless you have the capacity to supply them with ammunition and food, there's no sense putting them out there. Sam understood that. ... So to service these stores you've got to have timely information ... [Walton] became the best utilizer of information to control absentee ownerships which gave him the ability to open as many stores as he opened ... Without the computer, Sam Walton could not have done what he's done. He could not have built a retailing empire the size of what he's built, the way he built it.<sup>5</sup>

Marks's emphasis on logistics and information control at the strategic level echoes with the military conversations going on at the time of which, as a high-ranking leader of NMRI with links to IBM, he would have been well aware.

Walmart has maintained close links to NMRI even through a series of mergers and reorganizations. Now known as the Retail Industry Leaders Association (RILA), it "promotes consumer choice and economic freedom through public policy and industry operational excellence." Walmart has consistently had an executive presence on the RILA board of directors and currently both Don Soderquist, Walmart's former Chief Operating Officer, and Eduardo Castro-Wright, Walmart's Vice President, members. The RILA is also, like Walmart, opposed to organized labor.

Soderquist, aside from remaining the "keeper of the culture" after Walton's death, was also an early member of the organization Students in Free Enterprise (SIFE) along with Jack Shewmaker, Walmart's former president and chief operating officer. Shewmaker was one of the Walmart executives most adamant about developing the company's communications system and one of the key figures responsible for implementing their satellite network. He was especially devout in his belief in the principles and virtues of a free-market system (*Capitalism and Freedom* by Milton Friedman was first published in 1962, the year Walmart was founded). These convictions prompted Shewmaker to play a prominent role in SIFE whose aim is to "bring together a diverse network of university students, academic professionals and industry leaders around the shared mission of creating a better, more sustainable world through the positive power of business." Consisting of 40 countries and over 42,000 members, the organization oversees a range of development projects organized and run by students. While the organization promotes its anodyne logo and acronym "SIFE" in its promotional material, the actual name demonstrates the organization's ideological foundations.

Shewmaker's time at Walmart in the late 1970s and early 1980s coincided with the economic policies of the Reagan administration. There were also prominent public intellectuals committed to these principles. For example Herman Khan's 1982 publication *The Coming Boom* optimistically predicted the arrival a new period of prosperity in the US as a result of unregulated free enterprise and technology. Relevant to the discussion here is Kahn's identification of information as one of the key elements of future technology and the role that large computer systems would play in order to "extract the maximum information out of whatever data is on hand."<sup>6</sup> It is likely that Khan's presence loomed large in Shewmaker's approach to developing Walmart's relationship to technology. It is also significant that Shewmaker's successor as the chairman of SIFE, Stanley Gaines, is married to Gay Hart Gaines, a former member of the Hudson Group, Khan's think tank that he began after leaving the RAND Corporation.<sup>7</sup>

Connections with RAND are significant because of the role the think tank played in Cold War policy organization, and, more significantly, in Cold War territorial organization. In "War Against the Center," Peter Gallison shows how civilian officials in the

government were asked to assess their own towns' vulnerability to nuclear attack and to subsequently develop plans to decentralize industry and protect such systems with spatial strategies. He argues that the process of actually assessing their own settlements was key because "they began, quite explicitly, to see themselves, to see America, through the bombardier's eye ... each community, each industry, each factory was pressed into service this way, pressed to see itself this way, rather than simply receiving a designated perimeter line drawn by the federal government."<sup>8</sup> Gallison links this psychological shift with other postwar planning developments including the federal highway act and research at the RAND Corporation on distributed communications. Gallison summarizes the significance of his claims:

The obsession with protection in space labeled and levered the process of dispersion, validated deurbanization as a patriotic duty, certified decentering national life as a bulwark of national survival, linked it with the Office of Defense Mobilization, published it through industrial journals, tied it to the metropolitan planning processes, and paid for it with billions of dollars of tax rebates and zoning shortcuts.<sup>9</sup>

Through the development of his argument, Gallison spends time discussing research at the RAND Corporation, at the time still headed by Kahn. RAND was concerned not just with the physical installations of America's industry but also with their telecommunications systems. In pursuit of this, Paul Baran was hired from the Hughes Aircraft Company (the same company that would go on to develop some of the first commercial communications satellites, including the SBS-4 used by Walmart). Baran developed a series of papers that argued for a decentralized and redundant communications network. One paper in particular presented a diagram that is now widely recognized as an early model of dispersed digital communication, including the now famous ARPA-NET (Figure 01). Such robust and multiply redundant systems have become part of the vocabulary of many branches of network management, including logistics and retail. This is evident in the 2010 Retail Industry Leaders Association annual logistics conference program that adapts Baran's diagram for its cover, some 45 years after its initial publication (Figure 02).

Gallison's text in this case is not meant as an analogy for how Walmart locates its stores but rather as evidence that Cold War planning had significant spatial dimensions to it and also to help better understand the cultural moment out of which Sam Walton was developing his brand of discount retailing. However, Walmart's approach is similarly staked on

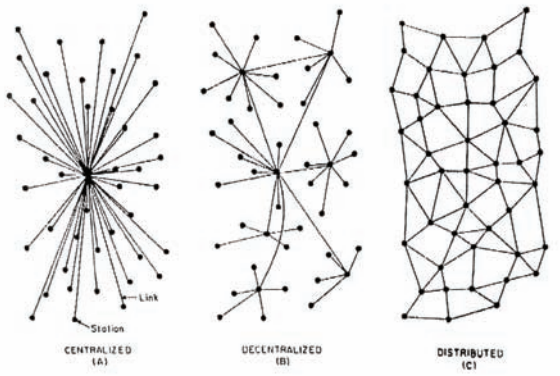


FIGURE 01: Paul Baran's network diagrams.



FIGURE 02: The Retailer Industry Leaders Association adopted a similar image for the cover of its 2010 conference.





FIGURE 03: Early data processing installation in the Walmart Home Office in Bentonville.



FIGURE 04: Images of advanced technology are particularized by atmospheric conditions like stained ceiling tiles and faux-finishes; White Room meets Rec Room.



FIGURE 05: The caption from the annual report reads: "Wal-Mart's overriding concern is the maintenance of its competitive edge." The image suggests that communications technology will help with this.

certain territorial ambitions. There are differences between the process Gallison describes and the means by which Walmart locates its stores that are worth briefly addressing. In Gallison's account, as the American military sought to understand the effects of the destruction of Hiroshima and Nagasaki, there was an attendant shift from abstraction to concreteness as they directly encountered the effects of "seeing through the bombsight." In contrast, Walmart's executives began on the ground and were fundamentally concerned with the specificity of the location they were considering. As the company grew, it demanded increased abstraction, if for no other reason than to simply cope with the growing number of stores. As Walton and his executives took to the air to identify sites, the terms on which they would assess location changed. Because they could see things from the air, they could think further into the future as they became more aware of infrastructural systems, traffic patterns and so on. As the number of stores continued to increase, the company developed its extensive telecommunications system that would also provide near-instantaneous communication throughout its network. This process was abetted by developments in satellite imagery. Such improvements precluded the need for Walmart executives to take to the air because their "eyes-in-the-sky" combined with advances in GIS and real estate planning software allowed them to make decisions in their home office in Bentonville. While site visits were still required, they were more of a formality needed only to confirm the courses of action already developed by the real estate team and their prospecting software.

Early adoption of electronic computing, at least for a discount retailer, forms another link between Walmart and Cold War technological build up. The company began using an IBM 360 system in 1972 to help coordinate its information management. When it had only 51 stores and was only operating in Arkansas and the states immediately adjacent to it. In 1974, Walmart upgraded from a 360/20 to a 370/125. (Figure 03) At this point, upgrading was not simply a matter of getting new software but of changing an entire system with significant material implications.<sup>10</sup> Walmart began including images of these computer systems in its annual reports in 1975. While the specific architectural features of these images and the spaces they document have been addressed extensively elsewhere, an articulation of their common traits helps clarify the position the computer quickly acquired in both Walmart's daily operations but also in its own

self-image. Compared to the marketing images of IBM products or the carefully organized showrooms in which they were displayed, the images from the Walmart annual reports offer a less pristine version of the space of corporate computing. In a photo from the annual report of 1979, for example, the modular "character" of such machines as envisioned by Eliot Noyes is hinted at but also undermined by the wood paneling and water stains in the ceiling tiles (Figure 04). Nonetheless, IBM's admonition / slogan "THINK" remains prominently displayed above one of the monitors. The photograph of the data processing center suggests that Walmart was deliberate about aligning their image with that of the modern and technologically innovative company providing their machines. In another photograph, this time from the 1980 Annual Report, the modular floor, workstations, and storage devices are shown neatly ordered in a room devoid of any evidence of other activities. The inclusion of such imagery also suggests efforts to assert the necessity and success of such technology to its shareholders. Consistently complementing the machinery are Walmart's data processing operators, phone to ear and eyes on monitors (Figure 05). The implication in such images is that these data processing centers are something like the automated control environments for which IBM's computer systems were instrumental in developing (e.g. the USAF's Semi-Automated Ground Environment, or SAGE). Walmart's technicians were initially responsible for ensuring the adequate supply and replenishment of inventory to its various stores. This role has become increasingly automated while the data storage apparatus has become significantly larger. However, the digital interface remains the primary site of Walmart's inventory management and real estate development. In this sense, Noyes's statement that, "If you get to the very heart of the matter, what IBM really does is to help man extend his control over his environment" exactly describes the role of information technology for Walmart.<sup>11</sup> This is further extended in recent photos of the control center in which technicians no longer fixate on a single monitor but rather keep track of an entire array of screens, each one constantly refreshing its readout.

An especially telling graphic from Walmart's 1986 Annual Report links the company's heavy investment in technology with the ideological mission on which Walmart set itself (Figure 06). The image is a drawing that combines several photographs of Walmart management and renders it in ink and watercolor.

Organized in four bands, the lowest portion is an image of a Saturday meeting in which the weekly numbers are reviewed with Walton perched on one of the tables. Extending from this group of managers is the plane of a desk on which one of Walmart's technicians is stationed in front of a computer monitor and wearing a communications headset. Rising almost from the back of his head is the large dish pointing south to Walmart's geostationary satellite. An American flag crowns the image and reinforces the words of Shewmaker in the lower right corner: "The development of efficient and cost-effective systems continues to move forward in support of our people development. The free flow of information and the continuous exchange of ideas with all our associates are cornerstones of Walmart philosophy." Shewmaker's emphasis on the "free" flow of information and his rendition of Walmart management structure as open to anyone and characterized by continuous feedback are some of the same principles of the free market that the retailer's executives were dedicated to defending. Thus for Walmart, sustained communication and data tracking are not just good business, they are fundamentally linked to the company's ideological mission to propagate free-market principles.

In this light, the photograph from 1980's Annual Report of Shewmaker pointing to a store location at the edge of the company's empire acquires another layer of significance (Figure 07). In the eyes of Walmart's management, each new store meant a stronger defense against their fears of regulation. It also meant more outposts from which to spread their gospel. The caption to the image of Shewmaker reads: "Walmart Stores, Inc. has achieved an outstanding record of growth and profitability during the decade of the '70's. President and Chief Operating Officer Jack Shewmaker points out with pride the increased boundaries of 'Walmart Country' from January 31, 1970 through January 31, 1980." In this context, "Walmart Country" is the country of free enterprise but also the country of small government, deregulation, and Christian values.<sup>12</sup> The growth that Shewmaker is highlighting was just beginning and—through his advocacy of aggressive investment in technology—would increase rapidly.

In what follows, these technologies are addressed in more detail in order to better understand the process by which Walmart acquires its territory. The role that personal aviation has played in early site selection is examined in order to argue that Walmart's



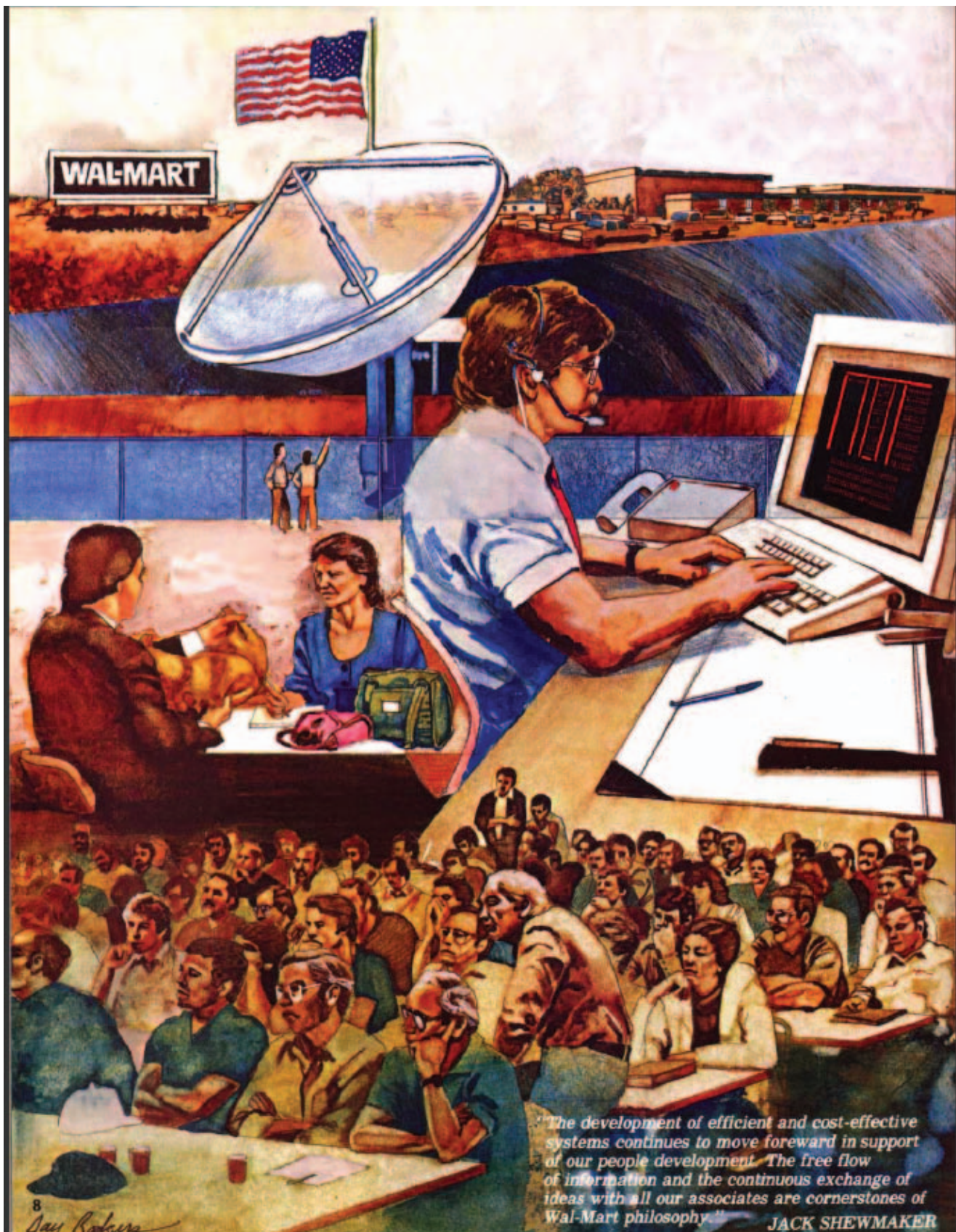


FIGURE 06: The satellite dish and telecom operator became part of Walmart's corporate iconography beginning in the mid 1980s as they developed their communications program.

executives were trained to see territory in both an abstract and comprehensive way. So trained, these territorial managers were then also especially willing to experiment with technological systems that would reinforce that way of seeing the world while also allowing the company to grow quickly. For Walmart, the communications satellite provided the ability to communicate with the entirety of their operation but also allowed them to visualize it in a variety of ways. Walmart's satellite network allowed it to develop a completely coordinated data exchange network which, in turn, fed its real estate process informed by sophisticated demographics software. All of this adds up to a perception of space based on performance, mechanization, and fungibility: a logistics of territory.

#### AIRPLANES OVERRIDE TERRESTRIAL INFRASTRUCTURE

The schematic process by which Walmart selects a specific site for development and acquires property is straightforward. The company's real estate office identifies areas in which they wish to open new stores based on their long-term business plan. Once the general area has been identified, the real estate team gradually refines its search based on a combination of consumer demographic data, growth projections, etc. Once the company has identified a site that meets its criteria, it tries to acquire the property, or at least the rights to build on it. In most cases, Walmart acts as the developer of the property, i.e. it buys the land and oversees construction of the building. Once they have secured these rights, they begin the process of municipal approval for their project. Walmart's actions from this juncture onwards; either to the completion of a building or to the abandonment of the project have been well documented, often in pursuit of understanding the dynamics of deliberative democracy or how small social groups can effectively challenge an organization as large as Walmart.<sup>13</sup> After the completion of a project, Walmart will sometimes sell the site to a property manager and then lease the site back from them. Essentially investing in Walmart, these property management companies are then responsible for the maintenance of the store. Walmart historians Sandra Vance and Roy Scott have pointed out that the advantages of this system were that "it was faster and more economical than using a developer; it permitted the company greater flexibility in choosing locations; it allowed Walmart to develop a closer relationship with local banks; and it enabled the firm to avoid percentage-of-sales clauses in leases."<sup>14</sup> Even though Walmart must evaluate each

site individually, at any given moment, it has several hundred sites in play at various stages of acquisition and development.

Walmart's basic approach to site selection in its early days was simple enough and amounted to building stores out to the limits of their distribution range and then filling the area back in. According to Soderquist:

The real estate department maintained a rolling five-year development plan based on target numbers and locations that it established in concert with senior leadership each year. Regional real estate managers were responsible for developing future potential sites in their market areas based on demographics and cost-effectiveness. The overall plan was to grow out from a current store base and then fill in any major gaps between stores.<sup>15</sup>

When the company anticipated undue stress on a part of their distribution network they would initiate the construction of an additional DC.<sup>16</sup> This new building would then become the center of a new ring of development until it was overloaded, a new one built, and so on. Significant in Soderquist's description is the emphasis on performance and on *numbers*.

The company was also aggressive in its efforts to secure territory. According to Walton, once they identified a site they liked from the air, they would immediately land, attempt to discover the owner, and make an offer on the spot. They would also do their best to remain anonymous. This did not work as well with Sam Walton who was a familiar face in the region but some of his team could maintain a low profile in their quest for real estate. Walton's son Jim was especially effective at this. According to Ortega:

Beneath that Haight-Ashbury exterior beat the heart of a businessman. Jim Walton used his looks to his advantage, flying out to find store sites, landing, and hauling his bicycle out of the back of his plane to pedal around a town without attracting the attention of local businesses. He would question property owners without mentioning his corporate connection.<sup>17</sup>

The airplane in this instance allows for nimble access to sites but the technology itself would be used opportunistically and hybridized with other more "low-tech" options when it made sense—the bicycle in this case.

Initially, location decisions were made intuitively based on Sam Walton's experience as a retailer. He and his team would scout locations by looking for prominent sites that were not too close to a competitor or to other Walmarts but close enough to their distribution facilities and to new growth. When confronted with questions of where to open new stores, Walton also preferred to be as involved as possible. As discussed in the earlier chapter, Walmart grows concentrically and new stores are always served by existing distribution centers. Rather





FIGURE 07: Jack Shewmaker and a map of Walmart's territory, 1980.

than “leap frogging”—opening stores in locations not immediately adjacent to existing Walmart holdings—the company built steadily outward from its headquarters in Bentonville. In the early years of its operation, this territory was concentrated around northwest Arkansas and could be managed by driving from location to location. However, as Walmart continued to open new stores it became increasingly difficult for Walton to visit all his sites with a frequency that satisfied him. To resolve this difficulty, Walton purchased a small private airplane and would fly from store to store. In fact, Walton was somewhat obsessed with airplanes and makes constant reference to this mode of reconnaissance as one of the aspects that has set Walmart apart from its competitors (Figure 08). While Walton is less explicit about the genesis of his interest in flight, it could be related to slightly frustrated military aspirations:

I wish I could recount a valiant military career—like my brother Bud, who was a Navy bomber pilot on a carrier in the Pacific—but my service stint was really a fairly ordinary time as a lieutenant and then as a captain doing things like supervising security at aircraft plants and POW camps in California and around the country.<sup>18</sup>

Without placing undue emphasis on Walton's biographical details, the military associations with flight and surveillance are present in the way Walmart operates and in the terms used in its retail growth strategies and site selection. Accepting Walton's latent military desires can shed some light on the verve with which he adopted flight as the company's primary way of controlling its real estate holdings.

In effect, the airplane allowed Walton to “hunt” for land in the same way that he would hunt for quail with his dog, Ol' Roy. In fact, according to Walton, “Once I took to the air, I caught store fever.”<sup>19</sup> This fervent approach to expansion enabled by air transport also brought with it certain ways of understanding the terrain only visible from the pilot's seat. Walton describes the thrill of flying:

I loved doing it myself. I'd get down low, turn my plane up on its side, and fly right over a town. Once we had a spot picked out, we'd land, go find out who owned the property, and try to negotiate the deal right then. That's another good reason I don't like jets. You can't get down low enough to really tell what's going on, the way I could with my little planes. Bud and I picked almost all our sites that way until we grew to about 120 or 130 stores... I guarantee you not many principals of retailing companies were flying around sideways studying development patterns, but it worked really well for us.<sup>20</sup>

This passage highlights several aspects of air travel that made it particularly well suited for Walton's approach. As he points out, he would not fly with jets but with small propeller planes. He is also quick to identify the manufacturers of his various craft, an early Air Coupe, a Piper Tripacer, a Beechcraft Baron, all the way to the Cessna Chancellor 414A that was

his last. These small aircraft are agile in terms of maneuverability but also in their capacity to access the nation's numerous small municipal airports. Without the constraints of roads, Walton could fly directly from store to store. He could also scout for real estate from a privileged vantage point. By looking at the territory in question from the air, Walton was able to acquire a more comprehensive sense of the surroundings than if he were traveling by car. As Walton describes it:

There's no question whatsoever that we could not have done what we did back then if I hadn't had my airplane. I bought that first plane for business, to travel between the stores and keep in touch with what was going on. But once we started really rolling out the stores, the airplane turned into a great tool for scouting real estate... From up in the air we could check out traffic flows, see which way cities and towns were growing, and evaluate the location of the competition—if there was any. Then we would develop our real estate strategy for that market.<sup>21</sup>

While this was not a scientific process yet, it does hint at the site selection approach that Walmart would continue to refine—especially in terms of its comprehensive view of its holdings and the abstraction that occurs in the process of surveying sites from the air.

### SATELLITES COLLAPSE DISTANCE

As their empire expanded, Walmart needed a more comprehensive vision and a way to make more informed choices about where to locate their new stores. To do this, they would go even further away from the earth than the planes would allow them: 22,282 miles above the equator in fact. Through the early use of a geostationary communications satellite, Walmart's command over its data expanded significantly. This was not an easy process and required some convincing on the part of Walton. In 1984, of all years, the company committed \$24 million to develop a satellite network of its own. This was over a quarter of their *entire* operating budget. In their annual report from 1988, Walmart boasted the “completion of the largest private satellite communication system in the United States which links all operating units of the Company and the general office with two-way voice, two-way data and one-way video communication. The inauguration of this system featured a live broadcast from Sam Walton to all Walmart associates.”<sup>22</sup> As the number of store locations continued to increase it became ever more difficult for Walton to maintain his preferred level of micro-management. He simply could no longer visit all the stores in person and still take care of his duties as CEO. The satellite network was an economical response to this condition because it granted Walton access to his stores and his employees through a one-way video channel. The new satellite network also enabled easier and cheaper

communication between different Walmart stores and allowed faster data transmission. This was important because the primary concern for Walmart continued to be its pursuit of optimization. Thus, the company's executives devoted significant amounts of time to scrutinizing the performance data from each location. According to Soderquist, “We recorded and analyzed same-store sales increases every single week at Walmart. Those were the first numbers we looked at every Saturday morning. At the first sign of weakness, we jumped to find out what might be the problem.”<sup>23</sup> Walton himself drove this obsession and would arrive at his office Saturday mornings as early as 3:30 a.m. to review the week's performance data before each meeting.<sup>24</sup>

In spite of the company's superlative achievements in logistics, its founder remained only interested in performance and wrote, regarding their extensive data network, “What I like about it is the kind of information we can pull out of it on a moment's notice—all *those numbers*.”<sup>25</sup> The data system not only provided nearly instantaneous access to Walmart's sales information but also to its employees via a closed-circuit television network. Even though he could not be physically present in each store, communication technology significantly extended Walton's command over his territory. Through the company's huge data network, Walton could, to some extent, transcend his physical limitations in order to communicate with his ballooning force of employees.

Walmart's satellite network allowed the company to constantly receive feedback from its various stores to its Bentonville headquarters. Because of the preserved centrality of its organization, the company became increasingly dependent on maintaining such an awareness of its operations.<sup>26</sup> *Discount Store News*, a retail trade publication explains that Walmart's network “provides real-time, round-the-clock transmission, with voice and computer data flowing between Bentonville and all locations, while video signals are broadcast only from headquarters to the stores and other facilities.”<sup>27</sup> Thus, not only do Walmart's stores have a physical presence in space as actual locations, they also register as monitoring stations that record and transmit vast amounts of consumer data related to purchasing habits. Stores are referred to by number and not necessarily by geographic location. For example, Supercenter 5494 and 5495 were opened sequentially yet are in Idaho Falls, Idaho and Glenolden, Pennsylvania, more



FIGURE 08: Sam Walton and one of his many aircraft.



than 2,000 miles apart. This is significant because it reinforces a certain relationship between the company's leadership and its territorial holdings. By abstracting individual locations into a 4-digit location index and by increasingly relying on each of these numbers for their constant stream of data, Walmart reinforces the understanding of its operations not as producing a collection of buildings but as establishing data-gathering stations to record and report their findings.<sup>28</sup>

The satellite network that enables such rapid and sustained transmission of information was a risky proposition at the time of its adoption. Shewmaker describes the foundation of the system in the following way:

I had this dream of an interactive communications system in which you could communicate back and forth between all the stores and the distribution centers and the general office. Glenn (Halbern) came up with the idea of using the satellite, and I said 'Let's pursue it without asking anybody.' ... The technology didn't really exist to do this for retail in the early eighties. But we got together with Macom & Hughes Corporation, and worked out a contract, and eventually we committed \$24 million to build it. We launched it and Sam liked to killed me the first two years [sic]. It was not an immediate success. But we got it working, and now, of course, everybody has one.<sup>29</sup>

As was often the case, Walmart was active in the development of a specific innovation that would allow them to improve their operations. Walmart uses the Satellite Business Systems SBS 4 Ku-band satellite to relay its information (Figure 09).<sup>30</sup> According to INTELSAT reports, this satellite was put into orbit on August 30, 1984 and was stationed at 91°05' W (Bentonville is at 94°12' W). The terminology used to describe the initiation of the system, or its activation, is thus somewhat imprecise. When *Discount Store News* writes that Walmart "launches" the world's largest private satellite communication system, the retailer continues to use just one satellite but has developed an extensive network including one large hub at Bentonville and a small "Portable Earth Station" at each store or distribution center. The SBS 4 acts as a relay for information travelling along the Ku-band frequency range. The satellite is named for SBS, the company who owns and operates it, while the make and model is a Hughes Network Systems 376. Hughes was instrumental in early satellite development and is responsible for the design and manufacture of some of the earliest satellites – both commercial and military. The SBS 4 consists of two concentric rotating drums wrapped in solar panels. The smaller drum can nest in the larger to save space during launch and transport. The coverage area of the satellite's "beam" includes most of the US and Hawaii.

Not shown are the neighboring satellites encircling the earth, also in geosynchronous orbit, including its immediate neighbors: WESTAR III at 92°W and Galaxy 4 at 91°W.<sup>31</sup>

Though Walton was reluctant to invest in the system, he came to appreciate its contribution quickly. For the CEO, "the satellite turned out to be absolutely necessary because, once we had those [UPC] scanners in the stores, we had *all this data* [sic] pouring into Bentonville over phone lines. Those lines have a limited capacity, so as we added more and more stores, we had a real logjam of stuff coming in from the field. As you know, I like my numbers as quickly as I can get them. The quicker we get that information, the quicker we can act on it."<sup>32</sup> But Walton was not interested in details of the system or how it worked, only how it performed. His primary objective with the improvement of their systems was the increased intelligence that came with them:

I can pick anything...and tell you exactly how many of them we've bought over the last year and a quarter, and exactly how many of them we've sold. Not only overall but in any or every region, every district, every store. It makes it tough for a vendor to know more about how his product is doing in our stores than we do. I guess we've always known that information gives you a certain power, but the degree to which we can retrieve it in our computer really does give us the power of competitive advantage.<sup>33</sup>

In his early days, he would spend his lunch hours walking through the aisles of Kresge and Woolworth's to gather information, now the company uses one of the largest satellite networks in the world for its intelligence:

I can walk in that satellite room, where our technicians sit in front of their computer screens talking on the phone to any stores that might be having a problem with the system, and just looking over their shoulder for a minute or two will tell me a lot about how a particular day is going... If we have something really important or urgent to communicate to the stores and distribution centers—something important enough to warrant a personal visit—I, or any other Walmart executive, can walk back to our TV studio and get on that satellite transmission and get it right out there. And, as I told you earlier, I can go in every Saturday morning around three, look over those printouts, and know precisely what kind of week we've had.<sup>34</sup>

Walton, in his description demonstrates the potential, at least in his eyes, of both the omniscience and the omnipresence that his communications systems promise. He can be everywhere at once through his video network and he can see everything at once through his data screens.

The particular example of communications satellites raises its own set of issues relative to territory. The inventor and author, Arthur C. Clarke, was one of the first to articulate a concept of an "extra-terrestrial relay" in a 1945 article in *Wireless World* (Figure 10). In Clarke's concept, "The system would provide the

following services which cannot be realized in any other manner: a. Simultaneous television broadcast to the entire globe, including services to aircraft; b. Relaying of programs between distant parts of the planet."<sup>35</sup> Satellite communications were developed in overlapping zones of Cold War military preparedness / paranoia and expanding private communications systems. As with any new communications system, regulation proved to be especially challenging. Confrontations with regulation, or lack thereof, served to highlight the capacity of satellite communications to override existing territorial boundaries. For example, Canada's first satellite, the ANIK, was launched in 1972. According to satellite historian James Martin, "it was soon realized that the ANIK satellites would provide cheaper long-distance telephone or television circuits than those of the established common carriers. Antennas were set up in the United States to use the ANIK satellites, and for the first two years in orbit these satellites earned a return on capital investment that was virtually unprecedented in the telecommunications industry."<sup>36</sup> In other words, companies could circumvent national regulations because of the way satellite communications operate. By being inventive about how their infrastructural service was developed and by pursuing somewhat counterintuitive approaches, American telecom companies could save on operating costs while Canadian companies could increase their profits. According to Rees, "Prior to the days of satellites, the task of government control was comparatively easy as either cable beach heads or larger antenna farms were need to provide the services...The arrival of satellites has introduced the ability of one country to influence greatly many aspects of other countries."<sup>37</sup>

The first domestic television broadcast, live-via-satellite, came on June 28, 1965, thanks to the Early Bird satellite. During the transmission, then President Johnson said: "This moment marks a milestone in the history of communications between peoples and nations. For the first time, a manmade satellite of Earth is being put into commercial service as a means of communication between continents."<sup>38</sup> Walton and Glass also inaugurated their new network with a live-feed from Bentonville (Figure 12) in which Walton referred to the company as "the nation's foremost pioneer in establishing a network of this type."<sup>39</sup> The platitudes about the corporation's achievements notwithstanding, this event marks a shift in Walton's understanding and engagement of territory. By



FIGURE 09: The SBS-4 satellite and its coverage area.



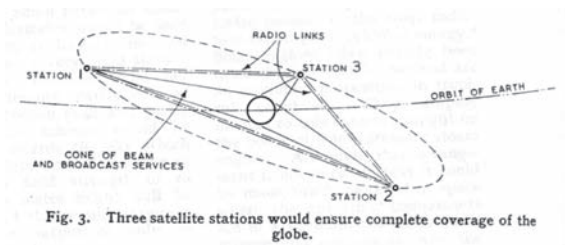


FIGURE 10: Arthur C. Clarke's proposal for space-based communication.



FIGURE 11: Commemorative pin suggesting ambitious future expansion plans.

using a small private aircraft, Walton would hop from one store to the next and search for new sites in the process. His “eyes in the sky” were indeed still his. With the development of its satellite network, the ways that Walton would “see” his territory changed significantly. No longer was there a direct association with the location and physicality of the different stores. Walton could simply choose a store number and would instantly be broadcast on their monitors. However, it was only a one-way channel thus preventing any possibilities of interaction. Employees could see and hear Walton but he could not see them. What he *could* see were the numbers; the consumer data that poured in through the retailer’s communications channels. The photo from Walmart’s 1988 Annual Report captures this dynamic (Figure 13). The bulk of the image is Walton perched on a stool eyeing the camera and addressing it. In the lower right, a small inset shows an image of his employees watching the broadcast at some remote site.<sup>40</sup> Thus the satellite network allowed Walton’s employees to see him when he deemed necessary and it allowed Walton to see his stores in terms of their numerical performance. This produces a kind of compound abstraction in which, with one shift in operating procedure, the employees and the stores they inhabit disappear from view and are replaced by a set of data concerned only with a very narrow set of performance criteria. This in turn feeds into a shift in the way new locations are chosen – abstractly and remotely. While Walton’s presence in his plane remained discreet, his “presence” in the satellite network is absorbed and distributed as he inhabits the world of his own creation through its information channels. As a result of the satellite network, Walton could take to the air—or, more precisely, the airwaves— even without his aircraft.

#### SOFTWARE TURNS EVERYTHING INTO POINTS

Surveying sites from the pilot seat of his small aircraft provided Walton an overview of a given territory and allowed him to guess how an area might develop based on traffic, adjacent programs, density, etc. As Walmart’s empire continued to grow, the retailer needed faster and more accurate ways of determining new store locations with reliable return on investment (ROI) projections. There was more competition for the discount retail market and there was more pressure from shareholders to guarantee their choices of site selection. To accommodate this growing need for more accurate site and demographics

data, Walmart, through its real estate division, began to rely more and more on software applications. Though technologically more sophisticated, the process remains consistent with Walmart’s tendency to abstract territory by reducing it quantifiable data. From the oblique view from the cockpit to the flat satellite photo and now—with the capacity for location software to render territory as data—to the single statistical point, this process of abstraction amounts to a reframing of territory as data whereby sites are understood by the company as quantities to be assessed in terms of performance, adopted if there is a match or if not, abandoned in search of a more compatible condition.

Most location software relies on the combination of various consumer databases. Possible locations are measured against types of customers in the area along with lifestyle habits to assess a previously identified site currently under consideration. The software can survey the proposed area and recommend whether it is a suitable match, determined mostly by the likely ROI. When there are several sites in one area considered for a new store, real estate planners can input all of them into a given software application and in turn generate a series of reports that rank the sites according to their likely success. Marc Liebermann, a member of Walmart’s real estate division describes the process:

We’d look at our market share, we’d look at our potential competition, at available retail sales—you could do it thematically—spreadsheet or database, and then you could come back and say here’s a real opportunity to serve this market where we’re not serving them today and then we would go out. We would probably start at a more regional level and work our way down to a more of a block group and say where exactly do we want to go... Now the difference is from the Sam Walton book is he would go out and fly his plane over the tops of stores to look at population. *Essentially we are doing the same thing*, we’re just using data sets and putting that on maps and we would give all that information to our real estate managers to go execute.<sup>41</sup>

Liebermann’s description of this location process highlights its tendency toward abstraction. Rather than physically moving through space and visually inspecting potential sites, Walmart’s real estate executives now operate remotely from their Bentonville interiors (themselves windowless). Site information is delivered to them through satellite imagery, demographics data, and mapping analysis software. Thus, without ever visiting a potential site, most of the process is already finished.<sup>42</sup>

While there is ample work related to geography and retail, the focus here is primarily on the software tools that are used in the site selection process.<sup>43</sup> For example, Thomas Holmes, in “The Diffusion of



FIGURE 12: The inauguration of Walmart's television network.

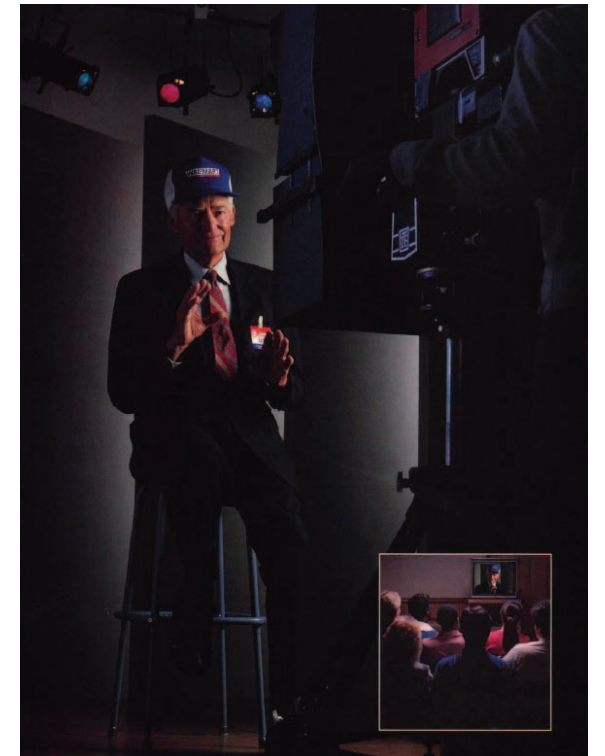


FIGURE 13: Staged address by Sam Walton to his employees. They can see him but he cannot see them.



Walmart and Economies of Density” demonstrates, at both a national level and metropolitan level, that Walmart’s general strategy is to grow in a continuous fashion and to ensure an efficient ratio between distribution centers and the retail outlets they serve. Holmes’s work demonstrates that Walmart’s strategy is one of contiguous growth that sustains connections to existing transmission nodes. The physical outcomes of this approach are familiar, as are the attendant landscapes of median strips, parking lots, berms, drainage swales, etc. that they produce.

The challenge of locating new stores from a centralized and remote corporate headquarters has prompted Walmart’s real estate division to supplement its efforts with a range of computer software applications, themselves part of a process of measuring and recording territory and indexing it based on different factors. These applications aggregate a combination of data and allow users to assess potential sites in terms of a variety of information including settlement patterns, growth predictions, traffic levels, user groups, income levels, etc (Figure 14). These data come from a variety of sources, some public and some proprietary. Residents are surveyed by phone, mail, or through sustained monitoring and this information feeds into a territorial survey in which behavior data is merged with location data. All of these efforts rest on assumptions that such data will lead to more accurate decisions.

There are two main data sources from the public sector: the decennial U.S. census and postal code information. In addition, some private companies develop their own demographics data or combine it with those of the public sector. One of the major providers, and one that Walmart relies upon often, is the AC Nielsen Corporation. The company is perhaps best known for its monitoring of television consumption trends through increasingly sophisticated technologies. However, Nielsen has diversified considerably and offers a range of applications regarding site selection. The company itself has roots in the era of industrial production in the United States of the 1920s. The company was founded in 1923 and incorporated in 1929. It initially specialized in monitoring the performance and quality of manufacturing hardware. Nielsen himself was trained as an engineer and seems to have brought both precision and obsessiveness to his company. During the great depression, demand for the company’s services diminished significantly and

prompted him to look for other opportunities that would benefit from the precise accounting methods he had been developing. As retailers were struggling to stay in business, the promise of a service that would increase sales while reducing waste was alluring. Nielsen offered its services to such businesses in a comprehensive manner that surveyed customers but also synthesized each customer’s data in search of patterns and trends. However, in order to present their findings in a comprehensible way, new analytical categories needed to be invented. One of these was the concept of “market share” that Nielsen developed in 1935. Market share can be understood as the number of customers in a given area shopping at a specific store and is thus an early example of measuring the intersection between territory and consumer behavior. Even though Nielsen became known for consumer behavior research in different media, it got its start in retail. With the growth of radio and the emergence of television, the advertising sector became both more lucrative and more competitive. If advertisers had a better idea of who was watching when, the thinking went, it could promote certain products at times more likely to persuade the customers in whom it was interested. Nielsen maintained an interest in technology and, like Walmart, would seize new technological opportunities. In 1952 the company acquired a very early IBM computer and in 1979 they had developed techniques for capturing and analyzing data from bar code scans (the UPC was only introduced in 1977). Given their interest in retail and in technology, it perhaps not surprising that the company would continue to develop products aimed at improving retail performance. More than just consumer behavior, the company began to turn to real estate—consumer behavior at a collective level—to advise companies on the location of new outlets.

Nielsen’s process of surveying consumers transforms them into data points. Like the development of regional science that sought to render territory as a statistical field, so too did Nielsen transform the ways the consuming public was understood. In this sense, resolution was one of the determining factors in the quality of information and the consequent accuracy of the predictive models. More information was held to yield better decisions. Such a mentality was reinforced by the planning culture at the time that invested significant energy and belief into such models.<sup>44</sup> These numbers also became a kind of currency by which, at least in the case of television, networks would trade in, especially with their advertisers. Nielsen *had* to

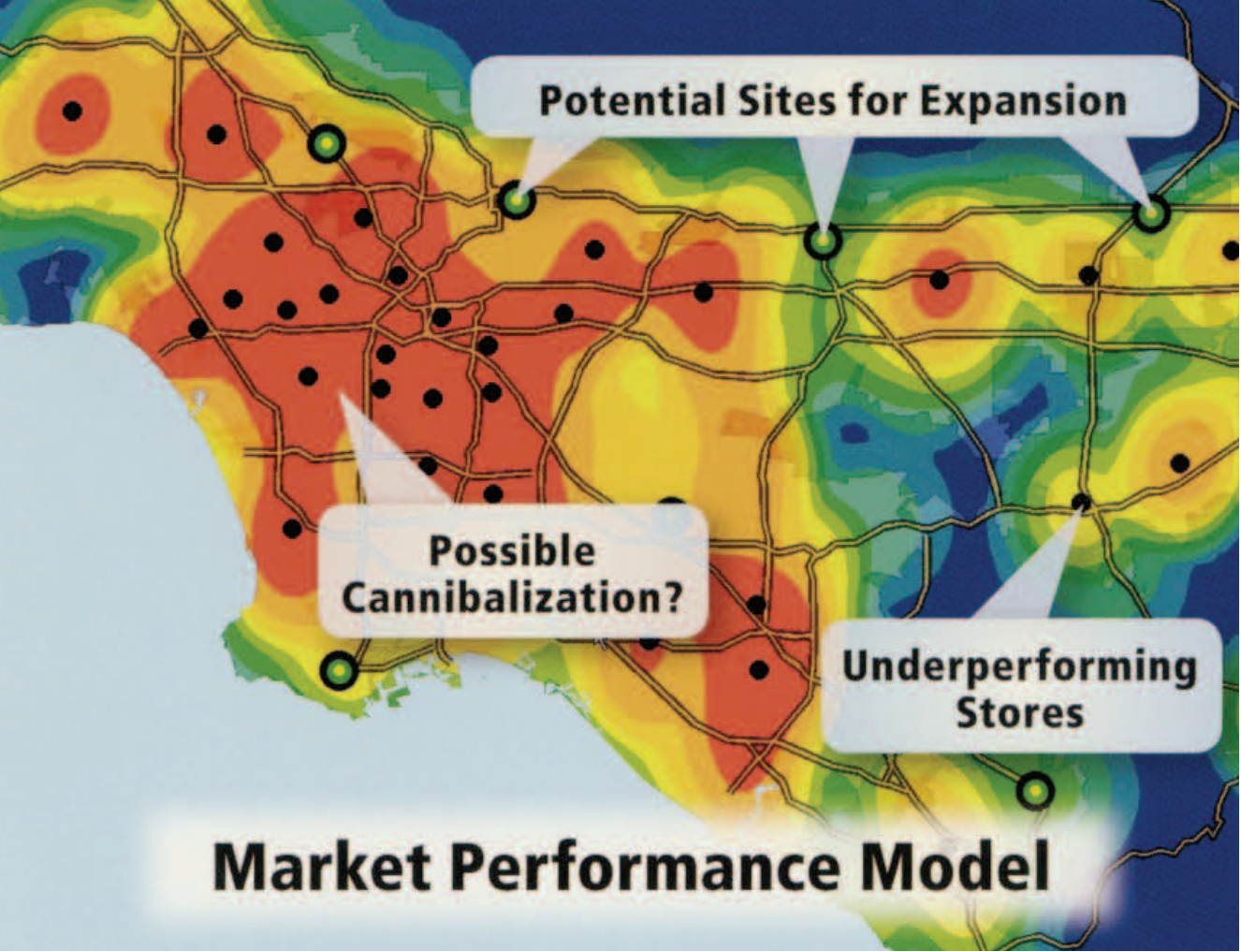


FIGURE 14: Example of site selection modelling applications from ESRI.



have monopolistic control over its numbers because otherwise television networks and ad buyers would not be able to properly compare relative popularity and thus, worth. But this value exists in an abstract sense because the income was speculative and linked to assumptions about buying habits and their correlation to advertising exposure. Similarly, it relied on assumptions that such behavior could be predicted with any form of accuracy. Such assumptions about prediction continue to hold a great deal of currency at all levels of the operation.<sup>45</sup>

Nielsen's website presents the company in different ways but all in service of directing viewers to pages ready to sell services or products. Under the heading "expertise," Nielsen offers its services in "Distribution Strategy and Execution." The company offers a series of "tools" to aid in the process of developing an appropriate distribution strategy including *Retail Measurement*, *Market Decisions*, *Spectra*, *Claritas Market*, *NetRatings*, *Mobile Media*, and *my.spaceman*. While these consulting services are provided at a more general level, Nielsen also offers "Market and Site Analysis" for the company who has established its distribution strategy and is looking for ways to optimize it. According to Nielsen's site:

With our market analysis and site analysis tools you will uncover potential real estate opportunities, eliminate overlaps in existing markets, and avoid inefficiencies in real estate planning and operations. In addition to expansion, you need to evaluate the impact of, and make intelligent and informed choices about remodels, relocations and closures. In addition, you will be able to find your best customers and prospects and see where your competitors are located in relation to you and your customers. Nielsen's market and site analysis solutions offer flexible area definition and interactive mapping combined with our reliable data - in applications for businesses of all sizes.<sup>46</sup>

Such a service promises customers that it will "uncover" hidden markets and unnoticed inefficiencies (politely referred in the quote above as "overlaps in existing markets" but often referred to as cannibalization). Nielsen offers the following site selection applications: *PrimeLocation*, *iXPRESS*, *SiteReports*, and *Claritas Analytic Consulting Services*. *PrimeLocation* is the most fully integrated site analysis tool. It allows users to test different "trade areas" based on different parameters. It is also a comprehensive platform designed to be part of a business's regular operations as they figure out how and where to grow. Essentially a version of RAND-style scenario planning, *PrimeLocation* is designed for "what-if market and site analysis." Nielsen's *iXpress* functions in a manner similar to *PrimeLocation* but is designed to operate more quickly and can be more easily integrated with other platforms. Users can

select different criteria for drawing their maps and can define market areas in a variety of ways. *SiteReports* is a small application in which customers request data from Nielsen who then provides a report based on the specified criteria. This service is designed for smaller clients who might only need the service occasionally. The description also promotes information access as a key quality of the site. This is basically a map-on-demand service in which "intuitive ordering screens provide hints to help define areas and offer report and map samples to preview before finalizing your order." *Analytical Consulting* is the most sophisticated and comprehensive but also the most open ended in terms of services provided. This Nielsen service offers, among other things, various models to help businesses understand aspects of potential sites including Site Potential Models, Gravity Models, Site Scoring Models, and Site Analog Models, all in an effort to forecast the performance of a given location, measured here in ROI. The retailer, Walmart in this case, would still have to go through the process of procuring the land and rights to build. By using analysis provided by Nielsen, the company can demonstrate to its shareholders that it has made the most informed and safest decision it could.

This process of locating new stores naturally requires the identification of potential sites. In Walmart's case, according to Liebermann, the company articulates growth goals in its long-term plan along with market areas in which they hope to build. Within those potential areas, members of the real estate team develop a selection of possible sites that are then processed and assessed using the tools described here. The results of this process—the actual artifacts that the company uses to choose sites—are often demographics reports and area maps. Reports from Nielsen or other providers like ESRI break down the prospective area's residents into different categories based on factors like age, income, marital status, etc. For ease of understanding, such consumers are often placed within certain market "segments" that allow the data provider to generalize about the likely behavior and consumer demands of a given group. ESRI has developed 72 different demographics segments (they call them clusters) and uses them to generate a profile for the types of people inhabiting that area. Retailers like Walmart have a certain consumer target range in mind and would therefore look for a site with the highest concentration of that group. Other factors include driving time, competing locations, and "overlap" with other outlets of the same business.

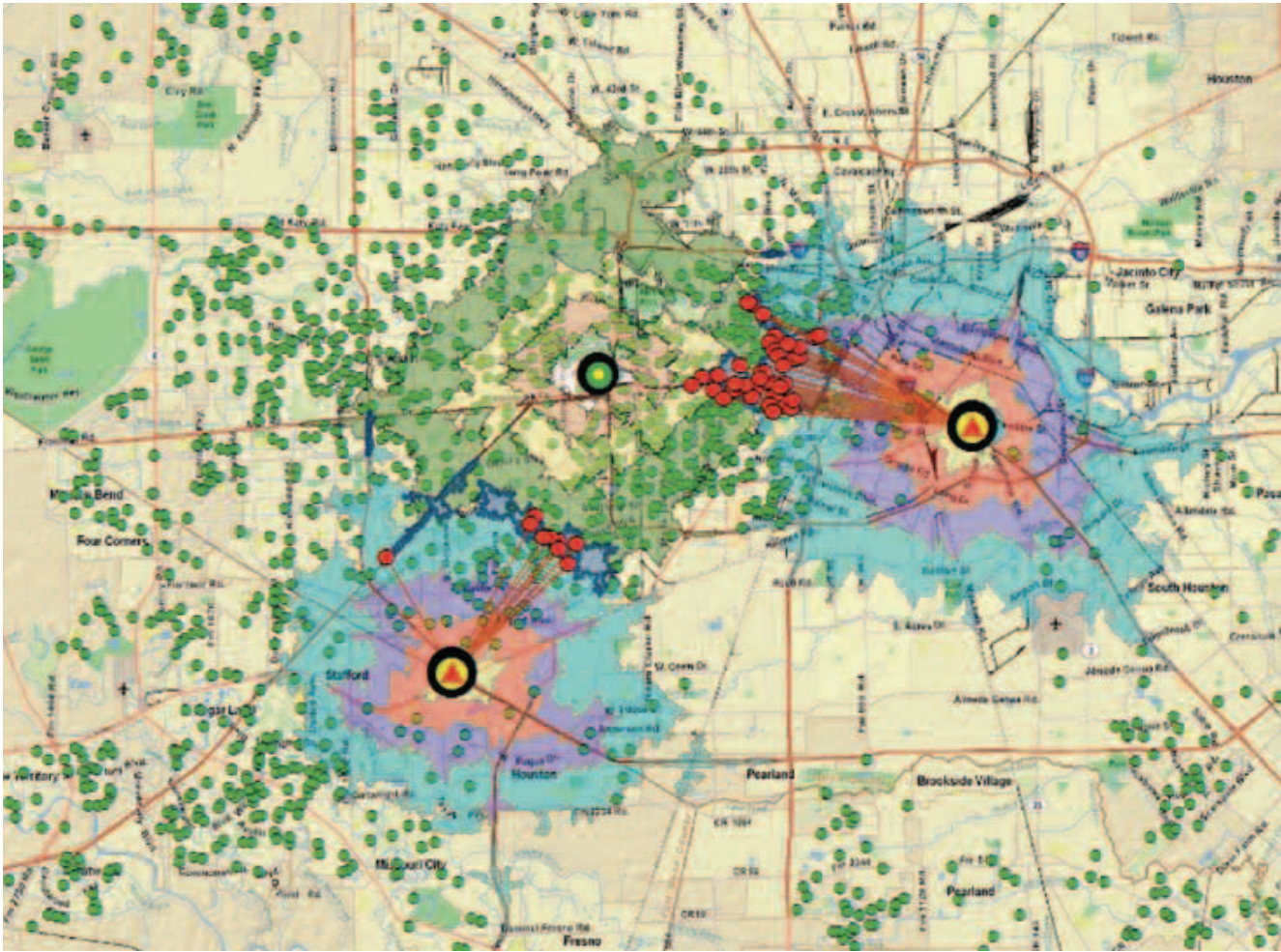


FIGURE 15: Illustration of the customers from one area that could be lured by a new store.



An examination of some of the cartographic images provided by these companies illuminates the ways in which territory is abstracted in pursuit of market performance (Figure 15). For example, a sample map from ESRI's "ArcGIS Business Analyst" shows three potential retail sites in the metropolitan region of Atlanta, Georgia. The map includes postal code divisions, local and national highways, shopping areas ranked by area, three consumer segments (Boomburbs, Metro Renters, and Up and Coming Families), as well as the potential trade areas surrounding each site. These areas are calculated, in this instance, in terms of driving distance from the proposed shopping center locations. They are arranged in three "rings" linked to time: 5 minutes, 10, and 15. The proposed site in the lower right of the map has a larger trade area because of its location along a major freeway, thus allowing more shoppers to arrive more quickly. However, if the three consumer segment groups are intended customers for the new center, then the site along the freeway overlaps with none of them. Instead the site in the upper right, though a smaller trade area, is placed squarely within the desired user groups. According to ESRI promotional material, "Common business challenges, such as site selection and trade area analysis, can be solved with the push of a button using GIS."<sup>47</sup> Moreover, "Done correctly, GIS exposes hidden relationships and helps everyone explore and investigate market conditions and performance."<sup>48</sup> This promotion of site selection software as a quasi-magical revelatory process in which "hidden relationships" are exposed with a simple mouse-click is a seductive notion, especially when organizations are confronted with increased competition and pressure to continue growing. Equally enticing is the command of territory from the comfort of one's desk chair, which in Walmart's case, is somewhere inside the windowless Sam Walton Research and Development complex. Desktop computers, linked to the company's large data network and satellite system, provide access to the world beyond.<sup>49</sup>

The delineation of the so-called trade area is one of the crucial steps in the site selection process. The trade area for a given store location is the territory that contains that store's potential consumers. They are primarily calculated in terms of the time it would take to travel to the location or in terms of distance (e.g. 1 mile, 3 mile, 5 mile radii). In an idealized model, the trade area would always be a circle around the site. Before the development of location software, the process of adjusting the trade area to the specifics

of the individual locations would be done manually. For that matter, the identification of the proposed location was also calculated by hand (Figure 16). In efforts to systematize the process of location, various methods are promoted that attempt to rationalize the process and automatically present possible locations in quantitative terms. One method suggests fixing a map of the area in question on a tabletop and drilling holes in locations that correspond to different factors that would affect the new site. By threading each opening with twine and knotting all the ends together on the table's surface, one can then fix weights to each loose end below based on different values. In this way, one can test different relationships; each new configuration, through different distributions of weight, would pull the knot to a different point of equilibrium. Such a resting point would then correspond to the optimum location for the given assignment of relative values of the different attractors. In what is basically an analog version of some of the real estate software described above, the location table makes clear the impulse to mechanize the process of location.<sup>50</sup> The analysis and site selection software applications like those Walmart uses are the extensions of the mechanical process illustrated by the location table. In both instances, the notion of site is reduced to a statistical entity to be optimized.

Real estate location and mapping software adds further possibilities to the selection process by eliminating the need to even have identified a particular site in the first place. In what is known as "prospecting" software, companies can choose a target market (e.g. households with two children and earning \$50,000 - \$70,000) and the application will generate a map of locations in a given territory ranked according to how well they conform to the criteria. Rather than finding an available site first and then assessing its appropriateness, these applications reorder a given territory to reflect the presence of certain types of consumers and to reflect the priorities of the retail market. As the name suggests, such prospecting software presents the city as a resource to be mined and promises to reveal the best places to start digging.

The manner in which Walmart chooses a site is linked to a certain set of performance criteria and forecasts about future consumer behavior. Performance in this case is measured mostly in profitability but also in customer traffic and same-store improvement from month to month. However, as Walmart maintains a constant overview of its operations, the performance

of an individual store is always assessed relative to those in the larger network. Understood thusly, locations for new stores are part of a dynamic system intent on encumbering territory and saturating a given market with the least amount of investment possible; an effort to do the most with the least. Thus the single location is less important than the aggregated system of sites. By focusing on questions of performance, Walmart concerns itself with a set of criteria based on tax rates, gasoline prices, real estate catchment areas, and so on. In other words, it attends to a logistical-economic field of requirements and sometimes ignores certain political distinctions or engages them only when necessary. Things like state boundaries or municipal divisions are significant only when they might disrupt the company's standard procedures or impact costs. This has implications for architecture because, as Walmart uses its buildings as part of this specific territorial agenda, the structures themselves become implicated in this process of territorial control. By focusing on certain aspects over others, Walmart can supersede political boundaries through the careful craft of its own parameters of market coverage. In many ways, Walmart acts at a coordinated regional level and does so in a way that makes it difficult for individual states or cities to reckon with. In this way, Walmart presents a successful model of regional governance and offers insights into the ways organizations might structure themselves at intermediate levels in order to be more responsive and more effective. In an effort to make this more concrete, two examples of how Walmart selects sites are examined more closely. The first has to do with Vermont and is an example in which the process was frustrated by local opposition and the second, in Merced, California, an instance of the company's understanding of the United States in terms of its own requirements and logics, rather than historic political divisions. Both are instances in which the process of territorial abstraction allows the company to perform inventively and more nimbly. Walmart redraws the map over and over again.

### SURROUNDING VERMONT

Vermont was the last of the United States to have a Walmart store within its borders. Largely because of local conviction that the retailer's presence in the state would increase traffic, threaten local businesses, and encourage diffuse suburban development, opponents waged a tenacious policy and media campaign that kept the company out of the state for several years. This struggle between the small state and the large

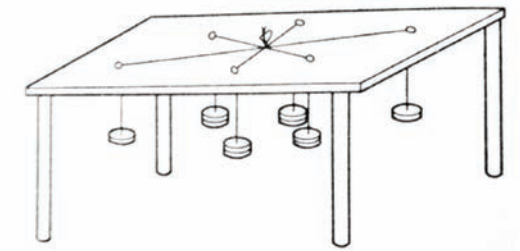


FIGURE 16: Site selection table.



FIGURE 17: If the Hinsdale, New Hampshire store were any closer to Vermont, it would be in the river.



corporation was seized upon by the news media whose coverage of the conflict consistently painted it in the colors of war by using headlines like: “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.<sup>51</sup> More than journalistic histrionics, the use of such analogies and metaphors provide a illuminate the military approaches adopted by both sides in pursuit of their aims. In spite of resilient opposition, Walmart continued its high-profile policy-based efforts to gain purchase in Vermont. At the same time, the company proceeded to systematically build a physical line of stores along the Vermont border. This blockade of retail outlets proved to be more potent than policy negotiations because it effectively saturated the market without ever entering it. By the time Walmart was allowed entry into the state, the real battle had already been won.

Faced with Walmart’s imminent arrival, concerned citizens, flatlanders, “Ecotopians,” and even the Vermont government mobilized their resources to prevent the company’s entry into the state.<sup>52</sup> Most of the usual approaches were adopted including petitions, demonstrations, and the strict enforcement of design guidelines. However, in the case of Vermont, other more inventive measures were taken. For example, in an effort to raise awareness of the situation, The National Trust for Historic Preservation—a private non-profit organization dedicated to the preservation of historic places—included the entire state in its annual list of “11 Most Endangered Places” in both 1993 and 2004.<sup>53</sup> Though this inclusion has no immediate policy impact, it nonetheless holds significant sway over public opinion. At the governmental level, Howard Dean, former presidential primary candidate and the governor at the time, flew to Arkansas to meet with David Glass, the CEO of Walmart. According to Dean, “We had a good meeting. I don’t think they’d had many governors come to meet with them. I wanted them to understand that we’re not against Walmart, but that we’re just against suburban sprawl... They agreed to consider downtown locations in the future.”<sup>54</sup> As if seeking to broker peace with a hostile invader, Dean’s role as ambassador is significant because it implicitly elevates the status of Walmart beyond that of a mere retail operation. The governor’s focus on property and territory is also revealing. It asserts that the state has less opposition to Walmart as a retail enterprise, but instead takes issue with its choice of sites, which

suggests that the conflict has less to do with ideology or aesthetics but more with simple location.

Spatial concerns have been a significant aspect of Walmart’s approach as it has consistently relied on a territorial strategy to expand its operations. As the company originated in rural areas serving a dispersed clientele, it adopted a procedure of peripheral market saturation. According to Walton, “We figured we had to build our stores so that our distribution centers, or warehouses, could take care of them, but also so those stores could be controlled...each store had to be within a day’s drive of a distribution center.”<sup>55</sup> A claim like this supports an understanding of Walmart’s operations as a dynamic totality rather than a collection of isolated retail locations and is significant because it helps illuminate how highly calculated their operation is. Walton goes on to write, “We never planned on actually going into the cities. What we did instead was build our stores in a ring around a city.”<sup>56</sup> This statement is supported by a 2006 study that found 49 percent of Walmart locations are within 500 meters of a city boundary, and 18 percent of stores are within 100 meters.<sup>57</sup> This same geographical precision of property acquisition played no small role in Walmart’s efforts to enter the Vermont market.

Encountering intense opposition within Vermont, Walmart proceeded to surround the state with outlets in an attempt to lure its inaccessible target market across the borders into New York, Massachusetts, or sales-tax-free New Hampshire (Figure 19-25). One reporter even suggested that Walmart was building a “Maginot Line of four open or soon-to-open stores along the state’s border.”<sup>58</sup> If Walmart could not enter Vermont, it would get as close as possible and distribute its locations to ensure saturated border coverage. There are seven Walmart locations within 5 miles from the border (two are even less than 2,000 feet away) and another six in a slightly larger ring around the state.<sup>59</sup> Taking a standard 20-mile radius as an index of coverage, The Vermont border is effectively sealed by Walmart stores. If one of the stakes in Vermont’s “battle” against Walmart is a kind of authentic “Vermont-ness,” then Walmart’s spatial tactics would, according to its opponents, threaten this quality. By encircling the state with precisely targeted retail locations, Walmart effectively acquired the market territory it was pursuing without ever entering Vermont itself. The state border that served as a political boundary is trumped by the “catchment areas” of the store locations and their strategic constellation

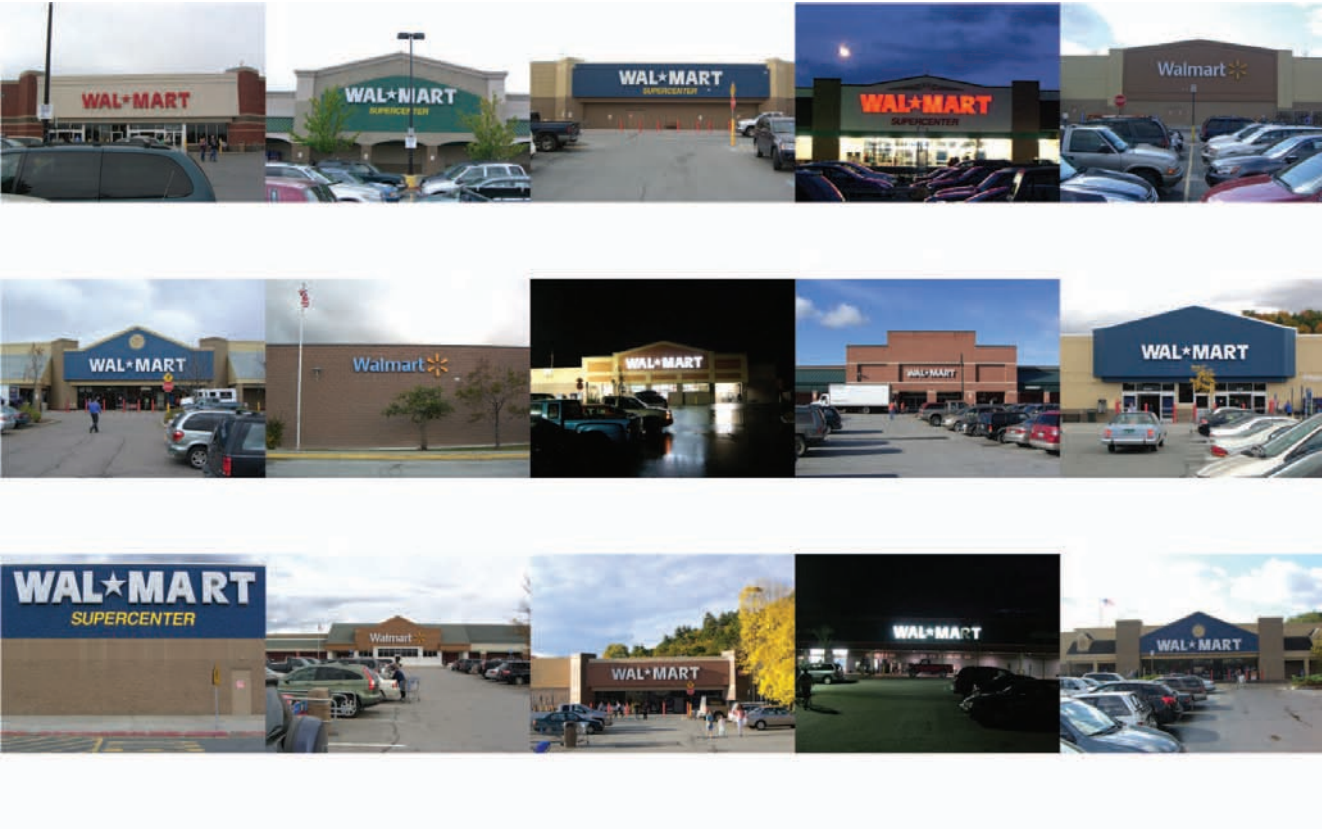


FIGURE 18: The Walmart stores in and around Vermont.



FIGURE 19: The state of Vermont.

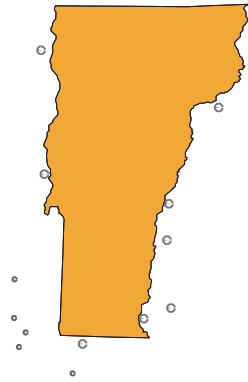


FIGURE 20: Walmart locations within 20 miles of the Vermont border.

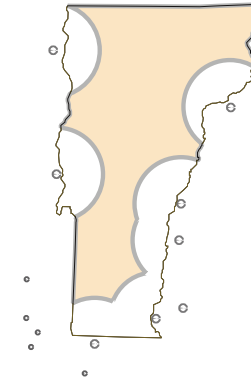


FIGURE 21: Walmart locations with 20-mile catchment area indicated.

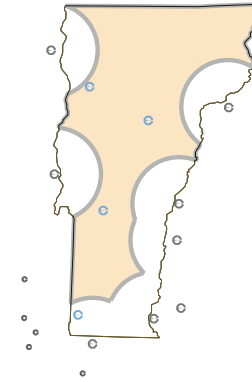


FIGURE 22: Four stores were eventually allowed to be built within the state's borders.

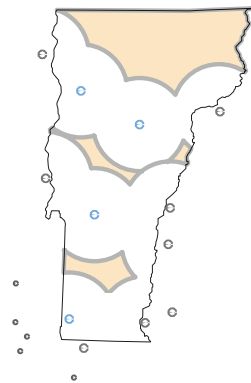


FIGURE 23: These stores effectively saturate the territory.

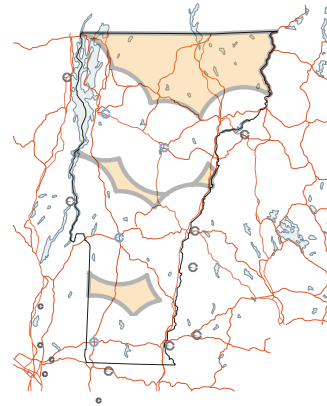


FIGURE 24: Store locations combined with roadways and waterways.

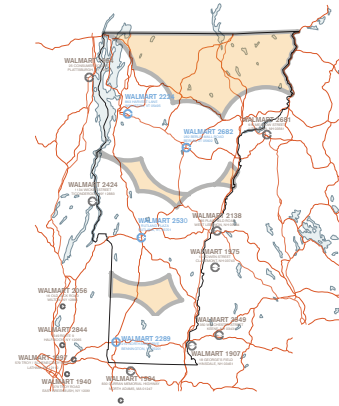


FIGURE 25: Complete coverage.



effectively inscribes a new kind of elastic border within and around Vermont. Faced with the increasing migration of its tax-base, the state eventually agreed to allow Walmart entry into its domain.

The four stores that *were* allowed to be built—in Williston, Berlin, Rutland, and Bennington—are themselves variations on typical Walmart formats, if only in small degrees. All four are located in towns at crossings of significant state roads or interstates to avail themselves to as much consumer traffic as possible. In Rutland, Walmart seems to have taken Dean’s request seriously and opened at one end of a shopping center in the center of the town and as part of a city revitalization project. This location is promoted in the company’s 1997 Annual Report as evidence of its interest in maintaining healthy and vital small towns but this particular arrangement is an exception to their standard model of growth. A last piece of evidence in support of the company’s precise location process is the store in Hinsdale, New Hampshire. A supercenter (not permitted in Vermont), the store is located almost immediately over the border—any closer and it would actually be in the river that separates the two states (Figure 17).

The deliberate and systematic discipline required to execute Walmart’s space-based take-over strategy is significant because it implicates architecture in practices of power and control. The single retail unit, when understood collectively, becomes a territorial instrument capable of securing space within an established logic of market control. Architecture can be understood here not as a system of isolated buildings but instead as an interlinked network united in a common purpose (Figure 18). In this sense, rather than developing the symbolic content of its buildings, Walmart emphasizes their symbolic presence and in doing so, asserts the importance of architecture within a territorial practice. By using buildings to create and enforce its own policy, one that eclipses federal divisions and desires, Walmart demonstrates that architecture is not the result of politics; it is politics.

REDRAWING MERCED

If one examines the map of distribution centers and the US Interstate Highway system, the continuity of Walmart’s operation is apparent (Figure 26). The distribution centers and their 100-mile radii act as relays from one coverage area to the next.<sup>60</sup> A closer look reveals a significant gap in this system in California’s Central Valley. This is the core agricultural

region of the state and a site of significant population growth. To mend this gap in their distribution coverage—and in anticipation of future growth—Walmart has gained approval for the construction of a new distribution center in Merced, a town of 90,000 and host to the newest outpost of the University of California system.

As with Vermont, the process of gaining approval to build a new distribution center encountered substantial resistance on the part of the local residents. The most vocal were the residents of the area immediately west of the proposed building as it would be, almost literally, in their backyard. The grounds of the argument were similar to other Walmart battlegrounds and concerned potential traffic increases, noise, pollution, and safety. Walmart countered with data regarding job creation, environmental remediation, and landscape improvements that would mitigate the new building’s impact. Significant for this discussion is the particularly regional character both of the proposed distribution center and of the discussion promoting it. In September, 2009, the City Council approved Walmart’s proposal.<sup>61</sup> Since then the citizen’s group, Merced Alliance for Responsible Growth (MARG), has filed a lawsuit against the city that alleges violations of the California Environmental Quality Act through the process by which Walmart’s proposal was approved. At the time of writing, this dispute is unresolved though the city of Merced remains dedicated to helping Walmart to open Regional Distribution Center 7073. According to John Ramirez, a lawyer working on behalf of the city, “This project is critically important for the city of Merced ... The economic recession has devastated the city, and the city has specifically targeted this piece of property for job creation and industrial use.”<sup>62</sup> On one hand, this statement is a reminder that, in spite of Walmart’s tendencies to reduce sites to abstract performance criteria, the process of committing to a particular site remains a difficult one and something the company prefers to do as quickly as possible. At the same time, as Walmart’s approach to site selection remains performance-based, at a certain point, local efforts to prevent its arrival become too costly for the retailer and it tries to establish a location elsewhere. The judge in the case acknowledged this, “This matter has been pending since ’06. It’s been four years... Walmart may pack it up and go down to Madera. They want Walmart down there.”<sup>63</sup> In the end, this is exactly what Walmart’s opponents are hoping for. By burdening the company with bureaucratic

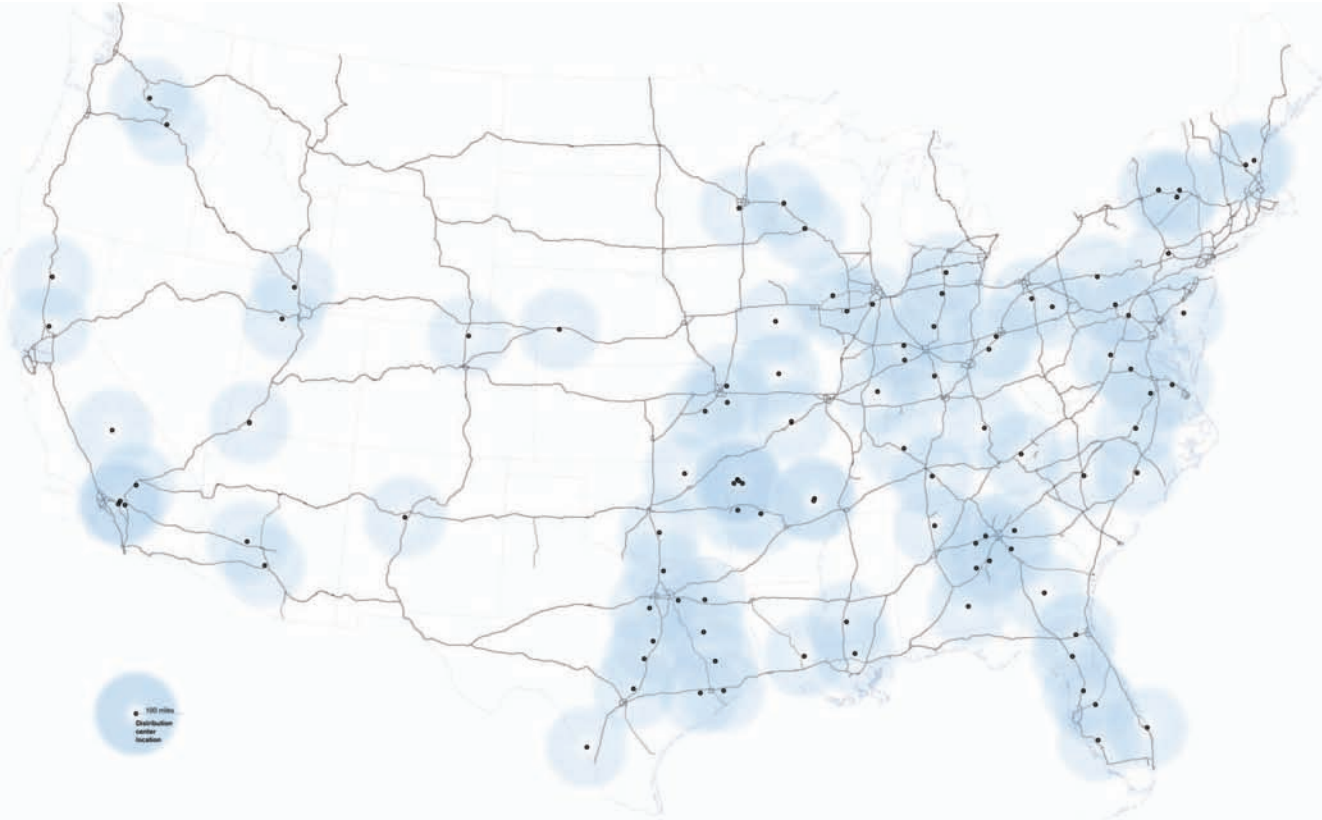


FIGURE 26: Walmart distribution centers and the Dwight D. Eisenhower National System of Interstate and Defense Highways. There is a noticeable gap in central California.

inconveniences, MARG and other opponents hope that it will eventually become too costly to stay in town. In other words, Walmart's lack of a regional distribution center for this part of the country is hampering their growth and is costing them money indirectly because of its overall drag of operational efficiency. Since Walmart maintains a regional view of its operations, one location is often interchangeable with another. Thus, even though its plans to build new stores are often thwarted,<sup>64</sup> it has other options that fulfill the same performance criteria.

Given Walmart's location habits, it is no surprise to see that Merced neatly straddles the distribution zones covered by DC6026 and DC 6021, respectively. The actual location of the proposed distribution center is on the southeastern edge of town in an agro-industrial area (Figure 27). The 230-acre site would contain the 1.2 million square foot distribution facility as well as parking and maintenance areas. The DC will employ roughly 1,200 people and will be in constant operation. The site itself is close to the Mission Avenue interchange of State Highway 99 and the smaller State Route 140. It is also immediately adjacent to a new expressway spur referred to as the "Campus Parkway" that will connect Highway 99 with the recently opened campus for the University of California, Merced. The adjacency of this proposal reinforces the carefulness with which Walmart selects its sites. The language that characterizes the site drawings is illuminating in its speculation. For example, the project site plan calls out the right of way as "Future Campus Parkway" while another site drawing refers to a "Conceptual Access Road." This future tense suggests Walmart's comfort trading in speculation. It is also a moment in which we can witness part of a city being made at infrastructural level.

The city of Merced itself is strategically located to serve California's growing central valley region. Not only is it positioned along the heavily trafficked Highway 99 corridor, it is also a proposed stop along the high speed rail line that is in the works for the state's central valley. While Walmart's distribution network relies primarily on its fleet of semi-tractors and trailers, it is currently trying to curtail its fuel consumption. The company is attempting this both to improve its public image and to reduce cost. As immense as its operations are, small reductions can have immense impacts when distributed across its entire network. In this regard, the promise of a future

high-speed freight link to the ports of Los Angeles and Oakland is one that Walmart takes seriously.

One document in particular reveals much about how Walmart operates at the territorial level (Figure 28). In a presentation to the Merced City Council on September 21, 2009, the distribution center project team included a map of Walmart distribution centers in the western US. While the predictable political borders are shown, they are overwritten by heavy contours that presumably delineate the boundaries of Walmart's respective distribution zones. From this image it is evident that its territory in Northern California and parts of Oregon and Nevada overburdens DC 6026. What is also evident from this image is that Walmart's logic of territorial organization cares little for existing political boundaries but, similar to the location of retail outlets, determines trade areas based on various performance criteria. The specific articulation of these trade areas is produced through, among other things, a combination of retail unit density and driving time: the more stores a given DC serves, the smaller its trade area. Thus DC 6037 serves the relatively few number of Walmarts in the Pacific Northwest compared to those served by DC 6021. Because of this, federal divisions are less relevant to Walmart than the performance of its system. In other words, Walmart has a decidedly regional approach to planning that overrides the historic state boundaries in favor of a dynamic system of territorial shapes. These boundaries are elastic and can be modulated quickly with the advent of new stores. Presumably the construction of the DC in Merced will take territory away from 6026 and 6021 as it establishes its own new regional jurisdiction and a new shape on Walmart's distribution map. At the larger regional level, this map is revealing because its ostensible stasis obscures its actual fluidity. The map is an image of Walmart's own system, drawn to suit its needs and with little heed for the political boundaries separating states. If the company's bid to build DC 7073 is successful, another zone will need to be added to the map. And, it is likely that this will not be the last regional distribution facility for Walmart nor the last redrawing of the map.

*MECHANIZATION TAKES COMMAND OF LOCATION*

For numbers-obsessed Walmart, products and locations are all part of a larger set of performance indicators that in turn suggest a conflation between object and place—territory for the retailer is abstract

in the same way that its merchandise streams are. This reduction of specific instances to abstract and statistical quantities raises certain issues related to the behavioral tendencies of the organization. Jonathan Crary in *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century*, for example, demonstrates the construction of perception by a confluence of competing forces: "If it can be said that there is an observer specific to the nineteenth century, or to any period, it is only as an effect of an irreducibly heterogeneous system of discursive, social, technological, and institutional relations. There is no observing subject prior to this continually shifting field."<sup>65</sup> Through his efforts to establish emerging forms of perception that precede certain technologies (rather than precipitate from them) and through his specific examination of certain optical devices, Crary helps to establish a foundation for other similar inquiries. One of which is by the architect and geographer John May whose research focuses on what he calls the development of "statistical-mechanical geographic vision." According to May, "This mode of thought is the result of an historical coalescing, operative since at least the outset of the twentieth century between a specific way of thinking about the natural and social worlds as aggregations of statistical regularities and a way of seeing that was from the outset rooted in certain technological devices and their attendant methods."<sup>66</sup> The ways of seeing that May addresses are primarily related to aerial photography and photogrammetry, themselves the heirs to the hot-air balloons, cycloramas, and stereoscopes of Crary's 19<sup>th</sup> century observer. May initiates an effort to chart a statistical understanding of a given area that emerged simultaneously with—and for the first time—an ability to see that area in its entirety. Through the overlay of statistics, the territory being examined gets infused with data. Though May's project pursues questions of environment and epistemology, it is relevant to this discussion because of its interest in territory and property. The imagery he addresses does not tend to abstraction but rather to a hyperreality in which otherwise hidden data are vividly rendered and made visible to the human eye thanks to advanced recording devices.

This work illuminates some aspects of the processes by which Walmart perceives, records, and understands territory in pursuit of its retail expansion efforts. As Walmart must grow to survive, deciding where to build new retail outlets is crucial. This process has developed through the integration of specific

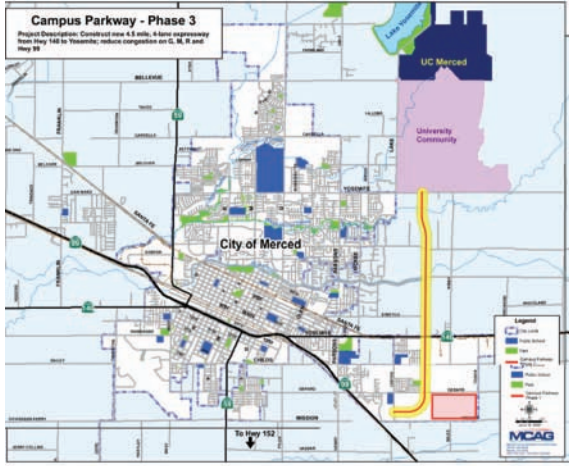


FIGURE 27: Proposed location for a new distribution center in Merced, California to close this gap. It is positioned next to the future site of a new freeway bypass.



technologies aimed at perceiving, recording, and managing territory. These developments have allowed the company to understand its real estate holdings and retail empire in ever more abstract ways. For Walmart, their locations—and the areas on the Earth’s surface they occupy—are often automatically generated and increasingly interchangeable. When the company began, there were a small number of sites, even up to a few hundred, that could be located and understood at an experiential level by the company’s executives. As the number of stores, i.e. the number of locations, increased, the company’s territory became harder to manage. The first response to this was to use airplanes to both select sites and to get to stores. Following the airplane, satellites were used for internal communication, data transmission, and for the images that they could generate. Even more advanced still, and with the need to target more specific market segments, Walmart, like many of its competitors, has come to rely on software to understand who is shopping and where it should build new buildings. By inputting specific criteria related to demographics, site selection software will automatically produce optimum locations that, according to the program and data, will perform according to the desired conditions. That Walmart real estate associates have to visit the sites in person to verify them is, in a way, irrelevant, because the bulk of the decision-making has already been done remotely. Thus, responsibility for selecting location, once understood on the ground and in person, has been given over largely to computers that can automatically and efficiently process the overwhelming amounts of data. In this sense, location has become an automatic process; it has become mechanized.

One of reasons to address Walmart’s real estate practices at a more comprehensive level and in terms of technology is that it sheds light on the ways in which the company grows and interacts with its potential customers. Walmart’s bids to build new stores are increasingly scrutinized by community organizations concerned with possible negative effects the retailer could have. The debates in Vermont and Merced highlight the manner in which architecture and design are implicated in Walmart’s expansion efforts. They also demonstrate the political agency of architecture and location as well as Walmart’s dramatically different ways of seeing territory.

As significant and dramatic as local struggles are however, they fail to address the much larger structural

issue of Walmart’s growth. For the residents of a small town, for example, their main focus is on preserving the specific qualities of their locale. However, Walmart understands things differently. To them, the specifics of a location are only significant insofar as they meet the requirements generated by their location software. In other words, while Walmart is fundamentally concerned with the performance of a site, it is indifferent to a given site’s specificity, citing instead a performative equivalence. Their concern is with the overall cost optimization of their operation. If they cannot build in one area, there are several others that will meet the same criteria. Thus, without coordinated efforts at regional scales, struggles against Walmart at the local level will likely remain successful only in isolated ways.

*SITES ARE FUNGIBLE*

*REAL ESTATE IS A LOGISTICAL OPERATION*

Walmart’s approach to site is like a phalanx of real estate: if one member falls, the rest of the system can quickly regroup. Similarly, “site” for Walmart is equally interchangeable and amounts to another set of numbers, another node in the abstract data field over which the company’s real estate agents pore and through which its data-cum-merchandise is directed.<sup>67</sup> We have already seen how Walmart does this with the design and production of its buildings and it is echoed in the company’s approach to territory. Walmart does not manufacture locations but rather seeks them out. Of course in doing so, a certain kind of space is produced that conforms to the company’s requirements. By projecting a version of the world based on performance criteria onto a given area, Walmart privileges certain characteristics over others.

In this regard, the notions of reproducibility, indifference, and equivalence can be extended through the adoption of a term familiar to economics: fungibility. More than simply describing an interchangeable set of things, the term implies a certain relationship to the particular instance and generic conditions. Historically, fungibility has been defined thusly:

When a thing which is the subject of an obligation... must be delivered in specie, the thing is not fungible, i.e. that very thing, and not another thing of the same or another class in lieu of it must be delivered. Where the subject of the obligation is a thing of a given class, the thing is said to be fungible, i.e. the delivery of any object which answers to the generic description will satisfy the terms of the obligation.<sup>68</sup>

While most commonly applied to commodities, with

Walmart’s real estate practices, the concept can be applied to territory. The company understands sites in terms of performance characteristics, for each location functions as “a thing of a given class” and as an object that “answers to the generic description” in spite of its otherwise specific qualities. In other words, while there are both sets of conditions embodied in any given site, Walmart’s expansion protocols foreground the fungible aspects of real estate.

In 2002, for instance, in Inglewood, California, Walmart’s plan to construct a supercenter was consistently frustrated. 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.”<sup>69</sup> 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. The retailer’s hybrid approach to its 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. Even if Walmart’s real estate planners see the United States as a field of data, such an outlook carries spatial implications with it. In a manner similar to the tension between the performance of bar-coded merchandise as both data and matter, locations for Walmart are abstractions with even more obvious spatial effects “on the ground.” Logistics once again offers a way to see this process and, indeed, the logistics of real estate is no longer a matter just of “location, location, location” but also of “delivery, delivery, delivery.” Furthermore, the process of

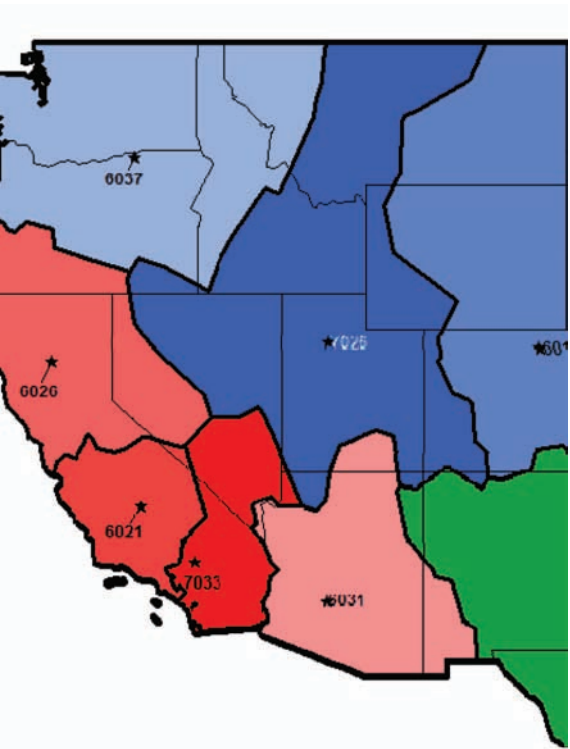


FIGURE 28: Walmart redraws the borders.



FIGURE 29: The NRC’s proposal to adopt regional jurisdictions in order to manage resources better and govern more effectively was not implemented.

choosing sites has relatively little to do with notions of social considerations or public space but, like the rest of Walmart's operations, is more concerned with efficiency and optimization. While municipal governments, for the most part, have yet to manage significant regional coordination, Walmart acts as a regional planner and governor of its own territory.

Weaving together military technology with consumer marketing trends, Walmart has developed a highly rationalized process of locating its stores that focuses on performance and market coverage. This trafficking in territory, this management and deployment of land area, reminds us that logistics is not only about optimizing supply chains but informs Walmart's entire mode of thinking. Armand Mattelart refers to the German political geographer Friedrich Ratzel who understood commerce as the "movement of people, goods, information from one place to another" and as the "mastery of space."<sup>70</sup> Commerce, in this sense, becomes synonymous with logistics—the very thing Walmart uses to secure its mastery of space. Not only are people, goods, and information moved through space, but so are the places themselves.



FIGURE 30: The NRC proposal suggested radical ways of reorganizing and reconceptualizing territory.



INTERLUDE B  
RECON

We have to facilitate your dreams and your ambitions. We have to help you make that big gamble of starting a business, or developing a shopping center, or growing one that's already existing because your dreams and your hard work drive our economy.

You are the job creators, not government.  
You are the engine of prosperity, not government.  
And not government bureaucrats.

So go do your thing and make those deals and get the economy roaring back to life.

It's through your hard work and your dreams and your pioneering, entrepreneurial spirit that we will prosper and from the bottom of my heart I thank you for being part of the solution that we need here on this earth.

Thank you so much and God bless you guys.

- Keynote speaker Sarah Palin to ICSC RECON attendees,  
May 23, 2010

Las Vegas is a fitting place for a convention that trades in speculation and risk taking. Once a year, tens of thousands of members of the retail and real estate industries gather in Las Vegas for three days of deal making. This retail real estate convention is called RECON and fills the entire Las Vegas convention center and many of the city's hotels. In order to navigate the expansive event, all registered participants are armed with a map of the three trade floors. The convention center is organized along an alphanumeric grid and the resulting map reads like a city plan (Figure 01). Lettered streets run the length of the building and are crossed regularly by numbered avenues. Central Hall runs from 9<sup>th</sup> Avenue to 21<sup>st</sup> Avenue and from D street to M street. The upper floor of the South Hall continues from 22<sup>nd</sup> avenue 49<sup>th</sup> avenue and from N street to S. The floor below includes avenues from 50 to 66 and streets T to X. Each exhibitor is then assigned an address. The City of Oakland for example, can be found at S595 Y Street. This small discontinuous city is known as the Leasing Mall and it is the space in which these thousands of realtors and retailers converge to make deals. The alphanumeric grid is necessary because otherwise one would easily get lost amidst the hundreds and hundreds of booths. The adoption of a conventionally legible urban form to organize the convention is striking for its contrast to the urban territories in which the participants of the convention are active in organizing. The International Council For Shopping Centers (ICSC) sponsors the convention and large-scale commercial development—usually at the edges of urban areas—is the primary mode of development here.

The ICSC is a trade association for the shopping center industry and organizes RECON as part of its larger efforts to promote the trade. In spite of its connections to retail, the convention is less concerned with merchandising and more with real estate insofar as the retailers participating are not promoting products as much as their business as a whole. They do this in the hopes of convincing landholders to entice them to open in their shopping center or to convince possible franchisees to take the risk. The complements to these efforts are companies who have space to lease and are looking to find tenants. Since many of the real estate holders run multi-tenant shopping centers, they are in Las Vegas to fill their spaces with successful businesses that will in turn bring customers to the rest of the center. Similarly, there are several booths operated by small cities in an effort to attract



FIGURE 01: The grid of convention booths.





FIGURE 02: Outdoor World.

businesses and land speculators. Companies with products specifically relevant to retail real estate—including goods, software, and services—also have a strong presence at the convention.

The space of the gridded convention hall functions as a kind of mini-Manhattan in which the individual exhibitors and vendors can then deploy their specific architectural manifestations. The form that each booth takes is highly variable depending on the company they house. Vendors—companies looking for hosts for their chains—most frequently recreate some version of their actual shops. The McDonald's booth, for example, is a dense cluster of small tables with some private meeting spaces in the corner opposite the entrance. Next to the entrance is a counter over which McDonald's employees hand guests free samples of coffee, vegetable snacks and yogurt parfaits. The counter also opens on to the main "street" and allows passers-by to quickly grab a sample, all the while being reminded by the large sign above that "There is Only One Big Mac." It is expensive to register for RECON and this ensures that most attendees are industry professionals. As a result, there is a level of familiarity, a shared language, and common set of priorities. However, when the amount of registered attendees is close to 60,000—many of whom are in one of two buildings at any given time—there is an urban intensity that results. The McDonald's booth's primary function is to play host to meetings and negotiations about lease terms but it also hosts a "public" of convention attendees interested in the free yoghurt parfaits and coffee. These two groups are then packed together inside the simulated restaurant space of the small pavilion. The kind of micro-urbanity that is cultivated unintentionally within the carpeted grid of RECON is evident in the areas immediately surrounding McDonald's as well. The McDonald's booth is on a corner and this allows the company to set up a station on its outside face that provides milk, sugar, stirrers, and napkins for coffee. Across the corridor from this station the opposite booth is designed in such a way that the continuous base that supports its partitions can become appropriated as a temporary seating area, a feature of the quasi-urbanity produced by RECON.

Vendors who have a narrower target audience often accentuate this in the architecture of their booths. The flexibility of the grid allows them to fully exploit this specificity through the production of idiosyncratic architecture. For example, "Outdoor World" of Bass

Pro Shops is presented as a kind of primitive hut, adorned with antler trophies, a small creek, a winning Nascar stock car, and small meeting rooms disguised as camping trailers (Figure 02). The duty of the staff of these outposts is to actively sell the brand and the jubilant attendants at Bass Pro Shops do their best to lure passers-by. One "block" over from the booth stands the IKEA Russia space that is the architectural opposite of Bass Pro Shops in its monochrome minimalism and matching spectacles (Figure 03). Both form miniature "gesamtkunstwerke" in which every aspect of the space has been designed and deployed.

Companies with land or retail space to lease or sell have an equally large presence at RECON. These have a less legible architectural manifestation than the retailers because their "product" is more abstract. The booths are often reflections of the highly regularized convention structure. Rather than opening their booth up and waiting to see who arrives, these realty companies often have a full docket of meetings that has been arranged in advance. The convention then is less of a chance to discover potential new tenants but rather a convenient way to consolidate meetings with otherwise far-flung companies. The nature of these activities is evident in the architecture as well in which there is a limited interface with the "public" and most of the area of the booth is given over to work areas in a semi-public area or private meeting rooms that have both visual and acoustical separation.<sup>1</sup> The Walmart Realty booth, for example, is comprised of thin scallops of columns that are connected by shorter partition panels. The columns reach beyond this line to support a continuous thick blue band with the company's logo on each corner and midpoint (Figure 04). At one corner the panels are removed and visitors can enter a small reception area, behind which Walmart representatives will help to schedule appointments with a real estate representative. This corner is also marked by a small tactile difference through an additional layer of carpeting. Visitors can occupy this space while access to the deeper recesses of the structure is by appointment only. The outside of the booth is more fortified as a way of directing access to a single point. The low partitions then double as display space for Walmart to promote recent innovations in building design and real estate development. Because the columns are taller than the partitions, the continuous blue band of signage is legible through the space of the convention center and serves as a constant reminder of Walmart's presence.

Some pavilions trade in generic corporate imagery - these are usually the real estate companies who sell no specific product but deal in square footage. Even if their product is abstract, there is still the necessity to broadcast their corporate image through the architecture. The structure for Developers Diversified Realty—one of the largest retail real estate companies in the country—offers an assembly of planes and screens all in service of presenting the company's logo as clearly as possible. Edens & Avant, a shopping center developer, uses more recognizable architectural language. The pavilion is designed as a grid of columns that are partitioned with faux-windows displaying information about the company. The structures muted palette and restrained architectural embellishment are meant to suggest the kinds of environments the company aspires to produce—and the kinds of customers it hopes to attract. Both cases, one an abstract planar assemblage, the other a mute domestic container, demonstrate an effort to use architecture to articulate and promote some notion of the abstract product in which they trade.

In efforts to attract both retail and real estate investment, numerous representatives from actual cities constitute a significant portion of the trade exhibitors. Over 50 cities had a presence at RECON 2010, each of which promoted itself as a dynamic region on the cusp of expansion and transformation. They describe themselves in language familiar global real estate executives who are used to assessing investments in terms of trade areas, market segmentation, and median incomes. The City of Apple Valley, for example, asserts that "low costs, free technical assistance, streamlined processing led by a single point of contact make it the place to do business! Apple Valley's economic development staff is ready to assist you through every phase of the development process as well as identify sites for your tenants."<sup>2</sup> Some cities are even more direct. The city of Murrieta is described as a "young, on-the-go affluent community just North of San Diego. Murrieta boasts a population of over 100,000 and a trade area of over 663,000. With a median age of 32, a median household income of 90,000 and recently recognized as the 2<sup>nd</sup> safest city in the nation, Murrieta is the future of Southern California!"<sup>3</sup> This directness signals an obvious awareness of the terms by which growing cities are evaluated and reinforces the dependence on private development.



FIGURE 03: IKEA Russia.



These hundreds and hundreds of small buildings, each host to their own program and set of specific functions and spaces, are sheltered by an expansive black ceiling that stretches away in all directions. Even if the alphanumeric grid is a gesture toward regularity, the “lot size” of each vendor is irregular. As apparent in the plan, some take up only very small plots while some, like Walmart, are significantly larger. Similarly, from time to time, voids are created within the grids that are used for gathering spaces, eating areas, or other collective functions. As the convention center is a multi-unit structure, these same conditions are repeated on level below. The convention center is large enough to produce its own interior urbanism that is constantly torn down and rebuilt. In the case of RECON, the city it contains consists of an array of small structures that, in some cases, are designed to reflect their programs. In other cases, the structures are generic and the programs are differentiated through applied signs and symbols. In other words, RECON is a city of tiny ducks and tiny sheds, all absorbed by the supple and endless space of the very large shed surrounding them.

RECON is one of the crucibles in which cities are produced. It is here amongst the booths and kiosks, handshakes and free samples that territory is encumbered and promised. While somewhere in the small towns and technoburbs and edge cities where this real estate is located there is likely a planning authority doing its best to push things in a certain direction, the frictionless space of the convention is where the specifics of such spaces are determined. Sarah Palin’s suggestion that retailers are more responsible than the government for economic recovery only reinforces the need to identify modes of engagement with the mechanisms shaping cities beyond those of planning regulation and policy making.



FIGURE 04: Walmart’s booth includes a carpeted vestibule and a series of meeting slots.

The lower animals keep all their limbs at home in their own bodies, but many of man's are loose, and lie about detached, now here and now there, in various parts of the world—some being kept always handy for contingent use, and others being occasionally hundreds of miles away. A machine is merely a supplementary limb; this is the be all and end all of machinery.

- Samuel Butler, *Erewhon: Or Over the Range*, 1872

# 04

## SERVO-ORGANISM

### Logistics And Operation

#### Introduction

#### Walmart's information system

#### Servo-organism

#### Operators and augmentations

##### Barcode scanner

##### Wearable scanner

##### Pallet truck

##### Man-on-board ASRS

##### Voice-directed picking

#### Spatial contradictions / blurred boundaries

The focus of this chapter is on the human-scale technology that is incorporated by the workers—often referred to as operators—who inhabit Walmart’s transmission network. Therefore less emphasis will be placed on specific architectural or urban technologies and more on technologies as they intersect with the human body. Instead the effort is to better understand the altered conditions in which these operators find themselves. In order to illuminate certain aspects these technologically saturated environments and suggests new forms of inhabitation that span scales and categories. The chapter looks first at Walmart’s overall information system before contextualizing it within some aspects of the discourse surrounding human-computer interaction that was emerging as Walmart was also growing. These parallels are not meant to suggest Sam Walton was party to cybernetic discourse. However, Walton was technologically savvy and aware of contemporary discussions surrounding technology. The primary focus of this chapter is on the various technologies that are used by the distribution center operators. As these technologies become more sophisticated, they also become more difficult to disentangle from their users. By examining documents produced to promote, explain, or support these technologies, the chapter investigates the role they play vis-à-vis their wearers and their spatial implications. The chapter also refrains from directly engaging much of the discourse surrounding human-computer interface, prosthetics, etc. choosing instead to examine the manners in which such technology is presented in images and what that might in turn suggest about the organization that is producing both the images and figures depicted in them. Similarly, this section will not address specific sociological questions, labor rights, or questions of control and subjugation, any of which might seem at first to be the most obvious issues to engage with an examination of warehouse employees. This is not because these things are not important but they have been addressed elsewhere. Here instead the focus is on the technologies that are used as part of Walmart’s logistics operations in order to better understand the implications they might have beyond their immediate context. This chapter then is an initial taxonomy of the various augmentation technologies that incorporate the human operators into the company’s larger information network.

The distribution centers themselves, as discussed above, are in fact semi-automated environments in which many of their necessary functions are



automatically executed. Yet, because of the size and nature of the enterprise, human labor continues to be necessary for the buildings to operate. The difficulty in modeling the demands of the inventory system also makes optimization a special challenge. Likewise, the economy of human labor for carrying out simple tasks like moving small boxes continues to trump that of the machines that could do the job, only at considerable cost and possible obsolescence. Thus for the near future, humans will continue to be necessary for the operation of such systems yet simultaneously occupy a strange middle ground. The condition of these operators is suggested by the image of an employee dressed as an over-sized credit card (Figure 01). The wearer of the costume has black trousers and cartoonish yellow shoes and gloves (with only four digits). However, beginning at the torso, the character becomes a large Walmart credit card. There are no indications of any openings for vision or air though the large “Mr. Smiley” logo is positioned on the edge of the card with the wearer’s hand protruding through its mouth. Part human cartoon and part plastic card, this strange hybrid embodies certain conditions in which distribution center workers find themselves placed. In one sense, this walking credit card transforms the Walmart employee into a consistent and recognizable format that contains a wealth of information not immediately apparent to external viewers. As credit cards, or more precisely in this case, customer loyalty cards, serve as ways of both indexing and producing information, the image is perhaps more telling than apparent at first glance. These cards are how Walmart, like many of its competitors, track and predict consumer behavior both in terms of what customers are buying but also at which branches they shop, how far they drive from their homes, how frequently they shop, and so on. Each shopper then contributes to a refinement of the company’s purchasing and supplying behavior. These data can confirm merchandising decisions but can also identify surprising or latent patterns. For example, by also indexing weather conditions and correlating them with customer purchasing habits, the company has discovered that shoppers in southern states tend to buy large amounts of Pop-Tarts when hurricane warnings are issued.<sup>1</sup> Consequently, the company pays special attention to such imminent calamities and issues rush orders in large quantities from the manufacturer when a larger storm system is brewing. The consequences of this tracking and forecasting method are played out through Walmart’s distribution network and held together by its distribution centers. The loyalty

card mascot is then a reflection of one of the primary modes of increasing the resolution of the company’s image of itself and its inventory needs. However, it is also an honest, if blunt, depiction of how the company imagines many of its employees. While the card is a traceable producer of information, so is the worker in the distribution center. They are checkpoints through which certain merchandise must pass and therefore still vital to the overall functioning of the transmission network. However, they are data points as well; managed, hoarded, deployed in the same way the company’s consumer information is wielded. It is this character, in its various guises and augmentations, that will be the focus of this chapter in order to better understand how it fits in the larger organizational landscape of Walmart’s logistics operations.

#### WALMART’S INFORMATION SYSTEM

Walmart Stores, Inc. has the largest private database in the world and records 20 million customer transactions a day.<sup>2</sup> Walmart maintains such a vast store of information because hyper-efficient inventory management is one of the ways that a company so large and with such thin margins can maintain profitability. While the goods in transit through these buildings are inherently material and must be physically moved, Walmart manages them as if they are immaterial – as if they are pure information. Correspondingly, the distribution centers function like gigantic computers whose inhabitants straddle both the concrete realm of things and the abstract realm of information. The specifics of the items for sale are important only insofar as they can be strategically distributed to maximize that profit – commodities are abstracted in the pursuit of capital. In order to make decisions about where these products can be best used, Walmart analysts work with a massive database in order to anticipate needs and market opportunities. Though physical in the sense that they occupy quantifiable space and need to be transported, functionally these goods are perceived as data.<sup>3</sup> However, even though this merchandise is conceptualized as data, its materiality is undeniable and, in spite of sophisticated information networks, it still must be transported using traditional means.<sup>4</sup> This conflict between high-speed digital networks and relatively slow terrestrial networks gives rise to the conditions in which Walmart distribution center employees find themselves placed – somewhere between the concreteness of physical space and the abstractness of digital space. The challenge of transporting and distributing merchandise is largely

responsible for the spatial manifestations of Walmart. The need to handle it efficiently dictates the location of distribution centers, the location of retail outlets, the traffic patterns in the parking lot, the interior layout, the aisle widths, etc. But this manifestation of physical parameters is coupled with a manifestation of less tangible factors, like the control of information.

Executives of companies like Walmart, with a data vault second only to the U.S. Department of Defense, can use this information access to exert themselves across time and space while also being able to “see” throughout their entire network. Though Sam Walton, the company’s founder, helmed the company largely before the advent of digital communications, he was nonetheless in the office at 5:00 a.m. every Saturday to review the all profit and loss information from the previous week. His successor, David Glass recognized the promise of information networks and was responsible for initiating Walmart’s aggressive information acquisition strategy. According to Glass, “Our distribution facilities are one of the keys to our success. If we do anything better than other folks, that’s it.”<sup>5</sup> Information management is not simply a business approach of a company; it is an obsession for its leaders and a way of life for its employees. A page from Walmart’s 1975 Annual Report celebrates the expansion of Walmart’s distribution center complex in Bentonville. While the DC remains linked to transit systems it is also located next to the Walmart home office and thus reinforces the fundamental role that logistics plays in both the company’s daily operations but also in the image it broadcasts of itself. In fact, in 1972, the company had the office and the Bentonville DC physically connected. Of the 250,000 square foot complex, only 25,000 was given to office space, the rest to the distribution facilities. The only signage apparent in the photograph is not on the office building but on the distribution, a suggestion of the larger source of Walmart’s identity. Similarly, the marriage of office building and distribution center meets tentatively in the large parking area in which Walmart’s fleet of uniform silver trailers are parked or attached to the individual loading docks. Almost the same color of the building and even more so because there are no tractors to pull them away, the trailers seem to be literally part of the distribution center architecture.

The architectural and infrastructural aspects of Walmart’s distribution centers (DCs) have been addressed in earlier chapters. However a brief return



FIGURE 01: The Walmart mascot is an information gathering tool.



to these structures will help to schematically explain the organization and function of the system. Their form and position are the results of a direct translation of efficiency protocols into a three-dimensional space. The materials handling equipment is standardized but forms a kind of kit of parts whose overall arrangements and constitution are custom-designed, often by the materials handling supplier, Dematic in the case of Walmart. This system is a combination of conveyors, rollers, shelves, struts, and actuators that process the company's merchandise. Trailers are pulled up to receiving docks and are unloaded into the DC, loaded onto conveyors and brought to the picking module. DC employees then, based on inventory needs from the Walmart home office, the new inventory is usually broken down from the case to smaller cartons based on different stores' needs. These smaller units are then placed in a tote, box, or directly on the conveyors that will then take the merchandise to the receiving bay at the other end of the DC. For all the talk of technology and automation, Walmart's DCs rely on a host of operators to ensure the smooth flow of material. An inspection of a press photo of a high-capacity automated distribution center issued by Dematic suggests that human presence is very limited, and indeed, it is difficult to locate any actual people in the image. In a similar kind of photograph, this one from Walmart, there is one operator standing in the foreground as trains of boxes whisk by along the rollers (Figure 02). The blur of the inanimate boxes makes the employee seem all the more wooden and out of place. Positioned there purposefully by Walmart to insist "people make the difference" the man seems to possess none of the usual attributes of a typical DC operator. Awkwardly positioned, it is as if he is contemplating his own imminent obsolescence.

By accepting that the goods Walmart handles can be understood as both information and material, then the distribution center functions more as a processing device than as a storehouse or a place of inhabitation. The computer scientist J.C.R. Licklider, in his influential essay "Man-Computer Symbiosis" uses the term "computer" to describe "a wide class of calculating, data processing, and information-storage-and-retrieval machines."<sup>6</sup> Given this definition and given the ultimately abstract nature of the merchandise that Walmart distributes, it can be instructive to view these distribution centers not just as very large buildings but also as very large computers. In light of Licklider's definition, the typical automated warehouse, in which "The Warehouse

Control System can itself have 'intelligence' to process dispatch-order patterns, to rearrange stock to suit the order demand, and to optimize equipment cycles and picking operations," could also be easily understood as a computer.<sup>7</sup> This categorization is useful because it allows a reconsideration of the actual humans who inhabit these mega-computers and their relationship to architecture and space.

In a typical distribution center, the workers experience direct and sustained contact with both machines and information. While contemporary with the early development of Walmart, though not someone that would have likely been read by Walmart executives, the writing of Marshall McLuhan nonetheless illuminates some conditions of these automatic and information-rich environments. One of the central claims of McLuhan's *Understanding Media: The Extensions of Man* is that media function as extensions of human thinking and feeling and thus as a defense mechanism of sorts in order to cope with the increasing hostility and intensity of a world characterized by media saturation. He explains this further by writing:

Any invention or technology is an extension or self-amputation of our physical bodies, and such extension also demands new ratios or new equilibriums among the other organs and extensions of the body... To behold, use or perceive any extension of ourselves in technological form is necessarily to embrace it. To listen to radio or to read the printed page is to accept these extensions of ourselves into our personal system and to undergo the 'closure' of displacement that follows automatically. It is this continuous embrace of our own technology in daily use that puts us in the Narcissus role of subliminal awareness and numbness in relation to these images of ourselves. By continuously embracing technologies, we relate ourselves to them as servomechanisms... An Indian is the servomechanism of his canoe, as the cowboy of his horse or the executive of his clock.<sup>8</sup>

McLuhan's idea of servomechanism posits that the relationship between media and humans is reciprocal. If a servomechanism is typically defined as "a powered mechanism in which a controlled motion is produced at a high energy or power level in response to an input motion at a lower energy level" then it is puzzling to label the human responsible for the input as the servomechanism.<sup>9</sup> In the more straightforward reading of the situation, the vehicle would be the servomechanism because it intensifies and extends the human's small effort of depressing the accelerator. However, McLuhan asserts that we are so influenced by the technology that surrounds us that we are the ones receiving the input, in effect becoming technology's "servo."<sup>10</sup> McLuhan argues that humans are not immune to the effects of the technology they created but that the relationship between the two is continuously and mutually transforming.



FIGURE 02: What is the role of the human in an automated environment?



Though writing a decade earlier, Licklider's writing complements McLuhan's because it also addresses the interconnectedness of humans and digital media, computers in this case. Licklider wrote "Man-Computer Symbiosis" in 1954 and its influence was widespread because it crystallized several ideas about the future of computing and offered a new understanding of the potential of interactive computing.<sup>11</sup> Licklider makes a case for the needs and benefits of a closely linked relationship between humans and their computers where the two operate as a single entity with a seamlessly integrated interface that allows for faster and more effective decision-making. He saw these possibilities as a result of the perceived complementary nature of humans and machines. Licklider's starting point for his argument is based on efficiency. He argues that large organizations and companies were spending too much time doing labor-intensive calculations and preparations in order to be properly equipped to make a decision and proposes that "Computing machines will do the routinizable work that must be done to prepare the way for insights and decisions in technical and scientific thinking."<sup>12</sup> Because computers were especially well-equipped to process large amounts of information they could accelerate the decision making process by freeing humans to do the "thinking" and to make decisions based on the data sorted and presented by the computer.

For Licklider, the optimal human-computer interaction would be one in which the computer would do the labor and the human would do the "thinking." Though this is often the case, the distribution centers of retail logistics offer another version of this relationship. In the case of Walmart, whose daily operation is characterized by an enormous amount of information management, the computer is actually performing many of the labor-intensive calculating processes in addition to many of the decision-making duties. Because Walmart's supplies are so carefully calculated, the decision about where to route different goods can be made based on inventory models developed by the retailers extensive data-mining operations. What the computer cannot do is manage the physicality of the merchandise. That is, it can locate the goods and it can determine where they should go but it cannot execute the repetitive and labor-intensive task of selecting them and transporting them to the desired location. It needs humans for this. Humans have the flexibility, agility and economy that currently—and for the foreseeable future—will outdo

those of computers.<sup>13</sup> This reliance on the humans by the computer to do the routinizable tasks that it is incapable of doing itself constitutes a reversal of the roles assigned by Licklider. Instead of the computer serving as the laboring "body" for the thinking human "head," the opposite is true. The servers in Bentonville are dependent on their organic counterparts to ensure that operations run smoothly. Combining McLuhan's version of "extension" and Licklider's "symbiosis" presents another understanding of the inhabitants of these large distribution centers not as workers, not as decision makers and not as "mechanically-extended" subjects but as a collective "servo-organism." If in a servomechanism the machinic output is disproportionately larger than the organic input, then in the case of the distribution center, the machinic input is relatively small while the human labor that it prompts is extensive.<sup>14</sup>

OPERATORS AND AUGMENTATIONS

Several examples of human-machine interface in a typical distribution center support the notion of the "servo-organism": scanner, wearable scanner, pallet truck, picking crane, and voice directed picking. In order for Walmart to maintain its mechanical and hyper-efficient routine of monitoring and distribution, the workers on the "front-lines" must be directly linked to the information network and must be able to quickly and nimbly move large quantities of goods or reconfigure the retail and warehouse floor. The resulting conditions can be better understood by examining each of these technologies in slightly more detail. For this I will rely on images from Walmart, from manufacturers' promotional material, trade publications, and patent applications.

BARCODE SCANNER

In order to access Walmart's large store of data, employees are equipped with wireless scanners that are with them at all times. The scanners are primarily a means of communicating with the central computer database and act as the "eyes" of the mainframe in Bentonville. In this sense, the computer depends on the humans for information but there is none of the collaboration that Licklider imagines in his ideal symbiotic relationship. Instead, the workers function as mobile conduits and as tools necessary for a completion of a job. The portable scanner could be seen as a mechanical extension, or servomechanism, for an individual. However, because the function of the device is not directed to the worker but beyond them, the worker-scanner combination functions

more as an extension of the central computer in Arkansas and places the human in the servant role – mechanically autonomous but bound to the demands of the computer.

The barcode scanner's discrete tool nature is reinforced by the way it is depicted and used in various patent applications from Symbol (and now its parent company, Motorola). For example, in U.S. Patent 6,216,951, the scanner is shown at rest in its cradle (Figure 03). Though a detail, it remains significant that operators of these scanners, or "scan guns" as they are often referred, can return it to a position independent of a user. Rather than "holstering" it in a container on their body, the scanner is returned to a stationary charging receptacle that is also connected to the warehouse computer system. This both reinforces the fact that the scanner is a technology beyond the human operator but also that it can be selectively engaged and disengaged over the course of the working day. Patent 6,244,513 shows a similar wireless barcode scanner, this time in that hand of an operator. The hand is drawn with dashed lines to allow the contours of the scanner's handle to remain legible (Figure 04). The drawing is meant to demonstrate the comfortable design of the handle. It also demonstrates that, in order to hold the scanner correctly, operators must hold it like a gun, and they must squeeze a trigger to register the barcode that they have scanned. The scanning laser is continuously looking for information to collect and by placing it over a barcode and squeezing, the data contained by the barcode's string of digits is recorded. These physical similarities likely contribute to a culture of labor within the distribution center in which operators are armed and are able to "shoot" things as part of their job.

Walmart uses these small scanners but also larger "hand-held computers" that they refer to in an annual report article from 1997 as "magic wands." According to the report:

The magic-wand' is actually a handheld computer, linked by a radio-frequency network to in-store terminals. It's a high-tech conduit to an internal information system that gives every associate a window on the world of Walmart merchandise... The computerized wands are amazing enough, 'seeing through walls' to find out what our customers want, when they want it.<sup>15</sup>

Operators cannot only "see" through walls but also through the crates and containers passing through the distribution centers. Blank save for perhaps a company logo, the barcodes attached to the exterior faces of the containers contain the information about the contents and their destinations. If this tool (and it remains distinctly unincorporated) enables a certain kind of

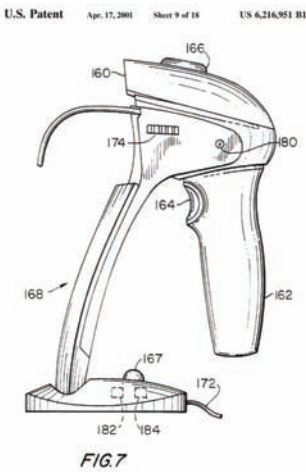


FIGURE 03: Patent illustration of a scanning gun in its cradle.

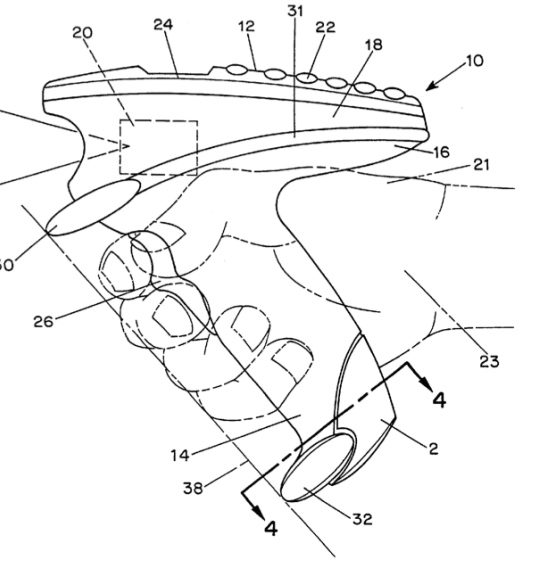


FIG. 1

FIGURE 04: Patent illustration of a scanning gun in use.

visual augmentation, the development of the “wearable scanner” continues this development only makes the connection much more directly; workers are effectively allowed to “see” with their fingers.

WEARABLE SCANNER

A further development in this human-scanner relationship is apparent in the “wearable scanner,” provided by Symbol, Walmart’s primary supplier of the hardware and software and the company that allows Walmart’s employees to remain in constant contact with the central information hub in Bentonville. This system “allows workers to move freely through inventory aisles and still be able to scan, access information and perform data entry”<sup>16</sup> but eliminates any decision making because the workers are always using it. That is, the workers still have control over all of their cognitive and motor abilities but now have to contend with the weight of the largest civilian database in the world that is now strapped to their forearms and wrapped around their fingers. Not only is there an erosion of the boundary between the human and computer but also there is internal sensory erosion within the user. Their hands are feeling, lifting and moving as usual but now they are also “seeing” for the central servers and are able to distinguish between an array of objects quite often hidden from them in a shipping container, pallet or cardboard box.

U.S. Patent 5,898,161 describes an early version of Motorola’s wearable scanner. It consists of a scanner worn as a “ring” and connected a console worn about the wrist that is in turn connected to a battery pack at the waist. Operators point at the barcode they would like to scan and depress a button on the side of their index finger to register the information. This condition is significantly different than that scanner guns described above. By strapping the computers to their forearms, operators are always using the scanning tool. This also enables their supervisors to maintain contact with them at all times during the working day. Furthermore, the mechanism by which operators record information is no longer that of a weapon – there is no trigger here. Thus the wearable computer becomes a new kind of tool / technology / weapon. No longer “like” a gun and wielded like a gun, the wearable scanner collapses the users themselves with the process of identifying and recording the target. Figure 01 of the same patent application continues to shed light on these changing relationships between user and gadget (Figure 05). This drawing shows a

man from the waist up but the body is rendered in a distorted fashion in order to, it seems, to illustrate the various features of the scanner system including arm computer, ring scanner, and battery pack. While the depiction of the body is not the primary duty of the drawing, its strangeness is worth dwelling on for a moment because it seems to suggest the effects of this technology. For example, while the operator is at work scanning a bar code on a box, his eyes are, in fact, closed. Indeed, some scanning technology, especially related to voice-directed picking, claims to be “eyes free.” While the promise is that operators’ eyes will be “free” to perform other duties, such a phrase could also be interpreted to mean that the eyes become unnecessary through the specific kind of augmentation we are here witnessing. In this case, the scanner on the operator’s right index finger is doing the visual work. The patent drawing is also striking for its decision to not show the man’s left hand. Perhaps omitted to see the rest of the box, the apparent amputation of the left hand also echoes the oft-used mobility attribute: “hands free.”

A diagram from Patent 5,514, 861 describes the space in which these augmented and amputated operators find themselves working (Figure 06). The project drawing shows two rows of inventory shelves being scanned by two operators who use their wireless glove-mounted scanners to send information to ceiling mounted base stations. These relays in turn send information to the host processor, presumably linked to a larger network, as would certainly be the case in a Walmart distribution center. In order to visualize the interior but also to understand that the relay stations are mounted to the ceiling, it is rendered as a grid of dashed lines. While this is a reflection of certain graphic necessities, it also underscores the manner in which these spaces are conceptualized. If one of the benefits of wireless scanning technology is its ability to maintain an overview of operator locations (by locating the source of their RF signal) then the invisible ceiling grid in Figure 05 of patent 5,514,861 inscribes this graphically. The location of the workers, the drawing suggests, can be tracked relative to a superimposed coordinate system. This further suggests that the operators are also an aspect of the interior to be managed and deployed to maintain functionality within the distribution center. Don Soderquist, former Walmart vice president, describes this approach:

Throughout the day, all distribution center managers monitor the production process on their computer screens to see how the work is flowing and where any bottlenecks may be developing. They can move associates from one area of the distribution center to another at a moment’s notice in order to keep the merchandise flowing. This

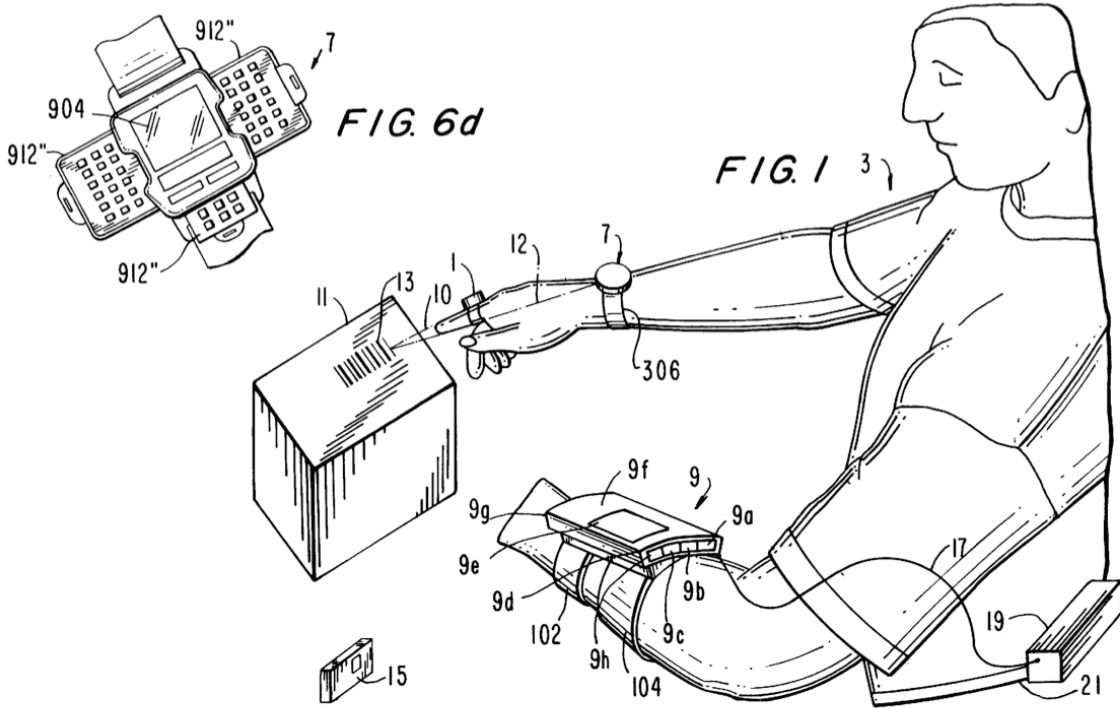


FIGURE 05: Patent diagram for a wearable scanner.

U.S. Patent Apr. 27, 1999 Sheet 1 of 6 5,898,161



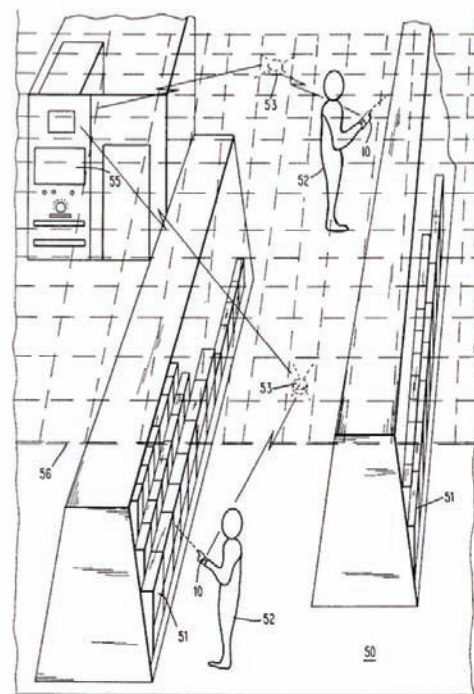


Figure 5

FIGURE 06: The local network that connects pickers on the DC floor.

is incredibly important, as the staggering volume of merchandise that each center receives and ships each day makes maintaining the highest level of efficiency a crucial priority. This type of process flow analysis is quite common in manufacturing but has been revolutionary for distribution centers.<sup>17</sup>

Soderquist's conflation of "associate" with the merchandise being processed is a telling glimpse into the mindset of Walmart's managers. Like the inventory being handled and sorted in the distribution centers, so too are the operators marshaled and directed to "keep the merchandise flowing." The martial overtones of this approach—in which a general maintains an overview of his troops and tactically directs them as deemed necessary—is not surprising given the other ways in which Walmart approaches its operations. Furthermore, patent illustration makes clear the integrated nature of the distribution center space. The workers, though apparently free to move about the space, are nonetheless incorporated into the larger information network and inventory control system. Though the drawing uses a jagged line to show the line of radio communication, it could just as well be a tether.

These wearable scanners have continued to develop but the basic organization remains the same. The descriptive diagram from Motorola's WT4000 shows the scanning element worn on an operator's finger. The scan trigger remains on the side of the assembly and is activated by squeezing thumb and forefinger together. The connector is perhaps the most significant element of this device as it is the link between the individual operators and the larger data network. It is this network that monitors the operators' activity and provides them with directions.

Two press images from Symbol (now owned by Motorola) further illuminate the conditions of the distribution center environment. In one image, the operator wears an earlier model of a wearable scanner (Figure 07). The computer console wraps entirely around the forearm and connects to the ring scanner. The image seems to be an effort to normalize the condition of wearing a computer and of being connected directly into one of the largest data networks in the world. It also demonstrates the necessity of such an augmentation within the space of the distribution center. While the focus of the image is the wearable scanner in use, it also illustrates the spatial conditions of distribution centers themselves. In fact, in this image, there is no evidence of a ceiling, only inventory stacked on large shelves and continuing out of the frame. The windowless and inwardly focused space is further compounded by the



FIGURE 07: A sorting facility worker in his environment of encrypted surfaces.



inscrutability of the boxes themselves. Blank except for the barcode information affixed to their surfaces, themselves encrypted and in need of a key in order to access the information they contain. The wearable scanner thus becomes necessary for the operators to navigate this information rich / information poor environment. The devices they incorporate augment their vision as they become trained to understand these otherwise illegible surfaces. As described in Walmart's annual report, the distribution center operators, with the help of their wearable scanners, can indeed "see through walls."

There are yet further modes of technological augmentation within the spaces of automated distribution centers. One such element is apparent in another publicity photograph from Symbol that depicts an operator's wearable scanner while he or she navigates through the system in some kind of vehicle. From the image, it seems that the operator is some distance above the floor and mostly likely in some kind of loader or picking crane. Before discussing these in more detail, I would like to take a step back and look at some of the earlier and simpler vehicles used in distribution centers and warehouses to manipulate inventory, beginning with the pallet truck.

#### PALLET TRUCK

Operators use a device known as a pallet truck or a pallet jack to aid them in moving and placing large quantities of goods that would be otherwise impossible for one person to lift or carry. The standard format that most goods arrive to the store is on a pallet, usually a wafer-like construction with three spacers connected perpendicularly with planks on either side. These two technologies developed simultaneously as mutual innovations prompted them into further refinement. Early versions of the now ubiquitous shipping pallet were developed during World War II to aim in the allocation and shipment of materiel and other provisions. The pallet became a crucial module in the military's logistics operation because it provided a standard format upon which planners and suppliers could depend. As long as things were placed on and secured to the pallet, it could be trusted that they would fit in the most efficient way. The pallet and the pallet lift also allowed more convenient stacking and access of material. By offering access points for the lift, different supplies could be reached more easily. The pallet itself has also been linked to the rise of containerization in oceanic shipping.<sup>18</sup>

Beyond ensuring the efficient loading and the ability to be accommodated by inter-modal transport systems, the shipping pallet was touted as a major laborsaving investment. A graphic produced by the United States Department of Defense in 1955 makes a case for the overall savings afforded by switching from loose cargo to palletized unit loads (Figure 09). The isotype chart compares two handling methods of a typical navy cargo shipment of 100 tons from supplier to point-of-use. This shipment consists of 4,080 separate packages and fits in 77 pallet loads. The time study concluded that the use of palletized unit loads saved 479 man hours. This document, produced for military use, was reprinted in the trade journal *Modern Materials Handling* as evidence for the private sector of the benefits of palletized shipping. Even though the military and private sectors are different in their operations, they are equally motivated by time savings and cost savings.

Most merchandise still arrives in distribution centers on pallets. In most cases, the contents of pallets must be disassembled into smaller units that are then placed on the conveyor system to be routed to their appropriate holding area as they wait to be picked to fulfill an order. In other cases, the pallets remain intact and are transported to the appropriate part of the distribution center from which they can be picked directly. In all cases, the need remains to move these large and heavy modules through the space of the facility; a need fulfilled largely by an array of pallet transports. These pallet trucks also allow their drivers to transport and manipulate elements that would otherwise be too large or too heavy. The hydraulic pallet jack is the most basic configuration in which operators slide the forks between the pallet stringers and pull down on the steering column to lift the forks and the pallet off the ground enough to move it. A diagram of a "rider" pallet truck manufactured by Crown shows the forks in their different positions. In this case, the cab itself is asymmetrical and is designed to position the driver to the side of the motor. A press photo from Crown shows the rider pallet trucks in action as they load and unload pallets from the trailers attached to loading docks (Figure 10). The image itself helps understand the interiors of these distribution centers because the rolling doors that seal each back of the loading dock are visible, as are the interiors of each trailer—basically understood as other spaces of the distribution center. In fact, as the rolling doors stay closed when there is no trailer, it is not inconceivable that the trailers are on the other side

of the door at all times. It is also significant that the bodies in the images are obscured by the technology they inhabit. An earlier image from *Modern Materials Handling* presents this even more plainly. The drawing is from an article profiling a range of mechanized trucks rendered in silhouette. In one instance, of a high-lift platform truck, the figure of the driver is literally fused with the body of the vehicle—a kind of contemporary centaur capable of delivering several hundred pallets per hour (Figure 08).

Crown manufactures a range of products for transporting palletized merchandise including what they call Walkie Pallet Trucks, Tow Tractors, Stockpickers, Sit-Down Counterbalanced Trucks, Stand-Up Counterbalanced Trucks, Narrow-Aisle Reach Trucks, and Very Narrow-Aisle Turret Trucks. The stock pickers, rather than allowing operators to reach inventory with forks from the ground, allow the operators to physically transport themselves to the merchandise needed. This would be necessary if the required units were a smaller quantity or not palletized, e.g. at the crate or box level. For example, a Crown press photo shows the company's SP 3500 lifting an operator off to ground in order to reach a small box. This is part of an order-building process by which the operator will assemble a range of material on the pallet attached and carried by the lift. Once the order is assembled, it will be wrapped and shipped. If the wearable scanners allow operators to see and know beyond their innate abilities, the stockpickers allow them to reach beyond those abilities. This also allows them to inhabit new spaces within the warehouse. On any given day a stockpicker driver might spend much of the day suspended far above the DC floor. There are more robust stockpickers called "four point" because they provide a stable platform for moving very large items about. As shown in the image, the four-point stockpicker produces a new but temporary floor to accommodate these large items and consequently a surprising and novel way of inhabiting buildings. Stockpickers are a hybrid of pallet truck and loader crane. There is yet another family of semi-automated high-density material handling equipment referred to sometimes as man-on-board automated storage and retrieval systems (ASRS).

#### MAN-ON-BOARD ASRS

In these instances, an operator occupies a cab connected to a crane and rail system that moves between aisles both vertically and horizontally. While such high-density storage systems are becoming

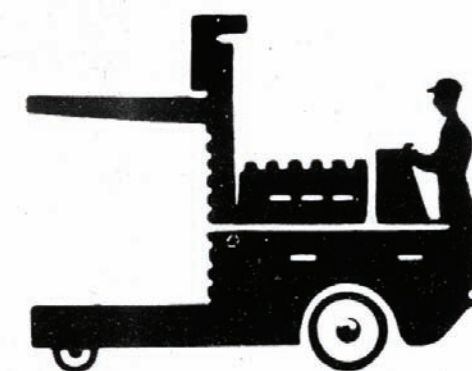


FIGURE 08: The relationship between vehicle and driver is ambiguous.



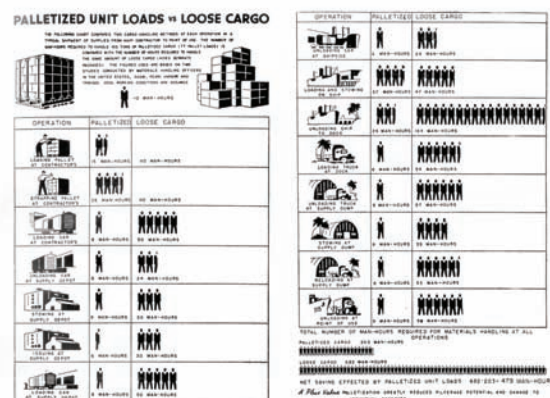


FIGURE 09: A graphic produced by the Department of Defense in 1955 making the case for savings that result from the adoption of the shipping pallet.

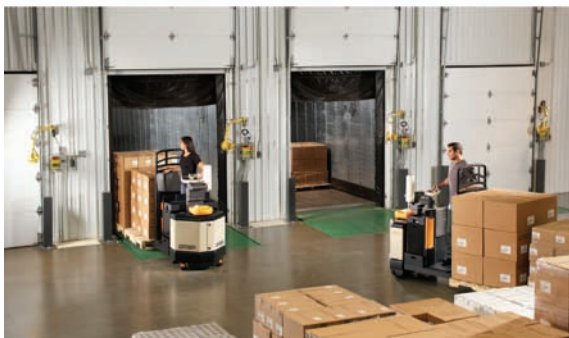


FIGURE 10: The interior of the trailers are mobile extensions of the distribution center.

automated with greater frequency, such systems remain in use and have been since early semi-automated storage environments. In cases of Man-on-Board ASRS, the operators can manually direct their cab. However, more frequently, the picking order sequence dictates their movement. The mechanism, outside the control of the operator, moves the cab to the appropriate inventory position, at which point, the operator picks the correct number of units and signals to the system to move to the next point. These operators spend their days suspended between two high density storage shelves, shuttled back and forth and up and down as they fulfill their orders. Suggesting another kind of radical incorporation, the operators in this case are mostly controlled by the central network in the sense that their movements and actions are not only determined by an external force (as is the case with picking operations like pick-to-light and put-to-light) but they are also physically transported by another force. Whereas the mobile stockpicker remains identifiable as a vehicle that operators can enter, exit, and drive around, the picking cranes are much more a piece of the buildings storage and transport infrastructure. Operators become absorbed by this configuration and allow it to both dictate their actions and control their movement. Once again, publicity evidence from materials handling companies and logistics manuals provides ample evidence of this radical kind of inhabitation in which humans become part of the buildings infrastructure. In an image from Dematic's systems overview brochure, three aisles are shown, each with a cab and operator (Figure 11). These three units move horizontally and vertically as their occupants take inventory units from the very high shelves and place them in the order trolleys. Earlier images from planning guides show a range of fixed picking cranes. These are less automated but their occupants are no less enveloped by the mechanism. In some cases, the human inhabitants of such systems are almost impossible to discern.

The promise of such enhancements has been present in materials handling discussions for sometime. In an advertisement from 1955 for Heppenstall tongs, the crane operator is reclining as he leisurely controls his mechanical arms (Figure 12). Through a series of buttons the operator controls five different cranes each performing different tasks: two are actually performing the loading tasks for which they are presumably designed, one crane is helping commuters get to work, one is sweeping the office, and the fifth is

forcible ejecting someone from a boxcar. The company promises that there is "no limit to the range of jobs that Heppenstall Safe-T-Tongs" can handle. It is significant that the same notions remain in circulation in contemporary materials handling environments. However, increasingly, the leisurely figure operating the control panel is mechanical and the tool at the end of the arm organic.

## VOICE-DIRECTED PICKING

The operators of such storage and retrieval systems receive directions through a range of channels. Typically, they have a list of orders they must fulfill in one hand and a scanning gun in the other. To alleviate the awkwardness of this and to increase the number of orders each operator can process in a given time period, some companies adopt what is referred to as "voice-directed picking." Rather than a list of items to pick, operators wear a headset with earpiece and receiver through which they receive and confirm instructions. The headset is connected to a small computer holstered at the waist and that is in turn connected to the larger DC network. Through voice recognition software and through a setup process, each operator communicates by voice with a computer program. Through synthesized language, workers are directed to different locations in the distribution center and prompted to pick certain quantities of certain items. They can then confirm the completion of each task vocally. Such an approach seems to be popular with managers who cite improvements in both the number of orders processed and in the accuracy by which they can be handled. It also allows operators to work both "hands free" and "eyes free" in the sense that their primary mode of communication is delivered in an audible format only. According to users of this system, it is easier, faster, and more accurate. While this is perhaps the case, it also seems to be a demonstration of the disciplining of the body as identified by Michel Foucault in which, "the formation of a relation that in the mechanism itself makes it more obedient as it becomes more useful."<sup>19</sup> Voice directed picking demonstrates development in several aspects related to such disciplining but also frustrates this notion of bio-political control because it is in fact a software application responsible for overseeing the workforce.

In promotional videos from one supplier of voice directed picking systems, a company called Dematic; the voice software is quickly humanized as its features are introduced and explained. According the video's



FIGURE 11: In some cases, pickers remain in the cab of the crane during their shift.





FIGURE 12: Mechanical augmentation is used for stopping crime and helping travellers in this 1955 ad.

narrator, “The system is designed to tell you, step by step, exactly what needs to be picked for every order. You don’t need a list so your hands are free to pick the order” and “just like you recognize the voice of a good friend on the phone, the system learns your voice. It knows how you pronounce words. Literally the pattern, the sound, and style of your voice.”<sup>20</sup> In a clever copy writing twist, the software and the operators are conflated and the suggestion is that the software will recognize operators’ voices as if they were old friends. In spite of such claims of intimacy, the range of information that is communicated remains limited and certainly focused on the picking tasks at hand.

Voice directed picking shifts authority away from DC supervisors and places it in the software system. Instead of another human delivering orders, operators are prompted by human-like speech synthesized and delivered by a disembodied authority. This is rendered more plainly by the script of a promotional video in which the narrator refers to this inventory control software as “The Voice.” The film goes on to explain, “The Voice will send you to a pick location. Once at the correct location, you can either say the check digit number, scan the location barcode, or scan the product ID. This verifies that you are at the correct picking location. The Voice will tell you how many units to pick.”<sup>21</sup> By placing the control authority in disembodied software, control is transferred from the local floor managers to another unknown site. In the case of Walmart, this site is the home office in Bentonville where all inventory data and models are stored and processed. This also makes it increasingly difficult for operators to engage the system because there is literally no body to talk to.

Some companies have gone further in their efforts to camouflage voice software as an actual human control system. For example, a logistics supplier called Lucas uses a voice directed picking application that they call “Jennifer.” According to on Lucas spokesperson, “We’ve named, or termed, our system ‘Jennifer’ to kind of give the technology a bit of a human look and feel and sound. And Jennifer is kind of like having a supervisor standing over your shoulder. So as you’re a worker out on the floor, wearing your headset you have someone speaking into your ear telling you where to go and what to do.”<sup>22</sup> Operators are thus trained to compete with themselves to constantly improve through this feedback process. The software system will also indicate how much of a job remains

or how fast operators are picking. The can find this information by asking, “how am I doing.” According to once Do It Best operator interviewed for the promotional video, “Now that we have the new system that we like to call Jennifer, our job is so much easier... There’s no way of making errors with Jennifer because you give her a number that tells her that you’re at the right location.” Thus the system acquires both gender and benevolence. “Jennifer” becomes a kind of maternal figure concerned with making the lives of her workers easier. Of course these feedback mechanisms are familiar tools of the disciplined institution, from the environments identified by Foucault, to the shop floors of Fredrick Winslow Taylor, Robert Owen, Henry Ford, and on through the conditions identified by Norbert Wiener.<sup>23</sup> However, as opposed to these earlier systems, the manner in which feedback is administered is as indirect as it is insistent. Additionally, the feedback process in voice directed picking is unilateral in the sense that it is not a matter of reciprocal calibration in which a course of action is set through mutual negotiation. Rather the synthesized computer voice serves to relentlessly correct and push the operator forward.

Voice directed picking is also especially adaptable to a diverse workforce. Because the communication is audible rather than written and because one program can be scaled up to a large number of employees, the economies of scale allow for a greater degree of customization. For example, the company Vocollect has provided the voice-directed picking system for Southeast Frozen Foods.<sup>24</sup> As some distribution center workers speak English and as others speak Spanish, the voice system can be easily adapted to communicate in the operators native language. This eliminates the need to read the labels on the cartons, only to be able to recognize the numbers and scan the bar codes. The computer system, in this sense, also demonstrates a greater capacity to communicate with its workers.

In another example, an article in *Logistics Management* called “Three Voices, Three Solutions” profiles a supplier’s use of voice directed picking. The vice president of logistics says “The main reason we like voice is because it isn’t hard-wired or confined to a specific location such as pick-to-light ... We also find voice to be faster than RF and not as cumbersome; but perhaps the best part was that it is hands-free and eyes-free.”<sup>25</sup> While the phrases hands-free and



FIGURE 13: A voice-directed picking headset.



FIGURE 14: Voice-directed picking allows workers to operate more easily in extreme conditions.



eyes-free refer to the fact that operators hands and eyes are “free” to manipulate objects and look around, there is also the connotation that hands and eyes are unnecessary for the completion of these tasks, a condition also suggested by the patent drawing examined above.

The actual hardware involved with voice directed picking is a standard communication console (Figure 13). An ear cup fits over one ear through which instructions are received and confirmations spoken into a microphone. The main difference is that operators are not speaking to a human at the other end of a communications channel but are rather part of a feedback process in which their voice signals are translated to signals understandable to the voice recognition software, the response processed, and in turn translated back into a set of signals comprehensible to humans. In this sense, operators are not “talking” to The Voice but are entering data into a set of algorithms that return with a response. The product literature also promotes the durability of this hardware that allows it to operate in a range of adverse conditions. For example, an image of the interior of a Pierre’s Ice Cream distribution center shows a worker using a system developed by Voxware in subzero conditions (Figure 14). Because of the layers of protective clothing the workers must wear, it was often difficult to manually manage their inventory. With the use of voice-directed picking software, these errors are reduced. Moreover, the implication is that such technology could help humans to exist and function in environments otherwise hostile to them or even deadly.

Voxware includes a diagram in their product literature that places the symbol of a human operator at the center of three concentric rings in an effort to demonstrate the range of applications offered by the company. It also suggests that the operator is at the center of the system. However, at the bottom of the list of voice applications in a smaller typeface appear the words “Managed through VoxConsole.” This is a telling phrase because it reminds us that in fact the individual workers have little to no control over their actions but to remain employed must follow the directions given by the software. Managers also praise these voice-operated systems for the ease with which they can be learned. Training can happen in a matter of hours rather than days or even weeks. Thus there is little incentive for companies to invest in their employees. Since few resources were necessary to bring

new employees to satisfactory level, the consequences of high turnover are significantly diminished. Workers, like the software that commands them, can be quickly replaced with only limited and very temporary reductions in productivity. Thus the diagram with the worker in the center is misleading because it fails to show the numerous additional workers, all of whom are connected back to the main server and all of whom share the same input source: the software that transforms inventory information and merchandise into signals audible and comprehensible to its human attachments.

### SPATIAL CONTRADICTIONS, BLURRED BOUNDARIES

In many of the instances above, the environments of warehouse buildings significantly absorb the humans who occupy them, transforming both the buildings and their operators. This hybrid of animal and building suggests new kinds of inhabitation modes in which certain boundaries are blurred. To develop this, an examination Rebecca Horn’s *Fingergloves* and *Pencil Mask* provides a helpful filter. The sculpture/performance *Fingergloves* witnesses the struggle of manipulating objects at a distance by using tools that are the literal and linear extension of the artist’s digits (Figure 15). The fingers and hands are one of the primary thresholds through which we inhabit our physical world. They are functional and agile and also sources of pleasure as they act as primary touch receptors. The monstrous extension of Horn’s fingers promises enhanced abilities to interact with her surroundings at a distance but at the same time denies their physicality because the wearer can no longer feel them. The promise of connection distances her even more from her surroundings. Likewise, because of their inflexibility, they preclude an interaction with objects within a certain radius. Most significantly, they prevent the wearer from touching herself save for in the most attenuated poses. In an effort to recognize objects at a distance, the wearer sacrifices the ability to recognize herself.<sup>26</sup>

The project *Pencil Mask* consists of a web of straps worn about the head from which protrude eighteen pencils (Figure 16). During the performance, the artist uses her head and the mask to cover a wall with a dense web of lines. In the same way that the wearable scanner breaks down certain internal divisions between touch and sight (the hands in effect “see”), the pencil mask both upsets and enables new sensory functions. One writes by moving and by seeing.

Furthermore, even though movement and seeing are conflated with communication, the author/wearer still has an impact on the outcome because the pencils follow the profile of her face and as a result, certain zones on the wall are darker than others because they receive more pressure. This suggests that even if mechanical extension of humans precludes certain forms of control or expression, there is still some reciprocal influence on the outcome. If in *Fingergloves*, sustained interaction with the surroundings serves to erode the integrity of the subject, in *Pencil Mask*, continued interaction creates more traces and increases the presence of the wearer.

In Horn’s pieces there is an analog to the concept of servo-organism and the tensions that it embodies. The workers are at once present and removed, strong and weak, fixed and mobile, connected and isolated. This suggests that the continued interaction with augmenting technology poses significant dilemmas in terms of how we might constitute bodies in space, and by extension, buildings. The benefit of such augmentation promises certain kinds of physical emancipation, whether through profound ontological transformations or more prosaic things like spatial mobility. Furthermore, the blurring of human boundaries in the servo-organism could also blur conditions at the scale of buildings and cities. We can witness such a process with the development of the “wearable” scanner. Not only does the border between body and space dissolve but also so do some of the internal borders within the wearer. The condition of these networked warehouses is one in which humans are both discrete entities but also “incorporated” into the larger body of the machine-information organism of Walmart such that the boundaries of both are in a constant state of negotiation. This kind of tension also suggests another way of understanding architectural scale not as an incremental reduction in size but instead as a continuous exchange across all scales in a very physical way such that “the city and body will interface with the computer, forming part of an information machine in which the body’s limbs and organs will become interchangeable parts with the computer and with the technologization of production.”<sup>27</sup> These conditions suggest, through their erosion of boundaries, the possibilities of moving beyond conventional urban binaries (urban/rural, center/edge, virtual/physical, abstract/concrete, etc.) in order to straddle both. Doing so opens up categories of seemingly contradictory urban states that can exploit the potentials offered by logistically driven operations like those of Walmart.



FIGURE 15: Rebecca Horn, *Fingergloves*, 1972



FIGURE 16: Rebecca Horn, *Pencil Mask*, 1972



INTERLUDE C  
HERCULES

This interlude examines Hercules, California and the capacity of instruments of urban governance to be deployed in novel ways in order to better understand architecture’s potential political agency and its ability to indirectly focus collective action or to produce new venues of public engagement. Hercules, California is a small city in the San Francisco Bay Area whose city council, with the support of its constituents, used bureaucratic means to thwart Walmart’s efforts to open a retail outlet in the town. By creatively wielding their eminent domain rights, the City attempted to forcibly buy a parcel of land owned by Walmart to prevent it from building a store in Hercules. Though the County Superior Court struck down this action on a technicality, Walmart surrendered nonetheless and sold its land to the city in 2009, four years after the process began.

Hercules was founded in 1879 when the California Powder Works acquired 3,000 acres from the 17,000-acre Pinole Rancho as part of an 1838 Spanish land grant. The area started manufacturing explosives immediately and after a series of divestures and reorganizations became Hercules Powder Company in 1913. After World War II, the emphasis expanded to include fertilizer manufacturing and in 1964 production of explosives ceased. The detailed history of the site is accounted for elsewhere, especially in the reports of the staff of the Hercules Redevelopment Authority. For the purposes here, it is significant to note that the larger Hercules parcel was subdivided and changed hands repeatedly through the intensive environmental remediation work required to mitigate the toxic soil conditions. These transactions, in combination with the zoning plan and “Plan for Central Hercules” adopted in 2000 (as the result of a community-wide design workshop), allocated the site in question for commercial use (Figure 01).

On November 7, 2005 the title for the parcel was granted to Walmart Stores, Inc. (Figure 03). Shortly after, on December 13, 2005, Walmart submitted an application to the City of Hercules in an effort to gain approval to build a 141,685 square foot Walmart discount store (Figure 05). According to the developers acting on behalf of Walmart:

The building architectural theme is of a Main Street style and uses construction materials that are widely found in the local area. Architectural materials such as concrete masonry block, brick veneer, wood siding, awnings, shingle roofing, and exterior plaster finish will be utilized on the building. Proposed colors are earth tone with multi-color accents. The building’s walls will be broken up by offsets of the roofline, architectural pop outs, articulated entry vestibules, accent wall colors and other interesting and attractive features.<sup>1</sup>

This proposal was denied by the Redevelopment Agency on the grounds that it was not in accordance with the 2000 “Plan for Central Hercules” that promotes high-density pedestrian-oriented development (Figure 04). The city commissioned a peer-review of the proposal, which concluded that “Walmart is not an appropriate retailer to serve Hercules residents, a Walmart could deter consumers seeking a higher-end retail experience in Hercules, and the presence of a Walmart would affect the types of businesses that locate in Hercules.”<sup>2</sup> Based on this recommendation, the City also found that Walmart’s “proposed use and densities” would be inconsistent with the town’s General Plan. Without dwelling on the minutiae of Conditional Use Permit Requests, Variance Requests, Environmental Impact Reports and the like, it will suffice to note that Walmart then resubmitted its application on March 31, 2006 in an effort to conform to the requests of the City (Figure 06). The revision called for a smaller building (roughly 100,000 square feet) that would include groceries and would be open 24 hours a day. These are significant concessions for Walmart because they require more staff, maintenance, and distribution requirements appropriate for handling food. The company also modified the design of the building as follows:

Per the Initial PDP, the building architectural theme includes elements of Craftsman architecture. Architectural materials such as wood siding and cement plaster with stone and brick veneer will be utilized on the buildings. The buildings will have metal seam roofs. Proposed colors are earth tone with multi-color accents. The buildings’ walls will be broken up by offsets of the roofline, architectural pop outs, articulated entry vestibules, accent wall colors and other interesting and attractive features.<sup>3</sup>

Significant in the application is the emphasis both on architectural features and format. Though the community objected to Walmart’s bid on programmatic, urban, and architectural grounds, the response by the company was constrained by its limited architectural vocabulary. To handle such critiques, the best Walmart could do was to make



FIGURE 01: The Plan for Central Hercules developed in 2000 as part of a series of community workshops.





FIGURE 02: New Urbanist townhouses in Hercules, CA.

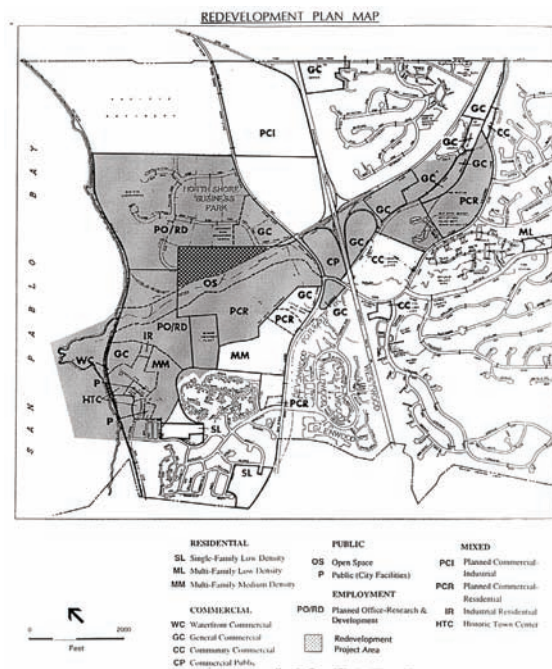


FIGURE 03: City Zoning Plan with Walmart lot highlighted.

the store smaller in footprint and more articulated in its façade. These design “solutions” were reinforced in a similar way by the narrow scope of the New Urbanist planning document of the City of Hercules (Figure 01). Derived largely from a set of architectural references that predate large format discount retail, plans like these demonstrate their inflexibility when confronted with incompatible building types.

Even before Walmart submitted its revision, the City of Hercules and the Redevelopment Agency had already begun proceedings to establish a Resolution of Necessity for the acquisition of the property from Walmart that would be put before the council on May 23, 2006. Their justification for drafting such a resolution was based on the power of eminent domain in which a government can acquire property for “public use” in exchange for “just compensation.” In the case of Hercules, the city, based on testimony from its citizens and constituents, determined that it would be in the public’s interest to prevent Walmart from opening a store in its jurisdiction. In one especially fervent statement, a resident of Hercules urged the City Council to do whatever it could and to “throw the bums out!”<sup>74</sup>

Eminent domain has a fraught history in the United States has been upheld by the Supreme Court case *Kelo v. The City of New London* in 2005. Eminent domain is often used as a means to acquire territory in order to implement infrastructural projects that are intended for “public use” and quality of life improvements. However, understanding what constitutes public use has been complicated by different ways of measuring a proposal’s outcomes. In recent cases, the “public good” that would attend a large new commercial development is often linked to abstract notions of overall economic development. Consequently, the justification for an eminent domain taking becomes more ambiguous and also able to be applied to commercial projects. In *Kelo v. City of New London*, the court ruled 5-4 in favor of the city and upheld that its takings were justified because they are intended to improve the economy, create jobs, and revitalize the area. In her dissenting opinion, Sandra Day O’Connor wrote, “Any property may now be taken for the benefit of another private party, but the fallout from this decision will not be random. The beneficiaries are likely to be those citizens with disproportionate influence and power in the political process, including large corporations and development firms.”<sup>75</sup> The opinion attached to the rule of the 2004

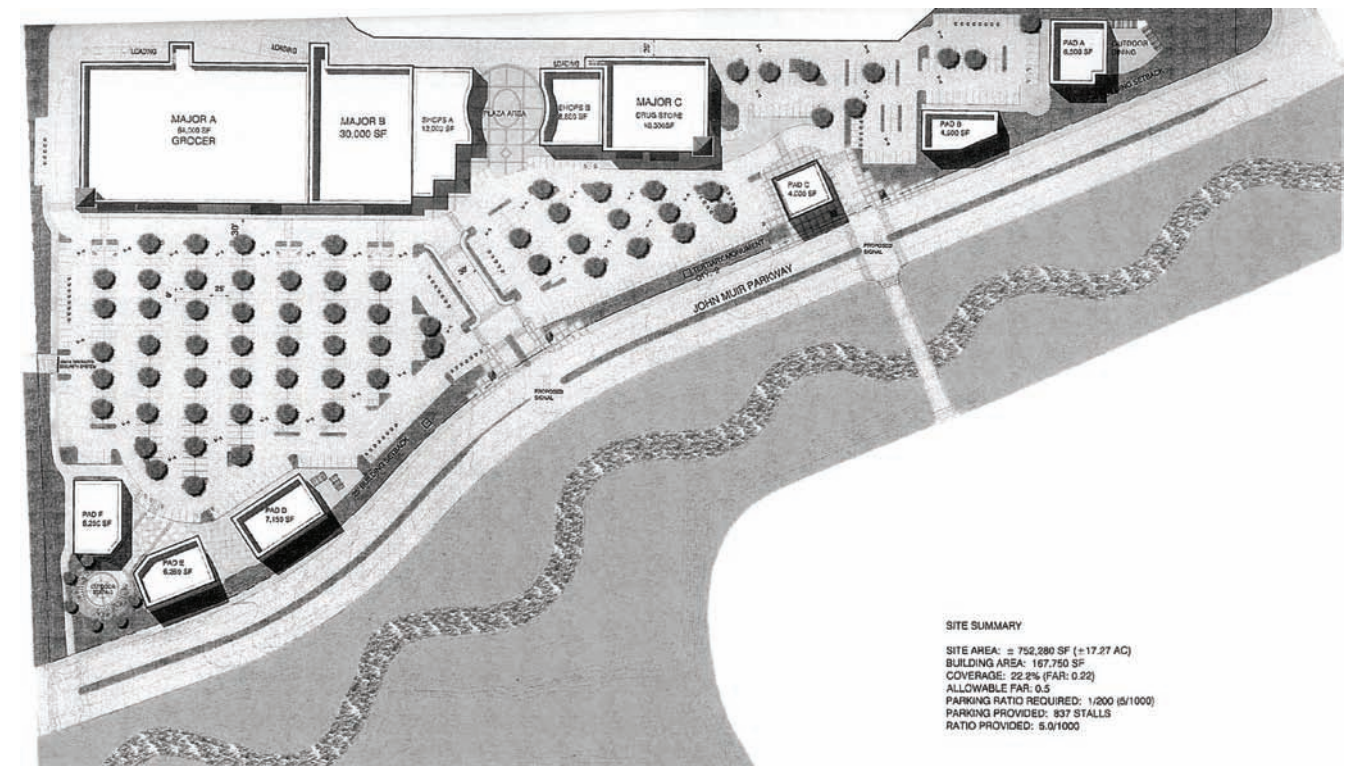


FIGURE 04: City proposal for lot development based on the 2000 planning document.

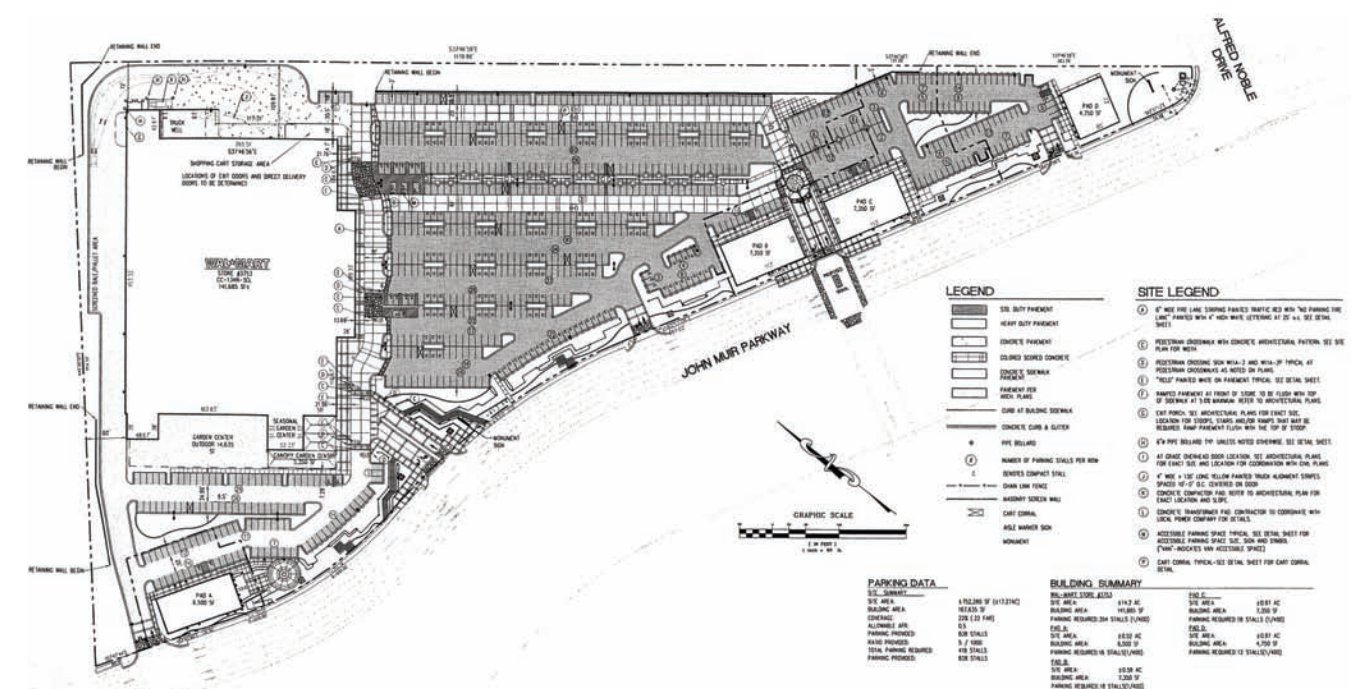


FIGURE 05: Walmart’s initial proposal to occupy the site was denied for not complying with the vision set forth by the city.

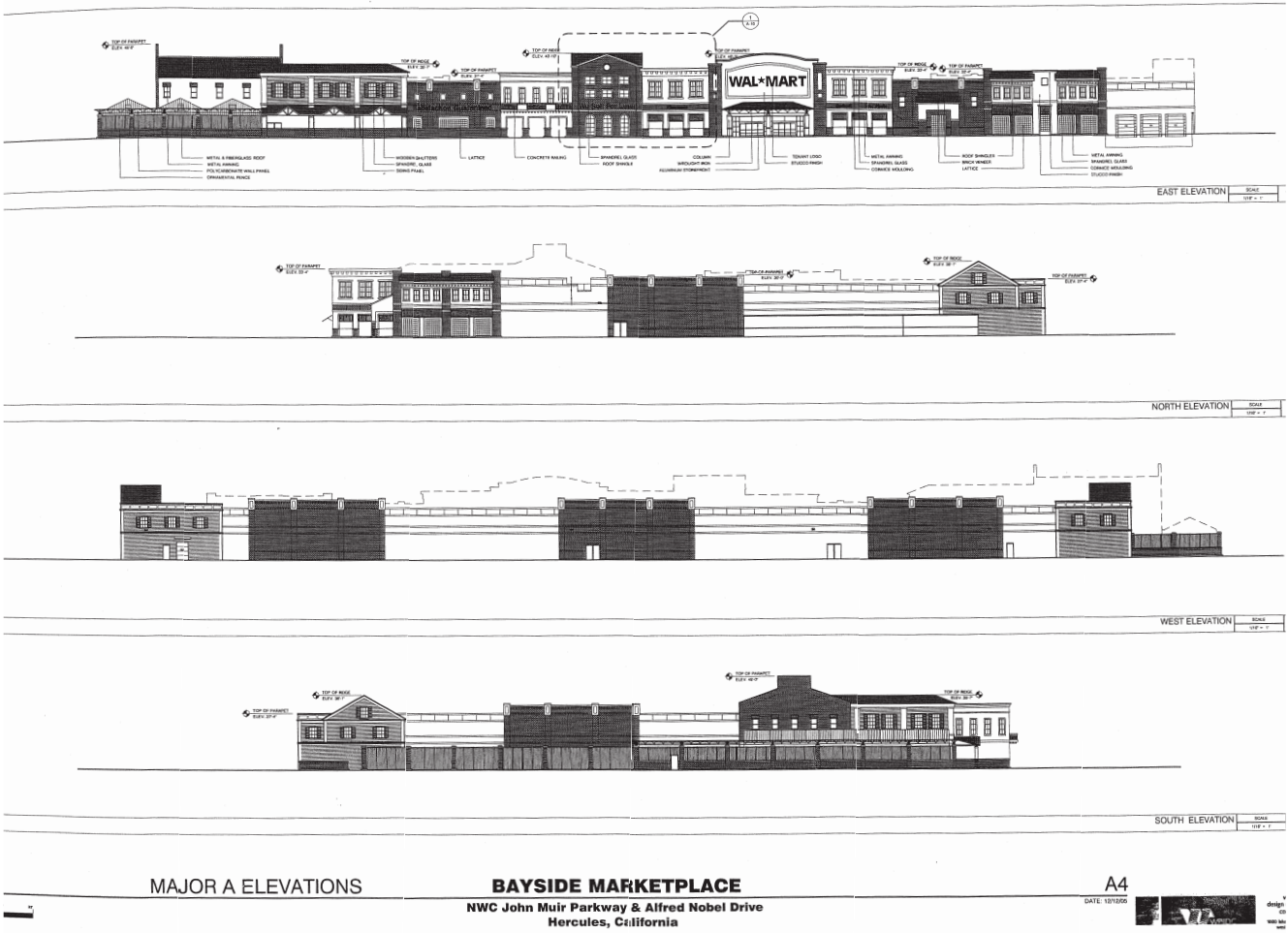


case *County of Wayne v. Hathcock* put the issues in similar terms: “If one’s ownership of private property is forever subject to the government’s determination that another private party would put one’s land to better use, then the ownership of real property is perpetually threatened by the expansion plans of any large discount retailer, ‘megastore,’ or the like.”<sup>6</sup> In both statements, the implicit belief seems to be that the will of private entities will trump those of the public.

The case of Hercules is different because the opposite occurred. Rather than foreclosing on individual property owners, the city obliged one of the largest corporations in the world to sell its land back. Furthermore, it did this as a result of intense community involvement. How can we account for this and what does it suggest about the role of government and participation in planning processes? Certainly the small size and relatively high affluence of a town like Hercules played a role in the consistent community involvement. As the proceedings were drawn out and costly, there is a demonstrated motivation on the part of the taxpayers to “invest” in this process. Also significant is the city council’s willingness to take legal risks knowing that they are acting on behalf of their constituents. Threatening Walmart with an eminent domain taking was a surprising move and was resolutely supported by the citizens’ testimony at the May 23, 2006 public hearing. In spite of the assertions from Walmart’s legal representation that the city’s resolution to buy land from the company would “not withstand judicial scrutiny,” the council voted to do so unanimously. In the end, the Superior Court of Contra Costa County found that the City of Hercules eminent domain rights had expired but the message to Walmart was clear and they consented to sell their property back to the city.

In a similar way that Walmart circumvented planning instruments in Vermont through the undeniable presence of its buildings, Hercules frustrated Walmart’s efforts through a sustained bureaucratic siege. For example, after commissioning a peer review on the economic impact of the proposed Walmart development, the city denied the retailer’s proposal on several points. While it is common practice to deny initial proposals, often the recommendations offer avenues for improvement and mitigation in order to reach a compromise. In the case of Hercules, little is offered to Walmart in the way of concessions from the city. The document “Resolution No. 06 – DENY – Final Planned Development Plan No. 06-01” includes

14 different findings in support of denying Walmart’s efforts in language that makes the city’s position clear: “(7) A community oriented retail shopping center as depicted in the Initial Planned Development Plan would better serve the City, would enhance the identity of surrounding retail establishments and would provide a better opportunity for the community to meet its general plan goals and maximize its sales tax revenue.” Finding 12 states, “The location, size, design and operating characteristics of the proposed project will not be compatible in design, scale, coverage, and density with existing and anticipated adjacent uses.” Though they never admitted it, it seems that the City Council was never going to let Walmart build a building in Hercules. Such conviction on the part of a local government against a corporation and developer is uncommon and begs the question of its source. According to urban governance scholar Paul G. Lewis: “The institutional configuration of a region’s local governance influences the perceptions, opportunities, and actions of elites. Most notably, the configuration involves the relative fragmentation or unity of the public sector.”<sup>7</sup> In the case of Hercules, the *Hercules General Plan* drafted in 2000 played a central role in producing this public sector unity. By relying on a somewhat visionary document that had already been agreed upon by the community, the city council could operate with the confidence, and even audacity, that it did. This is especially relevant to architecture and urban design because it offers evidence of the power of such design documents. Through the articulation of a collective vision for a region’s development, the City of Hercules could then more easily make decisions about how better to direct that growth. What seems necessary then, at least in the case of the United States, is to invest considerable creative capital into developing an expanded architectural and urban vocabulary for these kinds of projects. The current “new urbanism” based on regressive models of pre-war inner suburbs is convincing in its comprehensive articulation but limited by its source material. Through a renewed commitment to articulating collective visions of growth it is hoped that alternative “new” urbanisms can emerge.





“Hey Pal! How do I get to town from here?”

And he said, “Well just take a right where they’re going to build that new shopping mall, go straight past where they’re going to put in the freeway, take a left at what’s going to be the new sports center, and keep going until you hit the place where they’re thinking of building that drive-in bank. You can’t miss it.”

And I said, “This must be the place.”

- Laurie Anderson, “Big Science,” 1982.

# 05

## CONCLUSION

### *Logistics and Bentonville’s Global Metropolis*

*Northwest Arkansas is a new metropolis in its adolescence*

*Infrastructure of casual airspace mobility: Fayetteville / Springdale Class E*

*Infrastructure of tentative settlement: Vendorville*

*Infrastructure of audience production: Crystal Bridges*

*Walmart’s territory is a diffuse utopia*

*Prototypes are compromised by definition*

*Logistics is a habit of mind, not just a branch of management*

The concluding chapter returns to Bentonville in an effort to understand Walmart’s global position from the perspective of its point of origin. Walmart has announced plans to become an increasingly global company yet it remains concentrated in a relatively remote corner of the country. However, Bentonville demonstrates a form of global urbanity and a diffuse set of metropolitan conditions as a result of the numerous forces that coalesce in Northwest Arkansas. The development of the region offers a glimpse of a new generation of urbanism in its adolescence. It is a form defined by logistics, by mercantilism, by cold war ideology and by a commitment to promote the value of the free market, not just as a means to profit but also as a belief system and as a way of life. This commitment has an attendant architecture and urbanism that is different than many other forms because it is able to define itself without reference to an existing city center. Largely as a result of Walmart, the region’s blend of logistics, military strategy, sophisticated communications technology, and entrepreneurial capitalism produces specific spatial, architectural, and geopolitical manifestations. By taking advantage of the protocols and priorities required by their distribution network, Walmart has been influential in the establishment of another territorial order. Independent from surrounding considerations, Bentonville is not a satellite. Its settlement patterns and urban conditions, such as they are, are not defined in relationship to a historically legible city.<sup>1</sup> What kinds of new traits will appear in this environment that has been free to develop in a certain amount of isolation? Architecture as a process of elaborating boundary conditions is supplanted by an infrastructural system of deployable prototypes imbued with geopolitical agency. The use of these elements is enabled by larger shifts in territorial perception as a result of logistical vision. As places—the objects of this vision—become increasingly rendered as statistics, the spaces they inhabit are correspondingly abstracted. Territory thus becomes a field of data to be manipulated. Similar shifts occur at the level of inhabitation in which the spaces produced by Walmart’s logistics machine require new means of inhabiting and understanding them. At the urban level, the residue of these operations suggests other ways to occupy and develop the city in terms of mobility, settlement, and culture. This concluding chapter will show how Walmart’s operations and the new geographies enabled by its logistics expertise, protocols at work, and attendant norms have produced transformations in mobility, settlement, and culture.



FIGURE 01: Downtown Bentonville.

It will conclude by speculating about the utopian nature of Walmart's operation, the role of the prototype within it, and the architectural and urban transformations wrought by logistics.

### *NORTHWEST ARKANSAS IS A NEW METROPOLIS IN ITS ADOLESCENCE*

In June 2006, the Economics and Security Committee of the NATO Parliamentary Assembly visited Northwest Arkansas, one of the fastest growing metropolitan regions in the United States and home to not just Walmart but also JB Hunt and Tyson Foods. NATO delegates visited the area because they saw it as a "positive example of local economic development through global business activity."<sup>2</sup> Because of its international position, Northwest Arkansas—otherwise known as the Fayetteville-Springdale-Rogers Metropolitan Statistical Area—is arguably a global city yet its population density is barely 150 people per square mile (compared to, for example, Chicago's almost 13,000). This diffuse, remote, and until recently, demographically homogeneous region shares few of the characteristics associated with a global metropolis. Thanks to this surprising mix of ingredients, the region demonstrates certain latent radicalities in mobility, programming, and cultural production, each linked to specific spatial conditions at infrastructural, architectural, and regional levels.

The NATO parliamentary assembly representatives who visited Northwest Arkansas were part of the Economics and Security committee and were sent to the region to better understand how the combination of its geographic isolation and global connectivity were producing and affecting the region's rapid growth—largely fueled by Walmart. According to the committee's report:

Walmart's extraordinary success has certainly been one of the most important catalysts for economic growth in Northwest Arkansas. Not only has this high earning retail power pumped a tremendous amount of capital into the region, but it has also attracted representative offices of a range of supplier companies that simply cannot afford not to be present in the region due to the vital role Walmart plays in getting their products to the market.... The region's growing population and the influx of Walmart vendors has sparked a very dynamic local real estate market, and members reviewed plans for the construction of a large retail shopping centre close by the intersection of two important highway systems that link the region to the broader US economy and beyond. Northwest Arkansas is also located near the centre of the United States and this has only facilitated the movement of people to the region and the flow of goods through and from it.<sup>3</sup>

This summary highlights some key dynamics in the region's growth that set it apart from other processes of urbanization. Rather than being defined by its

relationship to an existing urban center, as so-called ex-urban conditions often are, the region has grown on its own accord and consequently might offer an image of post-industrial urbanization: a kind of Petri dish in which the consequences and possibilities of growth fueled by logistics and international trade are accelerated and illuminated. In the same way that earlier cities developed based on aggregations of industry to eventually become legible urban centers, so too has the city region grown—fittingly identified in terms of data as a Metropolitan Statistical Area (MSA). Only instead of growing from rural settlement to small town to larger city to a then major city with ex-urban conditions, and so on, Bentonville grew from a series of small towns into a diffuse metropolitan region that continues *not* to be defined relative to any other adjacent central city. Thus categorizations like Joel Garreau's "Edge City" or Robert Lang's "Edgeless City", though some traits are similar, cannot be as neatly applied to Northwest Arkansas.

The Fayetteville-Springdale-Rogers MSA is comprised of Benton, Madison, Washington, and McDonald counties and, as of 2010, had a population of almost 425,000. According to the United States Office of Management and Budget, a Metropolitan Statistical Area is "one or more adjacent counties or county equivalents that have at least one urban core area of at least 50,000 population, plus adjacent territory that has a high degree of social and economic integration with the core as measured by commuting ties."<sup>4</sup> There are currently 366 MSAs that the government uses for statistical purposes. Of these, the Fayette-Springdale-Rogers MSA is ranked 108<sup>th</sup> in terms of estimated population but 12<sup>th</sup> in terms of its growth rate. The area itself also straddles state boundaries because it includes Missouri's McDonald County. While the MSA classification has no inherent juridical implications, it does acquire political significance through its use as a regional identifier. It is also significant that the three "cores" that define the MSA are only marginally above the cutoff population of 50,000 people. Their combined population remains less than half of the entire MSA.

The metropolitan region of Northwest Arkansas is striking because its growth is not in reference to any established urban concentration. The area remained primarily agricultural and rural until a number of shifts saw an increase in movement toward the region's small towns after World War II.<sup>5</sup> In some ways, the conditions being described here conform to Robert

Fishman's category of the "technoburb" in which:

The massive rebuilding that began in 1945 represents not the culmination of the 200-year history of suburbia but rather its end. Indeed, this massive change is not suburbanization at all but the creation of a new kind of city, with principles that are directly opposed to the true suburb... [The residents of the technoburb] look to their immediate surroundings rather than to the city for their jobs and other needs; and its industries find not only the employees they need but also the specialized services.<sup>6</sup>

As Northwest Arkansas developed in relative isolation, there was never a larger urban center to which it could be considered "sub" or "ex." It was a combination of chance and circumstance that led Walton to start his business in the region. However, Fishman goes on to point out the continued prominence of dense city centers in which:

Larger and powerful organizations still seek out a central location that validates their importance, and the historic core of great cities still meets that need better than the office complexes on the outskirts. Moreover, the corporate and government headquarters in the core still attract a wide variety of specialized support services... that continue to make the center city viable.<sup>7</sup>

The implication here is that the "technoburb," however opposed it might be to historic suburbs, remains subservient to the centralized concentrations of large U.S. cities. This is reiterated by Saskia Sassen in her essay "Why Cities Matter," in which she writes, "The more these [information] technologies enable global geographic dispersal of corporate activities, the more they produce density and centrality at the other end; the cities where their headquarter functions get done."<sup>8</sup> The case of Northwest Arkansas is worth examining then because it seems to perform as a technoburb in Fishman's formulation yet it is not defined in relationship to an existing city center nor does it benefit from the kinds of incentives that he and Sassen describe. It also presents a growth pattern that is increasingly common as large economic engines are able to operate away from the concentrated resources of dense urban cores. In the case of Walmart, the world's largest company and a geographically dispersed corporation if there ever was one, its "other end"—while most certainly a concentration of power and technology—is not part of a global city and shares few recognizably urban traits. To some extent, this is fine with Walmart because they have little to gain from the complications that would arise from a visible urban presence. Rather they are content to operate on the geographical margins while remaining in the mainstream of the market—largely as a result of Walmart's rapid growth.

For the purpose of this study, the MSA might be perceived as a metropolitan laboratory in which experiments in the casual use of one infrastructure to supersede another, in new hybrid forms of



inhabitation and work, and in counter-intuitive sites of cultural production are tested. While the authors of these experiments are not necessarily aware of the nature of their efforts, reading them as such suggests that emerging metropolitan conditions like Northwest Arkansas could in fact be fertile sites for design engagement. The region also offers a glimpse into the future of urbanity because it shares increasingly common traits with other territories but is more advanced in its development. In the same way that other historical shifts in economic organization triggered transformation in territorial settlement and urban organization, so too is the Northwest Arkansas MSA demonstrative of changing urban patterns at the hands of a logistics economy.

*INFRASTRUCTURE OF CASUAL AIRSPACE  
MOBILITY: FAYETTEVILLE / SPRINGDALE  
CLASS E*

The region of Northwest Arkansas is dense with small municipal airports that allow new kinds of mobility to take place and subsequently suggest settlement patterns determined by more casual infrastructural uses. The particular configuration of territory in Northwest Arkansas, for Sam Walton at least, necessitated alternate modes of mobility that would go beyond the limitations imposed by the conventional highway transport. Walton's need to assess potential locations motivated him to seek out alternate modes of scouting new and lucrative sites for additional stores. In the early years of its operation, his retail outlets were concentrated around Northwest Arkansas and could be managed by driving from point to point. However, as Walmart continued to expand it became increasingly difficult for Walton to visit all his sites by car with a frequency that satisfied him. To resolve this difficulty, Walton purchased a small private airplane and would instead fly from store to store. According to Walton, "Once I took to the air, I caught store fever."<sup>9</sup> This fervent approach to expansion enabled by air transport also brought with it certain ways of understanding the terrain only visible from the pilot's seat. These aircraft not only allow access to new viewpoints but also to thousands of small municipal airports. Without the constraints of roads, Walton could fly directly from location to location. Faster and more direct than an automobile, but capable of slowing down and zooming in, Walton's planes allowed him to access his territory quickly and impulsively, especially for his real estate scouting mission. John Huey, Walton's ghostwriter, observed that Walton used his plane, "pretty much like a station

wagon. He would just go out, get in it, turn the key and leave. Never any checklist. One time we took off and the door wasn't closed yet. He would swoop down low and say, 'Okay, you look for the airport' and the FAA would come on and tell him he wasn't allowed to be that low and he'd just turn off the radio."<sup>10</sup> This description suggests the casualness—and perhaps recklessness—with which Walton operated his aircraft. However, this willingness to challenge the limits of a certain set of infrastructural protocols allowed his company to grow in an unprecedented way. By taking off without proper checks, flying too low, or landing without permission, Walton was certainly taking risks, calculated as they may have been. At the same time, his attitude suggests an effort to normalize the practice of air travel. It also offers an example of a creative use of an infrastructural network, a practice that is not unfamiliar to the worlds of ambitious capitalism but nonetheless serves as a reminder of the numerous possibilities that lie just below the surface. The aircraft is used as a surveillance tool more than a means of transport that Walton would use to also test the limits of regulatory agencies. Given the relative density of small aircraft and airports in the region, one cannot help but wonder what a city would look like if it developed by relying on local air travel instead of terrestrial transit networks.

The sectional aeronautical charts used by all pilots of slow to medium speed aircraft help to illuminate the ways in which territory is conceptualized from above. As the operation of small private planes relies heavily on visual navigation, the charts present a combination of legible elements like urban areas, topography, roadways, and other landmarks along with a superimposed set of invisible and regulatory information. The image presented by the chart is thus one of both visible and invisible orders and their combination produces other ways of seeing territory that are informed by the logic of small craft travel. These charts also offer clues for understanding other territorial implications. For example, one of the most immediately apparent characteristics of the charts are the numerous hollow figures formed by circles and squares drawn by a thick violet band with a slight gradient from its outer to inner edge. These shapes designate boundaries of "Class E" airspace with a "floor" seven hundred feet above the surface and help to identify the presence of a municipal airport's traffic management areas. They also help indicate the likelihood of other air traffic. A visual comparison between the Northwest Arkansas airspace and

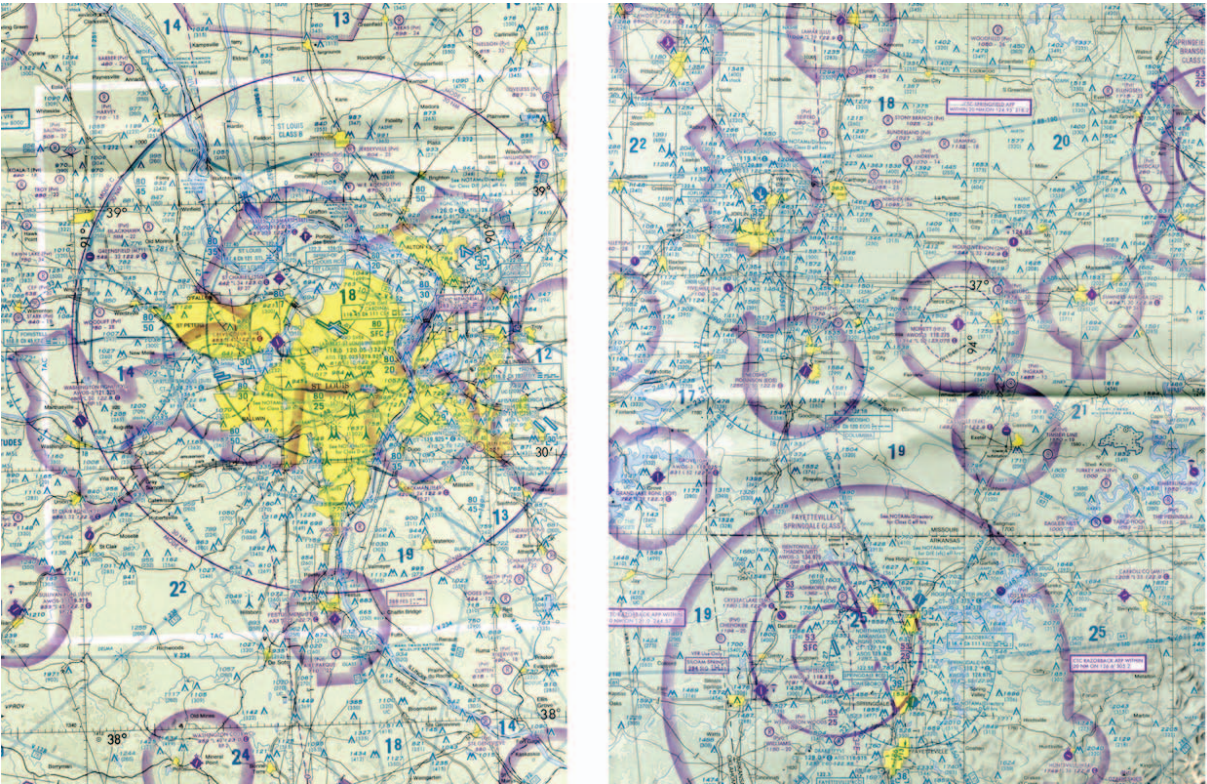


FIGURE 03: Sectional aeronautical chart comparing St. Louis to the Northwest Arkansas MSA.

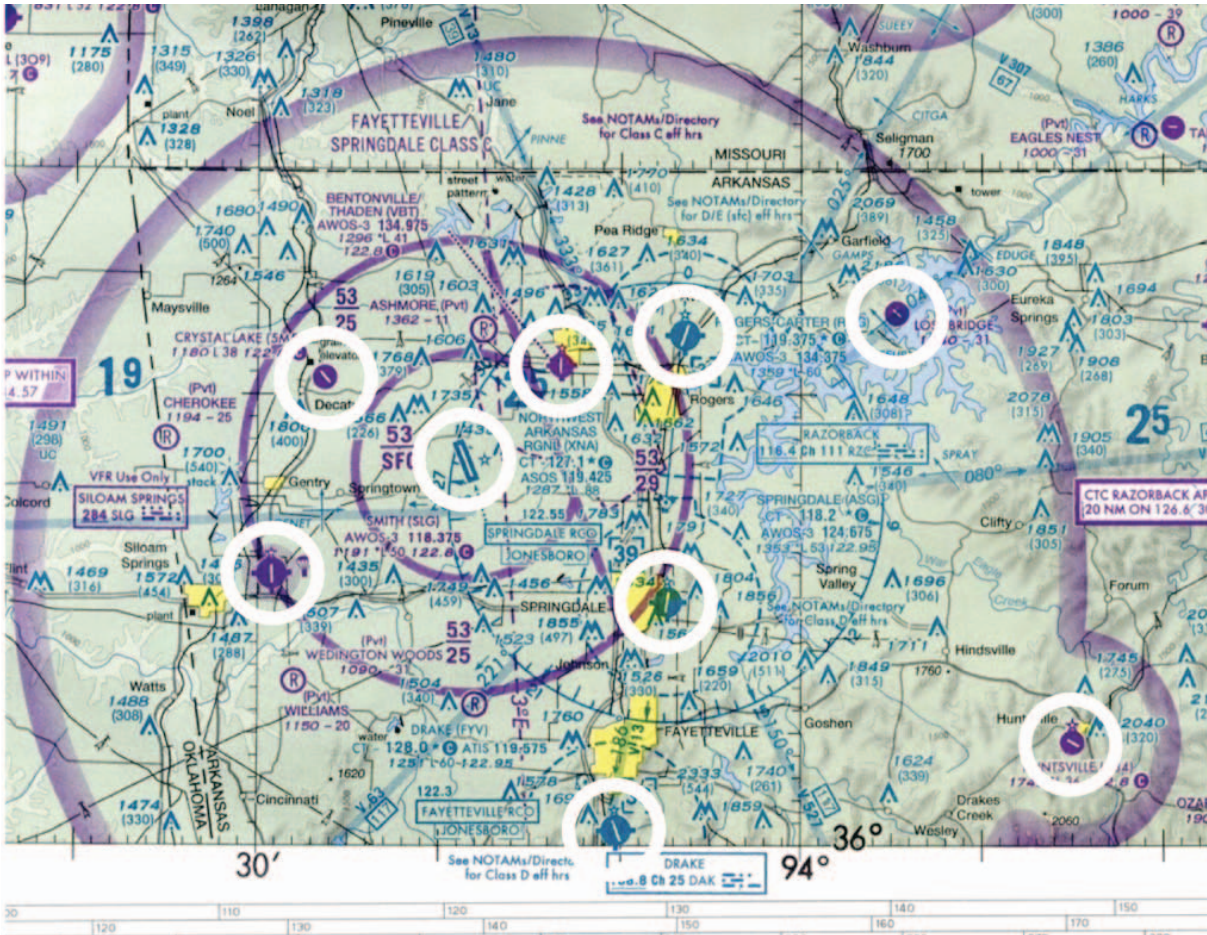


FIGURE 04: The density of small airports in the region.



that the nearby metropolitan region of Saint Louis shows two figures of similar area and with a similar number of airports (Figure 03). St. Louis has eight and Northwest Arkansas nine. However, the metro area of St. Louis is over 2.8 million people compared to Northwest Arkansas's 425,000. While this is a reminder of the relatively small population of the NWA MSA, it is also a surprisingly high number of airports (Figure 04). In St. Louis, there is roughly one airport for every 350,000 people while in Bentonville, that number goes down to 47,000 per airport. This difference suggests a greater demand for municipal airports in Arkansas because of the increased usage of personal aircraft. More airports for fewer people indicates a great demand for their use, in turn reflected by the number of people commuting by private plane.

There are a range of resources used by pilots for navigation including websites like [www.flightaware.com](http://www.flightaware.com) that allow pilots to monitor traffic at individual airports or [airnav.com](http://airnav.com) that provides detailed information about any listed airport, however small. For example, the Crystal Lake Airport near Decatur, AR is privately owned by a nearby farm and offers few services other than a place to land. The site estimates that 62 flights pass through per month, compared to the 50 a day in Bentonville. The Crystal Lake airport also includes, under the section "Additional Remarks," the note: "DEER ON & INVOF ARPT." All of this is worth describing because, taken collectively, it presents an alternative—or at least supplemental—geography of mobility that brings with it particular ways of seeing territory and a particular ways of inhabiting that territory. Namely, the mode of moving through space—literally through the air with the aid of a craft—relates to infrastructure in a more selective way than with automobile travel on roadways. With small private propeller aircraft (as opposed to large commercial jet planes) physical infrastructure is contained in the airports themselves (of course with the attendant connections to ground transportation) while the majority of their actually flying is governed by the non-physical regulating systems described by air traffic laws and sectional aeronautical charts. Air traffic control operators in turn enforce all of these regulations through their communication with and monitoring of pilots. Airspace is a multi-dimensional medium *through* which one can navigate, rather than a set of linear elements *along* which one travels.

### INFRASTRUCTURE OF TENTATIVE SETTLEMENT: VENDORVILLE

If Walmart's centrifugal growth patterns have prompted new ways of navigating larger territories, they have also produced a centripetal concentration of new commercial space in Bentonville itself. Driving south from Walmart Headquarters along Walton Boulevard one is confronted with clusters of low-slung buildings with domestic styling but with commercial guts. These projects are collectively referred to as "Vendorville" and serve as outposts for Walmart's numerous suppliers who have found it necessary to maintain a local presence in Bentonville (Figure 05). The idiom of cheap, rapidly produced housing stock from which these developments borrow reinforces the transient nature of their residents, subject as they are to the fluctuations of Walmart's demands upon them. Similarly, as these offices are rendered in a language of domestic architecture, they are camouflaged to some extent within the surrounding buildings but in uncanny ways. Slightly out of proportion, overweight, too large, these buildings are designed to look like homes but remain un-at-home in the commercial landscape of the Northwest Arkansas MSA. The Vendorville complexes also maintain a low profile in the way they broadcast their presence. There is limited directional signage and the individual vendors are indicated only by corporate logos on their doors. All this suggests a reluctance to be there and an uncertainty of how long they might remain. The buildings themselves, however, will remain and will continue to absorb the continuing supply of suppliers who come from a range of places, and many from large cities. Through this process of locating adjacent to Walmart headquarters they also bring with them their own habits, desires, and needs that in turn trigger subsequent transformations at larger social and cultural levels.<sup>11</sup>

These business parks are different not for the form they take but for the ways in which their forms are inhabited. The developments share the architectural language of strip malls but as these office spaces are densely packed with representatives from companies that supply merchandise to Walmart, the manner of their inhabitation is more akin to a collection of small consulates in a significant diplomatic capitol. Each of these small spaces typically includes a vestibule with a reception desk and occasional attendant. Adjacent to the entry space is usually a small office for the corporate representative. Beyond the entry is a larger space that serves as both showroom and meeting

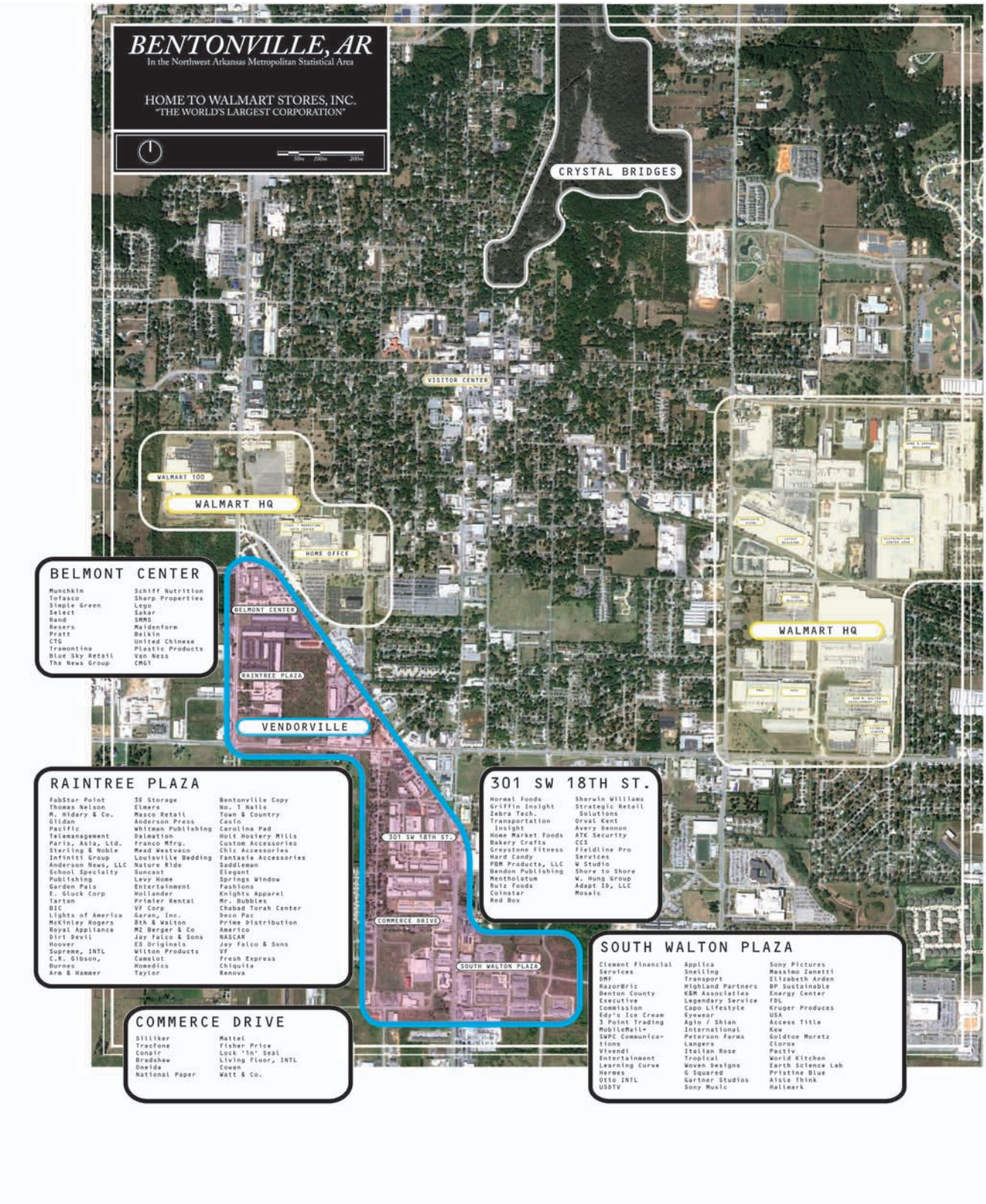


FIGURE 05: The various Vendorville complexes and their tenants.



room. Suppliers use these back rooms to host Walmart buyers as they negotiate prices and contracts. Walmart is known for its relentless insistence that suppliers lower their prices each year and, as this is a difficult task, these same suppliers have discovered that it is beneficial for them to maintain a physical presence next to the home office of Walmart. In fact, many suppliers dispose of the definite article, presumably because it is redundant. Thus Walmart Headquarters is simply referred to as “Home Office.”<sup>12</sup>

The complexes that are closest to the Walmart offices are literally across Sam Walton Boulevard. One is called the Belmont Business Center and immediately south is Raintree Plaza. Further along the boulevard one finds Commerce Drive and another identified only by its address: 301 SW 18<sup>th</sup> Street. Further south still is South Walton Plaza, a complex designed to include small offices but also a small number of housing units (Figure 06). These five linear office parks alone host 174 different businesses, each primarily concerned with attending to the needs of Walmart. These developments have a single frontage and face two or four rows of parking and another building opposite them. The buildings at Raintree Plaza include colonnades protected by deep eaves and punctuated with vertical elements clad in faux-cobblestone and with vague reference to Tuscan villas or to the towers of some minor chateau. If the precise stylistic source is elusive, the overall impression is one of neutral, if accommodating, domesticity. The buildings also serve to eliminate difference. In a field dominated by intense competition amongst rivals for market share or share of shelf space, the long low buildings of Vendorville absorb and neutralize these distinctions. Likely a consequence of economy more than anything, this organization suggests an attitude of “safety in numbers” in which individual suppliers, at the mercy of their largest account for most of the day, can at least return to the anonymity of their offices and to the implied solidarity of business partners in the complex.

Awkward corporate domesticity is most apparent in the architecture and organization of South Walton Plaza. This complex is even marked at the turn from South Walton Boulevard with a ceremonial flagpole and obelisk, further confusing the architectural aspirations. These offices, while similar in size and function, are distributed throughout the development in smaller house-like units of four to eight companies, usually sharing a common entrance. The smaller

footprint of each building produces more interstitial space that is covered with lawns and threaded with sidewalks. This results in a kind of backyard for each building in which there is enough space for a grill amongst the air conditioning units and hydraulic lifts for unloading merchandise from trucks designed for much larger loading docks. If Raintree Plaza traded in distant palatial imagery, South Walton presents a more familiar domestic idiom that borrows as freely from first generation suburbs as it does from antebellum plantations. For a group of corporate representatives who find themselves temporarily assigned to Bentonville, one wonders to what extent these domestic gestures provide comfort.

In some cases, mostly with companies who have substantial stake in Walmart, larger offices have started to open in the region. For example, Proctor and Gamble, for whom Walmart is the largest client, have opened a satellite headquarters in Bentonville. Similarly, Clorox, though smaller in operation, has opened a large office in South Walton Plaza. Again a strange hybrid of institutional and residential architecture with loose connections to the South, the design of the building makes many efforts to appear at home in spite of its awkwardness. Aside from the slightly comic manifestations of this office space masquerading as domesticity—like the five gas grilles on the back patio or kitchens overflowing with only Clorox cleaning supplies—the building suggests ways to understand corporations differently. One of the roles of these suppliers is simply to be hospitable and to ensure that Walmart remains “happy.” Even describing it in such a way illuminates an often-internalized habit of ascribing agency to corporations. Walmart’s “happiness” is of course a convenient way of indexing a range of variables that employees of the company assess and negotiate to ensure that they are getting the best arrangement possible. The vendors similarly rely on Walmart as both host and guest. They know that the retailer will maintain the upper hand in negotiations yet it also has a duty to its customers to ensure the product mixture that its demographics profile-monitoring software suggests. Nonetheless, the tendency to assign human emotions to corporations remains and is reinforced by their legal definition as a single entity. If the corporation indeed is a body, then it also needs a house. Corporate housing in this case acquires another kind of meaning. South Walton Plaza has taken that charge literally in the production of its quasi-domestic and semi-corporate architecture. While the corporate office park



FIGURE 06: Details from Vendorville, South Walton Plaza and Raintree Plaza.



is a familiar feature of the edge city, these vendorvilles are an emerging type unique to the logistically-driven urban landscape.

### INFRASTRUCTURE OF AUDIENCE PRODUCTION: CRYSTAL BRIDGES

The last example of the residue of Walmart's growth and sustained concentration in Northwest Arkansas focuses on a new art museum built from 2007 to 2011. In 2005, the 1859 painting "Kindred Spirits" by Asher B. Durand was sold by the New York Public Library to expand its endowment. The favored bidder going into the auction was a joint effort by the Metropolitan Museum of Art and the National Gallery of Art. However, to the surprise of many, their bid was substantially surpassed by that of Alice Walton who purchased the painting for over \$35 million as part of her effort to develop one of the premier collections of Americana. Alice Walton is the daughter of Helen and Sam Walton and—with a fortune estimated at \$19.5 billion—considered to be the second wealthiest woman in the world (the top spot goes to Christy Walton, the widow of Alice Walton's brother worth \$ 20 billion). The collection Walton is currently amassing will be housed in a museum complex called Crystal Bridges designed by Moshe Safdie in a remote site five minutes from downtown Bentonville. The museum itself is a combination of galleries, archives, education space, and event facilities built into the sides of a small ravine and organized around a rechanneled portion of the small creek that flows through the site. The forms of the individual buildings are variations of an arcing turtle-shell shape and are built of concrete, steel, glass, large laminated wood trusses and striped with wooden cladding. The final result will be tranquil and deferent. However, under construction the project has the atmosphere of a major engineering project because the site work necessary to divert Crystal Springs Creek has exposed the massive abutments for the project's eponymous gallery bridges (Figure 07, 08). Concrete is the most evident material and remains unmediated by the forthcoming furring, drywall, and decorative exterior wooden stripes. For the purposes here, the specifics of the building are less significant than the sheer fact of its existence and of its particular site.

The project architect referred to the site as being "in the middle of nowhere ... in the middle of nowhere."<sup>13</sup> In fact, the museum complex is in Alice Walton's childhood backyard. Not just in the sense that she grew up in the area but that literally

her family home (that Sam Walton commissioned from Fay Jones) spans the same creek as Crystal Bridges, only just upriver and around a bend. This bit of biography helps to understand what might be, at first glance, a counter-intuitive location for a major art institution. Its location suggests that Walton's motives are personal as much as they are philanthropic. And while the museum will surely attract its share of visitors, one cannot but wonder if another location would more effectively fulfill the mission of the museum to provide a venue for art exposure to a constituency otherwise limited in access. In the same way that Sam Walton domesticated the personal aircraft by using it "pretty much like a station wagon," and the way that corporate office space is domesticated in the various "vendorville" complexes, so too has Alice Walton brought the art museum home. Built in the woods in which she was raised and endowed to such an extent that admission will always be free and open to the public, Crystal Bridges offers a utilitarian approach to artistic consumption in which it is presented as a resource available to all and as part of everyday life—much like infrastructure. If a complaint about attenuated settlement patterns in America is their dearth of cultural institutions, then Walton's efforts to build up Crystal Bridges offers a potent counterexample.<sup>14</sup> Likewise, it would seem, perhaps obviously, that intense concentrations of wealth are able to override certain circumstantial constraints. However, the institutional patrons of the past were often located in cities not just out of choice but also out of necessity. Furthermore, in the case of cultural institutions at least, there is also the need for an audience, making urban concentrations desirable because of the assured presence of visitors. Walton seems to be genuine in her educational and philanthropic impulses and while her collection may be a sound investment, who exactly, one wonders, will end up visiting this museum? Certainly Crystal Bridges is part of a larger redevelopment effort and one that hopes to attract new tourists to the region. However, the asymmetry between institutional scope and local constituencies remains significant. In this sense, Crystal Bridges is designed as much to attract audiences as to produce its own. As such, its location in the dispersed metropolitan region of Northwest Arkansas with its large regional population seems well suited for such an institution. It privileges no group in particular yet is available to many. The museum is thus conceptualized as both a regional attraction and growth catalyst that happens to be in Bentonville. Given Walmart's success at accommodating a "pull"

economy in which consumer demand dictates growth decisions, it is surprising to see Crystal Bridges "pushing" its supply onto a public that may or may not be interested. However, in the same way that Walmart can effectively produce desire in its consumers, so too could Walton succeed in creating new groups around her museum. The implications of this privatization of culture notwithstanding, if Walton's wager pays off, it will challenge certain assumptions about growth. Rather than cultural institutions resulting from urbanization, the institution comes first with the hope that the city will follow. In pursuit of this urbanization, Alice Walton is not just building Crystal Bridges in an architectural idiom that evokes infrastructure; she also is literally building the region's transportation infrastructure. When visitors land at the Northwest Arkansas Regional Airport is the Alice L. Walton Terminal through which they pass.

The changing demographics of Northwest Arkansas are apparent in the area of the region called "Pinnacle Hills," which the NATO parliamentary assembly report refers to a "large retail shopping center close by the intersection of two important highway systems that link the region to the broader US economy and beyond." This development is a combination of shopping centers, housing developments, conference facilities, office space, discount retail, hotels, and mega-churches (Figure 09). Situated along Interstate 540 and on the way to the Walmart Home Office from the Northwest Arkansas Regional Airport, the Pinnacle Hills development contains a range of functions and services that produce their own version of urbanity. One can shop for groceries at the Walmart Neighborhood Market, be entertained at the Pinnacle Hills Promenade (an open-air shopping complex managed by General Growth Properties), worship at Cross Church, do business on of the many office buildings, attend a conference at the Embassy Suites Convention Center, and receive medical treatment at the Mercy Medical Center. All the elements are clustered between two exits on I-540 and, though justified in terms of business traffic, primarily serve the region's local population. In spite of the area's dependence on personal automobile use to reach these islands of program, certain elements have a high degree of activity and density of visitors. Apparent from aerial imagery is the lone Walmart Neighborhood Market built and open in the Southwestern corner of the development. Constructed in anticipation of the sizeable housing development known as "The District" at Pinnacle Hills, the store



FIGURE 07: One of Crystal Bridges' eponymous structures, under which water will flow.



FIGURE 08: A bridge abutment under construction.



now sits alone because of a foreclosure suit in early 2010 filed against the developers. The location of the Walmart is a reminder of the sequence in which these areas are produced: even before the infrastructure is installed for the housing development, a store is completed and open. The federal highway that splits the Pinnacle Hills project currently ends before crossing into Missouri and reverts to Arkansas State Highway 71. 20 miles later it beefs up again only to die out at Joplin, MO. If this corridor were completed, there would be a continuous interstate connection between Kansas City and New Orleans. The central location of the area combined with the historically reliable success of Walmart was enough to convince powerful national developers to invest in the Pinnacle Hills project, including John Q. Hammons, J.B. Hunt and others. For example, the W Hotel subsidiary chain “Aloft” opened an outpost in 2008 to cater to what the company saw as an underserved consumer group. As Walmart’s merchandising increasingly influences other organs of popular cultural output, suppliers are obliged to forge ever-tighter relationships. Representatives from New York-based medial groups like Nickelodeon and Comedy Central fly to Northwest Arkansas on a regular basis to meet with Walmart executives to discuss future cross-branding opportunities. When they come to meet with Walmart they stay at the Aloft hotel in Pinnacle Hills and the bartenders know them by name.

### *WALMART’S TERRITORY IS A DIFFUSE UTOPIA*

In Northwest Arkansas, Walmart is building a version of the world that it would like to inhabit in which work, leisure, and spiritual life are within easy reach and affordable. The region’s relative isolation has allowed it to grow in ways that produce unexpected outcomes. Taken together, Walmart is pursuing a weak utopian vision primarily driven by the relentless reduction of costs and abetted by its geopolitically mobilized infrastructure of buildings. 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 and

how-it-works 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 spite of its sometimes-troubling implications, Walmart demonstrates the possibilities of thinking big. Even if its instigators and operators did not set out with a fully formed vision in mind, they have developed a system that allows for its deployment and development in pursuit of its expanding and ambitious goals. While the suggestion here is not to adopt this mode, it does seem to offer evidence of means by which certain kinds of utopian visions can be achieved. While it is likely that “a better world” is not going to come by the means of a singular planning vision realized all at once from a single model, Walmart has managed, though its relentless deployment of small units, to produce its own diffuse utopia. If we can agree that architecture and design have the potential to impact systems of behavior and belief, and if we can agree that the need remains to pursue a more just world with increased happiness and well-being, then it seems that pursuing utopian goals should not be off the table. However, it is likely that they will not be able to be developed in the singular top-down models of the past.

### *PROTOTYPES ARE COMPROMISED BY DEFINITION*

If we can accept that Walmart pursues a utopian vision insofar as it dedicates resources to promoting and producing a version of the world that its executives want to live in and share with others, then its use of the prototype offers a clue as to how other kinds of aspirations might be achieved. As the prototype is just one a piece of a system—albeit a repeatable and contagious piece—it suggests ways of embedding architecture with certain biases that in turn could affect things beyond them. It is difficult to separate Walmart’s architecture from its business model and while the buildings themselves have not lead to the company’s growth alone, they have significantly aided it. Through the retailer’s logistical approach to architecture, the prototype takes on new

potency and capacity because it can mediate between the aspirations of its sponsor and the contingent world of its surroundings. As opposed to other utopian planning proposals that could only succeed in their pure form, the prototype—by not insisting on the purity or specificity of its order—requires a certain amount of *disorder*. By definition it exists in compromised states, in fact it seems to thrive in them. As architecture will increasingly be operating in such conditions, this model suggests a way to approach them that can adapt to the contingencies of unexpected conditions while preserving the internal vision of their sponsor.

The prototype presents a nimble design approach but not an improvisational one. As with the rest of Walmart’s operations, every move is calculated, only in different phases. The marketing, distribution, and replenishment demands of the store formats require a strict adherence to a prototypical floor plan. However, as these designs can only be completed through their instantiation in specific sites, there is room to negotiate between the particulars of location and the requirements of the Walmart’s logistics operations. The prototype, in other words, provides the necessary slack that allows a rigid system to adapt to a range of unexpected situations while remaining optimized. To be clear, the claim is not that Walmart’s success is only attributable to its system of buildings. However, its use of prototypical, incomplete designs has significantly abetted its territorial agenda.

### *LOGISTICS IS A HABIT OF MIND, NOT JUST A BRANCH OF MANAGEMENT*

What would change within the discipline of architecture if we concentrated more on designing formats and prototypes, i.e. systems of organization and approach in which the formal outcome is less pressing than the “performance” of the thing? Where is architecture needed like this? And in service of what?<sup>15</sup> In Walmart’s case, the company locates its buildings in places convenient for the shoppers they want to attract. The company is single-minded in its approach and this focus allows it to bracket other concerns. The local manifestation of these buildings is significant in direct relationship to the amount of friction it produces within the community. The less friction, the less attention is given to the way buildings look from the outside. The manner in which the buildings operate, however, is highly controlled and increasingly efficient. Are there other spaces in which this kind of approach could apply? Are issues

of expansion and territorial control the only cases in which architecture as an infrastructural system can operate? If it can operate so effectively in one context, could it do so as well in others? Where can we witness architecture becoming more effective because of its ability to saturate a territory? The future suggested by Walmart is a system of services in which boundaries are eroded and spaces connected through precisely calibrated interiors. Where is there slack in this system? Could this offer insight into ways of understanding program in terms of performance and distribution and frequency instead of function? If buildings are implicated in the production of an elastic geography then what are the geopolitical implications of this and to what extent does this suggest new forms of effectiveness for architecture? What could this be used for and how? All these questions merit further study and, if anything, this study only offers a very limited set of initial responses.

Logistics is implicated in a field called “materials handling” which includes the conveyor systems, servos, actuators, lifts, gantries, pallets and so on that help goods get from one place to another. The phrase typically refers to large, building-scale installations that borrow elements from infrastructure, architecture, and appliances but rest awkwardly amongst the three of them. Yet the agents doing the “handling” in such cases are not always so legible. If this is the case, i.e. if the handling happens through a biomechanical hybrid system, what does that suggest about the human components of such a system? Rather than only subjugating those involved, these systems could be applied to yet unidentified emancipatory ends. Given the different levels of augmentation that occur—in terms of strength, mobility, and intelligence—new forms of hybrid architectures could be developed that would deploy this intense coordination, connectivity, and augmentation in pursuit of nobler goals. What kinds of collective enterprises might this foster? More than just presenting an image of things to work against, such new hybrid conditions suggest new modes of inhabitation and new ways to interface with our surroundings.

At larger territories, Walmart’s way of seeing the world allows it to operate more nimbly because it abstracts things and renders complex situations purely as legible data and, in so doing, allows the city to be understood as a series of problems to be solved. This quantitative approach to planning seems anathema to more established methods of urban design and



planning. However, to what extent might the tools used for Walmart be productive if they were used counterintuitively? How might working backward help to generate surprising or more effective planning proposals? Indeed, if one of the claims levied against large-scale planning projects is their inability to take individual viewpoints into account, then could the world of marketing profiles and demographic tracking software offer clues to a more precise set of responses? The provision of infrastructure, for example (and especially in its expanded field), could be influenced by this information and could in turn have significant effects on subsequent urban development. What kinds of possibilities would emerge once architecture as a practice was less concerned with singular objects and more with the deployment of larger systems? What kinds of other criteria could be used to produce unexpected and perhaps more effective urban forms? For example, the National Resources Board's publication and series of maps suggests a more equitable distribution of territory. Similarly, a map from the previous century by John Wesley Powell draws new territorial divisions that privilege resource abundance rather than scarcity and produce divisions according to these priorities. Thus, the coastal state along the Pacific Coast is quite small compared to the resource rich state in the Central Valley. Had this kind of approach been adopted, the subsequent settlement would have been linked to watersheds and resource adjacency and would have had a significant influence on urban form and experience. In light of this, to what extent might contemporary locational software applications used by real estate companies be applied instead to issues of settlement and planning? To what extent might the logics of logistics be able to script and organize new territories as they continue to expand and mature? It is the belief here that this is a significant urban future that will require our attention.

Walmart is a company that has defined itself through its expertise in logistics. It is a company that through a combination of ambition, determination, cruelty, and flexibility has become the largest on the planet. Logistics is a way of thinking, not just a discipline of management. In this sense, a conclusion to a research project about Walmart and logistics might be expected to address questions of the field more explicitly. However, it is impossible to separate them because the habit of mind otherwise known as logistics permeates all aspects the retailer's operations. It informs the way Walmart designs its buildings, the ways in which it draws maps to locate those buildings, and the ways in

which it establishes control over those who work in them. Walmart is a shrewd geopolitical operator and calculating in its maneuvers. But this is no surprise. Any competitive successful business does this. How is Walmart's business different? What this project has attempted to demonstrate are the ways in which the retailer's logistics thinking has played out across a range of scales and through attendant technological developments. The hope is that this series of moments adds up to a larger image of a contemporary dynamic in architecture and urbanism. In this sense, Walmart is used as a case study to engage a larger set of issues on which much work remains to be done. These formulations can in turn influence design approaches through greater understanding or through the adoption and modification of techniques. Walmart has been successful in part because of its relentless commitment to certain principles. When historians of the future look back on the urbanism of the turn of the millennium, they will see, among many common features, the ubiquitous large low buildings that formed the bulk of the discount retailer's operations. It is possible that this collection of nearly identical buildings strewn about the land might, retrospectively, constitute a legibly utopian disposition. If they looked, for example, at the urban history of Northwest Arkansas, they might see the seeds of the urbanism they now inhabit.



FIGURE 09: Pinnacle Hills from above.



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NOTES

CHAPTER 01, pages 009–029

1 Such an approach is inspired by research projects such as *Hollow Land: Israel's Architecture of Occupation* by Eyal Weizman (London: Verso, 2007), Keller Easterling's *Enduring Innocence: Global Architecture and Its Political Masquerades* (Cambridge: MIT Press, 2005) and *Splintering Urbanism* (London: Routledge, 2001) by the urban geographers Stephen Graham and Simon Marvin.

2 Paul Edwards advocates a scalar method to investigating infrastructure in "Infrastructure and Modernity: Force, Time, and Social Organization in the History of Socialtechnical Systems" in *Modernity and Technology*, edited by Thomas J. Misa, Philip Brey, and Andrew Feenberg (Cambridge: The MIT Press, 2003), 185–226. Edwards focuses not on scales of size but on scales of force, time, and social organization. Doing so casts infrastructure in a much broader role and places it into a historical context that, in turn, highlights its role in "co-constructing" and "co-deconstructing" modernity at "macro-, meso-, and micro-scales of time, space, and social organization" (185). When addressing large systems, the author contends, one cannot address phenomena solely at either a micro- or macro-scale without omitting significant information and thereby operating in an overly reductive mode with resulting myopic views. Edwards acknowledges, however, the difficulty of such an approach and writes that scholars must "focus on ever-smaller chunks of time and space. The discipline of history, for example, demands topics (and archival sources) that a historian can hope to master in a few years... historians are ill equipped to explore broad patterns and multiple scales. Similar points could be made about sociology, anthropology, and other empirical approaches to modernity. Today's scholars tend to sneer at genuinely macro-scale empirical studies, likely as they are to contain mistakes at the level of detail that occupies the forefront of the specialist's attention" (223).

3 This approach is common within the field of geography and specifically its related disciplines – including urban, social, and economic geography. Regarding the last, Neil M. Coe, Philip F. Kelly, and Henry W.C. Yeung argue that "the awareness of how economic processes are constituted at multiple scales simultaneously" allows for a more robust understanding of the phenomena in question. Neil M. Coe, Philip F. Kelly, and Henry W.C. Yeung, *Economic Geography: A Contemporary Introduction* (London: Blackwell, 2005), 18.

4 David Harvey, *Spaces of Neoliberalization: Towards a Theory of Uneven Geographical Development* (Franz Steiner Verlag: Kornwestheim, 2005) 80.

5 Further discussion and theorization concerning scale would differentiate between a range of terms including scale, size, magnitude, level, order, etc.

6 The artifact-based pole is exemplified by Siegfried Giedion's *Mechanization Takes Command* (New York: Oxford University Press, 1948) in which technology is approached through an analysis of the effects of its products. Toward the other end, Lewis Mumford in *Technics and Civilization* (London: Routledge & Sons, 1934), and later in *The Myth of the Machine* (New York : Harcourt Brace Jovanovich, 1970) addresses technology more broadly via the notion of *technics* and through the distinction he makes between "machines" and "The Machine."

7 Though there are many possibilities for understanding the city in terms of logistics, military, media-based, and managerial approaches offer three useful positions from which to operate. Understanding cities through a military "lens" is exemplified in Lewis Mumford's *The Myth of the Machine* (New York : Harcourt Brace Jovanovich,

1970) or in Peter Galison's article "War Against the Center" in *Grey Room* 04 (Summer 2001): 6–33. *Networking the World: 1794–2000* by Armand Mattelart (Minneapolis: University of Minnesota Press, 2000) or *The Rise of the Network Society* by Manuel Castells (London: Blackwell Publishers, 1996) are both examples of investigations that focus on the impacts of media and network logistics. The managerial approach can be witnessed, for example, in Alfred Chandler, Jr.'s *The Visible Hand: The Managerial Revolution in American Business* (Harvard University Press, 1977).

8 Roderick Neumann, "Political Ecology: Theorizing Scale." *Progress in Human Geography* 33:3 (2009), 404. Neumann, in a summary of a range of texts writes, "Sayre uses ideas from ecology to critique the concept of scale in human geography. He suggests that much of the 'debate' on scale can be traced to the conflation of its meaning as size, level, and relation (Sayre, 2008). Specifically, he argues that human geographers often conflate and confuse level and scale (as size) and consequently confuse epistemological moments with ontological moments – households (see Marston, 2000) and cities (see Smith, 1984) are levels of social organization, not scales *per se* and choices to study households or cities are epistemological moments" (400).

9 Some examples include Paco Underhill's *Why We Buy: The Science of Shopping* (New York: Simon and Schuster, 2009); *The Globetrotting Shopaholic: Consumer Spaces, Products, and their Cultural Places* edited by Tanfer Emin Tunc and Annessa Ann Babic (Cambridge: Cambridge Scholars Publishing, 2008); and *The Harvard Design School Guide to Shopping / Harvard Design School Project on the City 2*, edited by Chuihua Judy Chung, Jeffrey Inaba, Rem Koolhaas, and Sze Tsung Leong (New York: Taschen, 2002).

10 This interest is in response to the statement of Bijker and Law: "The conduct of daily life surely demands a *tactical* lack of curiosity!" (2) Bijker, Wiebe E. and John Law, editors. *Shaping Technology / Building Society: Studies in Sociotechnical Change*. Cambridge, MIT Press, 1992.

11 Sanford Kwinter and Daniela Fabricius, "Generica" in *Mutations* (Barcelona: Actar, 2001), 534.

12 Kwinter and Fabricius write, "The American urban landscape, like the new American business cycle, is unfolding today according to the logic of short-term efficiencies: agility, turnover, scale. Ever more scientific in means and pragmatic in its ends, development seeks no other gradient but the one of least resistance... The result is that pure movement of resources becomes the central, spontaneously defined goal, without any of the limiting viscosity of social forces, traditions , or the specificities of place, time, or context... this landscape... offers itself as the pure, one-dimensional result of numbers, algorithms, and protocols crunched... elsewhere" (525).

13 Wiebe E. Bijker, and John Law, editors, *Shaping Technology / Building Society: Studies in Sociotechnical Change* (Cambridge: MIT Press, 1992).

14 Both Keller Easterling and Reinhold Martin have suggested the figure of the double-agent as a model for contemporary urban research for its ability to operate between multiple worlds. Martin, in the introduction to *Transnational City* (Barcelona: Actar, 2007): "This book ... aspires to a double agency that never leaves behind the risk of complicity that attends the practice of architecture and urbanism ... The double agent is at home everywhere and nowhere, a decidedly untrustworthy figure engaged in the perpetual construction of credibility" (12). Easterling, in her introduction to *Enduring Innocence*: "“The material collected here should, then, nourish a special kind of political imagination and ingenuity. Political practices often gravitate to one of several well-rehearsed roles: the earnest public servant, the political theorist, or the strident activist. Given the failures of some of these principled political stances to engage with more disorganized or elusive forms of political subterfuge, this book describes not only the classic political stance that declares its name in a democratic process, but also other politics that rely on fiction or corruption. Relinquishing the architect’s monologue of sincerity



and innocence, it studies the ethical masquerades of the double agent or non-believer who uses multiple personae to engage the market's confidence games and patterns of cheating" (10).

15 In *Far From Equilibrium: Essays on Technology and Design Culture* (Barcelona: Actar, 2008), Sanford Kwinter writes, "We continue to hear the fiction that what is important is how a technology is used; we are sermonized on the—microscopic, short-term, immediate—advantages that such technologies claim to offer us, but hardly ever do we meditate on wider implications: on what a given technology, or group of technologies, by virtue of nothing more than their simple presence within our perceptual economy...actually does *to us*" (18).

16 Siegfried Giedion, *Mechanization Takes Command: A Contribution to Anonymous History* (New York: The Norton Library, 1948), 2-11.

17 Lewis Mumford, *Technics and Civilization* (New York: Harcourt Brace & Company, 1934), 4.

18 Daniel Bell, *The Coming of Post Industrial Society: A Venture in Social Forecasting* (New York: Basic Books, 1976), 29.

19 Paul Edwards, "Infrastructure and Modernity: Force, Time, and Social Organization in the History of Socialtechnical Systems" in *Modernity and Technology*, edited by Thomas J. Misa, Philip Brey, and Andrew Feenberg (Cambridge: The MIT Press, 2003), 185-226.

20 "Sweden: Switch to the Right," *TIME*, Friday, Sep. 15, 1967 ([www.time.com/time/magazine/article/0,9171,941144,00.html](http://www.time.com/time/magazine/article/0,9171,941144,00.html), accessed March 30, 2010). See also "September 3 1967: 40 years of driving on the right side in Sweden" ([www.volvoclub.org.uk/history/driving\\_on\\_right.shtml](http://www.volvoclub.org.uk/history/driving_on_right.shtml), accessed March 30, 2010).

21 Regarding the need for sustained communication, Armand Mattelart writes, "Globalization is above all a model of corporate management that, in response to the growing complexity of competitive environments, creates and promotes competencies on a global level with a view to maximizing profits and consolidating market shares. It is, in a sense, a framework for interpreting the world that is peculiar to management and marketing specialists...The global firm is an organic structure in which each part is supposed to serve the whole. Any shortcoming in the interoperability between the parts, any lack of free interaction, is a threat to the system. Communication must therefore be omnipresent." Armand Mattelart, *Networking the World: 1794-2000* (Minneapolis: University of Minnesota Press, 2000), 76.

22 Nelson Lichtenstein, *The Retail Revolution: How Walmart Created a Brave New World of Business* (New York: Metropolitan Books, 2009), 255.

23 Thomas Holmes, "The Diffusion of Walmart and Economies of Density," *Econometrica* 79.1 (January 2011): 243-302.

24 Paul Ingram, Lori Qingyuan Yue, and Hayagreeva Rao, "Trouble in Store: Probes, Protests and Store Openings by Walmart: 1998-2005," *American Journal of Sociology* 116.1 (2010): 53-92.

25 For example, the catalog for the exhibition *Worlds Away: New Suburban Landscapes* (Minneapolis: Walker Art Center, 2008) contains essays like Virginia Postrel's "In Praise of Chain Stores: They aren't destroying local flavor—they're providing variety and comfort," David Brooks's "Our Sprawling Supersize Utopia," or Robert Bruegmann's "Learning from Sprawl" rightfully identify the need to critically engage this cultural landscape but the authors can tend to become apologists for it.

26 Alejandro Zaera Polo "The Politics of the Envelope: A Political Critique of Materialism," *Volume 17: Content Management* (2009): 76-105.

27 Alexander D'Hooghe, "The Case for the Big Box: Joys of a non-expressionist architecture," *Volume 19: Architecture of Hope* (2009): 38.

28 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.

29 *The Charlie Rose Show*, PBS, August 1, 2006. Lee Scott was CEO from January 2000 to January 2009.

30 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.

31 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 Cleeland, "An Empire Built on Bargains Remakes the Working World," *Los Angeles Times*, November 23, 2003.

32 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's reference is to a statement attributed to Otto von Bismarck. For earlier treatment of the term, refer to Antoine-Henri Jomini. *The Art of War*. Translated by Capt. G.H. Mendell and Lieut. W.P. Craighill. El Paso: El Paso Norte Press, 2005. (Original version published in 1838, reprint of 1862 translation).

33 Felix J. Gerace, *Logistics – Management – Information*, May 1965. Republished in James A. Huston, *The Sinews of War: Army Logistics 1775-1953* (Washington D.C.: Office of the Chief of Military History, United States Army, 1960), 693.

34 Paul Schönsleben, *Integral Logistics Management: Planning and Control of Comprehensive Supply Chains* (Boca Raton: St. Lucie Press, 2004), 10.

35 Easterling suggests this in *Organization Space: Landscapes, Highways, and Houses in America* (Cambridge: MIT Press, 1999): "To truly exploit some of the intelligence related to network thinking, an alternative position might operate from the premise that the real power of many urban organizations lies within the relationships among multiple distributed sites that are both collectively and individually adjustable. This discussion transfers intelligence from many different models of active organization to an understating of spatial environments. It pursues a fascination with simple components that gain complexity by their relative position to each other" (02).

36 Noel Greis, "Integrated Infrastructures for Moving Goods in the Digital Age" in *Moving People, Goods, and Information in the 21<sup>st</sup> Century: The Cutting-Edge Infrastructures of Networked Cities* (London: Routledge, 2004), 37.

37 Manuel Castells, "Space of Flows, Space of Places: Material for a Theory of Urbanism in the Information Age" in *The Cybercities Reader*, ed. Stephen Graham (London: Routledge, 2004) 85.

38 Susan Nigra Snyder and Alex Wall, "Emerging Landscapes of Movement and Logistics" *Architectural Design*: 68 (7-8, July-August 1998), 20. The authors also define the distribution landscape as "the domain of the logistics industry where information and technology intervene with the physical bulk of goods at ports, rail yards, air cargo, and truck depots" (16).

39 Regarding the aspirations of their project, Wall and Snyder write, "Beyond understanding the locational logic of these new urban developments, we believe the distribution landscape is a testing ground for new kinds of settlement, spatial patterns, and possibly and architecture where the shape of urban life is free to take on a new form" (21).

40 Ibid.

41 Published in *The Cybercities Reader*, Steven Graham, ed. (Routledge 2004), 179-184.

42 Clare Lyster, "Landscapes of Exchange: Re-Articulating Site" in *The Landscape Urbanism Reader*, ed. Charles Waldheim (New York: Princeton Architectural Press, 2006), 230.

43 Charles Waldheim and Alan Berger. "Logistics Landscape" *Landscape Journal* 27:2-08 (2008).

44 Ibid, 226.

45 According to former CEO, David Glass, "Our distribution facilities are one of the keys to our success. If we do anything better than other folks, that's it." David Glass quoted on wall display, Wal-Mart visitors center, Bentonville, AR July 28, 2006. Current CEO, Lee Scott, also states, "From the time Sam Walton founded the company and established our first distribution center and our trucking fleet, he understood logistics as an integral part of Wal-Mart's success. Lee Scott quoted on wall display, Wal-Mart visitors center, Bentonville, AR July 28, 2006. As chief architect William Correll stated, "Operational needs rule and productivity and efficiency is at the very center of what we're trying to." (Interview with author, July 31, 2006).

46 Jay Fitzsimmons, Walmart's former Senior Vice President and Treasurer reinforced this through his assertion, "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.

47 This is a common approach in retail but Walmart's scale of operations set it apart from its competitors.

48 Sam Walton with John Huey, *Sam Walton: Made in America: My Story* (New York: Bantam1992) 272.

49 Lee Scott, "21st Century Leadership," October 24, 2005 (<http://walmartstores.com/ViewResource.aspx?id=1965>, accessed Nov. 06, 2009).

50 Don Moseley, interview with author, Bentonville, AR, July 31, 2006.

51 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 (<http://www.nytimes.com/2009/12/06/opinion/06diamond.html>, accessed Feb. 27, 2011).

52 Walmart press release, "Walmart Announces Sustainable Product Index," July 16, 2009 (<http://walmartstores.com/FactsNews/NewsRoom/9277.aspx>, accessed Nov. 06, 2009).

53 Michael Barbaro and Justin Gillis, "Walmart at Forefront of Hurricane Relief," *Washington Post*, Sept. 6, 2005 (<http://www.washingtonpost.com/wp-dyn/content/article/2005/09/05/AR2005090501598.html>, accessed Nov. 06, 2009).

54 Walmart fact sheet, "Disaster Relief at Walmart" (<http://walmartstores.com/download/2304.pdf>, accessed Nov. 06, 2009).

55 "Armed Forces: Engine Charlie," *Time*, October 06, 1961, (<http://www.time.com/time/magazine/article/0,9171,827790-1,00.html>, accessed Nov. 06, 2009).

56 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" (26). Walmart might well take its place in this line as the paradigmatic corporation of the early 21<sup>st</sup> century, at once for its size, reach, cultural impact, and technological innovations.

57 For an account of Saarinen's work with both IBM and GM, refer to Reinhold Martin, *The Organizational Complex: Architecture, Media, and Corporate Space* (Cambridge: MIT Press, 2003).

58 Also addressed by Kwinter and Fabricius, 2001.

59 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, no. 3.

60 This network extends beyond national borders, of course, but here the discussion is confined primarily to the United States.

61 Floor manager of DC 6094, interview with author, Bentonville, AR, January, 2008.

## CHAPTER 02, pages 030-055

1 In some cases, certain Walmart actors will be quoted at length in order to demonstrate the attitudes implicit in their language that would be otherwise lost through paraphrase or summary.

2 For a thorough account of the development of mass merchandising and discount retail, see "The Evolution of Retailing and the Appearance of Discount Merchandising" in *Walmart: A History of Sam Walton's Retail Phenomenon* by Sandra S. Vance and Roy V. Scott (New York: Twayne, 1994).

3 Sandra S. Vance and Roy V. Scott, *Walmart: A History of Sam Walton's Retail Phenomenon* by (New York: Twayne, 1994), 12.

4 United States Patent and Trademark Office. Patent 1,397,824 (patented Nov. 22, 1921), 3.

5 Information on the development of the UPC has been taken from Harry E. Burke, *Automating Management Information Systems*, Vol. 1 & 2 (New York: Van Nostrand Reinhold, 1990); Lawrence E. Hicks, *The Universal Product Code* (New York: American Management Association, 1975); and the *Automated Identification History Museum The History of Item Identification* ([www.idhistory.com](http://www.idhistory.com), accessed July 30, 2009). See also Stephen A. Brown, *Revolution at the Checkout Counter: The Explosion of the Bar Code* (Cambridge: Wertheim Publications in Industrial Relations, 1997); George Lauer, *Engineering Was Fun! An Autobiography* (self-published, 2007); and Bill Selmeier, *Spreading the Barcode* (self-published, 2008).

6 More recently, Radio Frequency Identification (RFID) has been positioned as the heir to the UPC as the primary mode of inventory monitoring and managing. As RFID "tags" (consisting of a transmitter and antenna) continuously broadcast their location in space, the parties monitoring them can maintain close watch over their entire journey. This is different than the current mode of the UPC because the latter can only account for the products' locations at the checkpoints of their paths. The promise of RFIDs is ultimately to automate the process of shopping almost entirely. If all the items in a shopper's cart have RFID tags, then the consumers can pass through an electronic gate and their account will instantly and automatically deducted the amount necessary.

7 The other companies at the top of the list are usually insurance companies, automobile makers, or petroleum companies that have concentrated spatial locations in skyscrapers, office parks or factories. Conversely, Walmart spreads itself over vast territories. The company has nearly saturated its sales area in the United States because "fully 60 percent of the entire U.S. population lives within 5 miles of a







- Walmart location and 96 percent are within 20 miles.” (Matthew Zook and Mark Graham, “Walmart Nation: Mapping the Reach of a Retail Colossus,” in *Walmart World: The World’s Biggest Corporation in the Global Economy*, ed. Stanley D. Brunn (London: Routledge, 2006), 20.)
- 8 Daniel Bell, *The Coming of Post-Industrial Society: A Venture in Social Forecasting* (New York: Basic Books, 1973), 26. While this formulation is a simplification, it is a useful device for establishing differences. Nonetheless, it is helpful of Armand Mattelart to remind us that “As often happens with concepts that are accepted without being seriously evaluated, ‘post-industrial society’ appeared as a smooth and homogeneous totality that brought about the fusion of historically antagonistic ideological families and redistributed modes of perception of the world according to an opposition between archaism and modernity.” Armand Mattelart, *Rethinking Media Theory* (Minneapolis: University of Minnesota Press, 1992), 49.
- 9 One only need to think of Eero Saarinen’s General Motors Technical Center or Marcel Breuer’s IBM Research Center to understand that the corporations’ identities were fundamentally tied to their architectural ambitions. For thorough accounting of this, see, for example, *The Organizational Complex* by Reinhold Martin (Cambridge: MIT Press, 2005).
- 10 Alfred Chandler, Jr.’s *The Visible Hand: The Managerial Revolution in American Business* (Cambridge: Belknap, 1977) addresses US Steel among many others in his thorough documentation and analysis of the rise of managerial capitalism. Additionally, *A Nation Transformed by Information: How Information has Shaped the United States from Colonial Times to the Present* edited by Alfred Chandler, Jr. and James Cortada (London: Oxford University Press, 2003) addresses these topics in greater detail. Regarding the geographical manifestations of industry and location theory, see Paul Krugman’s *Development, Geography, and Economic Theory* (Cambridge: MIT Press, 1996) and *Geography and Trade* (Cambridge: MIT Press, 1994).
- 11 For more on automated buildings, refer to the interlude concerning Keedoozle.
- 12 William Correll described one duty of his division by stating, “We put together, if you will, the vehicles of choice. I wouldn’t look at it as cookie cutters of building layouts, but as base formats that one might take and apply while coming up with new concept stores. The prototypes are designed to be starting points – kind of like springboards.” Interview with author, July 31, 2006. Printed in *archithese 06.2007*: “The City and Shopping,” 32–37.
- 13 For more on formats, refer to Keller Easterling, *Organization Space: Landscapes, Highways, and Houses in America* (Cambridge: MIT Press, 1999), especially Part 03, Subdivision Products.
- 14 Random House Dictionary (<http://dictionary.reference.com/browse/> format, accessed Feb. 27, 2011).
- 15 Walton & Huey, 142–43.
- 16 Don Soderquist, *The Walmart Way: The Inside Story of the Success of the World’s Largest Company* (Nashville: Thomas Nelson, 2005) 156.
- 17 Significantly, Walton kept a large map of the United States above his desk with the location of every Walmart.
- 18 Examples of this in Vermont and California will be documented more thoroughly in the following chapter. Similar issues are also addressed in the interlude concerning eminent domain.
- 19 Interview with author, *archithese 06.2007*: “The City and Shopping,” 33.
- 20 Ibid.
- 21 Karrie Jacobs, “Massive Markets,” *Metropolis*, June 01, 2004 (<http://www.metropolismag.com/story/20040601/massive-markets>, accessed February 27, 2011).
- 22 Walmart is also constantly developing new prototypes, including an “urban” prototype and a “lifestyle” prototype.
- 23 Robert Venturi, Denise Scott Brown, and Steven Izenour, *Learning from Las Vegas: The Forgotten Symbolism of Architectural Form* (Cambridge: MIT Press, 1977, 1972), 87.
- 24 Julia Christensen, *Big-Box Reuse* (Cambridge: MIT Press, 2008) 5.
- 25 According D’Hooghe, a big box conforms to the following characteristics: (a) A big box has a contiguous floor plate, maximizing flexibility and exchangeability within its perimeter; (b) A big box has a repetitive structural and façade system built out of a few components that repeat themselves ad nauseam; (c) A big box is a horizontal form. There are no innate limits to its footprint because unlike conventional residential or office buildings, the big box does not get its natural light from its facades, but from its ceiling / roof patterns. It can, in other words, in principle expand in both horizontal directions almost endlessly; (d) The structural system of a big box limits the number of columns within the main space to an absolute minimum. Thirty to forty meter spaces are current normative averages for commercial big boxes. This is an extremely important reduction of the internal regimentation. This de facto abolishes that very existence of an internal regime, replacing it with nothing more than a vast platform or stage. (e) There is no strict relation between the big box as encasing protection against rain and wind on one hand and the energy regimes within the box on the other. In other words, the big box shell is not per se an energetically sustainable envelope. This is because the space covered can be enormous. Within its confines another layer of more temporary architectures are required each of which may demand their own energy regimes. This reduces the need for the big box’s façades to be laminated and thick. It also allows for a variety of in-between regimes (between inside and ‘outside’ climates) to exist within its perimeter.” Alexander D’Hooghe, “The Case for the Big Box: Joys of a Non-expressionist Architecture” in *Volume 19: Architecture of Hope*, 32–34.
- 26 Ibid., 38.
- 27 Christensen, 118.
- 28 Ibid.
- 29 Ibid.
- 30 Associating program with a building type is not necessarily what Venturi and Scott Brown had in mind with the development of the duck and the decorated shed. In fact, they are happy to point out that several buildings that perform both functions. (e.g. the Cathedral of Chartres). Applying Christensen’s point elsewhere helps to illustrate its limitations. For example, saying that a “big box” is culturally synonymous with “shopping” is similar to equating the “high rise” with “office work.” One could easily produce a “duck” high-rise (St. Mary’s Axe, Empire State Building, Burj Dubai, etc.) or a “decorated shed” high-rise (Seagram Building, Portland Building, etc.) but the programmatic associations remain. In other words, Venturi and Scott Brown’s point was not to catalog and categorize all buildings into one or the other but rather to explore, within a forthrightly declared narrow register based on image, the role of symbolism in architectural form (as the subtitle reminds us). The high-rise example also serves as a reminder that “decorated sheds” need not literally be sheds and that the application of signifiers does not necessarily only include large words or historical references. While the Portland Building’s flatness and architectural quotations provide a more obvious example, the Seagram Building’s appliqué I-Beams certainly form a kind of overlaid decoration.
- 31 Alejandro Zaera Polo, “The Politics of the Envelope: A Political Critique of Materialism” in *Volume 17: Content Management*, 79.
- 32 Correll explains this as a corporate policy designed to allow so variation in the stores’ design in order to somehow reflect the context of their situation. *archithese 06.2007*, 33.
- 33 It is also worth noting the change in overall floor area from 29,345 square feet in 1955 to 155,230 in 2007.
- 34 Walton and Huey, 141.
- 35 Robert Slater, *The Walmart Decade: How a New Generation of Leaders Turned Sam-Walton’s Legacy into the World’s #1 Company* (New York: Penguin Group, 2003), 94.
- 36 Ibid., 92.
- 37 Walmart launched its satellite network in 1988. The role of satellite communications will be addressed further in the next chapter. Arthur Markowitz, “Walmart launches world’s largest private satellite communication system” in *Discount Store News*, Feb. 01, 1988.
- 38 Based on the experience of the author when trying to photograph the center on Sunday, January 20, 2008. The author was questioned by one plainclothes deputy and subsequently by a uniformed officer.
- 39 Friedrich Kittler points out that “understanding media – despite McLuhan’s title – remains and impossibility precisely because the dominant information technologies of the day control all understanding and its illusions. What counts are not the messages or the content with which they equip so-called souls for the duration of a technological era, but rather (and in strict accordance with McLuhan) their circuits” Friedrich Kittler. *Gramophone, Film, Typewriter*. Stanford: Stanford University Press, 1986 (reprinted 1999), xl – xli.
- 40 Marshall McLuhan, *Understanding Media: The Extensions of Man* (Cambridge: MIT, 1964, 1997), 8.
- 41 For example, Walmart’s process of establishing its presence in Vermont amounted to surrounding the state with stores just over the border, thus saturating the market even though, technically, it was never allowed to open a Vermont store. This will be analyzed in more detail in the next chapter.
- 42 Other authors have tried to account for these instances of architectural ambiguity relative to infrastructure. One notable example is Martin Pawley’s *Terminal Architecture* (London: Reaktion Books, 1998). Though somewhat optimistic in its faith in technology the book effectively argues for an expanded idea of what constitutes architectural design. The pun of the title reflects this as well for the book is both an examination of architecture related to transit and material flows but also suggests that architecture’s days might be numbered.
- 43 Soderquist, 154.
- 44 Ibid, 161.
- 45 Ibid.
- 46 Ibid, 159.
- 47 CNBC, “The Age of Walmart,” May 20, 2007.
- CHAPTER 03, pages 064–095
- 1 The evidence to support the claims in this chapter is assembled from a range of material. Much of the historical data related to Walmart’s early formation and growth is drawn from the various memoirs of the company’s executives and employees. *Sam Walton’s Made in America, My Story* and Don Soderquist’s *The Walmart Way* are two such examples. Additional primary material is taken from Walmart documents such as their annual reports, fact sheets, and so on. Sites continue to play an important role, as does material generated from third-party literature like software suppliers or trade organizations.
- 2 Walmart’s daily operations are also infused with military terminology and imagery: customers and sites are “targeted,” the company is often accused of being “at war” with a territory in which it tries to open, not to mention the roots of logistics in military parlance.
- 3 “This was a time [1966] when quite a few people were beginning to go into computerization. I had read a lot about that, and I was curious. I made up my mind I was going to learn something about IBM computers. So I enrolled in an IBM school for retailers in Poughkeepsie, New York.” Sam Walton and John Huey, *Sam Walton, Made in America: My Story* (New York: Bantam, 1991), 107.
- 4 Clarence Saunders quoted in “Saunders Ready to Go Again With a New Store: Keedoozle System Open in March at Union Extended and Poplar,” Clark Porteus, *Memphis Press Scimitar*, January 23, 1948.
- 5 According to business historian David Magee, the Piggly Wiggly method of organizing its inventory was highly influential on executives from the Japanese automobile manufacturer Toyota. After a visit to a local Ford plant, the delegation visited a Piggly Wiggly store and were influenced by the manner in which inventory was restocked automatically as it was removed from the shelves and how merchandise was replaced only as customers depleted it. Magee asserts that this system was very influential on Toyota’s “pull” approach to material in which products are developed “just in time.” Source: David Magee, *How Toyota Became Number One* (New York: Penguin, 2007) 36–37.
- 6 “Keedoozle’s Robots Fail, Men Get Jobs: Saunders Throws Mechanical Men on Junk Heap, Clerks Will Work Behind the Shelves,” Jack Bryan, *Memphis Press-Scimitar*, February 02, 1938.
- 7 Woody Forbes, former mechanical engineer for Keedoozle recounts in an interview, “I doubt seriously if it would ever work in the grocery business... I’ve thought of other things he might have made that unit so that it could distribute ... a kind of warehouse type thing.” Interview of Woody Forbes by Mike Freeman, January 04, 1984. Mississippi Valley Collection, University of Memphis, 438-03-16.
- 8 Howard Sowell quoted in Porteus, *Memphis Press Scimitar*, January 23, 1948..
- 9 “A recent article in the financial section of the *New York Times* tells of the ‘invasion’ of New York, northern New Jersey and the New England states by Keedoozle. Keedoozle Eastern Corporation has been formed in the east as an affiliate of Saunders’ parent company, Automatic Systems Corporation, in Memphis. Franchises to some five stores will be issued this year in New York City. The *New York Times* says the Eastern organization plans to have 100 stores in New York City and another 100 in the rest of the territory by 1954, but Mr. Saunders said he hoped the system would spread much more rapidly in the East.” From “Keedoozle Stores Spreading Out: Corporation in East Plans 100 Units,” *Memphis Press-Scimitar*, January 20, 1949.
- 10 Quoted in “Thousands Get Free Food: Keedoozle Against Tennessee Law,” *Memphis Press-Scimitar*, September 24, 1948.
- 11 Advertising copy, “A New Star Shines: Keedoozle,” University of Memphis Library Special Collection 438.





- 4 Ibid., 109.
- 5 Ibid. 110-11.
- 6 Herman Kahn, *The Coming Boom: Economic, Political, and Social* (New York: Simon and Schuster, 1982), 73.
- 7 Bethany Moreton, *To Serve God and Walmart: The Making of Free Christian Enterprise* (Cambridge: Harvard University Press, 2009), 215.
- 8 Peter Gallison, “War Against the Center,” *Grey Room 04* (Summer 2001): 06-33.
- 9 Ibid., 31.
- 10 This is described by Reinhold Martin in *The Organizational Complex* (Cambridge: MIT Press, 2003), 178: “As IBM’s mainframes took on the organization with the help of so-called modern design, color-coded modular components made it possible to recognize this line of computers as an integrated system. Modular compatibility thus became the basis of the 360’s logical and visual organization alike.”
- 11 Quoted in Martin, 177.
- 12 For an in-depth discussion of these relationships, refer to Moreton, 2009.
- 13 Bob Ortega, for example, in *In Sam We Trust* has written thorough accounts of Walmart’s struggles to enter Steamboat Springs, Colorado, Lancaster County, Pennsylvania, and others.
- 14 In *Walmart: A History of Sam Walton’s Retail Phenomenon* (New York: Twane Publishers, 1994), Sandra S. Vance and Roy V. Scott write: “In fiscal 1971 the firm established a real estate and construction division to oversee the building of new stores. Its functions included acquiring the land on which the stores would be located, constructing the buildings, and arranging permanent financing for some locations. The properties were either retained by the company or, more commonly, sold to investors and leased back to Walmart. The sale and lease-back arrangement afforded certain advantages: it was faster and more economical than using a developer; it permitted the company greater flexibility in choosing locations; it allowed Walmart to develop a closer relationship with local banks; and it enabled the firm to avoid percentage-of-sales clauses in leases” (58).
- 15 Don Soderquist, *The Walmart Way: The Inside Story of the Success of the World’s Largest Company* (Nashville: Thomas Nelson, 2005), 179.
- 16 Bill Correll, interview with author, July 2007.
- 17 Bob Ortega, *In Sam We Trust: The Untold Story of Sam Walton and How Walmart is Devouring America* (New York: Times Books, 1998), 76.
- 18 Walton and Huey, 25-26.
- 19 Ibid., 52.
- 20 Ibid., 143-144. Don Soderquist reinforces this: “We started by looking in a general area on a map and identifying potential towns. A real-estate associate then visited all of the sites and recommended a few possibilities. We considered the demographics involved, and then senior leadership flew out to look at the potential locations from the air—Sam liked to look at the road systems and traffic flow from that vantage—before driving around the area to take an up close look.” (Soderquist, 156)
- 21 Ibid., 143.
- 22 Walmart annual report 1988, 2.
- 23 Soderquist, 179.
- 24 “My appreciation for numbers has kept me close to our operational statements, and to all the other information we have pouring in from so many different places...I found out early that one of my talents is remembering numbers. I can’t recall names and a lot of other things as well as I would like to. But numbers just stick with me, and always have. That’s why I come in every Saturday morning usually around two or three, and go through all the weekly numbers.” Walton and Huey, 147.
- 25 Ibid., 272.
- 26 James Martin clarifies the performance of satellite communication networks: “For all these signals it should be regarded as a broadcasting medium accessible from anywhere beneath it, not as a set of cables in the sky.” *Communications Satellite Systems* (Englewood Cliffs, NJ: Prentice-Hall, 1978), 9.
- 27 Arthur Markowitz, “Walmart launches world’s largest private satellite communication system,” *Discount Store News*, February 01, 1988.
- 28 Once Walmart shifted to bar code use, a product’s status would be registered and updated through the company’s computers system at all stages of its journey.
- 29 Walton and Huey, 270-71.
- 30 Markowitz, 1988.
- 31 David W. Rees, *Satellite Communications: The First Quarter Century of Service* (New York: John Wiley & Sons, 1990), 299. Though neighbors longitudinally, the satellites themselves are almost 400 miles apart at their geostationary position.
- 32 Walton and Huey, 271. Emphasis added.
- 33 Ibid.
- 34 Ibid., 272-73.
- 35 Arthur C. Clarke, “Extra-Terrestrial Relays: Can Rocket Stations Give World-wide Radio Coverage?” *Wireless World* (October 1945), 305 – 308.
- 36 Martin, 1978, 04.
- 37 Rees, 22.
- 38 Lyndon B. Johnson, Remarks at a Ceremony Marking the First Commercial Communication Satellite Service, June 28, 1965. The satellite whose launch the ceremony was celebrating also broadcast Johnson’s speech. (<http://www.presidency.ucs.edu/ws/index.php?pid=27056&st=&st1=>, accessed February 27, 2011).
- 39 Markowitz, 1988.
- 40 Flusser’s concept of “anonymous apparatus-operator complex” is illuminating in this instance: “The crowd does not dialogue with itself in the classical Greek sense, because it is continually exposed to discourses and therefore it only has control of information which is sent to everyone and everyone receives.” Vilém Flusser, *Writings*, ed. Andreas Ströhl, trans. Erik Eisel (Minneapolis: University of Minnesota Press, 2002), 18.
- 41 Interview with author, Bentonville, AR, January 2009. Emphasis added.
- 42 In this description it is not the intention to valorize physical encounters with territory but rather to account for the shifts in the process of decision-making and the role that proximity decreasingly plays.
- 43 Examples of texts concerning retail site selection include Peter R. Attwood, *Logistics of a Distribution System* (Aldershot, Hants, England : Gower, 1992); Dov Izraeli, *Franchising and the Total Distribution System* (London: Longman, 1972); John U. Marshall, *The location of service towns; an approach to the analysis of central place systems* (Toronto: University of Toronto Press, 1969); Richard L. Nelson, *The Selection of Retail Locations* (New York: F. W. Dodge Corp, 1958). Peter Scott, *Geography and Retailing* (London: Hutchinson, 1970)
- 44 Regarding statistical primacy in regional science, Paul Krugman writes, “Isard’s conclusion... was that one could therefore simply view location as another choice variable in a general equilibrium competitive model, of the kind that was coming to dominate economic analysis: and this was simply wrong: to make any sense of the various approaches to location that he surveyed, one must take account of increasing returns and hence of imperfect competition.” Paul Krugman. *Development, Geography, and Economic Theory*, (Cambridge: The MIT Press, 1996), 56. For more on regional science, see Walter Isard, *Introduction to Regional Science* (Englewood Cliffs, NJ: Prentice-Hall, 1975).
- 45 For example, Walmart relies on a company called Weather Trends International for long-term weather prediction on which to based sales projections. ([www.wxrends.com](http://www.wxrends.com))
- 46 [http://en-us.nielsen.com/tab/expertise/distribution\\_strategy/market\\_site\\_analysis](http://en-us.nielsen.com/tab/expertise/distribution_strategy/market_site_analysis), accessed May 19, 2010.
- 47 Simon Thompson, “The Future of Retail: Understanding the Geography of the Marketplace Helps Businesses Thrive” (<http://www.esri.com/library/reprints/pdfs/retailsolutionsonline-futureofretail.pdf>, accessed May 19, 2010).
- 48 Simon Thompson, “Geo Means Business! GIS to Dashboards: For Everyone in the Enterprise” ([http://www.esri.com/library/reprints/pdfs/lbxjournal\\_geo\\_means\\_business.pdf](http://www.esri.com/library/reprints/pdfs/lbxjournal_geo_means_business.pdf), accessed May 19, 2010).
- 49 For more on such environments, see John Harwood, “The White Room: Eliot Noyes and the Logic of the Information Age Interior,” *Grey Room 12* (Summer 2003): 05-31.
- 50 Compare this to the process described by Peter Gallison and consider the ends of the spectrum he describes. At one end, the mapping process of identifying targets by civilians produced a psychological inversion in which the planners, industrialists, etc. played the role of the bomber in order to determine their city’s weak points through distance and abstraction. At the other end, those studying the post-bomb effects of Hiroshima and Nagasaki became highly sympathetic with the victims, even if it had been abstraction of strategic planning that allowed the bombs to be dropped in the first place.
- 51 These articles include Frederic M. Biddle, “Battle of Vermont: Walmart Plots Its Assault on Last Unconquered State,” in *Boston Globe*, July 18, 1993; Malcolm Gladwell, “Walmart Encounters a Wall of Resistant in Vermont,” in *The Washington Post*, July 27, 1994; John Greenwald, “Up Against the Walmart,” in *Time*, August 22, 1994; Ross Sneyd, “Walmart Lost Battles, Won the War: Vermont Store Opens,” in *St. Paul Pioneer Press*, September 20, 1995; Pam Belluck, “Preservationists Call Vermont Endangered, by Walmart,” in *The New York Times*, May 25, 2004; George F. Will, “Waging War on Walmart,” in *Newsweek*, July 05, 2004; and Alex Beam, “Walmart and the Battle of Vermont” in *The Boston Globe*, September 12, 2007.
- 52 “Flatlanders” is a term used by Vermonters to describe outsiders who have moved to the state. “New Ecotopians” is a term established by the marketing firm Claritas to describe the demographic group made up of “consumers with above-average education who are technology-oriented and civically active. They are more likely than other Americans to make bread from scratch, drive a jeep, watch the Learning Channel and read *Outdoor Life* and *American Health* (Source: Malcolm Gladwell, “Walmart Encounters a Wall of Resistant in Vermont,” in *The Washington Post*, July 27, 1994).
- 53 The other entries for the 2004 list of “11 Most Endangered Places” include: 2 Columbus Circle, New York; Bethlehem Steel Plant, Pennsylvania; Elkmont Historic District, Tennessee; George Kraigher House, Texas; Gullah/Geechee Coast, South Carolina; Historic Cook County Hospital, Illinois; Madison-Lenox Hotel, Michigan; Nine Mile Canyon, Utah; and Ridgewood Ranch, Home of Seabiscuit, California; and Tobacco Barns of Southern Maryland, Maryland. The 1993 list also includes the following: Brandy Station Battlefield, Virginia; Downtown New Orleans, Louisiana; Eight Historic Dallas Neighborhoods, Texas; Prehistoric Serpent Mound, Ohio; Schooner C.A. Thayer, California; South Pasadena/El Sereno, California; Sweetgrass Hills, Montana; Thomas Edison’s Invention Factory, New Jersey; Town of Ste. Genevieve, Missouri; and Virginia City, Montana. (Source: [www.preservationnation.org/issues/11-most-endangered/](http://www.preservationnation.org/issues/11-most-endangered/))
- 54 Sally Johnson, “Vermonters are up against the Walmart - effort to stop retail chain from entering Vermont,” in *Insight on the News*, Jan 10, 1994.
- 55 Walton and Huey, 140-141.
- 56 Ibid, 141.
- 57 Zook and Graham, 23.
- 58 Frederic M. Biddle, “Battle of Vermont: Walmart Plots Its Assault on Last Unconquered State,” in *Boston Globe*, July 18, 1993. Perhaps it is worth noting that the comparison, however evocative, is misleading because the Maginot line of bunkers and fortifications was designed to serve protective and preventative purposes.
- 59 Though there are Walmarts in Canada, there are currently no locations within 20 miles of the Vermont border.
- 60 This is based on David Glass’s description of using a 100-mile radius to locate new distribution centers (Walton and Huey, 94).
- 61 [http://www.cityofmerced.org/depts/cd/planning/wal\\_mart\\_environmental\\_impact\\_report.asp](http://www.cityofmerced.org/depts/cd/planning/wal_mart_environmental_impact_report.asp) (accessed February 12, 2011)
- 62 Quoted in Ameera Butt, “Judge hears Wal-Mart distribution center arguments: Distribution center backers accused of withholding papers.” <http://www.mercedsunstar.com/2010/09/04/1556265/judge-hears-wal-mart-distribution.html> (accessed February 12, 2011).
- 63 Quoted in Jonah Owen Lamb, “Wal-Mart wants time to determine if competitors might be supporting lawsuits.” <http://www.modbee.com/2010/06/26/1227338/wal-mart-wants-time-to-determine.html> (accessed February 12, 2011).
- 64 For an assessment of the Walmart and local protests, see Paul Ingram, Lori Qingyuan Yue, and Hayagreeva Rao, “Trouble in Store: Probes, Protests and Store Openings by Walmart: 1998-2005,” *American Journal of Sociology* (forthcoming).
- 65 Jonathan Crary, *Techniques of the Observer: On Vision and Modernity in the Nineteenth Century* (Cambridge: MIT Press, 1992), 06 (emphasis added). See also Jonathan Crary, “Eclipse of the Spectacle” in Brian Wallis, ed. *Art After Modernism: Rethinking Representation* (New York: New Museum, 1984): 283-294.
- 66 John May, “Sensing: Preliminary Notes on the Emergence of Statistical-Mechanical Geographic Vision,” *Perspecta 40*: 42-53.
- 67 In this regard, Jean Baudrillard’s notions of indifference and equivalence are helpful to some extent in understanding Walmart’s relationship to locations. According to Baudrillard, “The stage of serial reproduction (that of the industrial mechanism, the production line, the growth of reproduction, etc.) is ephemeral. As soon as dead labor gains the upper hand over living labor (that is to say, since the end of primitive accumulation), serial production gives way to





generation through models. In this case it is a matter of a reversal of origin and end, since all forms change from the moment that they are no longer mechanically reproduced, but conceived *according to their very reproducibility*, their diffraction from a generative core called a ‘model’. We are dealing with third-order simulacra here. There is no more counterfeiting of an original, as there was in the first order, and no more pure series as there were in the second; there are models from which all forms proceed according to modulated differences. Jean Baudrillard, *Symbolic Exchange and Death*, trans. Mike Gane (London: Sage, 1993), 53, emphasis added.

- 68 Austin, John. *Lectures on jurisprudence 1832* (1879) II. xlvii. 807 (<http://dictionary.oed.com.ezproxy.cul.columbia.edu/help/bib/oed2-a2.html#austin>, accessed May 19, 2010).
- 69 Quoted in John M. Broder, “California Voters Reject Walmart Initiative,” *New York Times*, April 7, 2004 (<http://www.nytimes.com/2004/04/07/national/07CND-WALM.html>, accessed May 19, 2010).
- 70 Armand Mattelart, *The Invention of Communication*, trans. Susan Emanuel (Minneapolis: University of Minnesota Press, 1996), 210.

## INTERLUDE B, pages 096–101

- 1 The word “booth” is being used liberally here as these are really more like small temporary buildings.
- 2 RECON guide, p. 172.
- 3 Ibid., 179.

## CHAPTER 04, pages 102–121

- 1 CNBC, “The Age of Walmart,” May 20, 2007.
- 2 Misha Petrovic and Gary Hamilton, “Making Global Markets: Walmart and its Suppliers,” in *Wal-Mart: The Face of Twenty-First Century Capitalism*, ed. Nelson Lichtenstein (New York: The New Press, 2006) 133.
- 3 Marshall McLuhan articulates this condition, “In the new electric Age of Information and programmed production, commodities themselves assume more and more the character of information.” Marshall McLuhan, *Understanding Media: The Extensions of Man* (Cambridge: MIT Press, 1966), 102.
- 4 This is acknowledged by JCR Licklider in an interview: “The printing press was *the* great step into sharing information but the printing press didn’t handle the problem of distributing it, it handled the problem of copying it. And we have needed for a long time some better way to distribute information than to carry it about. The print on paper form is embarrassing because in order to distribute it you’ve got to move the paper around and lots of paper gets to be bulky and heavy and expensive to move about.” Though he is referring to the distribution of information, the same issues apply to the transit of physical goods. From Steven King, *Computer Networks: The Heralds of Resource Sharing*, 1972 (<http://video.google.com/videoplay?docid=4989933629762859961>, accessed Feb. 27, 2011).
- 5 David Glass, quoted in display in Walmart Visitor’s Center, Bentonville, Arkansas, USA.
- 6 JCR Licklider, “Man–Computer Symbiosis” in *IRE Transactions on Human Factors in Electronics*, no. 1 (March 1960): 59. See also <http://groups.csail.mit.edu/medg/people/psz/Licklider.html> (accessed August 12, 2010).
- 7 Joylon Drury and Peter Falconer, *Building and Planning for Industrial Storage and Distribution* (Oxford: Architectural Press, 2003), 201.

- 8 McLuhan, 45–46.
- 9 Oxford English Dictionary, 2010.
- 10 Elaborating on this notion, McLuhan writes, “The effects of technology do not occur at the level of opinions or concepts, but alter sense ratios or patterns of perception steadily and without any resistance ... we become what we behold” (McLuhan, 18).
- 11 According to Paul Edwards, Licklider’s essay “rapidly achieved the kind of status as a unifying reference point in computer science... It became the universally cited founding articulation of the movement to establish a time-sharing, interactive computing regime.” In Paul Edwards, *The Closed World: Computers and the Politics of Discourse in Cold War America* (Cambridge: MIT Press, 1996), 266.
- 12 Licklider, 1960, 59.
- 13 According to distribution expert Joylon Drury, “the final picking of discrete articles generally has to be done manually” (Drury and Falconner, 204).
- 14 More work here would need to be done to distinguish the notion of servo–organism from other concepts of machinic assemblages like those discussed by Wiener, Delueze and Guattari, Butler, Haraway, Foucault, and so on.
- 15 Walmart Annual Report, 1997, p. 12
- 16 [http://www.dp400.com/SYM\\_mobilecomputers.html](http://www.dp400.com/SYM_mobilecomputers.html) (accessed Aug. 12, 2010).
- 17 Don Soderquist, *The Walmart Way: The Inside Story of the Success of the World’s Largest Company* (Nashville: Thomas Nelson, 2005), 159. Soderquist’s description of the allocation and manipulation of labor within a given territory echoes other accounts of such practices. For example, in Michel Foucault’s assessment of the development of such spaces, he writes, “The first of the great operations of discipline is, therefore, the constitution of ‘*tableaux vivants*’, which transform the confused useless or dangerous multitudes into ordered multiplicities.” He goes on, “The unit—regiment, battalion, section, and later, ‘division’—became a sort of machine with many parts, moving in relations to one another, in order to arrive at a configuration and to obtain a specific result.” Michel Foucault, *Discipline and Punish: The Birth of the Prison*, trans. Alan Sheridan (New York: Penguin, 1997), 148, 162.
- 18 Marc Levinson’s book *The Box* (Princeton University Press, 2006) provides a detailed account of the development of the shipping container. In 1956 *Modern Materials Handling* published Herbert Hall’s three-part article “We’re Ready NOW to Standardize Shipping Containers” that developed a comprehensive case for intermodal transit enabled by a standard shipping unit. *Modern Materials Handling* (October, 1956): 89–93; *Modern Materials Handling* (November, 1956): 104–111; *Modern Materials Handling* (December, 1956): 97–103.
- 19 Foucault describes how a “‘political anatomy’, which was also a ‘mechanics of power’, was being born; it defined how one may have a hold over others’ bodies, not only so that they may do what one wishes, but so that they may operate as one wishes, with the techniques, the speed, and the efficiency that one determines” (138). Regarding new forms of monitoring, it “implies an uninterrupted, constant coercion, supervising the process of the activity rather than its result and it is exercised according to a codification that partitions as closely as possible time, space, movement. These methods, which made possible the meticulous control of the operations of the body, which assured the constant subjection of its forces and imposed upon them a relation of docility–utility, might be called ‘disciplines’” (137).
- 20 <http://www.dematic.com/voicepick> (accessed August 12, 2010).

- 21 Ibid.
- 22 Lucas / Motorola promotional video for Do It Best! Hardware stores (<http://www.youtube.com/watch?v=cbV0mY78VPE>, accessed August 12, 2010).
- 23 On feedback, Foucault writes “The training of school-children was to carried out in the same way: few words, no explanation, a total silence interrupted only by signals — bells, clapping of hands, gestures, a mere glance from the teacher, or that little wooden apparatus used by the Brothers of Christian Schools; it was called *par excellence* the ‘Signal’ and it contained in its mechanical brevity both the technique of command and the morality of obedience” (166). In *Cybernetics and Society*, in which feedback plays a defining role, Norbert Wiener writes, “In this conversation between the parts of the machine, it is often necessary to take cognizance of what the machine has already said. Here there enters the principle of feedback, which we have already discussed, and which is older than its exemplification in the ship’s steering engine, and is at least as old, in fact, as the governor which regulates the speed of Watt’s steam engine.” Norbert Wiener, *The Human Use of Human Beings: Cybernetics and Society* (Boston: Da Capo Press, 1954), 151–52.
- 24 Vocollect promotional video for Southeast Frozen Foods (<http://www.youtube.com/watch?v=nHUT6Tqc4-Y>, accessed August 12, 2010).
- 25 Maida Napolitano, “Three Voices, Three Solutions.” *Logistics Management* (July 2010): 42.
- 26 There are of course other art practices and projects that address questions of prosthesis, extension, amputation, and so on. I have chosen the Horn pieces because of their abstraction compared to say, the work of Stellarc that, in many ways, is a representation of what is already happening inside these distribution center environments, only in different forms. Likewise, the work of Kevin Warwick is relevant here, especially in terms of feedback, augmentation, and communication. Similarly, projects that incorporate prosthetics and amputees, like the involvement of Aimee Mullins in the work of Matthew Barney, address similar issues from another vantage point.
- 27 Elizabeth Grosz, “Bodies–Cities” in *The Blackwell City Reader*, Gary Bridge and Sophie Watson, eds (Oxford: Blackwell Publishers, 2002), 303.

## INTERLUDE C, pages 122–127

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- 2 Quoted in City of Hercules Planning Commission Staff Report, February 6, 2006, page 9. The full report, “City of Hercules: Peer Review of the Economic Impact Analysis of the Lewis / Wal-Mart Bayside Marketplace Project,” was prepared in September, 2005 by Strategic Economics in association with Main Street Property Services, Inc.
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- 7 Paul G. Lewis. *Shaping Suburbia: How Political Institutions Organize Urban Development* (Pittsburgh: University of Pittsburgh Press, 1996), 2.

## CHAPTER 05, pages 128–143

- 1 Whereas, for example, Robert Lang and Joel Garreau identify these new conditions in terms of their relationship to a metropolitan center, Northwest Arkansas has no such reference point. See Robert E. Lang, *Edgeless Cities: Exploring the Elusive Metropolis* (Washington, DC: Brookings Institution Press, 2003) for his distinction between “edge cities” and “edgeless cities.” Additionally, Robert Lang’s and Jennifer LeFurgy’s *Boomburbs: The Rise of American Accidental Cities* (Washington DC: Brookings Institution Press, 2007) further elaborates this work though continues to focus on development in reference to existing urban centers. The authors here align the term “boomburb” with Fishman’s “techoburb” yet Fishman’s point seems to be that it is difficult to continue using terms like “suburb” or “boomburb” to refer to conditions that have little to no relationship to an adjacent urban concentration. Though he is not celebrating this condition, he is pointing out that it is still in its adolescence: “The case for the techno-city can only be made hesitantly and conditionally. Nevertheless, we can hope that its deficiencies are in large part the early awkwardness of a new urban type. All new city forms appear in their early stages to be chaotic...Sprawl has a functional logic that may not be apparent to those accustomed to more traditional cities. If that logic is understood imaginatively... then perhaps a matching aesthetic can be devised.” Robert Fishman, *Bourgeois Utopias: The Rise and Fall of Suburbia* (New York: Basic Books, 1987) 204.
- 2 “NATO Group Tours Arkansas Wal-Mart Boom.” *Associated Press*, June 27, 2006.
- 3 “26–30 June 2006 – Visit To Arkansas And San Francisco By The Economics And Security Committee,” NATO Mission Report (<http://www.nato-pa.int/default.asp?SHORTCUT=1008>, accessed Dec. 01, 2010).
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- 6 Fishman, 184.
- 7 Ibid., 198.
- 8 Saskia Sassen, “Why Cities Matter” in *Cities, Architecture, and Society: exhibition catalogue of the 10. Architecture Biennale Venice* (Venice: Marsilio, 2006) 38.
- 9 Sam Walton and John Huey. *Sam Walton: Made In America, My Story* (New York: Bantam, 1992), 52.
- 10 John Huey quoted in *A&E Biography: Sam Walton – Bargain Billionaire* (A&E DVD Archives, 2004).
- 11 For example, in the last four years, a mosque and a synagogue have both been established in Bentonville, the latter also functioning as a Hindu prayer space. Marjorie Rosen’s book *Boom Town: How Walmart Transformed and All-American Town into and International Community* (Chicago Review Press, 2009) addresses these dynamics.



- 12 These developments are described in NATO’s report: Walmart “has also attracted representative offices of a range of supplier companies that simply cannot afford not to be present in the region due to the vital role Wal-Mart plays in getting their products to the market.” (“26-30 June 2006 – Visit To Arkansas And San Francisco By The Economics And Security Committee,” NATO Mission Report (<http://www.nato-pa.int/default.asp?SHORTCUT=1008>, accessed Dec. 01, 2010).
- 13 Author interview with Ed Stansea, project architect for Crystal Bridges, October 17, 2010.
- 14 Fishman addresses the gap in cultural production: “In dealing with these concerns, we must acknowledge the essential truth that the new city will probably never be able to compete culturally with the old centers. There will be for the foreseeable future a division founded on choice between those who seek out even at great cost the kind of cultural excitement that can only be found in the center, and those who choose the family centered life of the outer city. Yet the issue still remains undecided, whether it is possible to create a truly decentralized culture, one in which the family centered life is compatible with a fair degree of choice. There is the irony that American society, which can find in these decentralized regions more than enough specialists in the most arcane engineering specialties, cannot hope to attract a large enough audience to support a chamber music concert.” (Fishman, 202)
- 15 For example, regarding formats, Easterling writes, “The typical postwar suburb would be best described by a series of sequential operations performed on a repeatable dwelling. Residential fabric is typically arranged in generic formats with varying degrees of neutrality and differentiation, and either by design or default, their financing, ownership, and construction protocols differentiate or add complexity to them” (Easterling, 1999, 129).

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CHAPTER 5: CONCLUSION

01 Image by author.

02 Image by author.

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04 Class E Aeronautical Chart, Memphis (SMEM).

05 Image by author.

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