

Logistics Trends and Specific Industries that Will Drive Warehouse and Distribution Growth and Demand for Space

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About This Report

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Executive Summary

This report identifies the logistics trends and specific industries that will drive warehouse and distribution growth and demand for space in the coming decade. The report defines the logistics sector as the economic activities in both distribution and warehouse establishments. It identifies the characteristics regarding the inventory of warehouses and distribution centers and the square feet by employee that characterize each building type. The report also describes commodity shipments originating within the United States to determine the general trends and type of goods that will drive demand for warehouse and distribution buildings. Finally, the report identifies employment projections to determine the industries that are expected to grow and inform warehouse and distribution demand considerations and provides an assessment of the potential need for new logistics real estate space during the next decade.

For the last three decades, structural changes in the U.S. economy have heightened the importance of goods distribution as an economic engine, rather than simply as a cost of production. One is the sheer increase in the volume and value of trade. For example, the value of U.S. imports and exports has more than doubled since 1989 in real terms, and is now more than \$3 trillion. This does not include the even larger domestic market for goods traded between metropolitan regions.

Reductions in transportation costs have enhanced productivity, opened new markets and altered trading patterns. Along with intensified international competition, this has led to “just in time” logistics planning that seeks to minimize inventories and storage time; has created incentives for more horizontal integration of supply and distribution networks; and has spurred development of new distribution “hubs.” The distinction between production and distribution has become increasingly blurred, with value-added services such as parts production, assembly or customer service, integrated at distribution locations. This has provided an opportunity for some regions to capitalize on new job and business opportunities, while other regions that were tied to more traditional supply chains have suffered.

The decline in manufacturing jobs has raised the profile of the goods distribution industry as a resource of well-paying industrial jobs that do not require postsecondary degrees. There are a few other sectors that offer the potential for job growth for those who have traditionally been employed in manufacturing. Manual occupations such as trucking, dock work and freight handling can often (but not always) pay relatively high wages and unionized benefits. White-collar occupations such as logistics and sales management and freight forwarding also offer career opportunities that do not usually require a four-year degree.

The specific questions that were investigated through this research were:

(1) What is the real estate inventory and employment related to the logistics buildings?

- (2) What is the average square feet by employee for logistics buildings?
- (3) What are variations by region, building size, year built and building types of the logistics inventory, employment and square feet per employee?
- (4) What are the general trends of commodities shipment and what are the largest increases in terms of monetary value and tonnage that can impact logistics real estate?
- (5) What is the projected growth in employment for the logistics industries that could drive demand for warehouse and distribution logistic real estate?
- (6) Based on employment projections and inventory trends, what could be the expected new logistics square feet needed to accommodate this growth?

The inventory, employment and square feet per employee were identified through the Energy Information Administration Commercial Buildings Energy Consumption Survey for 1992, 1995, 1999 and 2003, the most recent year available. The commodities shipment trends were investigated based on the Transportation Commodity Flow Survey for 1997 and 2007 released by the Bureau of Transportation Statistics and the U.S. Department of Commerce. The employment projections are based on the Bureau of Labor Statistics Employment Projection Program for 2008-2018¹.

The methods used for analysis consisted of acquiring and analyzing the databases identified above and summarizing them by the specific questions identified for this research project. The limitations of this research result from limited data availability for recent time periods and for more specific building types and characteristics. *The uncertainty of employment projections, especially from the 2008 base year at the start of the recession, is also an important caveat.*

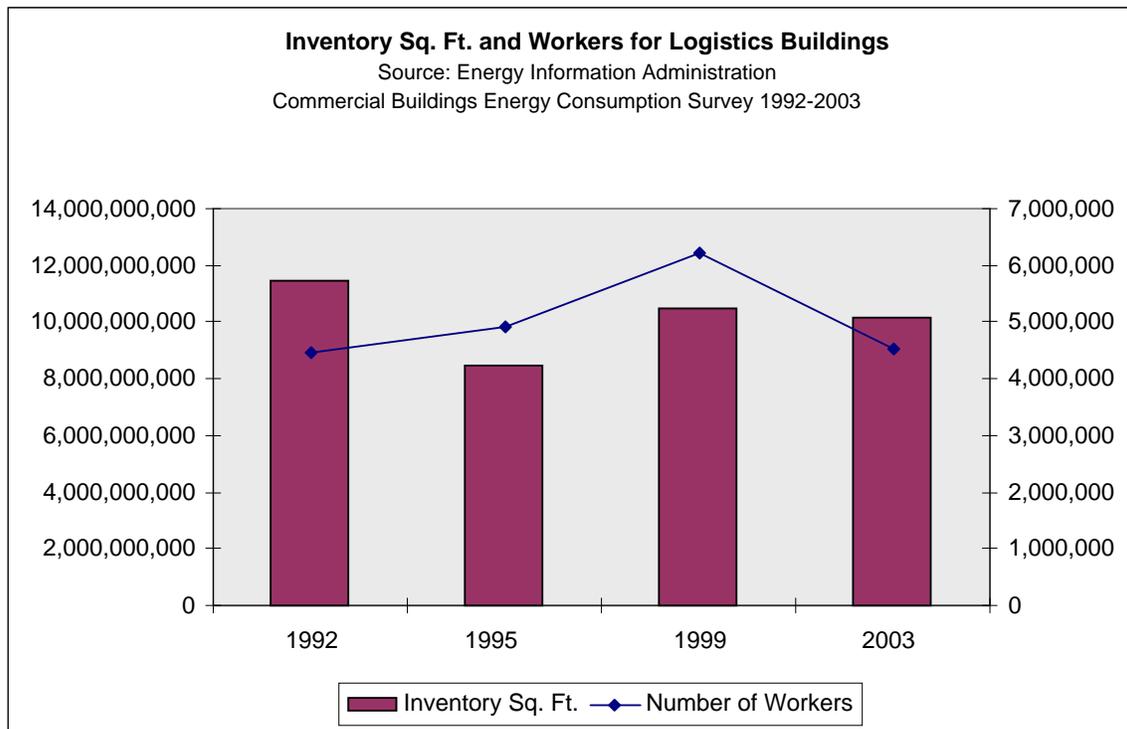
The research provides one perspective of the structural changes of the logistics industry. It is hoped that the study results will provide an objective assessment of the potential drivers for the demand of space and growth of the industry.

Warehouse and Distribution Growth and Demand for Space

As shown in Exhibit 1 below the real estate inventory for logistics buildings (including refrigerated warehouses, non-refrigerated warehouses, distribution or shipping centers, self-storage and flex buildings of 50 percent or more warehouse and storage activities) ranged from 11.4 billion to 10.1 billion square feet for the four available years of survey information between 1992 and 2003. Employment related to this inventory has ranged from 4.5 million to 6.2 million employees for the same years. The ratio of inventory to associated employment averaged 2,059 square feet per employee with no clear trend in direction, and was 2,241 square feet per employee in 2003, the most recent year.

¹ The data used predates the 2007 recession but is the most currently available as of March 2010.

Exhibit 1



This relation and its implications have also been broken down by various characteristics of the real estate inventory, including variations by region, building size, year built and building types. Of special importance is that during the 1990s, the construction of logistics buildings increased significantly, and the result of both growing demand and replacement of older buildings with modern warehouse and distribution facilities in new locations.

Data for commodity flows are available for different years than space inventory, so it cannot be aligned precisely with space data. However, shipped commodities in the United States grew by 30 percent in value and 13 percent for tonnage between 1997 and 2007. Commodity growth shows that there is a continued need for accommodating these increases, especially for lighter and more valuable commodities such as electronics or pharmaceutical goods.

The employment projections for the logistics industries suggest that the specific subsectors that compose the logistics economic activity will increase by 339,000 workers during the 2008-2018 period, a growth of 0.1 percent. The component subsectors of logistics are identified in Exhibit 2 as durable and non-durable goods merchant wholesalers, wholesale electronic markets, agents and brokers plus warehousing and storage. While this does not include employees of manufacturing or retail firms that are engaged in logistics functions, it does indicate the general trend for distribution activities.

Exhibit 2

Logistics Industries Employment 2008, 2018 and Change

Source: Bureau of Labor Statistics

Employment Projections Program 2008-2018 (In Thousands)

Subsectors	2008	2018	Change
Merchant wholesalers, durable goods	3,060.70	3,029.20	-31.5
Merchant wholesalers, nondurable goods	2,053.10	2,114.70	61.6
Wholesale electronic markets, agents and brokers	850.10	1,075.90	225.8
Warehousing and storage	672.80	755.70	82.9
Total	6,636.70	6,975.50	338.8

This trend suggests that most of the growth in employment will come from electronic markets and agents and brokers, which tend to handle higher value goods and is consistent with the commodity trends referred to above.

Both commodity shipment trends and employment projections indicate that space demand is likely to grow during the coming decade. Forecasts for employment in the logistics sector indicate a need for about 700 million square feet of warehouse and distribution space during the next decade on top of new construction for normal replacement, which averaged 300 million square feet per year from 1990-2003. If that trend continues, then a total of approximately 3.5 – 4 billion square feet of new construction will be needed during the next decade.

Introduction

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Logistics Buildings Inventory Trends

Based on the Commercial Buildings Energy Consumption Survey (CBECS) at the Energy Information Administration (EIA), this chapter identifies the inventory, employment and square feet by employee for logistics buildings and their characteristics across a set of variables (region, building size, year built and building types). Logistics buildings are buildings used to store goods, manufactured products, merchandise, raw materials or personal belongings (such as self-storage) and identified by the EIA as “Warehouse and Storage” buildings. Logistics buildings sub categories are: refrigerated warehouse; non-refrigerated warehouse; distribution or shipping center; self-storage; and flex buildings (with 50 percent or more warehouse and storage activities)².

Other buildings in this survey are identified by their principal activity as follows:

- Education;
- Food sales;
- Food service;
- Health care;
- Lodging;
- Retail other than Mall;
- Enclosed and Strip Malls;
- Office;
- Public assembly;
- Public order and safety;
- Religious worship;
- Service;
- Other;
- Vacant

This data can be used to calculate the average square feet per worker for the logistics industries and variations of these ratios by geographic region, buildings size, year built and building types. This knowledge can help planning, development and management of these buildings; identify the trends that characterize the different use of space in logistics buildings; and project the growth and demand for warehouses and distribution centers in the coming decade.

As shown in Table 1 and Figure 1, the inventory and number of workers for logistics buildings varied throughout the 1990s and averaged 10.1 billion square feet of inventory and 5 million workers. Figure 1 and Figure 2 show that inventory and employment did not always rise and fall in tandem. The biggest difference was between 1992 and 1995 when inventory declined by 3 billion square feet, even though employment increased. Between 1995 and 1999, inventory and employment increased at almost identical rates, while from 1999 to 2003 employment declined considerably faster than inventory.

² About 12% of the inventory described below is part of buildings used for self-storage. The data prior to 2003 is not available for breakdown by building sub-categories and this report includes self-storage buildings in its inventory figures.

Potential explanations include a lag between changes in employment and inventory; changes in the intensity of building use; an acceleration in the replacement of old inventory in response to the evolving needs of the logistics industry; and unexplained survey variation. All of these are likely to be partly responsible, although data on construction trends described later in this section suggest that changes in the type and location of space needs is the biggest factor.

Table 1
Inventory Sq. Ft. and Workers for Logistics Buildings
 Source: Energy Information Administration
 Commercial Buildings Energy Consumption Survey 2003

Year	Inventory Sq. Ft. (in billions)	Number of Workers (in millions)
1992	11.48	4.45
1995	8.48	4.90
1999	10.47	6.22
2003	10.16	4.53

Figure 1

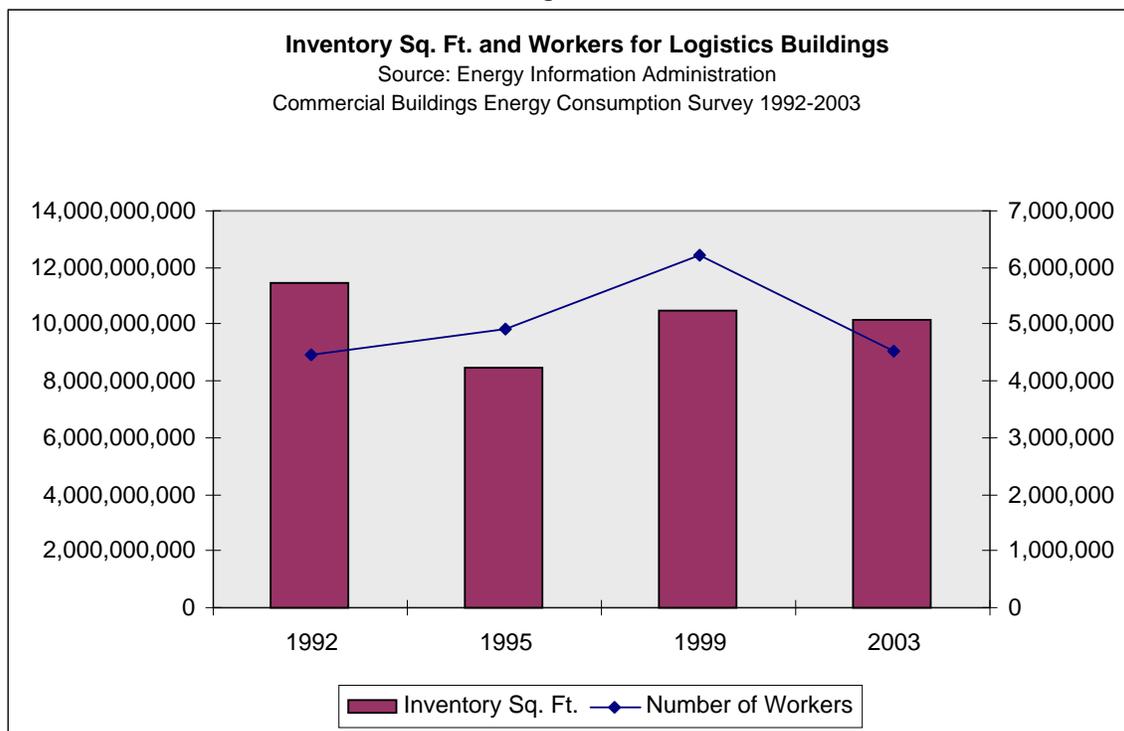
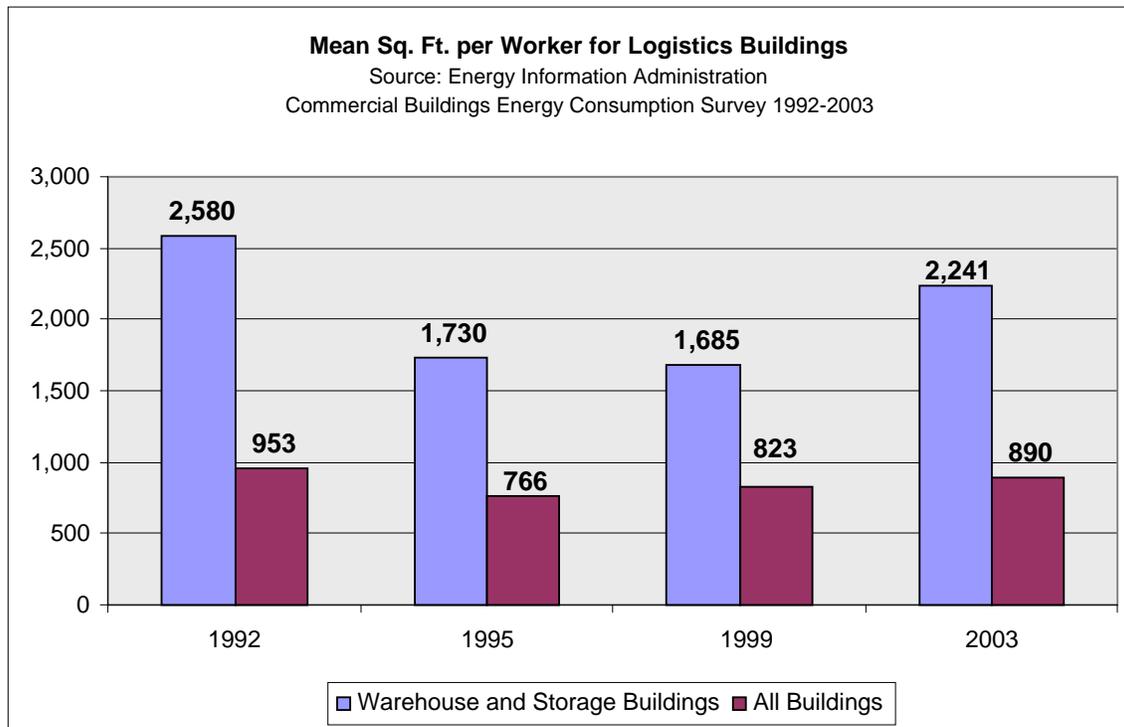


Figure 2



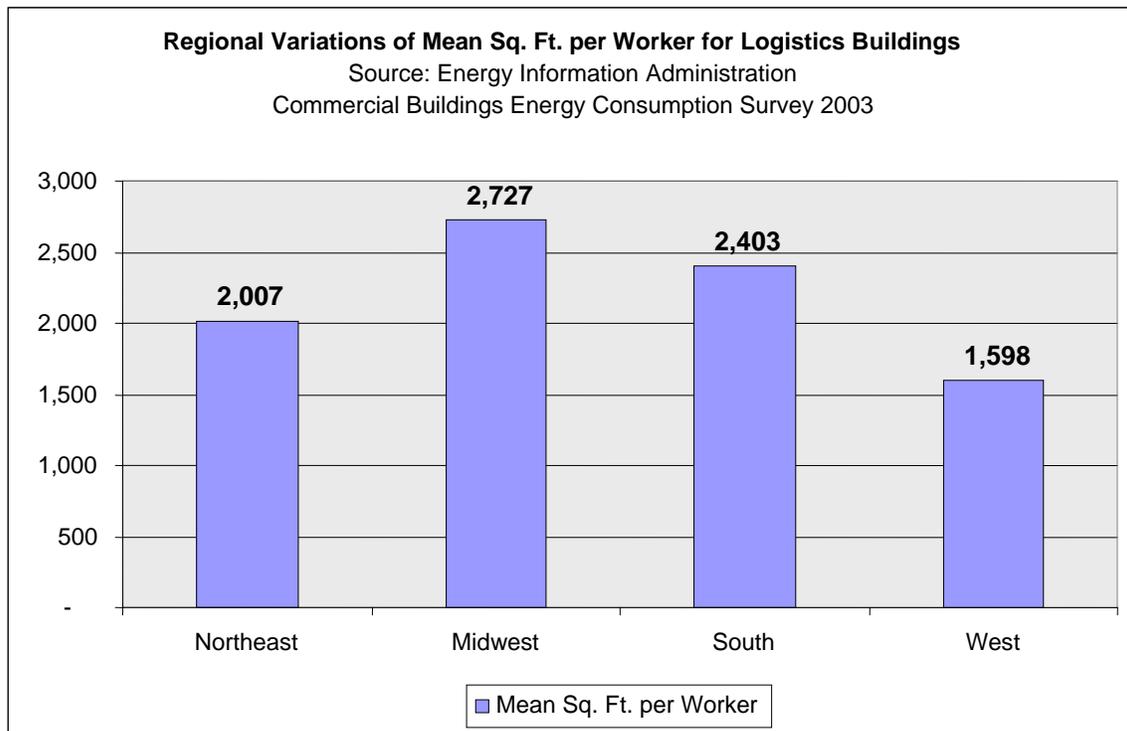
In Figure 2, the ratio of space per worker that is derived from these trends indicates a sharp drop from 2,600 to 1,700 square feet per worker from 1992-1995, followed by stability between 1995-1999 and an increase to 2,200 square feet per worker in 2003. The average for the four years is just more than 2,000 square feet per worker. Given the variation, and the lack of data post 2003, the most reasonable assumption for projecting space needs is to use the average of 2,000 for the four years, with the understanding that the reality could cover a wide range. In the following pages we will document the variations for this ratio across different characteristics to understand more detailed trends and characteristics of the logistics inventory.

As shown in Table 2 and Figure 3 logistics buildings in the Midwest and South have larger inventories, employee numbers and square feet per worker ratios (2,500-2,700) than buildings in the Northeast and West (1,500-2,000).

Table 2
Regional Inventory and Employment for Logistics Buildings
 Source: Energy Information Administration
 Commercial Buildings Energy Consumption Survey 2003

Region	Inventory Sq. Ft.	Number of Workers
Northeast	1,526,697,098	760,787
Midwest	3,036,377,285	1,113,463
South	4,026,576,613	1,675,921
West	1,571,694,268	983,646

Figure 3



It is also important to note that 70 percent of the stock of logistics buildings is located in the Midwest and South, according to the CBECS survey records. Proportionally the employment in these regions account for about 62 percent of the total employment in the logistics or warehouse and storage building types.

Looking at variations by building size, Table 3 and Figure 4 below show that about 50 percent of the building stock and 56 percent of the employment is located in buildings less than 50,000 square feet. As expected, the intensity of building use declines as buildings get larger. **Logistics buildings of less than 50,000 square feet have about 1,900 square feet by employee while buildings more than 50,000 square feet have about 2,900 square feet per worker.**

Table 3

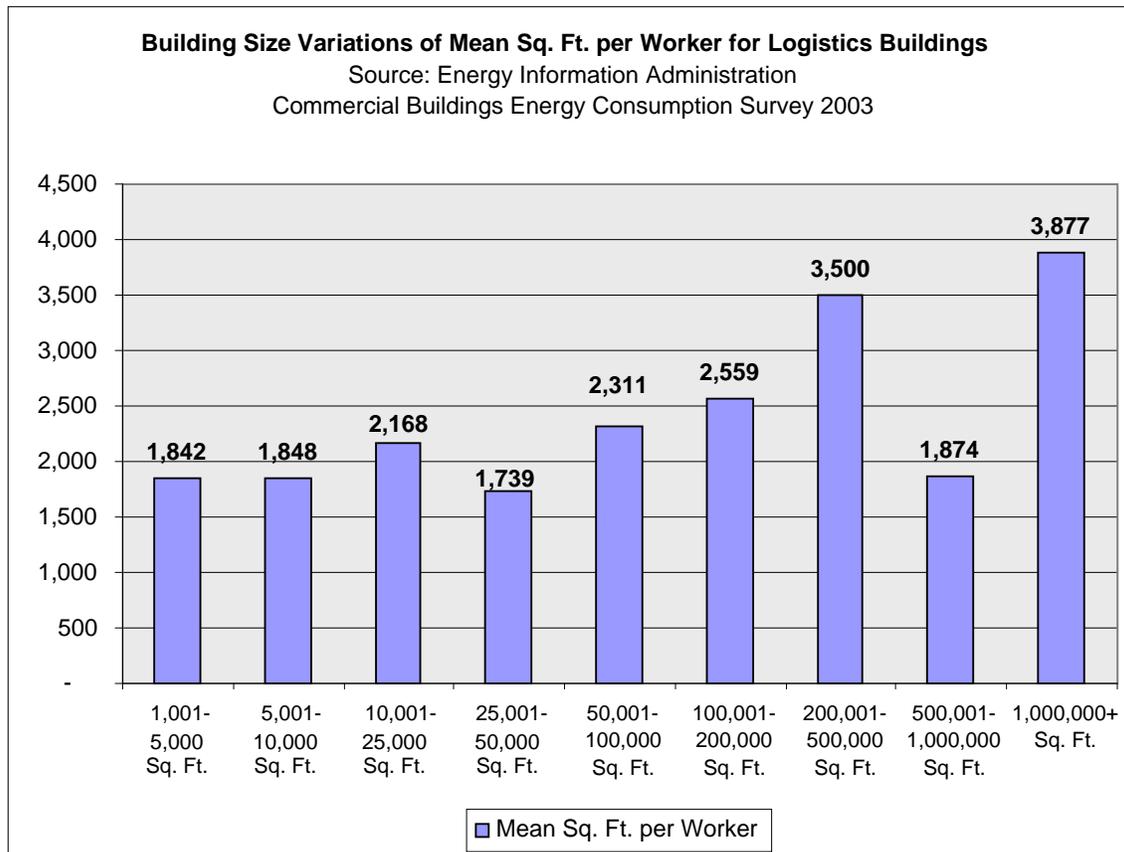
Building Size Inventory and Employment for Logistics Buildings

Source: Energy Information Administration

Commercial Buildings Energy Consumption Survey 2003

Building Size in Sq. Ft.	Inventory Sq. Ft.	Number of Workers
1,001-5,000	905,026,182	491,362
5,001-10,000	912,066,162	493,605
10,001-25,000	2,083,508,178	961,104
25,001-50,000	1,047,677,440	602,526
50,001-100,000	1,493,829,770	646,284
100,001-200,000	1,161,697,100	454,007
200,001-500,000	1,322,093,362	377,733
500,001-1,000,000	683,723,070	364,879
1,000,000+	551,724,000	142,317

Figure 4



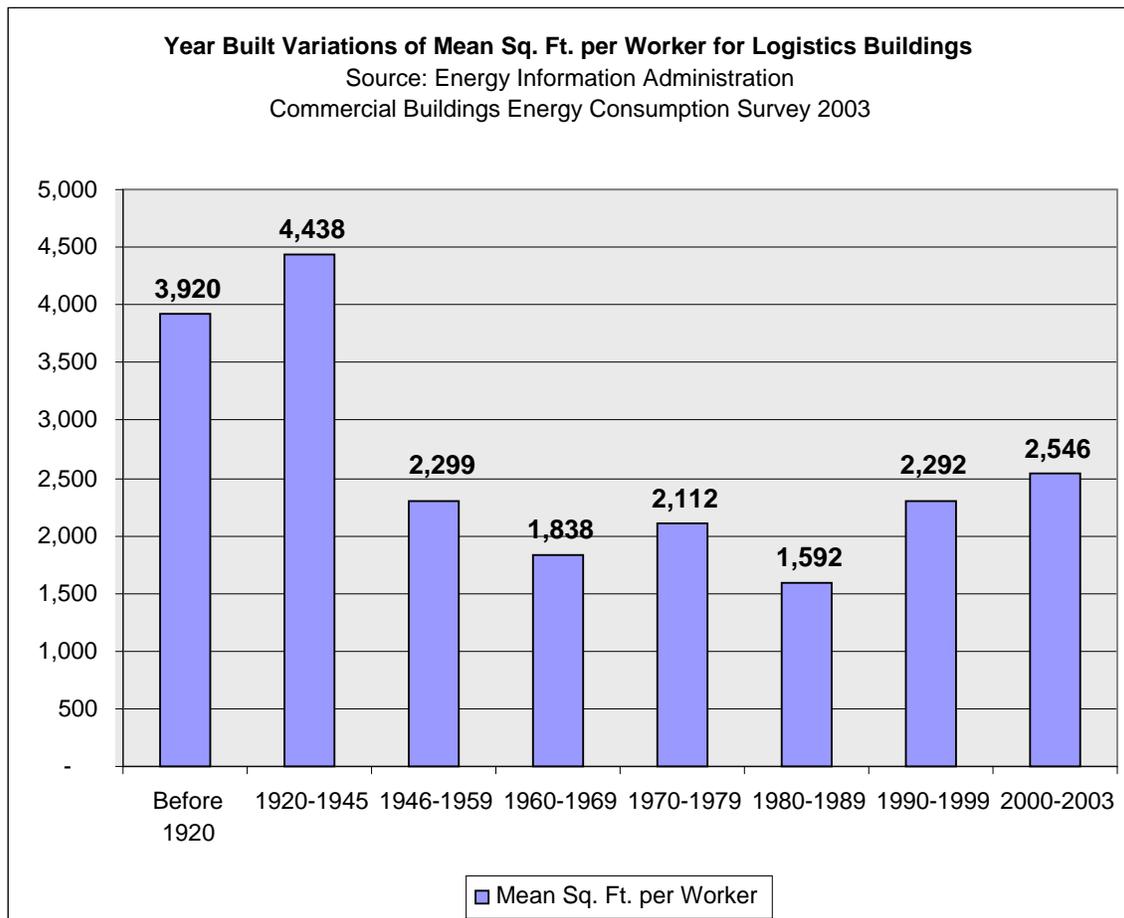
When looking at the age of the building stock, Table 4 and Figure 5 below indicate that about 45 percent of the stock and 41 percent of the employment base is located in buildings built before 1980. Of particular importance is that about 40 percent of the building stock, or 4 billion square feet, was built in the 13 years between 1990 and 2003. This points to a rapid replacement of older stock by new construction in this period, presumably because the technology, space

utilization and location requirements of the industry were undergoing a transformation as the result of changing patterns of global trade and “just in time” inventory practices. Also of note is that buildings built before 1945 have larger square feet per employee ratios while recent ones have 1,600 to 2,600 square feet to employee ratios.

Table 4
Year Built Inventory and Employment for Logistics Buildings
 Source: Energy Information Administration
 Commercial Buildings Energy Consumption Survey 2003

Year Built	Inventory Sq. Ft.	Number of Workers
Before 1920	254,155,521	64,844
1920-1945	1,216,230,928	274,053
1946-1959	581,708,982	253,037
1960-1969	1,051,259,709	572,031
1970-1979	1,468,347,172	695,350
1980-1989	1,528,514,991	960,093
1990-1999	2,734,375,984	1,193,251
2000-2003	1,326,751,978	521,158

Figure 5

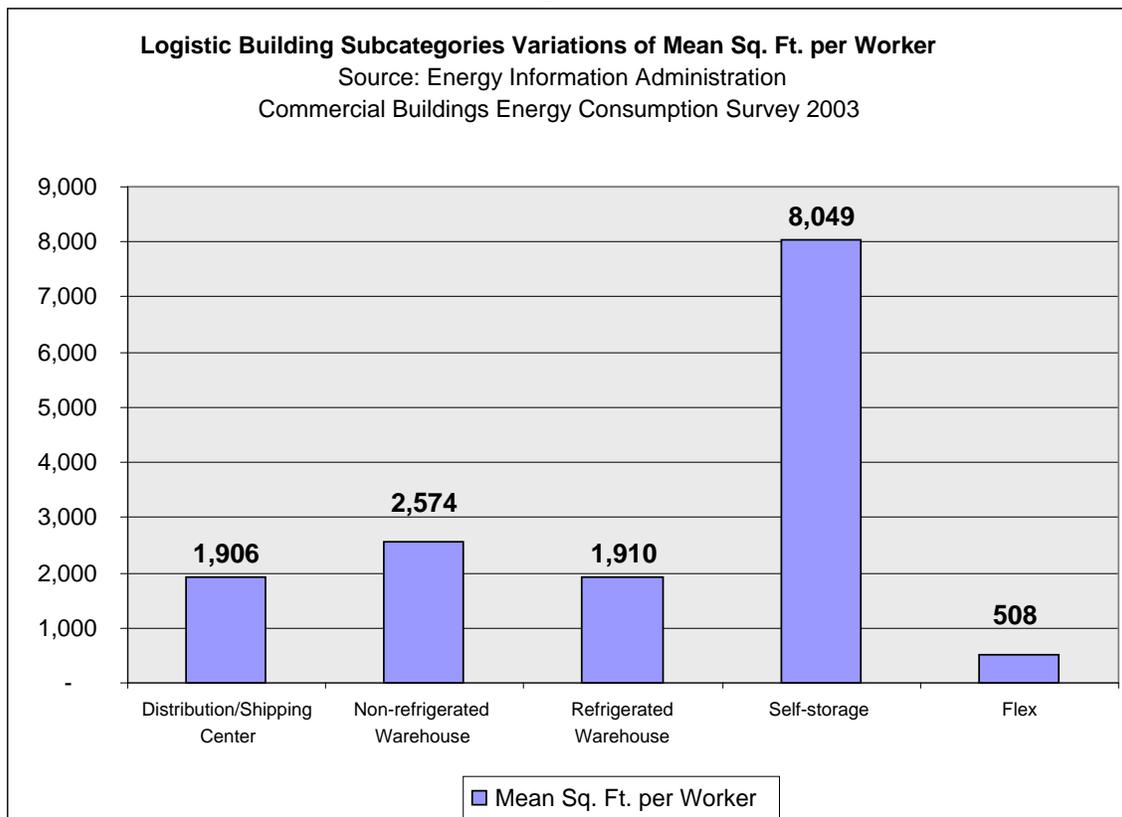


Finally, the types or subcategories for logistics buildings (Table 5 and Figure 6) show that about 52 percent of the inventory and 61 percent of the employment base is located in Distribution/Shipping Center buildings and have square feet by employee ratios (1,900). About 30 percent of the inventory and 26 percent of the employment is located in non-refrigerated warehouses that have a 2,500 square feet per employee ratio. Self-storage accounts for 12 percent of the inventory and 3 percent of the jobs and use about 8,000 square feet by employee. Finally, flex buildings are 1 percent of the inventory and 4 percent of the jobs with a low square feet by employee ratio of about 500, reflecting other more intensive uses of space combined with warehouse and storage such as office, based on the CBECS 2003 survey.

Table 5
Logistics Buildings Subcategories Inventory and Employment
 Source: Energy Information Administration
 Commercial Buildings Energy Consumption Survey 2003

Building Types	Inventory Sq. Ft.	Number of Workers
Distribution/Shipping Center	5,250,373,939	2,755,077
Non-refrigerated Warehouse	3,045,419,884	1,183,120
Refrigerated Warehouse	525,673,270	275,185
Self-storage	1,256,389,038	156,090
Flex	83,489,132	164,346

Figure 6



Looking at these trends as a whole, a few dynamics in the use of space stand out:

- Buildings constructed after 1990 have more space per worker than buildings built between 1960 and 1990. However, space built before 1960 has much less intense space utilization than newer buildings.
- New construction far exceeded the growth in either inventory or employment. For example, 4 billion square feet of space was built between 1990 and 2003, yet total inventory actually declined by 1.4 billion square feet between 1992 and 2003. This indicates extensive replacement or conversion of older buildings.

Commodities Shipment Trends

Data for both the value and tonnage of shipments is available for detailed commodities from the Commodity Flow Survey (CFS) at the US Department of Transportation for 1997 and 2007. This data provides some insights into the trends that drive warehouse and distribution growth and demand for space. The CFS captures data on shipments originating from business establishments located in the 50 states and the District of Columbia. *This survey counts only shipments originating and outgoing within the U.S.*

In 2007, the top five commodities by share of monetary value were:

- electronic and other electrical equipment and components and office equipment (9 percent of all value and \$1 trillion)
- mixed freight (8 percent of value and \$932 billion)
- motorized and other vehicles [including parts] (7.8 percent of value and \$907 billion)
- pharmaceutical products (6.6 percent of value and \$771 billion)
- gasoline and aviation turbine fuel (5.7 percent of value and \$663 billion)

Other commodities are each less than 5.4 percent of total value, estimated at \$11.6 trillion.

As seen in Table 6 the percent change monetary value increases between 1997 and 2007 of more than 100 percent are for:

- mixed freight (213 percent, consisting of items for grocery and convenience stores, supplies and food restaurants and fast food chains, hardware or plumbing supplies, office supplies and miscellaneous goods)
- fuel oils (207 percent)
- coal and petroleum products (177 percent)
- pharmaceutical products (166 percent)
- gasoline and aviation turbine fuel (136 percent)
- metallic ores and concentrates (102 percent)

The percent change for all commodities values between 1997 and 2007 was 30 percent.

Looking at the tonnage of each commodity in 2007, the five largest commodities by share are:

- gravel and crushed stone (16 percent or 2 billion tons)
- non-agglomerated bituminous coal (11 percent or 1.4 billion tons)
- non-metallic mineral products (9.2 percent of total tonnage and 1.1 billion tons)
- gasoline and aviation turbine fuel (7.6 percent or 959 million tons)
- fuel oils (5.1 percent or 641 million tons)

Other commodities are less than 5 percent each of the total 12 billion tons shipped in 2007.

In percent change terms, between 1997 and 2007 the commodities tonnage with increases of more than 50 percent were:

- mixed freight (173 percent)
- precision instruments and apparatus (93 percent),
- pharmaceutical products (93 percent)
- calcareous monumental or building stone (81 percent)
- waste and scrap (72 percent increase)

All other commodities increased less than 50 percent, while the percent change for all commodities was 13 percent.

The wide range of commodity types showing growth resists easy generalization. In general, however, **the data indicate a trend toward fuel and energy products and higher-value manufactured goods.**

Table 6
Shipment Values by Two-Digit Commodity for the United States 1997-2007
Source: Bureau of Transportation Statistics and U.S. Department of Commerce
Transportation Commodity Survey 1997 and 2007 ('07 \$ Millions)

Commodity description (2-digit)	1997	2007	Change	%Change
All Commodities	8,971,561	11,684,872	2,713,311	30%
Mixed freight	297,694	932,353	634,659	213%
Fuel oils	121,846	373,515	251,669	207%
Coal and petroleum products, nec ³	96,770	268,163	171,393	177%
Pharmaceutical products	289,984	771,252	481,268	166%
Gasoline and aviation turbine fuel	280,428	663,194	382,766	136%
Metallic ores and concentrates	16,286	32,910	16,624	102%
Waste and scrap	42,266	82,243	39,977	95%
Precision instruments and apparatus	204,065	304,620	100,555	49%
Calcareous monumental or building stone	3,522	5,202	1,680	48%
Gravel and crushed stone	14,868	21,167	6,299	42%
Nonmetallic mineral products	141,081	196,993	55,912	40%
Alcoholic beverages	113,607	158,322	44,715	39%
Plastics and rubber	360,248	489,435	129,187	36%
Live animals and live fish	7,975	10,833	2,858	36%
Base metal in prim or semifin forms and in finished basic shapes	369,109	488,410	119,301	32%
Articles of base metal	293,517	388,292	94,775	32%
Basic chemicals	206,231	271,469	65,238	32%
Fertilizers	35,315	43,613	8,298	23%
Motorized and other vehicles (including parts)	737,702	907,288	169,586	23%
Chemical products and preparations, nec	270,655	331,750	61,095	23%
Furniture, mattresses and mattress supports, lamps, lighting	125,652	152,286	26,634	21%
Natural sands	5,528	6,665	1,137	21%
Meat, fish, seafood, and their preparations	237,447	277,251	39,804	17%
Machinery	538,893	628,267	89,374	17%
Nonagglomerated bituminous coal	32,928	38,228	5,300	16%
Nonmetallic minerals nec	14,637	16,727	2,090	14%
Wood products	163,341	183,868	20,527	13%
Cereal grains	77,057	84,851	7,794	10%
Other agricultural products	132,227	143,637	11,410	9%
Other prepared foodstuffs and fats and oils	447,518	479,757	32,239	7%
Animal feed and products of animal origin, nec	86,367	90,472	4,105	5%
Transportation equipment, nec	166,906	173,883	6,977	4%
Grains, alcohol, and tobacco products	141,930	143,139	1,209	1%
Tobacco products	72,860	70,551	-2,309	-3%
Textiles, leather, and articles of textiles or leather	489,872	473,610	-16,262	-3%
Electronic and other electrical equipment and comp. and office equipment	1,123,611	1,046,495	-77,116	-7%
Paper or paperboard articles	127,063	118,070	-8,993	-7%
Pulp, newsprint, paper, and paperboard	137,698	126,857	-10,841	-8%
Miscellaneous manufactured products	543,776	490,305	-53,471	-10%
Printed products	336,340	190,389	-145,951	-43%
Logs and other wood in the rough	19,547	7,086	-12,461	-64%
Commodity Unknown	47,193	1,453	-45,740	-97%

³ NEC stands for "Not Elsewhere Classified"

Table 7
Shipment Tons by Two-Digit Commodity for the United States 1997-2007
Source: Bureau of Transportation Statistics and U.S. Department of Commerce
Transportation Commodity Survey 1997 and 2007 (Thousands)

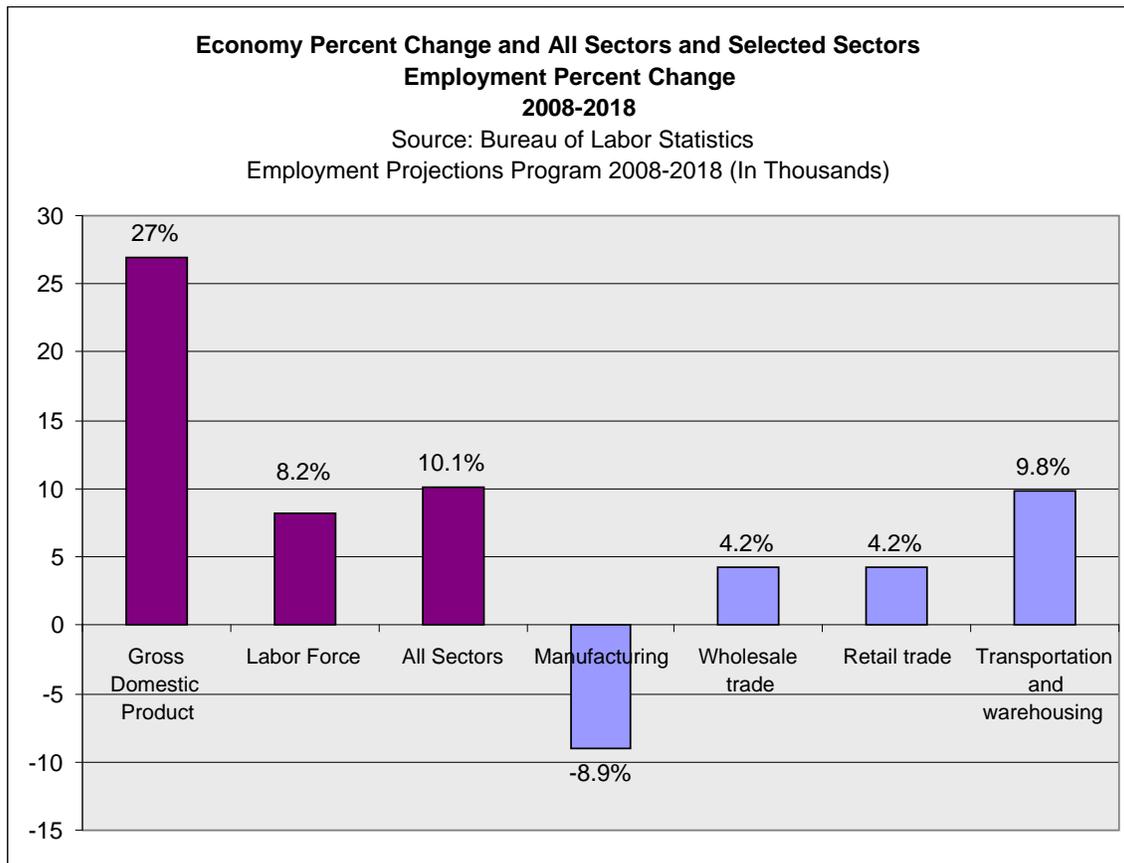
Commodity description (2-digit)	1997	2007	Change	%Change
All Commodities	11,089,733	12,543,425	1,453,692	13%
Mixed freight	110,271	300,922	190,651	173%
Precision instruments and apparatus	2,939	5,668	2,729	93%
Pharmaceutical products	9,897	19,076	9,179	93%
Calcareous monumental or building stone	15,893	28,738	12,845	81%
Waste and scrap	177,824	305,878	128,054	72%
Plastics and rubber	130,411	186,392	55,981	43%
Alcoholic beverages	81,079	114,012	32,933	41%
Basic chemicals	296,056	412,581	116,525	39%
Motorized and other vehicles (including parts)	98,074	133,126	35,052	36%
Chemical products and preparations, nec	92,034	123,537	31,503	34%
Furniture, mattresses and mattress supports, lamps, lighting	19,910	26,633	6,723	34%
Machinery	49,915	66,728	16,813	34%
Fuel oils	481,682	641,894	160,212	33%
Nonmetallic mineral products	910,133	1,156,790	246,657	27%
Transportation equipment, nec	5,477	6,815	1,338	24%
Articles of base metal	106,519	131,924	25,405	24%
Meat, fish, seafood, and their preparations	79,485	98,413	18,928	24%
Coal and petroleum products, nec	475,105	578,188	103,083	22%
Electronic and other electrical equipment and comp. and office equipment	39,612	47,528	7,916	20%
Other prepared foodstuffs and fats and oils	396,882	468,435	71,553	18%
Grains, alcohol, and tobacco products	102,721	120,023	17,302	17%
Nonagglomerated bituminous coal	1,217,038	1,416,187	199,149	16%
Nonmetallic minerals nec	235,731	272,264	36,533	15%
Gravel and crushed stone	1,814,761	2,039,457	224,696	12%
Animal feed and products of animal origin, nec	219,699	246,436	26,737	12%
Paper or paperboard articles	73,513	82,233	8,720	12%
Base metal in prim or semifin forms & in finished basic shapes	335,878	364,940	29,062	9%
Other agricultural products	201,661	211,890	10,229	5%
Cereal grains	489,693	514,151	24,458	5%
Natural sands	442,509	460,085	17,576	4%
Live animals and live fish	5,922	6,150	228	4%
Textiles, leather, and articles of textiles or leather	45,872	46,728	856	2%
Gasoline and aviation turbine fuel	962,815	959,161	-3,654	0%
Wood products	329,119	323,773	-5,346	-2%
Pulp, newsprint, paper, and paperboard	152,290	145,380	-6,910	-5%
Metallic ores and concentrates	90,705	76,672	-14,033	-15%
Fertilizers	179,056	149,600	-29,456	-16%
Miscellaneous manufactured products	112,492	91,844	-20,648	-18%
Tobacco products	4,128	3,289	-839	-20%
Printed products	78,053	51,435	-26,618	-34%
Logs and other wood in the rough	370,686	107,869	-262,817	-71%
Commodity Unknown	46,191	580	-45,611	-99%

Specific Industries Employment Growth

Based on the Employment Projections Program (EPP) at the Bureau of Labor Statistics, this third section identifies the employment projections for the logistics industries to determine the potential demand for warehouse and distribution centers. Comparisons to other industries in the supply and distribution chain – including manufacturing, retail and general considerations about the overall U.S. economy – are provided as comparisons for analysis. The logistics buildings identified in the first chapter of this report correspond generally to a group of subsectors of the economy reported on the North American Industry Classification System (NAICS) basis, identified below.

Looking first at the overall economy, the most recent Bureau of Labor Statistics projections have the labor force increasing at 0.8 percent per year or about 8.2 percent during the 2008-2018 period, while Gross Domestic Product is expected to grow at 2.4 annually or 27 percent during the decade.

Figure 7



As shown in Figure 7, of the sectors related to logistics (Manufacturing, Wholesale trade, Retail trade and Transportation and Warehousing), there is a continued decrease in manufacturing employment while there will be modest increases of Wholesale and Retail Trade employment. Transportation and Warehousing will grow at a larger percent rate than the labor force but on par with All Sectors in the economy.

Table 8
All Sectors and Selected Sectors Employment 2008, 2018 and Change
 Source: Bureau of Labor Statistics
 Employment Projections Program 2008-2018 (In Thousands)

Economic Sectors	2008	2018	Change
All Sectors	150,931.70	166,205.60	15273.9
Manufacturing	13,431.20	12,225.20	-1206.0
Wholesale Trade	5,963.90	6,219.80	255.9
Retail Trade	15,356.40	16,010.40	654.0
Transportation and Warehousing	4,504.90	4,950.40	445.5

As shown in Table 8 increases of employment are 256,000 for Wholesale trade; 654,000 for Retail trade; and 445,000 for Transportation and Warehousing. These increases account for a 9 percent of total increases for All Sectors estimated at 15 million new jobs during the projection period.

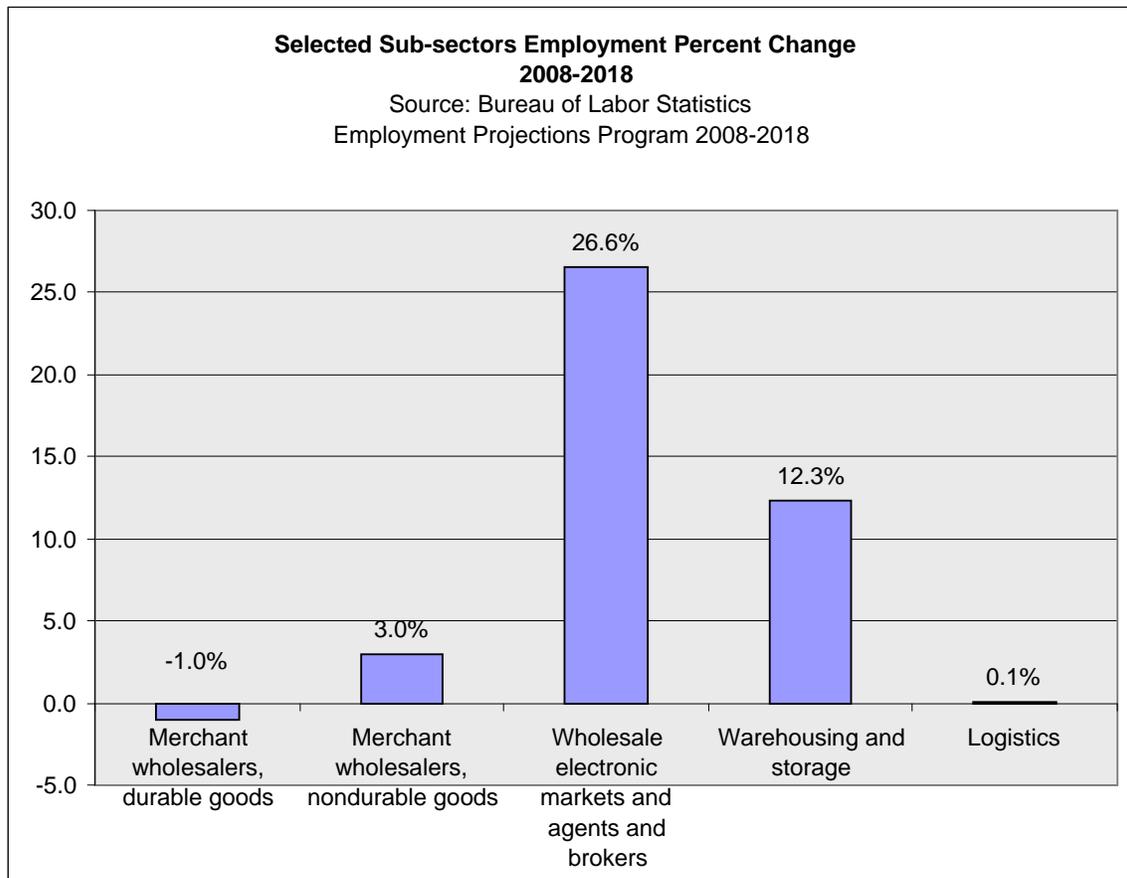
Under these general trends the specific subsectors that compose the logistics economic activity will increase by 339,000 workers during the 2008-2018 period. The component subsectors of Logistics activities are identified in Table 9 as durable and non-durable goods merchant wholesalers, wholesale electronic markets and agents and brokers (these three subsectors together form the Wholesale trade sector) plus warehousing and storage (part of Transportation and Warehousing).

Table 9
Logistics Industries Employment 2008, 2018 and Change
 Source: Bureau of Labor Statistics
 Employment Projections Program 2008-2018 (In Thousands)

Subsectors	2008	2018	Change
Merchant wholesalers, durable goods	3,060.70	3,029.20	-31.5
Merchant wholesalers, nondurable goods	2,053.10	2,114.70	61.6
Wholesale electronic markets and agents and brokers	850.10	1,075.90	225.8
Warehousing and storage	672.80	755.70	82.9
Total	6,636.70	6,975.50	338.8

Looking at the specific projections for these subsectors shows that the largest growth for logistics will come from wholesale electronic markets, agents and brokers (about 226,000 jobs or 67 percent of total jobs in the logistics sector), followed by warehousing and storage at 24 percent and non-durable goods wholesalers at 18 percent. It is important to note that durable goods wholesalers will decrease in employment by about 31,500 jobs during the 2018 projection horizon. The decrease is result of a larger trend within wholesaling in which improved technology – such as electronic data interchange and radio frequency identification tags – are expected to make storage, tracking and shipping more efficient, lessening the demand for employment.

Figure 8



The percent changes for the logistics subsectors show that overall the 339,000 workers increase for the logistics sector are modest (about 0.1 percent) and that the largest percent increases are again for wholesale electronic markets and agents and brokers at almost 27 percent, followed by warehousing and storage at an increase of about 12 percent. The goods management inventory technological advances help explain the decrease or low increase of the traditional durable and non-durable wholesale employment that are affected by these trends.

In order to identify in greater detail the projected growth industries that make up the logistics sector, Table 10 shows the detailed economic activity by actual increase or decrease. Again, two of the largest increases are seen in wholesale electronic and warehousing. But other industries with gains can be identified in this table. All these industries taken together constitute the logistics sector, broken down this time by industry or 4-Digit NAICS codes.

Table 10
Logistics Industries Employment 2008, 2018 and Change
 Source: Bureau of Labor Statistics
 Employment Projections Program 2008-2018 (In Thousands)

Specific Industries	2008	2018	Change
Wholesale electronic markets and agents and brokers	850.1	1075.9	225.8
Grocery and related product merchant wholesalers	730.6	816.6	86.0
Warehousing and storage	672.8	755.7	82.9
Drugs and druggists' sundries merchant wholesalers	208.1	247.7	39.6
Beer, wine and distilled alcoholic beverage merchant wholesalers	160.6	192.8	32.2
Miscellaneous durable goods merchant wholesalers	297.3	319.7	22.4
Hardware and plumbing heating equipment and supplies merchant wholesalers	253.0	272.0	19.0
Machinery, equipment and supplies merchant wholesalers	684.9	701.4	16.5
Lumber and other construction materials merchant wholesalers	236.3	244.1	7.8
Metal and mineral (except petroleum) merchant wholesalers	133.3	127.9	-5.4
Furniture and home furnishing merchant wholesalers	111.3	105.6	-5.7
Farm product raw material merchant wholesalers	76.2	69.0	-7.2
Chemical and allied products merchant wholesalers	130.1	117.7	-12.4
Paper and paper product merchant wholesalers	139.9	126.9	-13.0
Motor vehicle and motor vehicle parts and supplies merchant wholesalers	338.8	324.8	-14.0
Petroleum and petroleum products merchant wholesalers	100.7	85.3	-15.4
Electrical and electronic goods merchant wholesalers	351.0	334.9	-16.1
Apparel, piece goods and notions merchant wholesalers	149.0	131.9	-17.1
Miscellaneous nondurable goods merchant wholesalers	357.9	326.8	-31.1
Professional and commercial equipment and supplies merchant wholesalers	654.8	598.8	-56.0

As shown in Table 10, specific industries that will see employment growth are:

- grocery and related product merchant wholesalers (86,000 jobs)
- drugs and druggists sundries merchant wholesalers (39,600 jobs)
- beer, wine and distilled alcoholic beverage merchant wholesalers (32,200 jobs)
- miscellaneous durable goods merchant wholesalers* (22,400 jobs)
- hardware, and plumbing heating equipment and supplies merchant wholesalers (19,000 jobs)
- machinery, equipment and supplies merchant wholesalers (16,500 jobs)
- lumber and other construction materials merchant wholesalers (7,800 jobs)

* Comprises establishments primarily engaged in the merchant wholesale distribution of sporting, recreational, toy, hobby, jewelry goods and supplies and precious stones and metals.

Warehouse and Distribution Growth and Demand for Space

As shown in the first section of this report, the inventory of logistics or warehouse and distribution buildings averaged 10 billion square feet between 1992 and 2003. During the same time period, the average **space** utilization for this inventory has been 2,000 square feet per employee. Buildings constructed between 1990-2003 have a higher ratio – about 2,400 square feet per employee – and the average ratio for all buildings in 2003 was 2,200. *Averages would be somewhat less if self-storage facilities, which average more than 8,000 square feet per employee, were excluded.*

Both commodity shipment trends and employment projections indicate that space demand is likely to grow during the coming decade. From 1997 to 2007, all commodities increased at a rate of 1.2 percent per year by tonnage and 2.7 percent per year by value. While these rates almost certainly declined between 2007 and 2009 due to the recession, we should expect similar rates of growth when the recovery gains steam. If patterns are similar to the last decade, growth is likely to be strongest for mixed freight (generally non-durable goods for grocers, hardware and office goods), pharmaceutical commodities, electronic and other electrical equipment and office equipment.

Logistics employment projections described in the third section of this report indicate a growth of 339,000 employees during the 2008-2018 period. Most of this growth is expected from the wholesale electronic markets and agents and brokers, that represents the shipped commodity with higher monetary value in 1997 and 2007. These employment projections are not directly comparable to the workers in warehouse and distribution facilities. On one hand, many of the employees in this sector work in office or other settings outside of warehouse and distribution facilities. On the other hand, many who work in logistics facilities are in other sectors, notably manufacturing and retail. If we assume that these factors roughly cancel each other out, **an increase of 339,000 employees⁴ and about 2,000 square feet per employee would create the need for about 700 million square feet of warehouse and distribution space by 2018 on top of the natural replacement of obsolete inventory.**

The rate of replacement is also difficult to estimate. From 1990-2003, 4 billion square feet of new warehouse and distribution space was built even though employment was relatively flat. If the same annual rate moving forward is assumed (about 300 million square feet per year), then another 3 billion square feet would be built in the next decade above the amount needed to accommodate new employment. Together, the need for replacing outmoded space and the need to accommodate employment growth indicates a need for approximately 3.5-4 billion square feet of space during the next decade.

⁴ Because the economy is expected to trend out of the recession and return to full employment over the 10-year projections period, the current projections indicate faster growth rates and more numerous openings than might have been expected in several industries had employment not fallen in 2008, as the economy recovers from the current downturn.

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