EEOC

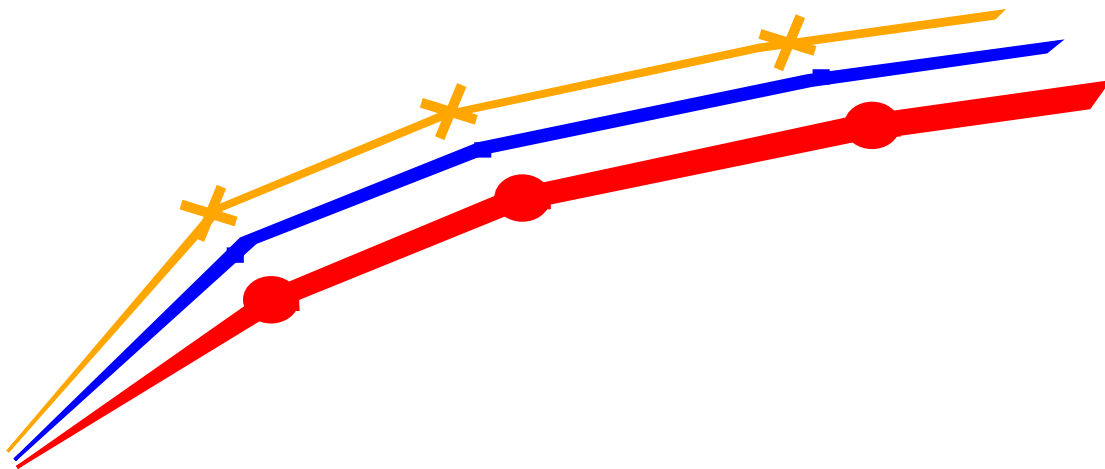# RETAIL DISTRIBUTION CENTERS: HOW NEW BUSINESS PROCESSES IMPACT MINORITY LABOR MARKETS

U.S. Equal Employment Opportunity Commission
RETAIL DISTRIBUTION CENTERS

FOREWORD

As part of the emphasis on proactive prevention in the Equal Employment Opportunity Commission's (EEOC's) Five Point Plan, this report seeks to aid retailers and similar employers in taking full advantage of America's labor markets. Our nation's retailers fulfill an important role in our economy and according to the EEOC's EEO-1 reports in 2002, employ nearly 15 percent of all private sector employees. In this second in a series of reports on this important industry, this report examines a unique sector of retailing: distribution centers. In contrast to traditional warehouses, a modern distribution center is essentially an operations center, managing the flow of information and goods between retailers and suppliers through the use of standardized bar codes, high-speed conveyors, laser scanners, and computerized databases.

These distribution centers represent not only a significant change in the way retail firms operate, but unlike store fronts they are often not very visible to the general public. These centers are commonly located away from central cities, either outside metropolitan areas altogether or on the edge of such areas. In searching for inexpensive land, favorable leases and low tax rates, retailers can easily lose sight of the value of a diverse workforce. This report attempts to alert retailers and others to the potential impact that distribution center location can have on the ability to develop and maintain a multi-cultural workforce. Readers, especially retailers, are encouraged to share their "best practices" in making location decisions for distribution centers in a manner that encourages a diverse work force.

U.S. Equal Employment Opportunity Commission
RETAIL DISTRIBUTION CENTERS

EXECUTIVE SUMMARY

This report examines how a recent business innovation, the retail distribution center, impacts the employment opportunities of minorities and women.

• In the retail industry, traditional warehouses designed to house inventory are being replaced by much large and more technologically sophisticated distribution centers that work towards maintaining a "just-in-time" inventory in stores and making the goods "shelf ready".

• Distribution centers often require greater space encouraging location away from the central city to lower priced real estate in less populated areas.

• Using EEO-1 data to identify retail distribution centers, the study finds that as retail distribution centers grow in size (measured by number of employees), they tend to be located in less populated areas. As areas become less populated, the percentage of women and minorities in the relevant job groups (operatives and laborers) declines.

• A comparison of the location of retail distribution centers/warehouses in 1982 to their location in 2002 suggests that had the locations remained in the same counties as in 1982, the relevant labor markets would have had ten percent (based on EEO-1 data) to 14 percent higher (based on 2000 Census data) minority representation as operatives and laborers.

• EEOC action in a number of areas might be effective in addressing this new type of business organization:

  – Educate corporate officials on the workforce ramifications of distribution center locations;
  – Collect equal employment opportunity (EEO) "best practices" that recognize the characteristics of logistic and supply chain operations;
  – Conduct outreach and education activities regarding EEO rights and responsibilities for potentially under served communities when distribution centers are located in less populated areas; and
  – Provide training and technical assistance regarding statutory requirements to employers in these less populated areas.

U.S. Equal Employment Opportunity Commission
RETAIL DISTRIBUTION CENTERS

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INTRODUCTION

Firms in a competitive business environment, such as retailing, develop mechanisms, such as outsourcing, relocating, retraining, and technological innovations, to obtain an advantage (Appelbaum, Bernhardt, and Murnane 2003, table 1.1). The development of new techniques can inadvertently have major consequences for the gender and racial/ethnicity of their workforce (e.g., Reskin, McBrier, and Kmec 1999; Tomaskovic-Devey 1993; Smith 1997:334-335; Stinchcombe 1990:261-265). This research uses data from the 2002 EEO-1 Survey of Private Employers and the Census 2000 EEO Special File to examine the gender and racial composition of a recent innovation, the retail distribution center. Specifically, we are primarily interested in the effects of retail distribution center location decisions on the employment of women and minorities.

BACKGROUND

The traditional retail warehouse was "a holding station for inventory ordered well in advance of sale" (Abernathy et al. 1999:57). Most shipments were large, infrequent and labor-intensive.

> The typical shipment between an apparel manufacturer and retail customers was large and of low frequency—usually once a season. Once delivered, the retailer held the products in central warehouses or as inventory in individual stores' "back rooms." When the desired time of display and sale arrived, workers stocked the product on the selling floor and replenished from store or warehouse inventories as the selling period progressed. Inventory control relied on painstaking, manual comparisons between sales records (paper receipts) and physical counts of items on the floor, in the back room, and in warehouses. (Abernathy et al. 1999:42)

> Traditional warehouses require hundreds of people, usually working on a single shift. In addition to loading and unloading trucks, a large number of jobs were devoted to receiving and inspecting incoming packages and stocking storage bins in the warehouse. A second group of workers was involved in "picking and packing," that is, assembling outgoing orders for stores by going to storage areas and bins and picking the required items and packing them for outbound shipment. Additional workers moved goods within the warehouse to adjust to space limitations arising from unexpected delays in shipping out orders, unexpected early arrival of goods, or holding unsold inventory. Capital per worker reflected the relatively low level of

technology in place in the warehouse (primarily equipment, such as forklifts, to load, lift, and unload pallets and boxes). (Abernathy et al. 1999:63-64)

By contrast, a modern distribution center is essentially an operations center, managing the flow of information and goods between retailers and suppliers through the use of standardized bar codes, high-speed conveyors, laser scanners,[1] and computerized data-bases:

> The most advanced set of practices are applied to incoming shipments that can be 'cross-docked.' In this case, goods are unloaded at one bay of the distribution center and moved to another bay by conveyer for shipment in the same day . . . The cross-docking procedure begins when trucks are unloaded (manually with some lifting equipment for heavier items or pallets), packages are positioned so that the bar code on the shipping container marker (SCM) can be scanned . . .The package then moves onto a scale and its weight is checked against the weight indicated on the label . . . At the same time, the information on the SCM is matched against data in the distribution center's database on purchase orders . . . Shipments that pass weight and purchase order verification move on to the main conveyer line, which has multiple sublines or "spurs" that correspond either to docks where packages are being consolidated directly for shipment to stores or to areas in the center devoted to opening certain types of goods for price marking, reconsolidation, or other manual processes . . . The various spurs of the main conveyer system end up at truck loading bays–often located on the opposite side of the distribution center–where storebound trucks can be docked. . . The computer completes its file associated with the particular shipment by indicating that the package has been loaded for shipping. Financial payments to the vendor are then initiated, along with a shipping manifest for the truck. The trucks are then sent out for deliveries to stores, where they will be unloaded and products stocked directly on the sales floor. (Abernathy et al. 1999:65-66)

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[1] Starting in 2005, Wal-Mart will require major suppliers to use radio-frequency identification (RFID) on cases and pallets. Unlike bar codes, RFID allows hands-free scanning without a direct line of sight. "One of the biggest motivating factors for people looking at RFID is the elimination of labor," says Melling [a RFID specialist at Symbol Technologies]. "They want the ability to know where everything is without having to pay a warehouse guy to constantly go and scan it, which is too expensive and too time consuming" (Murphy 2003:3).

Increasingly retail distributions centers also handle returns and value-added processing such as monogramming and final assembly (Bartholdi and Hackman forthcoming:17).[2]

According to trade publications, modern retail distribution centers tend to be large (covering one million square feet or more), recently constructed,[3] located in rural or semi-rural areas,[4] with substantial investments in material handling technology. As described by Foster (2003), a new Walgreens distribution center includes approximately 700,000 square feet of storage plus 14 miles of conveyors and a ten-story automated storage and automated retrieval (AS/RS) system with 48,000 pallet locations.[5] The total construction cost is over $100

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[2]   Hale and Van Bodegraven (2002:3) state: "The trend driving the provision of more in-DC [distribution center]-value-added services comes from both the sourcing end of the business and from customers. On the sourcing end, supply chain initiatives that drive inventory levels down by postponing value-added services, like packaging and labeling, are resulting in inventory deployed at the DC that still needs to be labeled, packaged, embroidered, printed, configured, loaded with software, populated, kitted, folded, re-boxed, wrapped–whatever. From the other end, customers are negotiating for traditional store back-room activities like price and security labeling, assortment building and display-ready product assembly done in the DC."

[3]   James H. Coridan, a commercial real estate specialist, describes the Columbus, Ohio distribution center market, "Building sizes and configurations have changed dramatically in the last five to 10 years. Buildings that were built 15 to 20 years ago are now functionally obsolete and sitting empty for prolonged periods. Building sizes are now 400,000 to 1,000,000 square feet, with 30-to 40-foot ceiling heights." *The State of Distribution Markets,* Summer 2003. Retrieved November 19, 2003 (http://www.sior.com/publications).

[4]   Jedd (2001:3) states: "While the rush is on to get into major markets, general urban sprawl is pushing DC's and other sites to outlying areas. . . Porter [an Atlanta-based logistic specialist] says. 'The site size required to build a million-square-foot facility is 50 to 60 acres of useable land. You typically can't locate those larger sites in the mainsteam distribution markets.'"

[5]   "Walgreens is the first drug chain to invest in an automated storage retrieval system that uses a robotic crane to transport product from the dock to a rack and vice versa. Lewis [senior vice president distribution and logistics for Walgreens] said that by eliminating the need for a forklift driver, the ASRS system–used in facilities more than 100 feet tall–reduces Walgreens productivity costs of an estimated 10 percent a year" (Parks, Liz. 2003. "DCs back Walgreens' Stores with 'Brawn.'" *Drug Store News* March 23:2).

million. The typical facility employs 300 to 400 people, most hired locally. Walgreens actively seeks non-unionized areas with 30 minute commuting times, reliable electric power, and low tax rates. *Drug Store News* (March 25, 2002) reports that Walgreens opened or plans to open four new distribution centers between 2002 and 2004, located in Jupiter, Florida (population 39,328), Waxahachie, Texas (population 21,426),[6] Perrysburg, Ohio (population 16,945), and Moreno Valley, California (population 142,381).[7]

It might seem that retail distribution centers are classical instances of "white flight," the movement of businesses from inner-cities to outlying suburbs. However, the anecdotal evidence in the trade press appears to be mixed. Some of the newer retail distribution centers have been built in predominantly White cities and towns. Others appear to located in areas with substantial minority populations, especially in California and the Southwest. For example, at the four Walgreens sites, the minority population ranges from 5.7 percent in Perrysburg, Ohio to 67.8 percent in Moreno Valley, California. Other recent examples, obtained from public information, can be seen in Table 1.

Viewed as rational decision processes, decisions to locate or relocate a distribution center involve a complex balancing of multiple economic and demographic considerations (Jedd 2001). For example, the Logistics Quotient™, published by *Expansion Management* and *Logistics Today* magazines, ranks the desirability of distribution locations by metropolitan areas using such factors as labor costs/availability/skill levels, highway spending, road congestion, fuel taxes, and interstate highway access. Using the Logistics Quotient™ data for 2003 (King and Keating 2003), Spearman rank correlations among the six labor, highway, and taxation indices across 328 metropolitan areas are computed for this report. Our results show that the fifteen rank correlations range from -0.33 to 0.35 suggesting substantial tradeoffs among the distribution indices. Comparing overall metropolitan rankings to Frey's analysis of the 2000 Census, about one half of the top twenty distribution

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[6] Don Hampton, "Waxahachie Wins the 'Super Bowl'" (*Southern Business and Development*, Summer 2001) attributes this decision to a low cost of living, affordable land, access to major highways linking Dallas, Houston, and Mexico City, and substantial financial incentives including a seven year tax abatement of 60 percent.

[7] 2002 population data retrieved, December 16, 2003, from http://www.city-data.com.

TABLE 1
EXAMPLES OF RECENTLY OPENED
RETAIL DISTRIBUTION CENTERS

Retailer	Location	Start Year	Size Sq. Ft.	Place Pop.	Percent Minority
Family Dollar	Morehead, KY	2000	907 K	5,914	6.3
Michaels	Hazleton, PA	2002	692 K	23,329	6.8
American Eagle	Ottawa, KS	2001	400 K	11,921	9.4
Target	Midlothian, TX	2004	1.35 M	7,480	17.7
Dollar Tree	Marietta, OK	2003	603 K	2,445	29.5
Wal-Mart	Hopkinsville, KY	2002	1.20 M	30,089	34.7
Sports Authority	McDonough, GA	1997	300 K	8,493	40.1
Kohl's	Corsicana, TX	2001	353 K	24,485	48.2
Lowes	Perris, CA	2001	1.20 M	36,189	77.2
Best Buy	Dinuba, CA	1999	635 K	16,844	79.4

locations are in areas (Nashville, Atlanta, Minneapolis, Houston, Macon, Louisville, Dallas-Fort Worth, Indianapolis, Columbus, and Memphis) where the 1990-2000 growth in Black population exceeded 20 percent (Frey 2001, tables 2 and 3). At least three of these areas, Dallas-Fort Worth, Houston, and Atlanta, also show substantial 1990-2000 gains in Hispanic population (Frey 2002, table 1).

RESEARCH QUESTION

Based on the literature suggesting that retail distribution centers are locating in less populated areas, the hypothesis that these location decisions will negatively affect the employment prospects of minority workers is explored. This is not to suggest that location decisions are based on discriminatory motives. Rather it appears that these business decisions focus on inexpensive land and location as the major consideration.

DATA

The Equal Employment Opportunity Commission (EEOC) as part of its mandate under Title VII of the Civil Rights Act of 1964, as amended operates a data collection system that collects data from nearly all employers in the United States with more than 100 employees. Private employers must file an Employer Information Report, EEO-1, with separate reports for each facility with 50 or more employees. In 2002, more than 39,000 employers submitted, individual establishment and headquarters reports for nearly 200,000 reporting units with about 52 million employees (U.S. Equal Employment Opportunity Commission, 2002).[8] The EEO-1 collects race/ethnic and gender data annually on nine major job categories.[9] In addition to the workforce data, information about each establishment's North American Industrial Classification System code, the establishment's county, its metropolitan area code and other data is included. The EEO-1 provides data that are more firm specific that other possible data sources and provides useful data by job groups, race/ethnicity and gender. For this research, EEO-1 data are supplemented with 2000 Census data from the 2000 U.S. Gazeteer (http://www.eeoc.gov/ stats/census/index.html) to obtain population data within geographic areas and the EEO Special File (http://www.eeoc.gov/stats/census/ index.html) to obtain supplemental workforce data.

IDENTIFICATION OF DISTRIBUTION CENTERS

We identified distribution centers in several steps. First, we defined the retail industry using North American Industrial Classification System (NAICS) codes for Retail Trade, (44 and 45). Motor Vehicle and Parts Dealers, Food and Beverage Stores and Non Store Retailers were then excluded because they utilize different occupations.[10] Second, we separated non

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[8] EEOC obtains and maintains EEO-1 reports pursuant to its authority under section 709 of the Civil Rights Act of 1964, as amended, 42 U.S.C. §2000e-8. Paragraph (e) of that section prohibits the EEOC and its employees from disclosing individual EEO-1 reports to the public. Violation of that section is punishable by fine and imprisonment. Aggregated data is available to the public.

[9] Details regarding the report characteristics can be found in the EEO-1 instruction booklet at, *http://www.eeoc.gov/stats/jobpat/e1instruct.html*

[10] For a discussion of Food and Beverage Stores and the employment status of minorities and women, see Sheryl Skaggs, "Producing Change or Bagging Opportunity? The Effects of Discrimination Litigation on Women and Minorities in Supermarket

sales establishments from sales establishments. Those establishments whose use of sales workers was significantly lower than their company's overall proportion of sale workers were identified as non sales establishments.[11] This produced a total of 1,046 establishments. Third, we distinguished between distribution centers and other non sales establishments such as fulfillment centers and call centers. Based on the trade literature, we selected easily identified distribution centers. Operatives and laborers were the dominant job groups in these examples.   Therefore, as a tentative rule, we retrieved EEO-1 reports from all non sales establishments where operatives and laborers made up more than 50 percent of an establishment's workforce or the unit name referred to a distribution center. To verify these tentative selections, we searched publicly available sources such as retail web sites and Security and Exchange Commission filings. Four hundred and sixty-four establishments were confirmed in this manner. Fourth, establishments in the Warehousing industry (NAICS code of 49311) were examined to determine if they contained any retail distribution centers. Of 709 such establishments, 168 had a headquarters number indicating that their parent firm was a retailer. We then applied the criteria, described above, regarding percentage of operatives and laborers and unit names. Finally, the relevant establishments from the retail industry were combined with those from the warehousing industry to produce a final sample size of 589 retail distribution centers.

Management." Presented at the Annual Meeting of the American Sociological Association. 2002.

[11] Decision is based on the use of an exact binomial test and a 0.05 level of probability.

CHARACTERISTICS OF RETAIL DISTRIBUTION CENTERS

Retail Distribution Centers are described from a number of perspectives. To examine the characteristics of these retail distribution centers, it is useful to first use a measure of geographic location.

LOCATION OF RETAIL DISTRIBUTION CENTERS

We used the rural-urban continuum index developed by the Economic Research Service (ERS) of the U.S. Department of Agriculture (ERS 2003). The index, based on the 2000 Census and the 2003 OMB definitions of metropolitan status, classifies counties into nine categories, divided into counties within and outside Metropolitan Statistical Areas (MSA). The three MSA-based categories are further subdivided into counties with one million or more population (ERS code 1), counties with 250,000 to one million population (ERS code 2), and counties with fewer than 250,000 population (ERS code 3). The six non-MSA categories range from counties with an urban population of 20,000 or more, adjacent to a MSA (ERS code 4) to completely rural counties with an urban population of less than 2,500, not adjacent to an MSA (ERS code 9).

Since many distribution centers are located within Combined Statistical Areas (CSA) and/or MSA's, we modified the rural-urban continuum index in several ways. The most rural categories (ERS codes 5 through 9) were combined into a single group labeled Non-Metropolitan Other. Given the geographic dispersion of the urban categories (ERS codes 1 and 2), locations within CSA's and MSA's were sub-classified using the Census 2000 place definitions. The urban areas were bifurcated based into "inner" locations and "outer" locations based on a composite measure that accounts for both population density and geographic location.[12] For example, among places with a population between 50,000 and

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[12] The "inner" and "outer" measure represents a factor composite score of two variables: (1) the relative county 2000 population density within the appropriate CSA or if not available, the appropriate MSA; and (2) the relative distance, measured in Census ZIP Code Tabulation Areas (ZCTAs) latitudes and longitudes, between the distribution center and the central business district of the first principal city in the CSA or MSA title (where the central business district was arbitrarily identified by postal addresses of federal courts, state courts, or EEOC district offices). The Pearson correlation between the two variables is 0.55, and the eigenvalue of the single principal component factor is 1.55. Each of these variables, taken separately, has various strengths and weaknesses. The ranking of county population

249,999, the measure distinguishes between Buena Park, California classified as "inner" (30.1 miles from Los Angeles) and Rialto, California classified as "outer"(68.3 miles from Los Angeles); among places 20,000 to 49,999 population, the distance measure distinguishes between Niles, Illinois (16.3 miles from Chicago) and Valparaiso, Indiana (49.6 miles from Chicago); and among places with less than 20,000 population, the distance measure distinguishes between Secaucus, New Jersey (11.4 miles from New York) and Cranbury, New Jersey (46.0 miles from New York).

Table 2 summarizes the twelve categories in the modified rural-urban continuum index. Approximately four-fifths (84.1 percent) of the retail distribution centers are located in MSA's: 61.5 percent in MSA's with 1 million or more population, 17.4 percent in MSA's with 250,000 to 1 million population, and 5.1 percent in MSA's with less than 250,000 population. Less than 10 percent of the retail distribution centers are located in the most rural category.

A striking feature of the modified rural-urban continuum index is the variation in county population densities. The median county population density varies from 1,980 persons per square mile in the largest urban locations to 55 persons per square mile in the smallest rural locations. Within MSA's with 1 million or more population, outer locations consistently have smaller median population densities than inner locations. The difference between inner and outer locations is 1,498 persons per square mile for places with 50,000 to 249,999 population, 1,729 persons per square mile for places with 20,000 to 49,999 population, and 1,131 persons per square mile for places with less than 20,000 population. If all of the low density categories are combined, 61.2 percent of the retail distribution centers are located in counties with population densities of less than 500 persons per square mile, and 21 percent of the retail distribution centers are located in counties with population densities of less than 200 persons per square mile.

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densities is most appropriate for CSA's or MSA's with a large number of counties. The business district measure is most appropriate for CSA's or MSA's centered on a single "hub" surrounded by smaller cities and suburbs. Taken together, however, the composite scores, sub-divided into equal-sized sub-groups within the place categories, provide a plausible measure of distribution centers likely to be located on the fringes of CSA's or MSA's.

TABLE 2
MODIFIED RURAL-URBAN CONTINUUM
FOR RETAIL DISTRIBUTION CENTERS

RURAL URBAN LOCATION	DIST. CENTERS		PLACE POP.	COUNTY POP. SQ MILE	FIRST EEO-1	TOTAL EMP-LOYEES
	#	%	MEDIAN			
METCNTY 1M, PLACE 250K+	95	16.1	650,100	1,980	1996	163
METCNTY 1M, PLACE 50-249K: INNER	33	5.6	128,358	1,957	1998	136
METCNTY 1M, PLACE 50-249K: OUTER	34	5.8	106,221	459	1997	213
METCNTY 1M, PLACE 20-49K: INNER	40	6.8	29,489	1,980	1996	110
METCNTY 1M, PLACE 20-49K: OUTER	39	6.6	30,004	251	1995	216
METCNTY 1M, PLACE < 20K: INNER	60	10.2	7,787	1,404	1999	163
METCNTY 1M, PLACE < 20K: OUTER	61	10.4	8,771	273	1998	275
METCNTY 250-999K, PLACE 50K+	45	7.6	131,510	469	1994	191
METCNTY 250-999K, PLACE < 50K	58	9.8	10,897	358	1995	387
METCNTY < 250K	30	5.1	37,622	153	1997	411
NONMET, URBAN 20K+, NEAR METRO	46	7.8	17,982	111	1997	445
NONMET OTHER	48	8.1	8,525	55	1998	459
	589	100				

AGE OF RETAIL DISTRIBUTION CENTERS

The literature, summarized in the earlier Background section, suggests that facilities built in secondary markets are more likely to be newer, larger and more technologically sophisticated. We measured a retail distribution center's age by the year of the facility's first EEO-1 report.[13]   The first reported year in our sample varies from before 1978 to 2002.

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[13]   Strictly speaking, the first EEO-1 submission represents the first year the facility met the size and eligibility requirements for the EEO-1 survey. Facilities that changed counties in the period 1990-2002 were assigned the location of the most recent address.   It should be noted that the 2002 EEO-1 Survey represents either new firms or continuing firms. It does not include former firms with no EEO-1 reports in 2002.

Most of these retail distribution centers are relatively new. Thirty two percent of the distribution centers first filed an EEO-1 report in 2000 or later. Only 14.8 percent of the establishments first reported in 1985 or earlier. The corresponding percentages for all establishments in the 2002 EEO-1 statistical file are 22.5 and 22.2 percent respectively.

Table 2 reports the median of first reported year by the modified rural-urban continuum index. There does not seem to be a strong relationship between the distribution center's age and geographic location. Distribution centers in the most rural category have more recent median start years than distribution centers in the most urban category (1998 versus 1996 respectively). However, within MSA's with 1 million or more population, the "inner" urban areas have more recent median start years than the "outer" urban areas, and all of the "inner" areas have more recent median start years than the place sub-categories in MSA's with 250,000 to 999,999 population.

SIZE OF RETAIL DISTRIBUTION CENTERS

We do not have systematic information on plant size in square footage or the dollar value of capital investments. The EEO-1 report, however, does provide information on the total number of employees. Most of the retail distribution centers in our sample are moderately large. The total number of employers per distribution center in our sample varies from 50 persons to 1,354 persons. (Keep in mind that centers with less than 50 employees are not required to file individual EEO-1 reports.) The median firm size is 212 employees with an upper quartile of 507 or more employees and a lower quartile of 98 or fewer employees.[14] By contrast, the median firm size, for all establishments in the EEO-1 Survey, is 111 employees with an upper quartile of 201 or more employees and a lower quartile of 70 or fewer employees.

Table 2 reports the median number of total employees by the modified rural-urban continuum index. Distribution centers in the most rural category are about three times larger than distribution centers in the most urban category (a median number of employees of 459 versus 163 respectively). Within MSA's with 1 million or more population, the "outer" locations all have larger median workforces than the "inner" locations, often by substantial margins. The difference between outer and inner locations with respect to median total

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[14] It should be noted that the size of the workforce may not be directly related to square footage or capital investments. Lower land costs can increase the room for more employees, but they also can allow the introduction of labor-saving equipment that reduce the number of employees.

employees can be expressed as ratio of 1.6 (213 versus 136) for places with 50,000 to 249,999 population, 2.0 (216 versus 110) for places with 20,000 to 49,999 population, and 1.7 (275 versus 163) for places with less than 20,000 population. In addition, there is a steady increase in the median number of employees in the last five categories of the modified rural-urban continuum index, from 191 employees in MSA's with 250,000 to 999,999 population to 459 employees in the unclassified non-metropolitan category. Unlike the results by age of distribution centers, there appears to be a systematic inverse relationship between establishment size and geographic location. That is, as employment at retail distribution centers increase, their location becomes less urban.

GENDER AND MINORITY COMPOSITION

Table 3 examines laborer and operative employees at retail distribution centers. Employment in these key distribution center jobs is just like total employment as it increases as locations become less urban. The total number of distribution center laborers and operatives in the most rural category (19,455 employees) is slightly larger than the total number of distributive laborers and operatives in the most urban category (17,328). Within MSA's with 1 million or more population, the "outer" locations all have a larger number of distribution center laborers and operatives than the "inner" locations. The difference between outer and inner locations with respect to the number of laborers and operatives can be expressed as ratio of 1.4 (7,436 versus 5,253) for places with 50,000 to 249,999 population, 1.6 (10,238 versus 6,335) for places with 20,000 to 49,999 population, and 1.7 (20,559 versus 11,958) for places with less than 20,000 population. In addition, within MSA's with 250,000 to 999,999 population, the number of distribution laborers and operatives in places with a population under 50,000 is more than twice the number of distribution laborers and operatives in places with a population of 50,000 or more (21,295 versus 9,076 employees respectively).

TABLE 3
MODIFIED RURAL-URBAN CONTINUUM INDEX
FOR RETAIL DISTRIBUTION CENTERS
EMPLOYMENT OF MINORITIES AND WOMEN

RURAL URBAN LOCATION	NUMBER		PERCENT LABORER/OPERATIVES				
	DIST. CEN-TERS	LABORER/ OPERA-TIVES	TOTAL	WOMEN	MINOR-ITY	BLACK	HIS-PANIC
METCNTY 1M, PLACE 250K+	95	17,328	11.1	35.6	59.8	31.5	23.5
METCNTY 1M, PLACE 50-249K: INNER	33	5,253	3.4	37.6	74.6	20.8	41.9
METCNTY 1M, PLACE 50-249K: OUTER	34	7,436	4.7	36.9	68.9	16.5	48.2
METCNTY 1M, PLACE 20-49K: INNER	40	6,335	4.0	40.4	45.1	18.2	18.6
METCNTY 1M, PLACE 20-49K: OUTER	39	10,238	6.5	36.0	52.4	17.2	27.9
METCNTY 1M, PLACE < 20K: INNER	60	11,958	7.6	44.3	47.7	22.3	20.4
METCNTY 1M, PLACE < 20K: OUTER	61	20,559	13.1	34.3	43.8	19.6	22.0
METCNTY 250-999K, PLACE 50K+	45	9,076	5.8	31.7	57.0	23.3	28.4
METCNTY 250-999K, PLACE < 50K	58	21,295	13.6	34.5	35.6	13.8	17.9
METCNTY < 250K	30	9,350	6.0	43.0	33.9	19.8	10.7
NONMET, URBAN 20K+, NEAR METRO	46	18,287	11.7	28.4	24.8	15.6	8.0
NONMET OTHER	48	19,455	12.4	23.3	20.2	12.1	6.9
	589	156,570	100				

Table 3 also reports the percentage of females and minorities among laborer and operative employees. The percentage of minorities appears to more strongly related to geographic location than the percentage of females. As a general rule, both females and minorities are more likely to be employed in more populated areas than less populated areas, but the differences between the highest and lowest percentages are much larger for minorities than females.   The percentage of female laborers and operatives is 35.6 percent in the most urban category and 23.3 percent in the most rural category, a difference of 12.3 percent. By

contrast, the percentage of minority laborers and operatives is 59.8 percent in the most urban category and 20.2 percent in the most rural category, a difference of 39.6 percent.[15]

SUMMARY

As expected, population density is positively related to the percentage of minority laborers and operatives (Spearman correlation coefficient of 0.345) and negatively related to the total number of retail distribution center employees (Spearman correlation coefficient of -0.292). The higher the population density, the smaller the workforce and the greater the percentage of minority laborers and operatives. On the the other hand, there is no relationship between population density and the percentage of female laborers and operatives (Spearman correlation coefficient of 0.0005). There is also no relationship between the age of the retail distribution center (measured as first year of EEO-1 reporting) and the percentage of minority laborers and operatives (Spearman correlation coefficient of -0.004).

[15] Notice that patterns for Black and Hispanic employees appear to be different. Within MSA's with 1 million or more population, Black laborers and operatives are slightly more likely to be found in inner areas than outer areas. Hispanic laborers and operatives are slightly more likely to be found in outer areas than inner areas.

COMPARISONS OF 1982 AND 2002 LOCATIONS

Given the relationship between the location of distribution centers and the employment of minorities in key operative and laborer jobs, this section further examines this relationship. Specifically, we determine if the change in locations of retail distribution centers from 1982 to 2002 influences the minority composition of their labor markets. We identified distribution centers in 1982 using the same process as before with the exception that we translated NAICS codes to the Standard Industrial Classification (SIC) codes used in 1982. The process yields 420 establishments.

COUNTY CHANGES

There were 306 counties with distribution centers in 2002. The mean number of distribution centers per county was 1.9, and the mean employment in distribution centers per county was 663. In 1982 there were 188 counties with distribution centers. The mean number of distribution centers per county was 2.2, and the mean employment level was 321 employees.

TABLE 4
TEN COUNTIES WITH THE LARGEST INCREASE IN
RETAIL DISTRIBUTION CENTERS

RANK	COUNTY	INCREASED UNITS	INCREASED EMPLOYMENT	PERCENT MINORITY OPERATIVES/ LABORERS
1	FRANKLIN, OH	16	5,755	27.9749
2	SAN BERNARDINO, CA	11	3,675	70.4940
3	RIVERSIDE, CA	8	2,094	72.7871
4	MIDDLESEX, NJ	8	2,479	64.4120
5	SAN JOAQUIN, CA	6	1,140	65.3296
6	YOLO, CA	5	2,503	63.1034
7	DU PAGE, IL	5	809	54.3082
8	HARFORD, MD	5	2,282	34.9419
9	RUTHERFORD, TN	5	632	30.8204
10	WINDHAM, CT	4	971	13.0236

The total sample of counties with distribution centers in either time period was 381. The mean change in the number of distribution centers per county is 0.44, and the mean change in employment per county is 373. Both changes are significantly different from no change. Table 4 lists those counties with the largest increase in the number of retail distribution centers.

TABLE 5
TEN COUNTIES WITH THE LARGEST DECREASE IN
RETAIL DISTRIBUTION CENTERS

RANK	COUNTY	INCREASED UNITS	INCREASED EMPLOYMENT	PERCENT MINORITY OPERATIVES/ LABORERS
1	COOK, IL	-13	-4,365	65.5001
2	LOS ANGELES, CA	-10	863	82.4761
3	HUDSON, NJ	-5	-140	71.1335
4	HARRIS,TX	-5	401	72.2892
5	SAN FRANCISCO, CA	-4	-980	65.4664
6	HENNEPIN, MN	-4	-333	30.1419
7	OKLAHOMA, OK	-4	-313	39.3978
8	SALT LAKE , UT	-4	-228	32.4858
9	SAN METEO, CA	-3	-315	76.0444
10	DENVER, CO	-3	-165	51.0335

Table 5 lists those counties with the largest decrease in the number of retail distribution centers. Note those counties associated with large cities. For example, Cook County (Chicago), Los Angeles County (Los Angeles) and Harris County (Houston).

The other important factor for examining changes in retail distribution center locations is employment. Table 6 lists those counties with the largest increase in distribution center employment. These counties might be associated with non urban areas or smaller cities. For example, Columbus is located in Franklin County, Ohio.

TABLE 6
TEN COUNTIES WITH THE LARGEST INCREASE IN
RETAIL DISTRIBUTION CENTER EMPLOYMENT

RANK	COUNTY	INCREASED UNITS	INCREASED EMPLOYMENT	PERCENT MINORITY OPERATIVES/ LABORERS
1	FRANKLIN, OH	16	5,755	27.9749
2	SAN BERNARDINO, CA	11	3,675	70.4940
3	YOLO, CA	5	2,503	63.1034
4	MIDDLESEX, NJ	8	2,479	64.4120
5	HARFORD, MD	5	2,282	34.9419
6	RIVERSIDE, CA	8	2,094	72.7871
7	WAUKESHA, WI	3	1,785	24.6978
8	ONEIDA, NY	2	1,708	8.0416
9	CLAY, MO	1	1,704	23.7316
10	LUZERNE, PA	4	1,609	8.3228

Table 7 is the companion table showing those counties with large decreases in employment. Counties with large cities are prevalent although perhaps not as dominant as before. For example, Cook County once again tops the list but also see San Francisco County (San Francisco), New York County (New York) and Milwaukee County (Milwaukee).

TABLE 7
TEN COUNTIES WITH THE LARGEST DECREASE IN
RETAIL DISTRIBUTION CENTER EMPLOYMENT

RANK	COUNTY	INCREASED UNITS	INCREASED EMPLOYMENT	PERCENT MINORITY OPERATIVES/ LABORERS
1	COOK , IL	-13	-4,365	65.5001
2	SAN FRANCISCO, CA	-4	-980	65.4664
3	ALLEN , IN	-1	-801	22.5759
4	NORFOLK, MA	-1	-702	28.7060
5	NEW YORK, NY	-3	-685	68.8479
6	FAIRFIELD, CT	-1	-627	55.5369
7	INGHAM, MI	-1	-613	20.7415
8	KING, WA	-2	-565	37.0434
9	MILWAUKEE, WI	-3	-551	41.9348
10	BRISTOL , MA	-2	-531	18.8348

EEO-1 BASED CALCULATIONS

We used 2002 EEO-1 data to analyze the distribution center counties in different ways. First, we examined "new entrants" by comparing counties with distribution centers in 2002 but not in 1982 ("new 2002 counties"), computing a simple percentages of minority operatives and laborers currently employed in the two groups of counties. Differences in these percentages suggests that the new 2002 counties with distribution centers have substantially different labor markets. The percentage of minority operatives/laborers in the 1982 counties was 50.4 percent, and in 2002 it was 38.8 percent. The difference in minority representation as operatives and laborers is 11.6 percent. The difference is largest for Hispanics which is 8.0 percent lower for the new 2002 counties. Asian employment is 2.5 percent lower. African American (0.9 percent) and American Indian (0.1 percent) rates are just slightly lower in the new 2002 counties.

To account for changes in the locations of distribution centers, we also weighted all counties by their proportion of distribution center employment in 1982 and in 2002.   For example, in

Maricopa County Arizona, minorities make up 54.2 percent of operatives/laborers in 2002. In 1982, the proportion of all distribution center employees located in Maricopa County was 0.004229. So the weighted percentage of minority operatives/laborers in Maricopa County is 0.229 (54.2 X 0.004229) based on distribution center employment in 1982. In contrast, in 2002, the proportion of all distribution center employees located in Maricopa County was 0.0091. The weighted percentage of minority operatives/laborers in Maricopa County is 0.493 (54.2 X 0.0091) based on distribution center employment in 2002. (For a similar application of weights, see Gastwirth and Haber 1976.) The increase from 0.229 to 0.493 reflects how the increased employment of distribution workers in Maricopa County by 2002 influences the total labor market for minority operatives/laborers. Again, only 2002 workforce data is used but it is weighted by the proportions from the relevant years. This approach controls for the dramatic changes that occurred in minority employment over the past two decades. Adding the weighted percentages across counties, the overall percentage of minority operatives and laborers, weighted by the location of employees in 1982, is 50.4 percent. The overall percentage of minority operatives and laborers, weighted by the location of employees in 2002, is 40.4 percent. EEO-1 based estimates suggest than if distribution centers maintained the same location and proportion of employees in 2002 as they had in 1982, one might expect minorities to make up 10 percent more of the relevant labor market.

CENSUS-BASED CALCULATIONS

These computations are replicated using 2000 Census data from the EEO Special File. Given the present absence of available files with EEO-1 job groups, we relied on the job group aggregation for State and Local Governments based on the EEO-4 report job categories (EEO Special File, Table 5). The occupational titles likely to dominate the work force in distribution centers are all located in the job group "Service/Maintenance." [16] This is roughly equivalent to combining operatives and laborers but adding service workers. The percent of minorities in this job group is computed for each county. (In this instance it represents all relevant employees except those classified as White, non Hispanic.) Once this figure is derived, the weights described above are applied for each county and then the results are added to provide a summary measure. For example in Maricopa County Arizona, minorities make up 46.9 of the Census job category service/maintenance worker in 2000.

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[16] Identified job titles are "Laborers and Freight, Stock and Material Movers, Hand (962)", "Packers and Packagers, Hand (964)", and "Miscellaneous Material Moving Workers, Including Conveyor Operators and Tenders; Shuttle Car Operators; and Tank Car, Truck and Ship Loaders (975)." Data by job title is not available for all counties.

Recall that in 1982, the proportion of all distribution center employees located in Maricopa County was 0.004229. So the weighted percentage of minority service/maintenance workers in Maricopa County is 0.198 (46.9 X 0.004229) based on distribution center employment in 1982. In contrast, the proportion of all distribution center employees were located in Maricopa County in 2002, was 0.0091. The weighted percentage of minority operatives/laborers in Maricopa County is 0.427 (46.9 X 0.0091) based on distribution center employment in 2002. Adding the weighted percentages across counties, the overall percentage of minority service/maintenance workers, weighted by the location of employees in 1982, is 48.6 percent. The overall percentage of minority service/maintenance workers, weighted by the location of employees in 2002, is 34.5 percent. The census-based estimates suggest than if distribution centers maintained the same location and proportion of employees in 2002 as they had in 1982, one might expect minorities to make up 14 percent more of the relevant labor market.
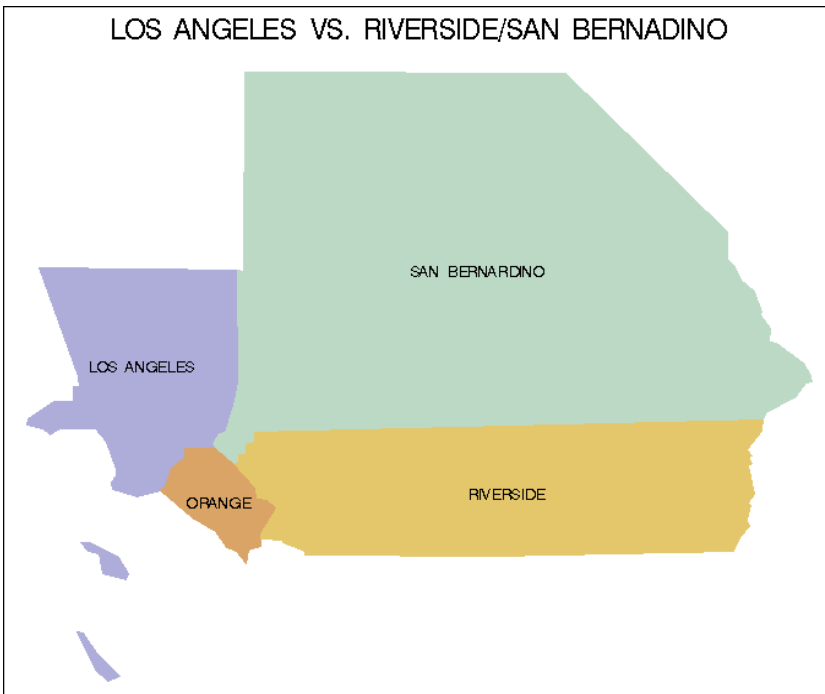

SPECIFIC AREAS

The shift in the location of distribution centers (warehouses) from 1982 to 2002 may be more complex than summary statistics suggest. It is useful to examine a few of the shifts in greater detail in order to get a better sense of the regional dynamics.

LOS ANGELES, CALIFORNIA VS. RIVERSIDE/SAN BERNADINO, CALIFORNIA

When counties are ranked in terms of the largest gains in the number of distribution centers from 1982 to 2002, San Bernadino and Riverside are ranked second and third highest. At the same time, Los Angeles County is ranked second to last. The small increase in Los Angeles distribution center employment (863 employees) pales in comparison to the gains made by Riverside (2,094) and San Bernadino (3,675). "A noteworthy trend in Southern California's warehousing industry is the shifting of firm location eastward into San Bernadino and Riverside County" (Kirshner, 2002:12). Although, very close in proximity, Los Angeles County and San Bernadino and Riverside Counties are in separate Metropolitan Statistical Areas. Hispanic employment as operatives and laborers is similar among the three counties, Los Angeles (65 percent), Riverside (61.6 percent) and San Bernadino (57.4 percent). However, the percentage of African Americans (10.1 percent) and Asians (6.9 percent) in Los Angeles County is higher than in Riverside where African Americans make up 6.2 percent and Asians make up 4.3 percent of


LOS ANGELES VS. RIVERSIDE/SAN BERNADINO

operatives/laborers and higher than in San Bernadino where African Americans are 9.2 percent and Asian are 3.5 percent. While Hispanics dominate all three labor markets, the rise in distribution center employment in the two outlying counties could have a negative influence on African Americans and Asians.

FRANKLIN, OHIO VS. COOK, ILLINOIS

Franklin County, Ohio, where Columbus is located, is the county with the largest increase (5,755 employees) in distribution center employment between 1982 and 2002. Cook County, Illinois, where Chicago is located, has the largest decrease (4,365). While these two counties do not share the geographic proximity of Los Angeles, Riverside and San Bernadino, the contrasts are interesting. If a retailer decides to locate a distribution center in Franklin rather than Cook County, the proportion of Hispanic operatives/laborers is likely to be affected. While the percentage of these workers is 35.7 percent in Cook County, it is just 2.8 percent in Franklin County. The proportion of African Americans (25.2 percent versus 22.1 percent) and Asian (4.4 percent versus 2.6 percent) is also lower in Franklin County.

WAUKESHA COUNTY VS. MILWAUKEE COUNTY, WISCONSIN

Two counties that are close geographically are Waukesha and Milwaukee in Wisconsin. Waukesha is basically a suburb of Milwaukee and they are in the same Metropolitan Statistical Area. Milwaukee County ranked ninth among counties losing distribution center
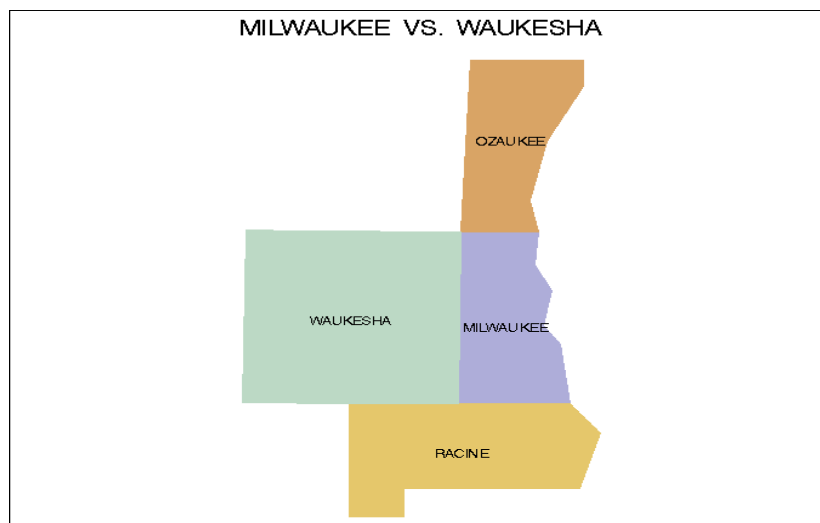
employment (-551) while Waukesha ranked seventh among counties with increased distribution center employment (1785). The difference may reflect a preference for a suburban location for retail distribution centers. Despite their proximity, the labor markets are quite different. Minorities make up 41.9 percent of operatives/laborers in Milwaukee County but just

24.7 percent in Waukesha County. This difference is comprised largely of African Americans who make up 23.3 percent of operatives/laborers in Milwaukee County but just 9.7 percent in Waukesha County.

SAN FRANCISCO, CALIFORNIA VS. YOLO, CALIFORNIA

San Francisco and Yolo counties are relatively close in northern California. Yolo is part of the Great Central valley, specifically the Sacramento valley, and San Francisco is located on the Pacific ocean. It seems likely that the eastward movement of distribution centers from a Pacific port city to a nearby valley location in Los Angeles observed by Kirshner (2002) also occurs in San Francisco. While San Francisco County was ranked second among counties losing distribution center employment between 1982 and 2002, with a loss of 980, Yolo county gained 2,503 such employees and is ranked third behind Franklin and San Bernadino among counties with the largest gain of these employees. San Francisco and Yolo counties are similar in the employment of total minority operatives/laborers. The percent of minorities in these jobs is 36.9 percent in Yolo County and 34.5 percent in San Francisco County. However, in Yolo County, African Americans make up just 4.9 percent of these workers, while they comprise 14.2 percent of these workers in San Francisco County. Similarly, Asians are 13.5 percent of operatives/laborers in Yolo County but 21.7 percent in San Francisco County. In contrast, Hispanic operatives/laborers are much better represented in Yolo County (42.8 percent) in comparison to San Francisco County (28.5 percent).

PROGRAM IMPLICATIONS

Retail distribution centers appear to be a growing segment of the retail industry with more than 200,000 jobs at the 589 retail distribution centers identified for these analyses. They have roughly the same level of EEO-1 employment reported for the railroad industry.[17] Additionally, these low-wage jobs may be more valuable than other lower skilled jobs, particularly within the retail industry. Waxman and Lambert's study of the Chicago area (2002) indicates that starting retail jobs typically pay more than the federal minimum wage and that entry-level employees in distribution centers are among the highest paid in this industry. They report that these jobs pay about $2.00 an hour more than beginning sales jobs and $3.00 an hour more than starting cashiers (Waxman and Lambert: 11.) This is roughly equivalent to Bureau of Labor Statistics (BLS) figures. For example BLS reports that in the Warehousing and Storage industry Laborers and Freight, Stock and Material Movers had median hourly earnings of $10.87 and Packers, and Packagers earned $9.47. In contrast, cashiers in General Merchandise Stores (other than Department Stores) have a median hourly pay rate of $7.27 and sales workers earn a median of $7.84 per hour. Further, Waxman and Lambert suggest that jobs in distribution centers tend to be full-time (Waxman and Lambert: 12) while hours worked in the retail industry overall are declining. Harold Forman of the United Food and Commercial Workers International Union notes that a major issue for retail workers is declining work hours at the same time that stores are open longer. BLS statistics for retail trade, excluding eating and drinking places, show that the average hours worked was 37.4 hours per week in 1964 but was just 31.0 hours per week in 2002. Thus, reductions in retail distribution center labor market opportunities for minorities can result in important job losses and reduced economic well-being. Of course, these distribution centers are also important to the communities where they are located. Often they become one of the largest employers in the area. They may also introduce new technologies and skills that enhance the local labor market.

While business decisions about the location of distribution centers can have a serious influence on the labor market that will be used and thus the employment of minorities, there is no clear indication that the selected locations are based on discriminatory motives. Trade journals suggest that the motivating force in deciding on the location for these centers is the availability of large parcels of inexpensive land and geographic proximity to major transportation routes. (Certainly, the ability of local governments to provide incentives such as tax relief and infrastructure improvements are important but related factors.) However,

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[17] Table 1. *Job Patterns for Minorities and Women in Private Industry, 2001*. p. 21.

when decisions are made solely on those criteria, important workforce characteristics may not be adequately addressed. In fact, a recent trade publication warns companies, "The reasons behind a move should go beyond the factors of land cost, the length of a lease or a comparison of local taxes" (Hess: 3). The direct involvement of human resource experts in deciding on the location of these centers would assist retailers develop and maintain the advantages of a diverse work force. In fact, Hess recommends that companies utilize a relocation task force that includes human resources staff.

A key role for the EEOC is the education of retailers concerning the potential impact that distribution center location can have on their ability to develop and maintain a multi-cultural workforce. It would be advantageous to provide information and suggest solutions that will equip retailers to better understand how location decisions can influence their workforce. The focus, of course, needs to be at the corporate level because location decisions are most likely to be made there.

It would also appear that a useful mechanism here would be the communication of "Best Practices." For example, areas with what were previously locations for manufacturing firms may be converting to locations for distribution centers. Rockford, Illinois is one example (Andrews, 2004).

> Rockford has become a case study of how an industrial area can respond to a shifting economic landscape. This city has long been synonymous with manufacturing . . . Confronted with the choice between adopting or dying off, Rockford has tried to reinvent itself. "We are in a global economy, and we are in the throes of a major transformation." . . . That transformation mirrors a strategic shift in the Rock River valley area. Manufacturing is either stagnant or in decline, but transportation and logistics are booming (p. BU-7).

As the President of Rockford Powertrain explains, "We want to stay in Rockford . . . We just don't want to manufacture here" (p. BU-7). It is possible then that retailers may be able to take advantage of an existing skilled and presumably more diverse workforce by locating distribution centers in declining manufacturing areas rather than turn to more rural areas. Corporate experiences with the issue of distribution center location warrant collection and dissemination of "Best Practices" to retail colleagues, and the EEOC can facilitate this process.

Another role here is enforcement. District Offices need to be cognizant of retail distribution centers in their jurisdictions. The location of distribution centers away from central cities where the EEOC has offices presents two obstacles to effective monitoring of compliance.

First, more rural locations make filing charges more difficult for employees. Outreach and education activities in these communities appear to be appropriate. Second, EEOC officials are likely to be less aware of these facilities and potential equal employment opportunity problems because our staff might not be exposed to these employers during the normal course of business or through the local media. This suggests that field staff with large distribution centers in their jurisdictions might benefit from more actively monitoring of their EEO-1 reports to make certain that hiring practices reflect local labor market characteristics. In fact, these employers are sometimes located in isolated "industrial parks" with other employers or are otherwise isolated. McGranahan and Gale's (2003) description of manufacturing in rural areas might apply as well to retail distribution centers.

> Manufacturing is a relatively invisible rural economic sector. Driving through a rural county, agriculture often occupies much of the open country, while stores occupy the town main streets and malls. But manufacturing, often secluded on two back streets or outskirts, was directly responsible for over 1 in every 4 dollars earned in the rural private sector in 1997. Manufacturing is an essential rural industry sector, particularly in low-education counties (p. 1).

These pockets of commerce may need attention, including training and technical assistance efforts, to assure that they are aware of and complying with their equal employment requirements.

CONCLUSION

This paper examines the rural-urban distribution of retail distribution centers in 2002 and finds that retail distribution centers in 2002 are more likely to have minority workers in well-populated areas than less populated areas. This paper also examines changes in the geographic location of retail distribution centers from 1982 to 2002 and finds that the minority composition of local labor markets would have increased if the facilities had been located in the same counties in 2002 as in 1982. Readers are cautioned that the analyses focus on the demographic consequences of location or relocation decisions and not questions of intentional discrimination or disparate recruitment. Future research on retail distribution centers would benefit from (1) a more precise definition of fringe MSA or CSA locations based on GIS mapping software (2) plant data regarding capital investments, material-handling equipment, employee wages and skills especially among entry level workers; and (3) observation studies of actual work patterns and (4) the employment of minorities and women as officials and managers at these centers.

ADDITIONAL INFORMATION

For additional information, visit our web site at *http://www.eeoc.gov*. Click on *STATISTICS* and *JOB PATTERNS FOR MINORITIES AND WOMEN* (*http://www.eeoc.gov/stats/jobpat/jobpat.html*) for sample copies of the EEO-1 form, an instruction booklet and aggregate statistics.

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