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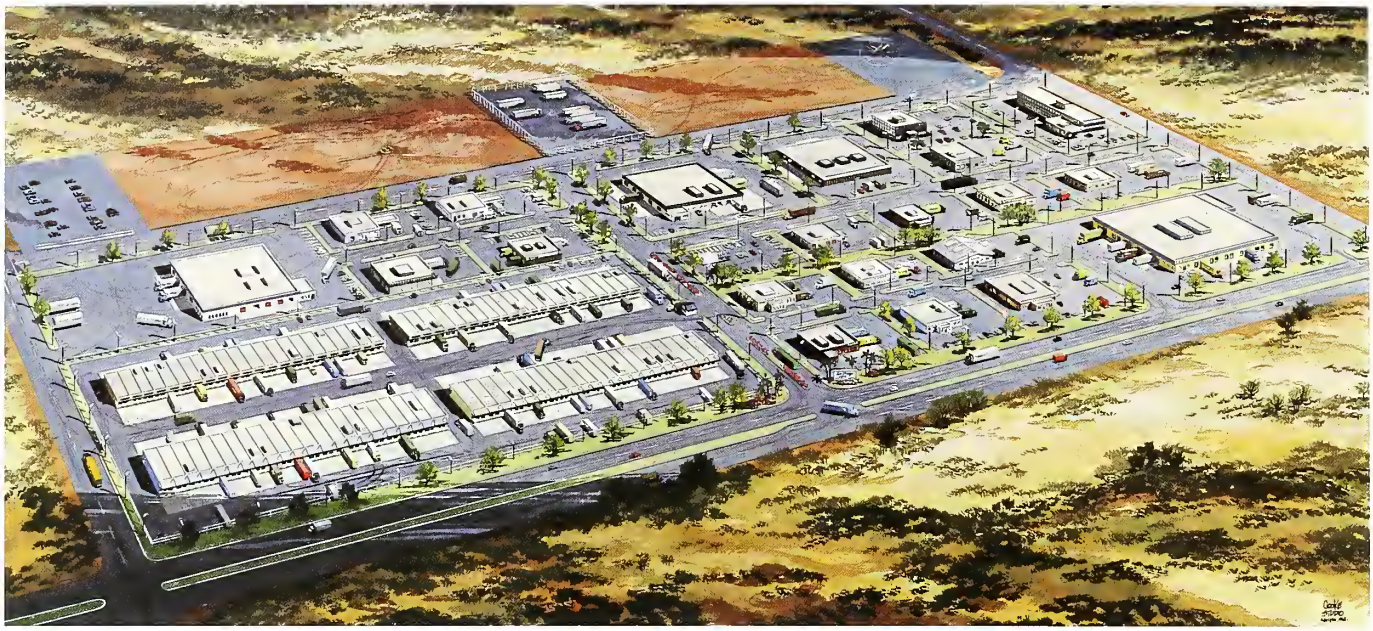

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This study was conducted in cooperation with the city of San Diego and the San Diego Association of Governments. Special appreciation is extended to John P. Fowler, Assistant City Manager, city of San Diego, for his personal support during the project and for the cooperation and assistance of his staff; Michael Stepner, Assistant Planning Director, city of San Diego, for information concerning current and future urban development planning; and Herbert Lemon, Project Administrator, Economic Development, city of San Diego, for arranging and coordinating meetings and for other assistance during the entire scope of this project.

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Plans for Improved Wholesale Food Distribution Facilities for San Diego, California

By Richard K. Overheim (project leader), marketing specialist; James N. Morris, Jr. (assistant project leader), industrial engineer; Ralph F. Kessler, civil engineer; Errol R. Bragg, marketing specialist; Edmond S. Covey, marketing specialist; David S. Hunt, agricultural economist; Gary W. Meyer, agricultural economist; H. Ronald Smalley, agricultural economist; and Charles F. Stewart, marketing specialist.[1]

[1]Messrs. Covey and Meyer have transferred to other Agencies in the U.S. Department of Agriculture; Mr. Hunt transferred to the Department of Defense.

Summary

This report describes the scope of the present food marketing system in the greater San Diego, California area, defines the numbers and kinds of new wholesale and processing facilities needed to improve efficiency and provide for continued growth of the system, and assesses major costs and benefits associated with recommended improvements.

A total of 230 wholesale food and processing firms operate in the study area. Each firm is classified on the basis of the food or related product and/or service company (brokers) or nonfood specialty company (florists) comprising the single largest percentage of annual sales. The 13 categories are bakery products, beverages, candy and confectionery, dairy, fish and shellfish, florists, food brokers, food products, frozen foods, fruits and vegetables, groceries, meat and related products, poultry and shell eggs. (Information about poultry and shell egg firms is combined to avoid revealing confidential information.) About half of the firms are located in the city of San Diego, and the remainder are scattered throughout San Diego County.

Together, the firms in the study area handle about 2.4 million tons of food and food-related products annually. This volume represents annual sales in excess of $1.6 billion annually. Of this total sales volume, about $1 billion in sales is by firms within the city of San Diego; the remaining $600 million is distributed by firms located outside the city but within the county.

Wholesalers in the study occupy more than 4 million square feet of enclosed space, or about 91 acres under roof. Currently, the firms are paying about $13 million annually in rental or facility-related charges.

Food and food-related firms are major employers in the area. More than 5,000 workers are employed by the 230 food firms included in the study.

Fruit and vegetable firms form a particularly important element in the wholesale food industry in San Diego and are a significant focus of this study. A total of 63 fresh fruit and vegetable firms operate in the study area. Together, all fruit and vegetable firms handle about 811,000 tons of products, occupy about 1.3 million square feet of commercial space in the study area, and employ about 1,500 workers in various categories.

A total of 64 area food wholesale and processing firms need new facilities. Together, these firms distribute about 600,000 tons of food products worth more than $304 million annually. Presently, the firms needing new facilities and included in new facility planning occupy about 856,000 square feet of commercial space and employ about 1,000 workers.

A new complete wholesale food distribution center would meet the projected needs for new buildings of the 64 firms identified as needing new facilities. This center, an industrial park designed to handle food, would include three types of buildings: single-occupancy, multiple-occupancy, and support.

The single- and multiple-occupancy buildings directly occupied by the firms included in new facility planning would total about 503,000 square feet on the new market. These buildings would be expanded to about 722,000 square feet over the life of the new market. A site of about 150 acres would be needed for the new market. Of the 150 acres, 103 acres is needed for the food firms that presently need new facilities. The remainder of the site would be used for support facilities and for the space that would be needed by other firms which are likely to want to locate in the new center in later stages of development. Less land and fewer buildings would be required for a smaller, specialized market intended to meet the facility requirements of only one of the firm groups included in new facility planning.

Twelve illustrative sites that are located in various sections of the city and county and are considered representative of industrial sites available in the region were identified as possible locations for a new San Diego wholesale food center.

Depending on the site selected, total investment in land and facilities for the center would range from a low of less than $50 million to a high of more than $100 million. The costs of wholesalers' buildings and auxiliary facilities would account for $35 million of the total investment. Based on estimated 1987 construction costs, rental charges on the new center would range from a low of $12.04 per square foot to a high of $34.72 per square foot, depending on site and method of financing selected.

A comparative analysis of projected costs and revenues indicates that the development of a new food distribution center would be potentially cost effective. That is, the combination of improved efficiency of operations and increased sales volumes could be expected to generate more net revenue—total revenue minus total costs, including facility costs—if those firms identified as needing facilities were to relocate to the new center rather than maintain their existing bases of operation. Again, the specific location and method of financing could be expected to have a major impact on the relative levels of potential net revenues associated with the planned center.

Other benefits that were not specifically measured during the study also could be expected to result from developing a new center. Those benefits could include better quality food, less traffic congestion, an increase in the region's tax base, improved working conditions, better enforcement of health and safety regulations, and improved land use.

The city of San Diego, local food industry groups, and others interested in improving the regional wholesale food distribution system requested assistance from the U.S. Department of Agriculture (USDA) to evaluate the feasibility of developing new and improved wholesale food distribution facilities to serve the region. In response to the requests, the Market Research and Development Division of the Agricultural Marketing Service initiated a study of the area's existing wholesale food marketing system in 1984, representing the base year of the study. This study was conducted to provide information for decision makers, in both the public and the private sectors, who are concerned about the future development of the food wholesaling and distribution systems in the greater San Diego, California, area.

In the development of plans for the study, the potential impact of large-scale construction planning on the regional wholesale food industry was a major consideration. Before the initiation of this study, the city of San Diego initiated a major urban renewal and revitalization project in the Gas Lamp District of the city. A significant number of wholesale food firms, primarily fruit and vegetable wholesale companies, were located in areas that either would be directly affected by redevelopment plans or could be affected later by possibly sharply rising property values. In addition, a new convention center for the city is under construction near the present location of other wholesale food companies. Similar pressures for relocation may be experienced by those companies.

The San Diego area is a region in transition. Presently the 16th largest and one of the most rapidly growing metropolitan areas in the United States, San Diego's population increased nearly 37 percent from 1970 to 1980. Population is projected to grow an additional 45 percent from 1980 through the year 2000. Most of this past and projected growth represents people coming to the area to work in new and expanding local industries and defense installations or to establish residences for retirement, leisure, or recreational purposes.

The accelerating development of the local economy has been reflected in changes in the regional wholesale food industry. Many food firms have responded to changing conditions by expanding the services and products they offer to their customers. They have also sought new sources of products and branched into new activities. Fruit and vegetable firms have been particularly active in this transition. Increasing emphasis has been placed on the wholesale activities that serve local and regional customers. Grower-shipping firms (fruit and vegetable firms maintaining both farms and wholesale businesses) have also remained an active part of the fruit and vegetable trade in the San Diego area.

Area food firms have been active participants in supplying food to military and related installations. Many have provided specialized services to this important type of customer.

Due to their proximity to the United States-Mexican border, many firms in the San Diego food industry have a close working relationship with customers and suppliers in Mexico. Although wholesale food sales into Mexico have been inhibited by several factors, that country remains an important potential market for United States food producers, and San Diego serves as a gateway to part of that market. Mexico is also an important supplier to local food firms, some of which are involved with transshipment of Mexican produce to other parts of the United States. While exports to other countries currently represent a small portion of total sales by area food firms, the growing importance of international trading activity in the study area suggests a potential for expanded exports of food and related products in the future.
Nearby California cities are important to the San Diego wholesale food industry from both a supply and distribution perspective. A significant number of San Diego firms have ties with Los Angeles companies. Food firms in both cities often distribute to customers in San Diego and Los Angeles. Wholesale food distribution in Los Angeles was the subject of an earlier U.S. Department of Agriculture study.[2] A wholesale food distribution center was constructed in Los Angeles in 1985.

San Diego County, including the city of San Diego, was defined as the study area. This study area, in turn, was subdivided into product movement areas. The study area and associated product movement areas are illustrated in figures 1(a) and (b).

The objectives of this study were to (1) develop a general overview of the local wholesale food industry in San Diego County, (2) identify facility-related problems affecting individual firms, (3) estimate the number and kinds of new facilities needed to correct identified problems and inefficiencies, (4) develop designs for potential new facilities, (5) survey potential locations for such facilities, and (6) evaluate the costs and benefits associated with such potential new facilities.

[2]Taylor, E. G., et al. *Los Angeles Wholesale Food Distribution Facilities,* MRR 966, USDA, 99 pp, ill., 1972.

A condensed version of the results of this study was released in 1985 jointly with the city of San Diego and the San Diego Association of Governments.[3] The report expands and updates that material to provide information necessary for the planning and development of a new wholesale food distribution center. Construction costs and associated revenue requirements are shown for both the base year of the study along with updated estimates for 1987.

Based on the material collected in the original survey, some product movement data associated with companies identified as needing new facilities are also updated through 1987.

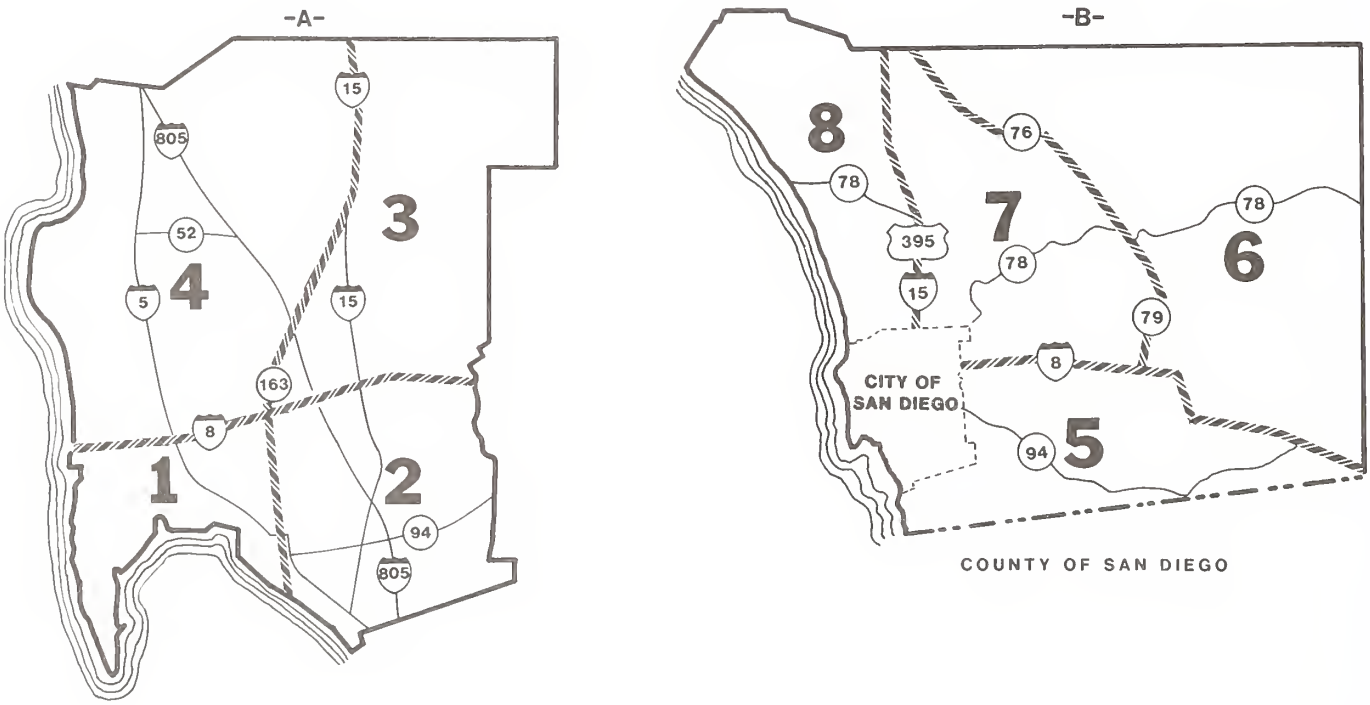


Figure 1.—Study area and distribution zones: (A) city of San Diego and (B) county of San Diego.

[3]*Improved Wholesale Food Distribution Facilities for San Diego, California,* U.S. Department of Agriculture, the city of San Diego and the San Diego Association of Governments, 1985, 45 pp, ill.

Impact on Marketing Facility Improvements

A clear understanding of the nature, scope, physical description, and present facilities used by the food wholesaling and processing firms in San Diego is a key element to (1) identifying facility-related problems that hamper the efficient process of that system and (2) designing new facilities that will improve the operating efficiency of the system. The kinds and amounts of food products handled by San Diego firms determine facility requirements. Information concerning the origin and destination of the products moving to the wholesale food industry is a key element to evaluating potential locations for new facilities. Operating characteristics such as unitized shipments; product movement within existing facilities; the kind, type, and age of the existing buildings used by the food industry; and employment within those facilities effectively illustrate the technological level of the food industry as a whole. The operating characteristics also provide a basis for later evaluation of potential costs and benefits associated with new facilities.

Number and Location of Firms

A total of 230 food wholesale and processing firms operate within the study area. Each of these firms is classified based on the single food or food-related product and/or service (broker) or nonfood specialty (florist) making up the largest portion of the company's annual sales. For the purposes of this study, the 13 major categories are bakery products, beverages, candy and confectionery, dairy products, fish and shellfish, florists, food brokers, food products, frozen foods, fruits and vegetables, groceries, meat and related products, and poultry and shell eggs. Of the 230 firms studied, fruit and vegetable firms represent the single largest number, 63 firms, or 28 percent. Other food groups, including florists, bakery firms and other food product firms, each represent 11 percent or more of the present total. Spice wholesalers and freeze dry camping food manufacturers are examples of firms in the other food products category.

Considering all firms together, wholesalers operating in the study area are about equally divided between the city and the county of San Diego. Many, particularly fruit and vegetable wholesalers, are concentrated in the Gas Lamp District, an area subject to pending redevelopment. Others are located in industrial portions of the city and in producing areas in northern San Diego County. Other major concentrations of firms in the county are located in Encinitas and National City. Those concentrations consist mainly of fruit and vegetable companies. Table 1 gives the number of wholesalers classified in each of the 13 defined categories in the county and in the city. Appendix table 1 gives detailed locations of these firms by zip code.

Table 1.—Number of each type of firm by location, San Diego, California

Type of firm	County	City	Total
	Number		
Bakery products	7	18	25
Beverages	0	7	7
Candy and confectionery	1	2	3
Dairy products	6	10	16
Fish and shellfish	2	10	12
Florists	25	2	27
Food brokers	0	3	3
Food products	12	14	26
Frozen foods	2	3	5
Fruits and vegetables	37	26	63
Groceries	4	6	10
Meat and related products	7	16	23
Poultry and shell eggs	9	1	10
Total	112	118	230

Volume and Sales

Together, the firms in the study area handle about 2.4 million tons of food and food-related products annually. The single largest volume is handled by fruit and vegetable firms, 811,000 tons, followed closely by grocery firms with 649,000 tons. Reflecting the relative size of the firms, most of this tonnage, 71 percent, moves through firms located within the city of San Diego. The remaining tonnage is handled by companies located within San Diego County.

Wholesalers included in the scope of this study handle a total of $1.6 billion of food and food-related products. Of that total, $1 billion is handled by firms within the city of San Diego. The remaining $600 million in annual sales is distributed by firms presently located within the county of San Diego.

Of the total annual sales, almost $500 million, or 31 percent of the total, is distributed by grocery companies. Fruit and vegetable firms, consisting of more firms than any other category in this study, account for about 19 percent of the total sales volume.

Of the two measures of annual sales—physical volume in tons and sales volume in dollars—annual volume in tons is used in this report as a common element of measure. This selection supports the facility design objective of this report. Such facility planning is based not on the dollar value of the products handled but on the facility dimensions required to store and handle the products of the various types of food firms. Concurrently with this project, a separate study was conducted of the value per ton of various commodities handled by the firms included within the scope of the project.

Information from this separate study was adjusted for California. In some instances, volume data were provided to the interviewers as annual tonnage volumes instead of annual sales volumes. In such instances the tonnage volumes were converted to sales volumes. For highly specialized products, conversion factors provided by the companies involved were applied to the sales and tonnage volumes included in the survey data. Table 2 lists the annual sales and tonnage of the firms included in the scope of this study.

Some firms handle few products outside their area of specialization. Beverage companies and fish and shellfish wholesalers are consistent examples of narrow specialization. Wholesale florists also handle little, if any, food-related items.

Table 3 presents some of the major commodities moving through the study area by various types of firms. Of the total volume handled by San Diego firms, about 34 percent is represented by fruit and vegetable tonnage, 27 percent by grocery and related products, 29 percent by other products, and the remaining percentages by other commodity groups. Commodity groups are generally broad categories and include many related items; totals may also represent tonnage moving out of the San Diego area as well as the weight of containers and wholesale shipping cartons. The tonnages shown in table 3 represent volumes handled and may include products sold more than once as the items pass through the marketing system.

Processing is a major element among San Diego firms. Table 4 identifies the operational classifications of the 230 wholesale firms included in this study. Of the total, 59 of the San Diego firms were identified as representing primarily processing operations; these firms processed most or all of their volume to increase the value of the products sold to their customers or to meet specific commodity marketing requirements. Of the different kinds of firms, the meat, bakery,

Table 2.—Sales and tonnage volumes by type of firm, San Diego, California[1]

Type of firm	Sales volume			Tonnage volume		
	County	City	Total	County	City	Total
	Dollars			*Tons*		
Bakery products, beverages, and candy and confectionery	3,130,600	231,086,892	234,217,492	2,804	502,614	505,418
Dairy products	31,904,765	92,381,597	124,286,362	39,051	137,629	176,680
Fish and shellfish	10,050,000	39,300,000	49,350,000	1,330	10,665	11,995
Florists and food brokers	53,860,000	15,400,000	69,260,000	15,835	55,729	71,564
Food products and frozen foods	29,594,750	47,145,000	76,739,750	17,665	47,971	65,636
Fruits and vegetables	189,574,000	123,551,600	313,125,600	447,623	363,304	810,927
Groceries	90,460,000	408,480,000	498,940,000	106,525	542,065	648,590
Meat and related products and poultry and shell eggs	142,510,650	111,683,256	254,193,906	69,738	32,839	102,577
Total	551,084,765	1,069,028,345	1,620,113,110	700,571	1,692,816	2,393,387

[1]Data concerning certain types of firms are combined to avoid revealing confidential information.

Table 3.—Commodities handled by type of firm, San Diego, California

Type of firm	Commodity									
	Fruits and vegetables	Meat	Dairy	Eggs	Poultry	Groceries	Frozen foods	Fish and shellfish	Other	Total
	Tons									
Bakery products	0	0	0	0	0	0	0	0	44,383	44,383
Beverages	0	0	0	0	0	0	0	0	460,592	460,592
Candy and confectionery	0	0	0	0	0	0	0	0	443	443
Dairy products	0	0	40,069	500	0	721	0	0	135,390	176,680
Fish and shellfish	0	0	0	0	0	0	0	11,995	0	11,995
Florists	0	0	0	0	0	0	0	0	16,139	16,139
Food brokers	55,125	0	0	0	0	300	0	0	0	55,425
Food products	0	0	0	0	0	25,197	0	0	20,924	46,121
Frozen foods	400	1,000	150	30	200	2,000	15,610	125	0	19,515
Fruits and vegetables	669,966	0	50	5,478	0	115,646	13,527	0	6,260	810,927
Groceries	100,157	18,274	594	31	14	507,168	12,319	0	10,033	648,590
Meat and related products	0	49,651	676	0	1,665	0	0	195	1,115	53,302
Poultry and shell eggs	0	4,810	0	35,456	8,450	0	543	16	0	49,275
Total	825,648	73,735	41,539	41,495	10,329	651,032	41,999	12,331	695,279	2,393,387

and fish and shellfish firms were most representative of processing operations and food products and fruits and vegetables were most representative of wholesalers. Firms were also classified into a series of other special operational classifications, such as purveyors, grower-shippers, or institutional wholesalers (firms selling mainly to restaurants and institutional feeding establishments). These other classifications are grouped together as "other" in table 4.

Product Movement

Product movement refers to the physical transportation of the products moving into and through the San Diego marketing system. The scope of product movement includes (1) method and type of receipt, (2) origin, (3) sales by type of customer, (4) method of delivery, and (5) the geographical location of the customers. Figure 2 illustrates the product movement reported by all the firms included in this study.

Most products handled by San Diego firms are received directly from manufacturers or growing areas. Some products, however, are sold between similar firms to cover temporary shortages or to secure supplies needed to complete a general inventory from narrowly specialized wholesalers or processors. This type of receipt is defined as "interdealer transfer." Of the 13 categories of wholesale firms, only bakeries, fish and shellfish wholesalers, and fruit and vegetable firms report interdealer transfers. Table 5 summarizes direct and interdealer transfer receipts. Unless otherwise noted, all further references to volume refer to the total volume handled (direct and interdealer volume) by the firms included in the scope of this study.

Trucks dominate the movement of food products to San Diego wholesalers. Of the total volume handled, more than 97 percent arrives on trucks at the wholesale facilities. Rail traffic is primarily concentrated among grocery firms, with some fruit and vegetable volumes arriving at local team tracks. Boat receipts and some air shipments, subsequently trucked to wholesale facilities, represent mainly imports. Table 6 gives the methods of direct receipt.

Table 4.—Operational classifications by type of firm, San Diego, California

Type of firm	Wholesalers	Processors	Other	Total
		Number		
Bakery products	4	21	0	25
Beverages	4	1	2	7
Candy and confectionery	3	0	0	3
Dairy products	0	0	16	16
Fish and shellfish	2	10	0	12
Florists	0	0	27	27
Food brokers	0	0	3	3
Food products	19	1	6	26
Frozen foods	4	1	0	5
Fruits and vegetables	34	3	26	63
Groceries	5	0	5	10
Meat and related products	5	15	3	23
Poultry and shell eggs	3	7	0	10
Total	83	59	88	230

Table 5.—Receipts by type of firm, San Diego, California

Type of firm	Direct	Interdealer transfer	Total
		Tons	
Bakery products	44,170	213	44,383
Beverages	460,592	0	460,592
Candy and confectionery	443	0	443
Dairy products	176,680	0	176,680
Fish and shellfish	11,686	309	11,995
Florists	16,139	0	16,139
Food brokers	55,425	0	55,425
Food products	46,121	0	46,121
Frozen foods	19,515	0	19,515
Fruits and vegetables	789,004	21,923	810,927
Groceries	648,590	0	648,590
Meat and related products	53,302	0	53,302
Poultry and shell eggs	49,275	0	49,275
Total	2,370,942	22,445	2,393,387

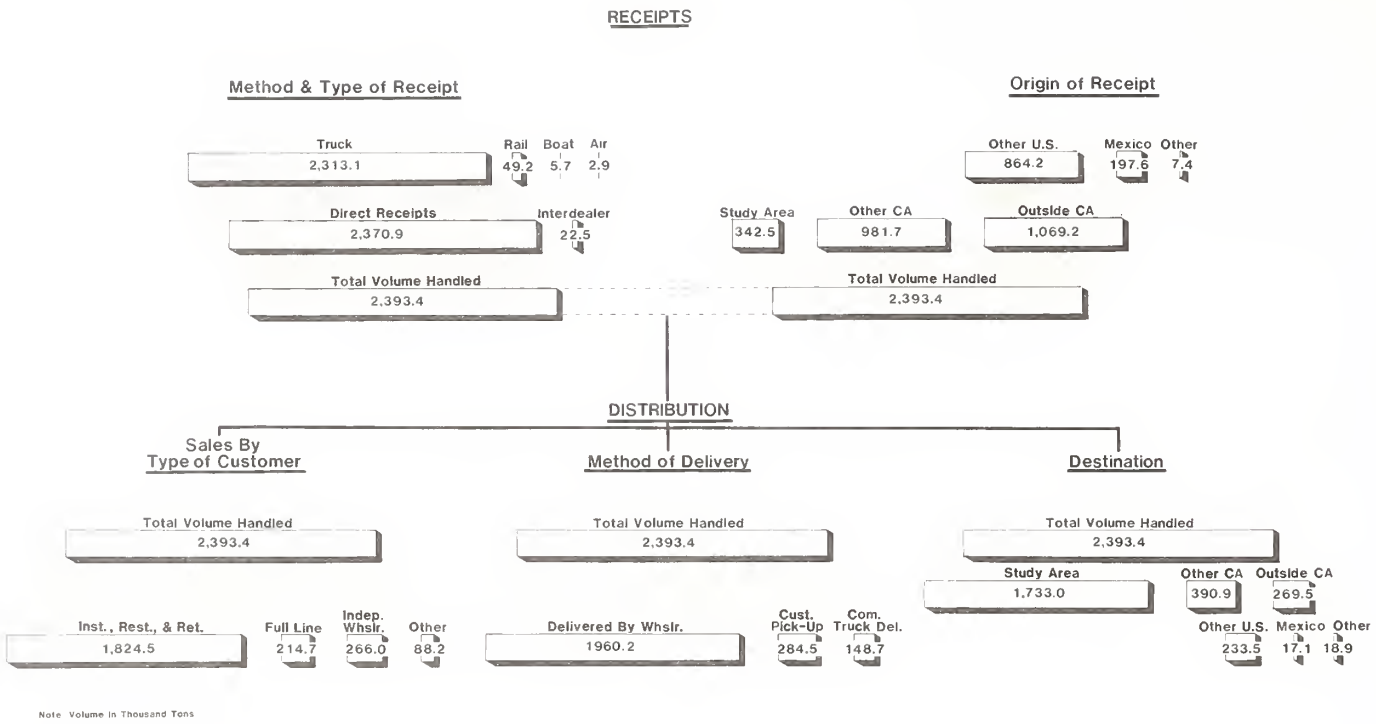


Figure 2.—Movement of product through all firms.

Substantial changes are underway in the forms in which products are received from manufacturers at wholesale facilities. San Diego food firms are sharing in this change. Of the total volume handled by these firms, more than 60 percent arrives on disposable pallets or slipsheets. Unitized shipments are well represented among 10 of the 13 types of firms included in this study. Specialized requirements among florists, candy firms, and poultry and shell egg firms limited their use of unitized shipments. Meat firms still receive substantial amounts of their products in carcass form, 24 percent of the total volume handled by this firm category. In the future most of their products will be received as boxed meats. Other forms of receipt, mainly specialized forms of bulk shipments, move to companies engaged in substantial amounts of processing. Table 7 gives the forms in which products are received.

San Diego food firms draw their supplies from a wide geographical area. Of the total volume handled by all firms, about 14 percent originates from within the study area (fig. 1). The remainder of California contributes almost half, or about 41 percent, of the total, reflecting the substantial agricultural production in the State and the extensive processing operations maintained near agricultural production areas in California. Other States provide about 36 percent of total receipts. Mexico provides about 8 percent, which moves mainly to fruit and vegetable firms. Table 8 summarizes the sources of receipts.

Table 6.—Methods of direct receipt by type of firm, San Diego, California

Type of firm	Rail	Truck	Boat	Air	Total
			Tons		
Bakery products	4,541	39,629	0	0	44,170
Beverages	0	460,592	0	0	460,592
Candy and confectionery	0	443	0	0	443
Dairy products	0	176,680	0	0	176,680
Fish and shellfish	0	6,045	2,951	2,690	11,686
Florists	788	14,891	278	182	16,139
Food brokers	0	55,425	0	0	55,425
Food products	0	46,121	0	0	46,121
Frozen foods	0	19,515	0	0	19,515
Fruits and vegetables	13,286	774,970	748	0	789,004
Groceries	30,593	616,244	1,753	0	648,590
Meat and related products	0	53,302	0	0	53,302
Poultry and shell eggs	0	49,275	0	0	49,275
Total	49,208	2,313,132	5,730	2,872	2,370,942

Table 7.—Forms in which products are received by type of firm, San Diego, California

Type of firm	Bulk	Pallet	Package	Carcass	Primal	Other	Total
				Tons			
Bakery products	16,481	18,908	8,994	0	0	0	44,383
Beverages	6,000	363,161	91,040	0	0	391	460,592
Candy and confectionery	0	0	443	0	0	0	443
Dairy products	0	30,102	23,142	0	0	123,436	176,680
Fish and shellfish	0	3,225	3,739	0	0	5,031	11,995
Florists	0	0	16,093	0	0	46	16,139
Food brokers	0	27,563	27,862	0	0	0	55,425
Food products	2,686	32,206	11,229	0	0	0	46,121
Frozen foods	0	19,065	0	0	0	450	19,515
Fruits and vegetables	172,106	326,426	312,395	0	0	0	810,927
Groceries	0	606,960	41,630	0	0	0	648,590
Meat and related products	0	8,192	32,381	12,584	145	0	53,302
Poultry and shell eggs	0	0	49,275	0	0	0	49,275
Total	197,273	1,435,808	618,223	12,584	145	129,354	2,393,387

Table 8.—Sources of receipts by type of firm, San Diego, California

Type of firm	Study area	Other California	Other States	Mexico	Other	Total
			Tons			
Bakery products	5,889	23,507	14,687	0	300	44,383
Beverages	12,366	27,035	420,800	0	391	460,592
Candy and confectionery	1	355	87	0	0	443
Dairy products	537	121,764	54,280	0	99	176,680
Fish and shellfish	2,142	2,218	3,650	2,035	1,950	11,995
Florists	13,921	467	406	743	602	16,139
Food brokers	150	9,634	42,806	2,835	0	55,425
Food products	4,887	36,932	4,277	25	0	46,121
Frozen foods	50	5,531	13,934	0	0	19,515
Fruits and vegetables	248,963	272,947	114,527	174,490	0	810,927
Groceries	14,782	448,771	166,621	17,315	1,101	648,590
Meat and related products	3,374	31,944	14,842	151	2,991	53,302
Poultry and shell eggs	35,456	559	13,260	0	0	49,275
Total	342,518	981,664	864,177	197,594	7,434	2,393,387

Most sales are made directly to retail outlets, including military installations. These outlets also include stores, restaurants, and food service establishments. Of the total volume, direct sales to retail outlets account for 76 percent of the total. An additional 9 percent of the food volume is sold to large corporate chains or other full-line distributors for later distribution to retail outlets, often outside of the San Diego area. About 11 percent is sold to other independent wholesalers, many also outside the San Diego area. Unidentified customers, mainly from cash-and-carry sales, account for the remainder. Bakery firms, with extensive rack-servicing operations, deliver most of their products directly to retail outlets. In contrast, food brokers distribute most of the products they physically handle to independent wholesalers. Fruit and vegetable companies are well represented in each of the various sales categories. Table 9 summarizes volume handled by type of firm and customer.

Although military sales were not broken out specifically during the course of this study, those sales are included in table 9 under the category "retail outlets." Discussions with wholesalers indicate foods purchased for military use are delivered directly to commissary or troop-feeding outlets, or they are delivered to military warehouse outlets for Federal distribution to overseas installations. Sales for military use were usually delivered on the wholesalers' vehicles to a warehousing or use point. Purchases are usually arranged through bid or through military buyers.

San Diego wholesalers are committed to providing a high level of service to their customers. Of the total volume these firms handle, about 82 percent is delivered to customers on the wholesalers' trucks. In contrast to the general trend, fruit and vegetable firms deliver only about 59 percent of their total volume, reflecting customers' practice of "shopping" the market for quality and price. Some of the delivered volume has been selected for purchase by customers during an earlier visit to the wholesalers' facilities. Much of the volume identified as being picked up at the wholesale facilities by customers represents cash-and-carry sales in buildings specifically designed to support this type of wholesale activity.

Commercial carriers are álso used by wholesalers for delivery operations, particularly for products that are processed for distant delivery. For the purposes of this study, commercial carrier distribution was identified as distribution at the cost of the shipper. Table 10 summarizes the methods of delivery used by San Diego wholesale firms.

The firms studied serve a wide geographical area. About 72 percent of the total volume handled remains in the study area, but an additional 16 percent moves to other areas in California. San Diego firms also serve a national market, mainly representing sales by grower-shippers, processors, or other highly specialized companies. Such national sales, including sales for export, represent about 11 percent of the total volume handled by San Diego firms. Table 11 lists the destination of the products handled by the firms included in this study.

Space Occupied

San Diego wholesalers within the study area occupy more than 4 million square feet of enclosed space or 91 acres under roof. Table 12 lists the kinds and amounts of space occupied by the various types of firms included in this study. The space occupied by San Diego firms is divided into two categories: (1) primary space, which is defined as the principal place of business, and (2) secondary space, or other buildings located away from the principal place of business. Some larger firms occupy more than one building on their facility site, each structure usually designed to serve some specialized purpose. Use of secondary space usually reflects an inability to expand existing facilities at the site of the primary facilities. Appendix table 2 gives detailed information on present space used by the firms studied, including types of space and floor levels involved.

Table 9.—Volume handled by all firms by type of firm and customer, San Diego, California

Type of firm	Type of customer				
	Retail outlets	Full-line distributors	Wholesalers	Other	Total
			Tons		
Bakery products	41,998	0	2,252	133	44,383
Beverages	450,668	1,336	4,088	4,500	460,592
Candy and confectionery	443	0	0	0	443
Dairy products	123,156	4,883	25,563	23,078	176,680
Fish and shellfish	8,166	368	2,807	654	11,995
Florists	4,066	30	10,703	1,340	16,139
Food brokers	150	7,035	48,240	0	55,425
Food products	41,600	389	2,878	1,254	46,121
Frozen foods	14,430	105	0	4,980	19,515
Fruits and vegetables	430,122	193,734	167,932	19,139	810,927
Groceries	617,267	0	0	31,323	648,590
Meat and related products	46,162	3,806	1,553	1,781	53,302
Poultry and shell eggs	46,220	3,055	0	0	49,275
Total	1,824,448	214,741	266,016	88,182	2,393,387

Table 10.—Methods of delivery by type of firm, San Diego, California

Type of firm	Delivered by wholesaler	Picker up by customer	Delivered by commercial carrier	Total
		Tons		
Bakery products	42,476	1,103	804	44,383
Beverages	455,072	5,520	0	460,592
Candy and confectionery	410	33	0	443
Dairy products	156,868	14,827	4,985	176,680
Fish and shellfish	8,375	1,145	2,475	11,995
Florists	3,270	10,846	2,023	16,139
Food brokers	10,425	731	44,269	55,425
Food products	41,941	4,148	32	46,121
Frozen foods	19,410	0	105	19,515
Fruits and vegetables	480,185	237,408	93,334	810,927
Groceries	641,714	6,876	0	648,590
Meat and related products	50,859	1,817	626	53,302
Poultry and shell eggs	49,190	85	0	49,275
Total	1,960,195	284,539	148,653	2,393,387

Table 11.—Destinations of products by type of firm, San Diego, California

Type of firm	Study area	Other California	Other States	Mexico	Other	Total
			Tons			
Bakery products	33,749	10,487	147	0	0	44,383
Beverages	420,828	39,764	0	0	0	460,592
Candy and confectionery	427	16	0	0	0	443
Dairy products	172,843	2,332	0	0	1,505	176,680
Fish and shellfish	9,685	943	1,280	48	39	11,995
Florists	2,940	4,558	8,334	0	307	16,139
Food brokers	50,539	105	731	4,050	0	55,425
Food products	37,973	2,883	5,265	0	0	46,121
Frozen foods	16,769	2,686	60	0	0	19,515
Fruits and vegetables	392,188	176,620	214,582	10,484	17,053	810,927
Groceries	523,487	122,899	0	2,204	0	648,590
Meat and related products	45,207	7,638	120	337	0	53,302
Poultry and shell eggs	26,351	19,991	2,933	0	0	49,275
Total	1,732,986	390,922	233,452	17,123	18,904	2,393,387

San Diego food firms maintain primary facilities totaling about 3.8 million square feet, of which 97 percent is located on the first floor. They also maintain a little less than 200,000 square feet of secondary space, almost all of which, 99 percent, is also located on the first floor. Secondary space is utilized by most of the food firm categories with the exception of candy and confectionery, dairy, food brokers, frozen food firms, meat, and poultry and shell egg companies.

The use of space varies considerably between different kinds of food firms. Of the total space occupied by San Diego firms, about 31 percent is occupied by fruit and vegetable companies. Grocery firms, with 21 percent of the total, occupy the next largest portion of the overall space used by the San Diego wholesale food industry. Bakery product wholesalers occupy about 7 percent of the total. The space used to handle individual products within these categories of firms varies with turnover rate and, in some instances, seasonal demand.

Some firms occupy relatively little space (table 12). Less than 1 percent of the total space, or about 11,000 square feet, is used as actual wholesale space by food brokers. These companies usually deliver products directly from the supplier to the wholesale customer without intermediate storage or use commercial storage facilities to hold inventory prior to sale. Frozen food firms occupy less than 2 percent of the total space, perhaps reflecting the movement of frozen food products through the inventory of other types of food companies. The high-value processing and inventory and high turnover are reflected in the less than 1 percent of space occupied by candy and confectionery companies.

A total of 229 firms maintain primary facilities; and of that number 21 also maintain secondary facilities. Table 13 summarizes types of tenure of the 229 firms in primary facilities.

[4]One of the 230 total firms studied presently operates from space leased only as needed.

Of those firms,[4] almost half, or 48 percent, lease their primary facilities. An additional 12 percent rent such facilities on a month-to-month basis. The high rate of rental and leasing may limit equity capital available for the construction of potential new facilities. Of the total number of firms maintaining wholesale facilities, 41 percent own their primary facilities. Similarly, 48 percent rent or lease secondary facilities and 52 percent own secondary facilities.

Some physical features of the buildings used by San Diego wholesale firms significantly affect the operating efficiency of the companies using the facilities. Table 14 gives information on the design of the receiving and shipping facilities at primary facilities. Forty-seven percent of the firms surveyed maintain receiving and shipping areas at efficient truckbed height but a larger share, 52 percent, load and receive products from the ground. Two firms maintain other types of receiving and shipping areas. The high incidence of ground-level receiving and shipping facilities reflects both obsolete building designs and some use of open trucks for delivery operations; such trucks are loaded in the street by forklift trucks that place pallets along the perimeter of the open vehicle.

Most primary facilities are in good condition. Of the 229 firms surveyed, 66 percent have good facilities but 34 percent occupy buildings in fair or poor condition. The condition of these primary facilities does not reflect sanitation but the general condition of the structures. As buildings age they become more difficult to maintain in good condition despite continuous efforts by the food firms occupying the facilities. Table 15 summarizes the condition of the primary facilities of the food firms included in this study. Secondary facilities were in similar condition.

Primary and secondary facilities are often located an appreciable distance apart. Because secondary facilities are often buildings used to handle overflow or to house subsidiary operations, available structures are often utilized regardless of distance from primary facilities. Table 16 shows these distance ranges. Secondary facilities for firms in the "food

Table 12.—Types and amounts of space presently occupied by type of firm, San Diego, California

Type of firm	Type of space		
	Primary	Secondary	Total
	Square feet		
Bakery products	277,700	13,050	290,750
Beverages	394,420	36,990	431,410
Candy and confectionery	10,100	0	10,100
Dairy products	206,499	0	206,499
Fish and shellfish	107,700	6,500	114,200
Florists	230,286	16,692	246,978
Food brokers	11,500	0	11,500
Food products	194,784	12,000	206,784
Frozen foods	71,770	0	71,770
Fruits and vegetables	1,241,632	15,700	1,257,332
Groceries	746,600	95,000	841,600
Meat and related products	185,668	0	185,668
Poultry and shell eggs	126,800	0	126,800
Total	3,805,459	195,932	4,001,391

Table 13.—Type of tenure in primary facilities by type of firm, San Diego, California

Type of firm	Lease	Own	Rent	Total
	Number			
Bakery products	17	7	1	25
Beverages	4	3	0	7
Candy and confectionery	2	0	1	3
Dairy products	9	5	2	16
Fish and shellfish	8	2	2	12
Florists	12	14	0	26
Food brokers	0	3	0	3
Food products	15	6	5	26
Frozen foods	5	0	0	5
Fruits and vegetables	25	24	14	63
Groceries	4	6	0	10
Meat and related products	7	14	2	23
Poultry and shell eggs	1	9	0	10
Total	109	93	27	229[1]

[1]One of the 230 total firms studied presently operates from space leased only as needed.

products" category were located an average of 21 miles from the primary facilities, in contrast to the 0.3 mile reported by fish and shellfish companies. Long distances between primary and secondary facilities cause higher-than-necessary handling costs, additional transportation expense, and, often, additional management charges to support separated operations and transfers of inventory.

San Diego food firms' facilities incur more than $12 million annually in building occupancy costs. Exact rental comparisons between different types of food firms are difficult due to different definitions of rental charges and the inclusions of rental equivalents for firms that owned their primary and/or secondary facilities. Table 17 summarizes the reported rental or estimated rental equivalents for primary and secondary facilities for all firms by category.

Employment

Food and food-related firms are major employers in San Diego. More than 5,000 workers are employed by the 230 food firms included in the scope of this study. Of the 5,000 total, the largest portion, 27 percent, is engaged in processing operations. Distribution (truck divers and helpers) and office workers (administration and sales) account for 23 and 24 percent of the total, respectively. Table 18 summarizes the kinds of employment, by type of firm and function, of San Diego food companies.

Distribution is an important and labor-intensive function of most firms. Some labor assigned to handling operations is also used for loading outgoing orders on companies' and customers' trucks.

Labor represents the key cost element of wholesale facility operations. Modernization efforts, value-adding processing, and additional customer services will all substantially impact the level of employment in the San Diego wholesale food industry. Some trends in labor utilization are already apparent. Specialized processing is increasing as firms seek new markets in their effort to remain competitive. Modernization efforts in handling, storage, and inventory management are increasing some types of labor while decreasing other types. Broadened inventories and additional services demanded by customers are creating still additional employment opportunities in some firms.

Fresh Fruit and Vegetable Firms

Fruit and vegetable firms form a particularly important element in the wholesale food industry in San Diego and thus become a significant focus of this study. Such a focus was necessary because of the significant portion of the total volume (tons) of food they move through the area, their close association with agricultural production in the region, their occupancy of much of the existing wholesale space, and their status as the major employer in the San Diego food in-

Table 14.—Types of truck loading areas in primary facilities by type of firm, San Diego, California

Type of firm	Truckbed	Ground	Other	Total
		Number		
Bakery products	6	19	0	25
Beverages	1	6	0	7
Candy and confectionery	0	3	0	3
Dairy products	7	8	1	16
Fish and shellfish	8	4	0	12
Florists	6	20	0	26
Food brokers	2	1	0	3
Food products	9	17	0	26
Frozen foods	5	0	0	5
Fruits and vegetables	36	27	0	63
Groceries	7	3	0	10
Meat and related products	15	7	1	23
Poultry and shell eggs	6	4	0	10
Total	108	119	2	229

[1]One of the 230 total firms studied presently operates from space leased only as needed.

Table 15.—Condition of primary facilities by type of firm, San Diego, California

Type of firm	Condition			
	Good	Fair	Poor	Total
	Number			
Bakery products	18	6	1	25
Beverages	7	0	0	7
Candy and confectionery	2	0	1	3
Dairy products	7	7	2	16
Fish and shellfish	6	2	4	12
Florists	12	11	3	26
Food brokers	2	1	0	3
Food products	17	4	5	26
Frozen foods	5	0	0	5
Fruits and vegetables	43	17	3	63
Groceries	5	4	1	10
Meat and related products	17	5	1	23
Poultry and shell eggs	10	0	0	10
Total	151	57	21	229[1]

[1]One of the 230 total firms studied presently operates from space leased only as needed.

Table 16.—Average distance between primary and secondary facilities by type of firm, San Diego, California

Type of firm	Miles
Bakery products	17.3
Beverages	7.0
Candy and confectionery	0
Dairy products	0
Fish and shellfish	.3
Florists	0
Food brokers	0
Food products	21.0
Frozen foods	0
Fruits and vegetables	18.0
Groceries	0
Meat and related products	0
Poultry and shell eggs	0

dustry. In addition, fruit and vegetable firms may be particularly affected by pending urban renewal construction, particularly in the Gas Lamp District redevelopment project.

A total of 63 fresh fruit and vegetable firms (table 4) are included in the scope of this project. The variation among these firms, taken as a whole, is as great as among the San Diego food industry as a whole. Of the 63 firms, the following 5 basic kinds of fruit and vegetable firms are operating in the study area: (1) wholesalers—companies that buy fruits, vegetables, and other products from producing areas and resell them to retail outlets or other wholesalers; (2) Grower-shippers—companies that have many of the same functions as wholesalers but also directly produce and distribute their own agricultural products as well as purchase produce for sale to wholesale and retail accounts; (3) repackers—firms that buy fruits and vegetables and pack them for subsequent sale to wholesale firms; (4) processors—companies that purchase fruits and vegetables and use them to manufacture specialized products for wholesale and retail distribution; and (5) wholesaler-jobbers—firms that have many of the functions of wholesale firms but also distribute producers' products under commission arrangement without taking ownership of the products.

Because many companies perform functions typical of several of the five classifications, particular classifications were based on the major activities of the respective fruit and vegetable firms at the time of the study. Table 19 summarizes the number of fruit and vegetable firms classified according to the major functions which they perform. More than half of the firms, 54 percent, are wholesalers, and grower-shippers make up an additional 38 percent. The remainder are classified as "other," including repackers, processors, and wholesaler-jobbers.

Table 17.—Rent per year in primary and secondary facilities by type of firm, San Diego, California

Type of firm	Primary facilities	Secondary facilities	Total
		Dollars	
Bakery products	903,225	199,000	1,102,225
Beverages	2,572,000	176,500	2,748,500
Candy and confectionery	32,840	0	32,840
Dairy products	528,970	0	528,970
Fish and shellfish	478,200	13,200	491,400
Florists	715,256	15,000	730,256
Food brokers	33,000	0	33,000
Food products	411,384	49,200	460,584
Frozen foods	471,000	0	471,000
Fruits and vegetables	4,277,059	20,760	4,297,819
Groceries	336,600	90,000	426,600
Meat and related products	764,400	0	764,400
Poultry and shell eggs	179,090	0	179,090
Total	11,703,024	563,660	12,266,684

Table 18.—Kinds of employment by type of firm, San Diego, California

Type of firm	Administration and sales	Handlers	Processors	Distribution		Other	Total
				Truck drivers	Drivers' helpers		
			Number				
Bakery products	104	31	346	258	0	15	754
Beverages	303	77	98	217	2	100	797
Candy and confectionery	11	3	0	4	0	0	18
Dairy products	97	39	31	168	0	9	344
Fish and shellfish	59	12	61	41	5	0	178
Florists	113	22	90	25	0	161	411
Food brokers	14	1	0	3	0	2	20
Food products	78	29	88	85	0	0	280
Frozen foods	40	25	27	23	0	0	115
Fruits and vegetables	260	388	487	225	3	178	1,541
Groceries	91	214	0	73	3	20	401
Meat and related products	98	38	90	71	2	6	305
Poultry and shell eggs	30	13	117	36	0	21	217
Total	1,298	892	1,435	1,229	15	512	5,381

Wholesalers dominate the produce industry, handling 65 percent of the total volume moving through fruit and vegetable facilities. Grower-shippers distribute an additional 33 percent of the tonnage. Sales tonnage reveals a similar pattern, with wholesale firms holding the larger market share, reflecting the higher value of produce at the wholesale level than of similar products at the farm gate. Table 20 summarizes tonnage and sales volumes by type of fruit and vegetable company.

As with the food industry as a whole, the movement of products through fruit and vegetable firms is a significant measure of the role they play in the wholesale distribution of food in the San Diego area (figure 3).

The flow chart shown in figure 3 follows the same design and definitions used earlier for figure 2.

Most products are received by San Diego fruit and vegetable firms directly from growing areas. Interdealer transfer is a significant element for some wholesale firms and a few other companies but no interdealer transfers were reported for grower-shippers. A small quantity of interdealer transfers were received by handtruck from nearby firms, but most were moved from one wholesale firm to another by truck. Most such transfers are fill-in inventory orders or small purchases from specialty companies.

The movement of produce to San Diego fruit and vegetable firms, as well as to other types of wholesale firms, is dominated by trucks. Some wholesale firms receive a limited amount of products by rail, primarily products not grown in the California production areas. Of the total volume handled by wholesale fruit and vegetable firms, a little more than 2 percent arrives by rail. They also receive a limited quantity of products that arrive at team tracks and then are moved to

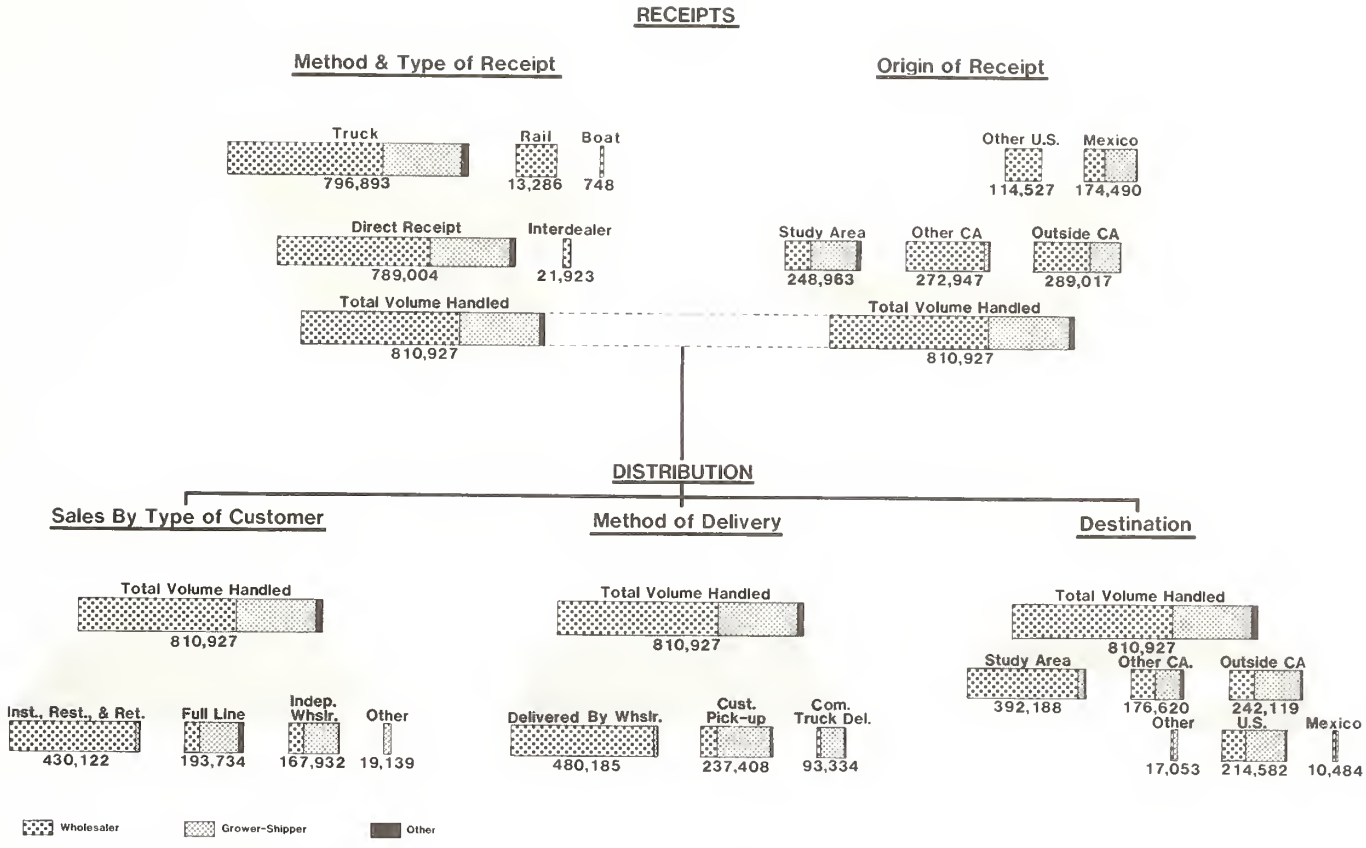


Figure 3.—Movement of product through fruit and vegetable firms (volume in tons)

the wholesale facilities by truck. Piggyback receipts are included as a part of truck receipts. Table 21 summarizes the methods of receipt by San Diego fruit and vegetable firms.

Table 22 summarizes the sources of the products distributed by San Diego fruit and vegetable firms. As might be expected, these firms draw extensively from other parts of California; about half, or 49 percent, of their total volume comes from those areas. An additional 13 percent comes from Mexico. In contrast, grower-shippers draw more than half, or 55 percent, of their total volume from within the study area, primarily growing areas owned or leased by the companies. Mexico is also a substantial source of supply for grower-shippers, providing more than 40 percent of their total sales. Part of the receipts to grower-shipper fruit and vegetable firms may come from land leased in Mexico for growing products distributed by this San Diego food firm.

Table 19.—Number of fruit and vegetable firms, San Diego, California

Type of firm	Number
Wholesaler	34
Growershipper	24
Other	5
Total	63

Table 20.—Annual tonnage and sales volumes handled by fruit and vegetable firms, San Diego, California

Type of firm	Tonnage volume	Sales volume
	Tons	*Dollars*
Wholesaler	524,480	212,884,800
Grower-shipper	264,514	92,458,000
Other	21,933	7,782,800
Total	810,927	313,125,600

Unitized shipments, mainly on pallets, are a major form of receipt by San Diego fruit and vegetable firms. Table 23 describes the form in which products are received by those firms. Wholesalers, as might be expected, receive more than half, or 54 percent, of their products stacked or strapped on pallets—a form of shipment allowing considerable economies in interior handling. They receive only a small quantity of products, mainly potatoes, in bulk. In contrast, more than half, or 51 percent, of the grower-shipper receipts are in bulk; limited amounts arrive from other suppliers on pallets and in floor-stacked cases in trucks. Other firms receive products in a variety of forms.

The different kinds of fruit and vegetable firms serve very different customers. Wholesalers concentrate on sales to local retail outlets. Such sales form 80 percent of their total volume. Grower-shippers, concentrating on larger orders, sell to customers that will, in turn, redistribute the products to distant points for retail sale. Sales to chains and other wholesalers account for more than 95 percent of the total

Table 21.—Methods of product receipt by fruit and vegetable firms, San Diego, California

Type of firm	Direct receipts					Interdealer transfers			Total volume handled
	Rail	Truck	Boat	Air	Total	Truck	Handtruck	Total	
					Tons				
Wholesaler	13,286	489,310	748	0	503,344	20,171	965	21,136	524,480
Grower-shipper	0	264,514	0	0	264,514	0	0	0	264,514
Other	0	21,146	0	0	21,146	787	0	787	21,933
Total	13,286	774,970	748	0	789,004	20,958	965	21,923	810,927

Table 22.—Sources of products received by of fruit and vegetable firms, San Diego, California

Type of firm	San Diego County	Elsewhere in California	Remainder of United States	Mexico	Other	Total
			Tons			
Wholesaler	83,899	259,025	114,527	67,029	0	524,480
Grower-shipper	144,744	12,861	0	106,909	0	264,514
Other	20,320	1,061	0	552	0	21,933
Total	248,963	272,947	114,527	174,490	0	810,927

Table 23.—Forms in which products are received by fruit and vegetable firms, San Diego, California

Type of firm	Bulk	Pallet load	Packages	Total
		Tons		
Wholesaler	17,383	285,087	222,010	524,480
Grower-shipper	135,264	39,370	89,880	264,514
Other	19,459	1,969	505	21,933
Total	172,106	326,426	312,395	810,927

volume of grower-shippers. Table 24 identifies the customers of San Diego fruit and vegetable firms.

Different kinds of San Diego fruit and vegetable firms provide various levels of service to their customers. Wholesalers use company vehicles to deliver most of their sales, almost 90 percent of their total volume, to their customers. Grower-shippers, serving larger customers with their own truck fleets and delivery operations, distribute, 96 percent of their total volume of products through backhaul arrangements (picked up by customer) and commercial trucking firms (delivered by commercial carrier). Other firms are about equally split between delivery and customer pickup. Table 25 summarizes the methods of delivery.

Wholesalers and grower-shippers differ widely in their geographic markets. Wholesalers concentrate their sales (70 percent of total volume) within San Diego County whereas grower-shippers sell only 8 percent of their volume in this area. Grower-shippers serve a national market with more than half, 52 percent, of their total volume moving out of California to the rest of the United States; they also maintain a fairly significant export market, mainly to the Far East. Los Angeles is an important market for San Diego grower-shippers; wholesalers interviewed during this study indicated a significant amount of their sales to Los Angeles move to the new produce marketing facilities in that city. Table 26 gives the destination of products sold by San Diego fruit and vegetable firms.

Fruit and vegetable firms occupy a large part of the space used by the San Diego wholesale food industry. Together, all of the fruit and vegetable wholesalers occupy about 1.3 million square feet of space (tables 12 and 27), almost 30 acres under roof. Of the different kinds of fruit and vegetables firms, wholesale and grower-shippers occupy roughly about the same amount of space. As with space occupied by the rest of the San Diego wholesale food industry, most of the space occupied by fruit and vegetable firms is located on the first floor. Wholesalers and grower-shippers use only a limited amount of secondary space.

Fruit and vegetable firms differ somewhat from the overall food trade in their employment pattern. They had more than 1,500 employees at the time of this study. Of that total, about 32 percent are engaged in processing operations (including sorting, grading, and packing). Most of the 487 processing employees, about 88 percent, worked for grower-shippers. In contrast, 54 percent of the 388 employees working in handling operations work for wholesale firms. Total employment among fruit and vegetable firms is about equally divided between wholesalers and grower-shippers—41 percent and 50 percent, respectively. The remaining employment was represented by people working for repackers, processors, and wholesaler-jobbers (classified as "other" firms). Table 28 summarizes fruit and vegetable employment.

Table 24.—Sales by type of customers of fruit and vegetable firms, San Diego, California

Type of firm	Retail outlets	Full-line distributors	Wholesalers	Other	Total
			Tons		
Wholesaler	418,628	44,017	45,646	16,189	524,480
Grower-shipper	9,131	131,607	120,826	2,950	264,514
Other	2,363	18,110	1,460	0	21,933
Total	430,122	193,734	167,932	19,139	810,927

Table 25.—Methods of delivery by fruit and vegetable firms, San Diego, California

Type of firm	Delivered by wholesaler	Picked up by customer	Delivered by commercial carrier	Total
		Tons		
Wholesaler	467,526	50,458	6,496	524,480
Grower-shipper	10,545	171,658	82,311	264,514
Other	2,114	15,292	4,527	21,933
Total	480,185	237,408	93,334	810,927

Table 26.—Destinations of products sold by fruit and vegetable firms, San Diego, California

Type of firm	San Diego County	Elsewhere in California	Remainder of United States	Mexico	Other	Total
			Tons			
Wholesaler	365,487	76,405	72,096	9,901	591	524,480
Grower-shipper	21,067	89,349	137,053	583	16,462	264,514
Other	5,634	10,866	5,433	0	0	21,933
Total	392,188	176,620	214,582	10,484	17,053	810,927

Table 27.—Space occupied by fruit and vegetable firms, San Diego, California

Type of firm	Basement	First floor	Second floor	Other	Total
			Square feet		
Primary space:					
Wholesaler	0	653,796	10,078	0	663,874
Grower-shipper	40,000	502,490	900	0	543,390
Other	0	34,368	0	0	34,368
Total	40,000	1,190,654	10,978	0	1,241,632
Secondary space:					
Wholesaler	0	7,500	200	0	7,700
Grower-shipper	0	8,000	0	0	8,000
Other	0	0	0	0	0
Total	0	15,500	200	0	15,700
Total space:					
Wholesaler	0	661,296	10,278	0	671,574
Grower-shipper	40,000	510,490	900	0	551,390
Other	0	34,368	0	0	34,368
Total	40,000	1,206,154	11,178	0	1,257,332

Table 28.—Employment in fruit and vegetable firms, San Diego, California

Type of firm	Administration and sales	Handlers	Processors	Truck drivers	Drivers' helpers	Other	Total
			Number				
Wholesaler	160	210	14	188	3	60	635
Grower-shipper	89	106	429	33	0	116	773
Other	11	72	44	4	0	2	133
Total	260	388	487	225	3	178	1,541

Problems and Potential Solutions

Several major factors are prompting San Diego firms to consider relocating to new facilities. Some firms are in areas that may be subject to extensive redevelopment that could eliminate existing buildings. Others are operating in well located, fairly modern buildings, but the buildings are now on sites that preclude the additional expansion necessary to accommodate increasing sales volumes. Some others are in buildings that are not suitable for modern operations or cannot be economically modernized or expanded. Others are currently operating in buildings that were adapted, with varying degrees of success, to handling and processing food products.

Firms that need new or improved facilities have several potential alternatives. They can relocate individually to existing industrial parks or individual building sites; where possible, they can demolish their existing buildings and construct new, modern buildings on the same site; they can attempt modernization within their existing buildings; or they can jointly develop a modern industrial park designed expressly to meet the needs of wholesale and food processing firms—a wholesale food distribution center.

Firms Needing New Facilities

Number and Kind

A total of 64 wholesale and food processing firms in the city and county of San Diego need new facilities to replace those currently used in their businesses. Fruit and vegetable firms make up the single largest group needing new facilities, 47 percent of the total, or 30 companies (table 29). Firms that are classified as bakery products companies, dairy products wholesalers, fish and shellfish firms, and meat and related products companies are also well represented in the total number of firms that need new facilities. The firms specified could comprise the nucleus of an initial development of a new wholesale food distribution center to serve San Diego and the surrounding area. Other firms could also be expected to locate on a well-designed center in later stages of development as more existing buildings become unsuitable for modern operations. Additional firms from outside the immediate area might also consider locating on such a center during the development period.

The wholesale and food processing firms needing new facilities are located throughout the study area. Of the total of 64 firms included in new facility planning, 66 percent or 42 firms are now within the city boundaries of San Diego. The remaining 34 percent, 22 firms, are outside the city but within the county of San Diego.

Table 29.—Number and types of firms included in new facility planning, San Diego, California

Type of firm	Number
Bakery products	6
Beverages	1
Candy and confectionery	1
Dairy products	6
Fish and shellfish	4
Food brokers	2
Food products	4
Frozen foods	3
Fruits and vegetables	30
Groceries	1
Meat and related products	4
Poultry and shell eggs	2
Total	64

Volume and Sales

The firms included in new facility planning are a significant part of the regional food industry. The firms handle almost 600,000 tons of food products annually, representing almost $305 million in sales. For the protection of confidential information, the various categories of firms outlined in table 29 are combined into six new categories: (1) bakery products and beverage companies; (2) candy and confectionery, food brokers, and food product firms; (3) fruit and vegetable firms; (4) meat and related products and poultry and shell egg firms; (5) dairy products companies; and (6) groceries, frozen foods, and fish and shellfish firms.

Table 30 outlines the volume and sales of the companies needing new facilities. Of the group, fruit and vegetable firms handle about 70 percent of the total annual tonnage volume and more than half, 52 percent, of total annual sales volume. Dairy firms handle a substantial volume, about 10 percent of the total tonnage volume or 12 percent of the total annual sales of the firms included in new facility planning.

Product Movement

Product movement is a particularly important consideration involving the group of San Diego food firms included in new

Table 30.—Annual tonnages and sales volumes of firms included in new facility planning, San Diego, California

Type of firm	Tons	Dollars
Bakery products and beverages	18,065	9,935,375
Candy and confectionery, food brokers, and food products	60,720	19,940,000
Fruits and vegetables	418,607	157,772,000
Meat and related products and poultry and shell eggs	16,556	42,154,650
Dairy products	61,141	36,431,590
Groceries, frozen foods, and fish and shellfish	22,528	38,617,750
Total	597,617	304,851,365

facility planning. Major elements of a potential new wholesale food distribution center, including possible sites, are directly affected by the product movement patterns of the firms needing new facilities as well as those of the total food industry (figure 2). Figure 4 summarizes the product movement of the firms included in new facility planning.

Trucks dominate the movement of supplies to this group of firms as they do in the overall movement of food to the San Diego food industry. Ninety-five percent of the total volume handled arrives at existing wholesale facilities by truck. Only 2 percent of the total arrives at these facilities by rail, and much of that volume currently arrives in the area on team tracks for later movement to primary facilities by truck. Rail access may not be a major element in new facility planning. Interdealer transfers are also not of major consideration as they account for only 3 percent of total volume. Of the limited amount of interdealer transfers, almost all arrives at the wholesale facility by truck. Table 31 summarizes the methods and types of receipt.

The San Diego firms included in new facility planning make major use of unitized shipments. Almost half, 45 percent, of the total annual volume of products arriving at existing wholesale facilities is preloaded by the supplier on reusable or throw-away pallets. Much of the remainder, 41 percent, still arrives at the wholesale facilities stacked in truck bodies. Fruit and vegetable firms are typical of the firms, as a group, in the use of unitized receipts. New facilities will need specialized receiving docks suitable for taking full advantage of the economies made possible by unitized shipments. Table 32 outlines the forms in which products are received at the buildings used by the firms included in new facility planning.

California is a major supplier. More than 55 percent of the total volume handled by firms included in new facility planning originates within the State; about 14 percent, mainly fruits and vegetables, originates within the study area. Imports, mainly from Mexico, are also important to fruit and vegetable firms, as well as to some of the other categories. Extensive use of nearby sources of supply may be a major factor in limiting the use of rail for incoming shipments. Table 33 summarizes receipt by point of origin.

The firms included in new facility planning serve a wide variety of customers, concentrating on selling to retail outlets and the institutional trade. Of the total volume handled, about 57 percent moves to these types of customers. Independent wholesalers are also important customers, accounting for about 23 percent of total volume. New facilities will need to accommodate display areas and to include flexibility

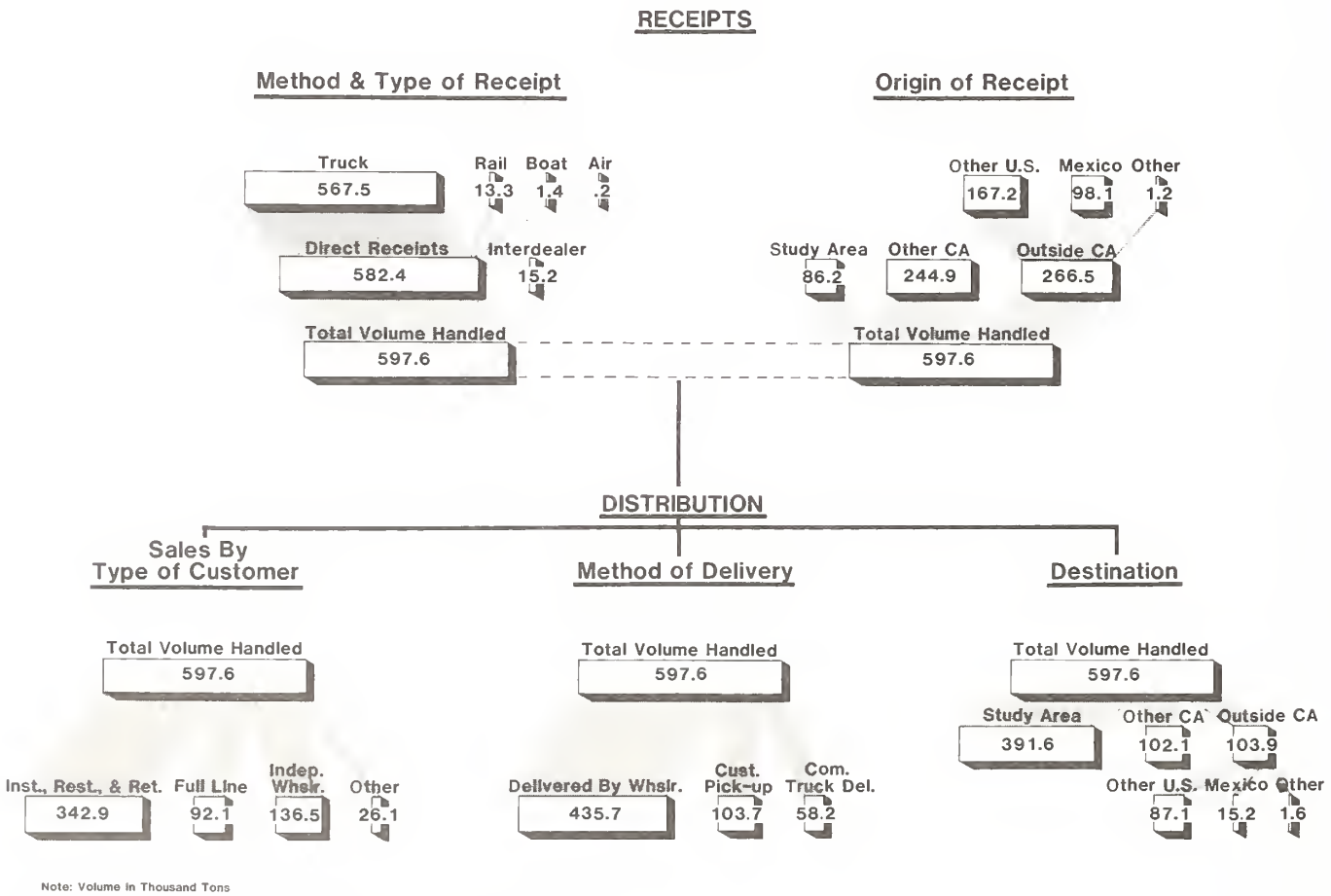


Figure 4.—Product movement by firms included in new facility planning.

Table 31.—Methods and types of receipt by firms included in new facility planning, San Diego, California

Type of firm	Direct receipts					Interdealer transfers			Total volume handled
	Rail	Truck	Boat	Air	Total	Truck	Handtruck	Total	
					Tons				
Bakery products and beverages	0	17,922	0	0	17,922	143	0	143	18,065
Candy and confectionery, food brokers, and food products	0	60,720	0	0	60,720	0	0	0	60,720
Fruits and vegetables	13,286	389,553	748	0	403,587	14,055	965	15,020	418,607
Meat and related products and poultry and shell eggs	0	16,556	0	0	16,556	0	0	0	16,556
Dairy products	0	61,141	0	0	61,141	0	0	0	61,141
Groceries, frozen foods, and fish and shellfish	0	21,668	683	155	22,506	22	0	22	22,528
Total	13,286	567,560	1,431	155	582,432	14,220	965	15,185	597,617

Table 32.—Forms in which products are received by firms included in new facility planning, San Diego, California

Type of firm	Bulk	Pallet	Package	Other	Total
			Tons		
Bakery products and beverages	0	16,176	1,889	0	18,065
Candy and confectionery, food brokers, and food products	194	31,719	28,807	0	60,720
Fruits and vegetables	32,195	190,874	195,538	0	418,607
Meat and related products and poultry and shell eggs	0	3,847	12,679	30	16,556
Dairy products	0	11,612	30	49,499	61,141
Groceries, frozen foods, and fish and shellfish	0	17,175	4,403	950	22,528
Total	32,389	271,403	243,346	50,479	597,617

in design to provide for the many kinds of products demanded, particularly by the institutional food trade. Table 34 outlines sales in tons by types of customers.

These firms also provide a high level of service to their customers. Of the total volume handled, about 73 percent is delivered on the wholesalers' trucks directly to their customers' facilities. An additional 10 percent is distributed by commercial carriers at the sellers' expense. The remaining 17 percent is picked up at wholesale facilities by customers on their own trucks. These different delivery methods place specific demands on the design of potential new facilities. First, a substantial amount of parking space for delivery trucks must be available, both directly at new wholesale buildings and away from the immediate vicinity of the new buildings, to accommodate the extensive delivery operations of these firms. Also, shipping facilities must be served by truck parking and maneuvering areas large enough to accommodate tractor-trailer combinations typically used by most commercial carriers. Additionally, firms carrying out cash-and-carry operations should have facilities with low, open docks designed to accommodate the small trucks and vans typically used by customers to transport merchandise to retail outlets and small restaurants.

Most of the customer pickups at fruits and vegetables firms are at grower-shipper firms,[5] and such sales are usually transported in large tractor-trailer vehicles. Customers of these firms are often wholesale firms that make arrangement for commercial carriers to move their purchases to their wholesale facilities for later redistribution to retail or other outlets. Table 35 outlines methods of delivery for all firms included in new facility planning.

Customers' locations are a particularly important consideration in the development of a potential new market to house the companies included in new facility planning. Table 36 gives information on the geographic destination of products by type of company.

From the standpoint of site location, the most important type of product movement is that movement within the study area. Costs associated with other distribution extending for substantial distances beyond San Diego County will not be substantially affected on a proportional basis by different sites within the study area. Also, distribution outside the

[5]See tables 24 and 25 for illustrations of sales by customer type and delivery patterns of the fruit and vegetable firms included in this study.

Table 33.—Origins of receipts by firms included in new facility planning, San Diego, California

Type of firm	California			Other States	Imported			Total
	Study area	Other	Total		Mexico	Other	Total	
				Tons				
Bakery products and beverages	1,889	16,176	18,065	0	0	0	0	18,065
Candy and confectionery, food brokers, and food products	498	14,484	14,982	42,903	2,835	0	2,835	60,720
Fruits and vegetables	79,954	164,520	244,474	78,950	95,183	0	95,183	418,607
Meat and related products and poultry and shell eggs	1,285	2,144	3,429	12,288	0	839	839	16,556
Dairy products	368	41,223	41,591	19,550	0	0	0	61,141
Groceries, frozen foods, and fish and shellfish	2,264	6,325	8,589	13,479	90	370	460	22,528
Total	86,258	244,872	331,130	167,170	98,108	1,209	99,317	597,617

Table 34.—Types of customers served by firms included in new facility planning, San Diego, California

Type of firm	Institutional and retail	Chains and full-line distributors	Independent wholesalers	Other	Total
			Tons		
Bakery products and beverages	17,693	152	220	0	18,065
Candy and confectionery, food brokers, and food products	5,006	7,364	48,350	0	60,720
Fruits and vegetables	257,683	81,812	64,892	14,220	418,607
Meat and related products and poultry and shell eggs	15,834	390	121	211	16,556
Dairy products	30,113	2,185	22,629	6,214	61,141
Groceries, frozen foods, and fish and shellfish	16,558	233	322	5,415	22,528
Total	342,887	92,136	136,534	26,060	597,617

Table 35.—Methods of delivery used by firms included in new facility planning, San Diego, California

Type of firm	Wholesalers' trucks	Buyers' trucks	Commercial carriers	Total
		Tons		
Bakery products and beverages	17,119	946	0	18,065
Candy and confectionery, food brokers, and food products	15,287	1,164	44,269	60,720
Fruits and vegetables	316,439	92,917	9,251	418,607
Meat and related products and poultry and shell eggs	16,251	305	0	16,556
Dairy products	51,823	4,948	4,370	61,141
Groceries, frozen foods, and fish and shellfish	18,776	3,472	280	22,528
Total	435,695	103,752	58,170	597,617

county would be either by large vehicles with a fairly low ton-mile cost or by commercial carriers with fixed tariffs. In contrast, distribution within San Diego County is often by small vehicles with a very high ton-mile cost. Of the total volume presently handled by these firms, 66 percent is distributed within San Diego County.

Present Facilities

Existing space provides a benchmark for the planning of a new wholesale food distribution center. Modern, centralized facilities, however, can be expected to support processing, storage, and handling operations efficiently, requiring less space per ton of volume. Also, for the realization of construction economies, new facilities must accommodate

Table 36.—Destinations of products distributed by firms included in new facility planning, San Diego, California

Type of firm	California			Other States	Exported			Total
	Study area	Other	Total		Mexico	Other	Total	
				Tons				
Bakery products and beverages	17,822	96	17,918	147	0	0	0	18,065
Candy and confectionery, food brokers, and food products	55,334	405	55,739	931	4,050	0	4,050	60,720
Fruits and vegetables	228,097	94,372	322,469	85,777	8,787	1,574	10,361	418,607
Meat and related products and poultry and shell eggs	12,180	4,256	16,436	0	120	0	120	16,556
Dairy products	59,437	1,704	61,141	0	0	0	0	61,141
Groceries, frozen foods, and fish and shellfish	18,702	1,303	20,005	296	2,227	0	2,227	22,528
Total	391,572	102,136	493,708	87,151	15,184	1,574	16,758	597,617

growth expected for the first 5 years of a new center's life. Table 37 outlines the space presently used by the companies included in new facility planning.

Together, those companies occupy about 856,000 square feet, or about 20 acres under roof. Of that total, about 95 percent is first-floor space, and almost all of the space is in primary facilities. Of the total space, 19 percent is in coolers and freezers and about 11 percent is used for processing or other specialized operations.

Fruit and vegetable firms dominate the existing space of the firms anticipated to relocate to a new center, about 66 percent of the total. Dairy product firms currently occupy an additional 12 percent of the total existing space.

Table 38 outlines some of the present facility characteristics other than space that are important considerations in new facility planning. Currently, the firms included in new facility planning are paying about $2.6 million annually in rent or, if owned, rental equivalent. Such facility charges cannot be measured accurately and compared between companies or types of companies because many special arrangements exist between owners and tenants of commercial property to support taxes, utilities, maintenance, and other related, expenses.

Most firms rent or lease their buildings. Of the 64 firms included in new facility planning only 27 percent own their primary facilities. The high percentage of firms renting, 73 percent of the total number of firms, reflects substantial property values in some of the areas currently occupied by segments of the San Diego food industry.

More than one-third of the existing buildings are considered to be in fair to poor condition. The remaining buildings are in good condition but may be either too small to support existing or anticipated operations or otherwise unsuited for modern food warehousing or processing techniques.

Employment

Employment is a major social measure of the importance of the developing of a new wholesale food distribution center to support the firms included in new facility planning. More than 1,000 employees currently work in those firms. They range from administration and sales workers (25 percent of the total) warehouse workers and processors (43 percent) to those distributing products to San Diego customers (28 percent). The remaining employees are generally in support functions. Table 39 outlines the current employment of the companies included in new facility planning.

Table 37.—Present space (primary and secondary) used by firms included in new facility planning, San Diego, California

Type of firm	non-refrigerated	Refrigerated			Office	Other	Total
		Cooler	Freezer	Total			
				Square feet			
Bakery products and beverages:							
Basement	0	0	0	0	0	0	0
First floor	19,957	2,431	5,144	7,575	6,531	23,008	57,071
Second floor	1,000	0	0	0	450	0	1,450
Other	0	0	0	0	0	3,000	3,000
Total	20,957	2,431	5,144	7,575	6,981	26,008	61,521
Candy and confectionery, food brokers, and food products:							
Basement	0	0	0	0	0	0	0
First floor	24,686	464	200	664	3,650	4,700	33,700
Second floor	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0
Total	24,686	464	200	664	3,650	4,700	33,700
Fruits and vegetables:							
Basement	0	0	0	0	0	0	0
First floor	437,042	85,968	510	86,478	9,394	16,901	549,815
Second floor	0	0	0	0	5,628	400	6,028
Other	0	0	0	0	0	6,240	6,240
Total	437,042	85,968	510	86,478	15,022	23,541	562,083
Meat and related products and poultry and shell eggs:							
Basement	1,565	500	500	1,000	0	0	2,565
First floor	1,900	12,265	4,400	16,665	3,050	3,635	25,250
Second floor	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0
Total	3,465	12,765	4,900	17,665	3,050	3,635	27,815
Dairy products:							
Basement	0	0	0	0	0	0	0
First floor	13,850	18,585	8,325	26,910	12,170	29,800	82,730
Second floor	10,000	0	0	0	10,000	0	20,000
Other	0	0	0	0	0	0	0
Total	23,850	18,585	8,325	26,910	22,170	29,800	102,730
Groceries, frozen foods, and fish and shellfish:							
Basement	0	0	0	0	0	0	0
First floor	32,025	8,170	14,490	22,660	5,070	8,415	68,170
Second floor	0	0	0	0	200	0	200
Other	0	0	0	0	0	0	0
Total	32,025	8,170	14,490	22,660	5,270	8,415	68,370
Total:							
Basement	1,565	500	500	1,000	0	0	2,565
First floor	529,460	127,883	33,069	160,952	39,865	86,459	816,736
Second floor	11,000	0	0	0	16,278	400	27,678
Other	0	0	0	0	0	9,240	9,240
Total	542,025	128,383	33,569	161,952	56,143	96,099	856,219

Table 38.—Primary building characteristics of firms included in new facility planning, San Diego, California

Type of firm	Rent or rental equivalent (all facilities)	Tenure					Condition			
		Rent	Lease	Total rental	Own	Total	Good	Fair	Poor	Total
	Dollars				*Number*					
Bakery products and beverages	304,461	0	5	5	2	7	5	2	0	7
Candy and confectionery, food brokers, and food products	132,516	3	2	5	2	7	5	2	0	7
Fruits and vegetables	1,278,221	9	14	23	7	30	20	7	3	30
Meat and related products and poultry and shell eggs	266,250	0	2	2	4	6	5	1	0	6
Dairy products	246,750	0	5	5	1	6	2	4	0	6
Groceries, frozen foods, and fish and shellfish	411,600	1	6	7	1	8	4	1	3	8
Total	2,639,798	13	34	47	17	64	41	17	6	64

Table 39.—Employment by firms included in new facility planning, San Diego, California

Type of firm	Administrative and sales	Warehouse			Distribution			Other	Total
		Handlers	Processors	Total	Truck drivers	Truck helpers	Total		
				Number					
Bakery products and beverages	38	11	63	74	23	0	23	5	140
Candy and confectionery, food brokers, and food products	23	6	9	15	14	0	14	2	54
Fruits and vegetables	102	230	48	278	150	0	150	13	543
Meat and related products and poultry and shellfish	35	11	13	24	24	0	24	6	89
Dairy products	24	10	15	25	43	0	43	2	94
Groceries, frozen foods, and fish and shellfish	45	28	10	38	33	5	38	7	128
Total	267	296	158	454	287	5	292	35	1,048

Wholesale Food Distribution Center

A new wholesale food distribution center to serve the San Diego region represents the major alternative for meeting the facilities requirements of the firms needing to relocate to new buildings. Such a center, an industrial park designed to meet the particular needs of a wide variety of food wholesale and processing firms, offers the opportunity for correcting the identified problems in present facilities. Figure 5, which illustrates an artist's conception of such a new wholesale food distribution center, shows the center as it would appear at the end of the development period with all buildings fully developed. It also shows additional buildings for firms needing to relocate from specialized, shared facilities to custom-designed structures over the life of the projected development.

The concept of a complete wholesale food distribution center is in contrast with smaller, specialized markets designed to serve the facility requirements of only one of the food firm groups included in new facility planning. More specialized markets may lack the financial flexibility and stability of the concept illustrated in figure 5 but such a smaller center may be necessary to accommodate site limitations should the new center be located in some portions of the study area.

Types of Facilities

Three types of buildings are included in the plans for the new center: (1) single-occupancy buildings, (2) multiple-occupancy buildings, and (3) support facilities. Each type is designed to meet a particular need on the new center.

Single-occupancy buildings are wholesale or processing facilities designed to meet the needs of a particular firm and are custom designed for that firm only. Generally, large firms requiring more than 10,000 square feet of first-floor space choose to occupy single-occupancy buildings. Figure 6 illustrates the exterior of a typical single-occupancy building.

This particular building is designed for large, general-line fruit and vegetable firms with specialized processing operations.

Multiple-occupancy buildings are designed to be shared by several independent companies. Each multiple-occupancy building contains a series of 30- by 100-foot modules or units. A wholesaler or processing firm can rent, lease, or own one or more of these modules. The multiple-occupancy building is designed to allow stacking products to a maximum height of 21 feet from the main floor of the building. This ceiling height represents a compromise between storage efficiency through the extensive use of overhead space and a need to minimize construction costs.

Figure 5.—Artist's conception of a planned wholesale food distribution center for San Diego, California. (see also inside cover)

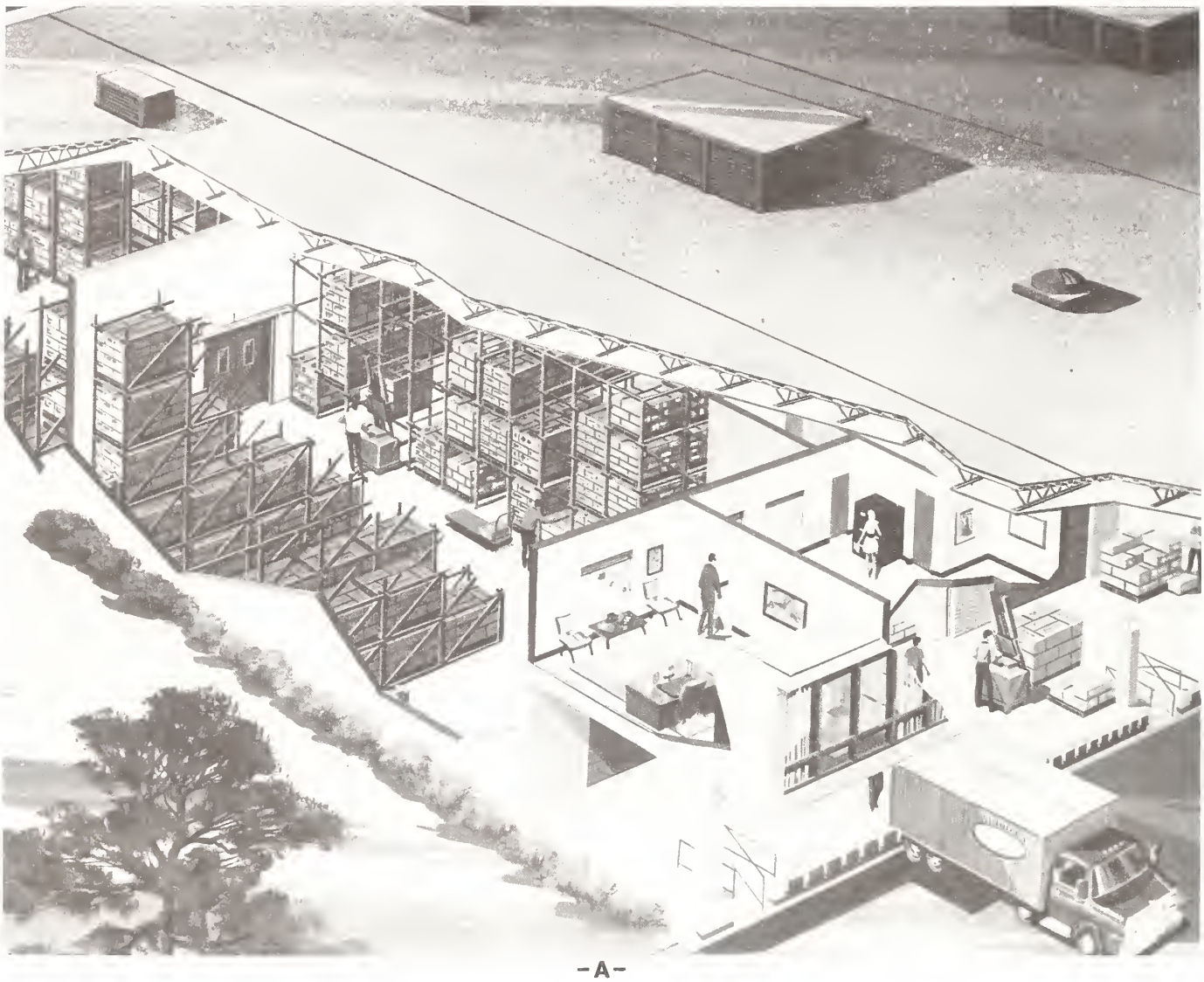
Figure 6.—Artist's conception of the exterior of a single-occupancy building.

Dock heights are compatible with those of modern trucks. Other design features incorporated in multiple-occupancy buildings were included to make these buildings compatible with their intended uses. Drains, where appropriate, are located in the floor to dispose of water used to clean floors or, when handling some products, water from melting ice. Doors and other vulnerable edges are protected by bumper strips. First floors are concrete and designed to bear expected loads. Freezer floors require additional subslabs to withstand the constant freezing temperature.

A 20-foot mezzanine extends across the front of the building for offices, restrooms, lunchrooms, lockers, and light storage. Some types of multiple-occupancy units may require mezzanine extensions to form complete or partial second floors for extensive support facilities or light storage.

Plans include two designs for multiple-occupancy buildings in the design for the new San Diego market—one with an open platform and one completely enclosed from front to rear. While each unit within a multiple-occupancy building would be uniform, the different buildings on the center could feature one or the other of the two basic designs. The particular building a firm chooses would presumably depend on the type of delivery operation the firm expects to use.

Some wholesalers depend on customers visiting the wholesale facilities to select and load their merchandise. Such customers require a continuous platform to provide them with access to the individual firms and to allow them to move their purchases to trucks parked at various locations along the building. Figure 7 (A and B) illustrates the general structural design for a multiple-occupancy building with an open platform. The plan (fig. 7B) depicts two adjacent units enclosed at the rear. Four truck doors provide access along the front of the unit, and a combination entrance provides access both to the building's first floor and an overhead mezzanine. Overhead 10- by 10-foot doors allow efficient use of space, while allowing a high-reach forklift truck easy access between the building and the platform. Additional truck doors can be located along the back of the building if needed for additional access. Bumper strips protect the front edge of the open platform. Recessed stairways provide access to the platform from the street; stairs are generally located at regular intervals along the platform to minimize the distance walked by truckers to prepare their vehicles for unloading. An emergency exit is located at the back of the building; this exit may not be needed if conventional doors are located along the rear of the facility. Restrooms are located on the mezzanine; additional restroom facilities may be located on the first floor, as required, in larger combinations of units. Small sales or



-A-

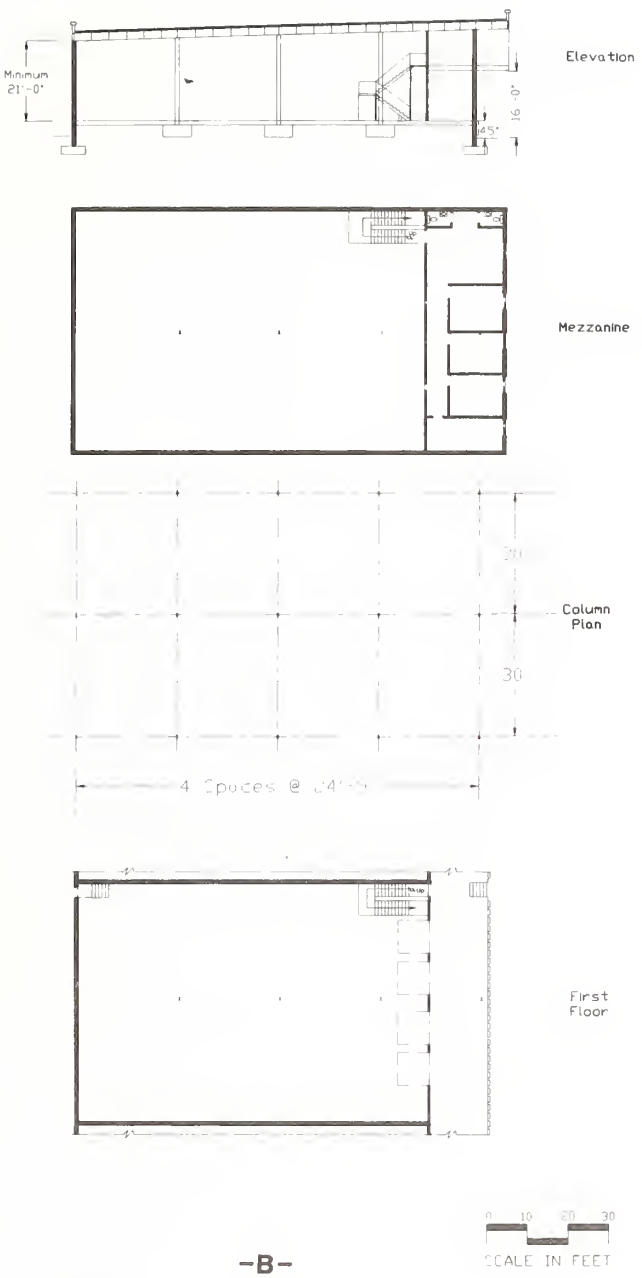
Figure 7.—(A) Artist's conception of the interior of a multiple-occupancy building unit with open platform and (B) plan for a multiple-occupancy building double unit with open platform.

managers' offices may be located near the front doors. The open platforms are generally used for extensive displays of products offered for sale by the companies.

Other wholesale firms sell by telephone and deliver most of their products to their customers on company trucks. Those firms need the maximum amount of space possible for storage and other wholesale or processing operations. Such users of multiple-occupancy buildings prefer a building completely enclosed from the front to the rear like that illustrated in figure 8 (A and B). Optional truck-receiving doors are shown
at the rear of the facility. Separate stairways provide access to the ground from each firm's unit. A separate stairway provides access to the overhead mezzanine. The space under the mezzanine is used for order assembly, a function that generally does not require the high ceilings needed for pallet racks and modern forklift trucks.

Other types of facilities are also needed on a new San Diego wholesale food distribution center to support the activities of the food firms operating on the market. Such facilities may include an office building, restaurants, motels, banks, and other commercial facilities. Other food- related facilities, such as public dry and/or refrigerated storage warehouses, may also be located on the site.

A centralized refrigeration facility may offer particular opportunities for economies in the investment and operation of the significant amount of refrigerated storage and related facilities expected on the new San Diego center. A single central



-B-

energy plant would provide chilled fluid, for all of the coolers and freezers on the center, through underground pipes to individual buildings. In addition, the plant would also provide hot water produced from the heat recovered from refrigeration machinery for cleaning, processing operations, and other purposes. Research by the U.S. Department of Agriculture indicates that the investment and operating costs for a centralized refrigeration plant to serve the needs of all of the wholesalers and processors on the San Diego center would be substantially less than those for each firm to have its own, individual refrigeration equipment.[6] Specific information from some of this research has been updated to support facility recommendations in this and previous studies of wholesale food distribution facilities.

Some facilities support general activities on the market. Such facilities include offices for the market manager, sheds for storing street cleaning and other maintenance equipment, facilities for solid waste storage and disposal facilities, and facilities to support security services. Research has been conducted by the U.S. Department of Agriculture[7] and others on the development of such facilities.

Streets and parking are particularly important considerations and represent a major portion of the physical area of modern wholesale food distribution centers. Parking should be designed for both conventional cars and large over-the-road tractor-trailers that would be present in substantial numbers on a new San Diego wholesale food distribution center. Streets should be designed to accommodate the wide turning radius of tractor-trailers, as well as the weight of fully loaded vehicles. Concrete strips should be available in some parking areas to accommodate the small front wheels used to support trailers removed from tractors.

Utilities are an important part of the infrastructure needed to support modern food firms. Above-ground facilities should be located where they will accommodate intended purposes and where they will be well protected against accidental damage from handling equipment and vehicles using center streets and parking areas. All streets and parking areas should be carefully drained and served by suitable sewers.

Planned Space

The various parts of the planned wholesale food distribution center are intended to meet the immediate and planned facility requirements for the 64 wholesale firms that were included in new facility planning and are expected to locate on the new development. They will require a total of 502,810 square feet of first-floor enclosed building space and land for an additional 218,890 square feet of space over the 30-year anticipated life of the development. When fully developed, the new center will total 721,700 square feet of food wholesale and processing space and additional space for support and auxiliary facilities. Table 40 summarizes the initial space needs and the additional space needed for expansion. The methodology used to develop these estimates is summarized in previous USDA publications and unpublished technical studies.[8]

The initial space, 502,810 square feet, will be about equally divided between multiple-occupancy (48 percent) and single-

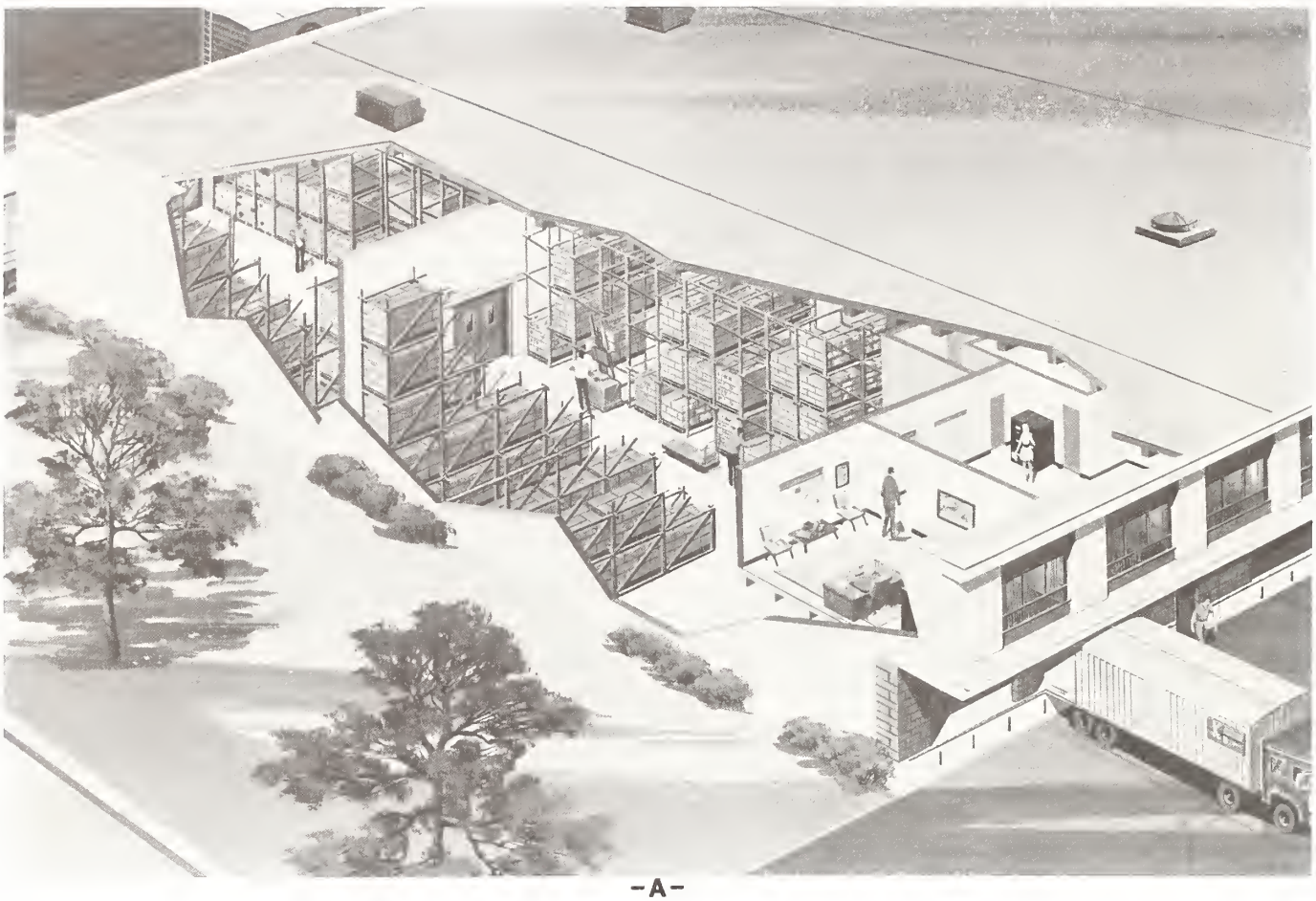
[6]Stahlman, Robert L. *A Study of Refrigeration Systems for Urban Food Distribution Centers*, MRR-921, USDA, 107 pp., ill., 1972.

[7]Goulston, Charles L. *Security for Food Distribution Centers*, ARS-NE-33, USDA, 16 pp., ill., 1974.

Stearns, Robert P., et al. *Solid Waste Management in Wholesale Food Distribution Centers*, MRR 994, USDA, 57 pp., ill., 1973.

[8]Overheim, Richard K., et al. *Improved Food Distribution Facilities for Northeastern New Jersey*, MRR 1133, 118 pp., ill., USDA, 1983.

Norton, Jerry D. (Unpublished), *The Space Projection Model and Its Consumption Projections*, 7 pp., ill., 1987.



-A-

Figure 8.—(A) Artist's conception of the interior of a completely enclosed multiple-occupancy building unit and (B) plan for a completely enclosed multiple-occupancy building double unit.

occupancy buildings (52 percent). Of the six types of firm groupings, fruit and vegetable firms will occupy the single largest portion of the initial space, almost half of the total, or 49 percent. In contrast, the next largest user of space, bakery product and beverage companies, will occupy only 14 percent of the initial space.

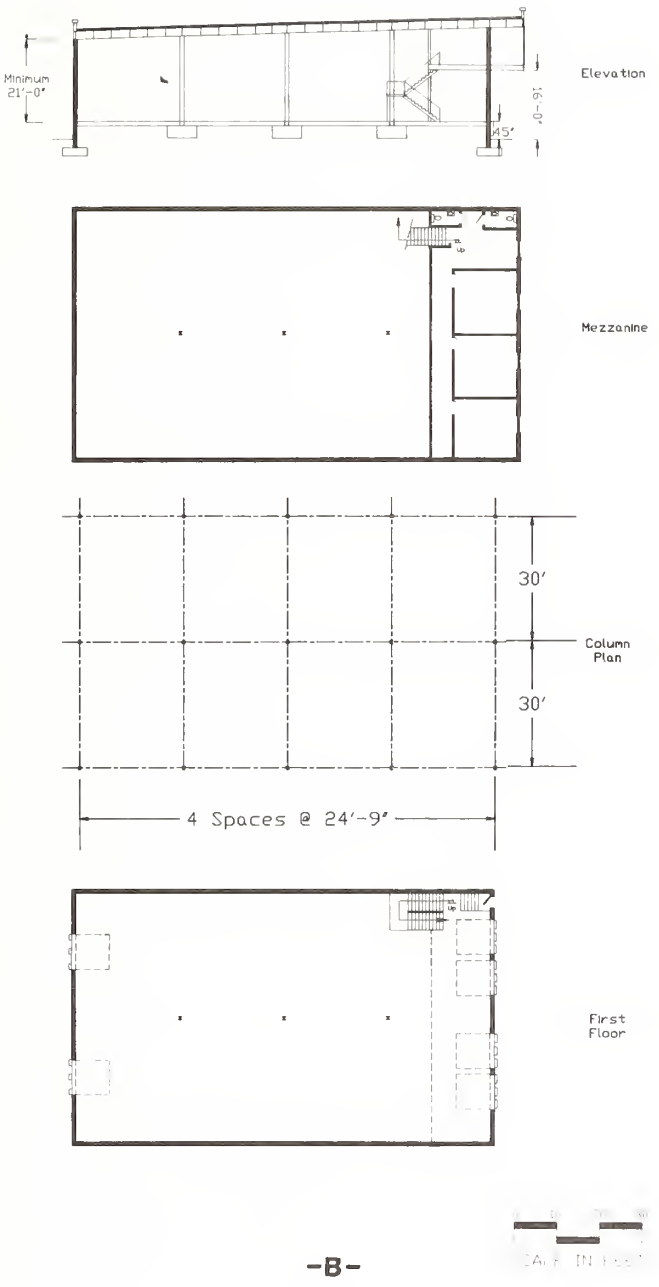
Fruit and vegetable companies follow a similar pattern of space utilization, as do the firms that will occupy the center as a whole. Produce companies are about equally split between multiple- and single-occupancy buildings, 53 and 47 percent, respectively, of the total space occupied by this group of firms.

Over the life of the development, the kinds and amounts of space needed by the firms included in new facility planning will evolve into new arrangements. Some firms in multiple-occupancy buildings will expand, acquiring additional adjacent or nearby units to accommodate their business growth. Other firms in this type of building are expected to expand their operations to the extent that they will need to relocate from a group of units in a multiple-occupancy building to custom-designed, single-occupancy buildings that can more efficiently meet their facility requirements.

Generally, space vacated in multiple-occupancy buildings will be occupied by other companies in the multiple-occupancy building when they expand their operations, in turn. Over the life of the development seven additional multiple-occupancy units will be required to meet those expansion needs. These additional units are in addition to three units which are expected to become available from bakery products and beverage companies relocating to single-occupancy buildings or adjusting space requirements to meet anticipated changes in consumption patterns.

Single-occupancy space will undergo a more dynamic growth pattern. Initially, 13 single-occupancy buildings will be needed to meet the immediate demands for space by large firms that are expected to locate on a modern San Diego wholesale food distribution center. They include:

Type of firm	*Single-occupancy buildings*
Beverage	1
Bakery	1
Food products	1
Fruit and vegetable	3
Meat	2
Dairy	3
Frozen foods	2



-B-

When the development is complete, this pattern will have changed substantially. Single-occupancy buildings for bakeries will have increased from one to two; and fruit and vegetable single-occupancy buildings will have more than doubled, from three to seven.

A total of 102 acres is needed to accommodate the wholesale food and processing firms anticipated to locate on the new center and to provide space for the orderly expansion of these firms over the life of the new development. Table 40 summarizes these specific land requirements for each type of firm included in new facility planning. An additional 8 acres would also be needed for necessary support facilities and auxiliary businesses expected to locate on the center during the initial development phases of the project. A still additional 40 acres may be needed for firms locating on the new market in later stages of development for a total land requirement of 150 acres.

Arranging Space

Planning for the changes anticipated over the growth of a new center is necessary to ensure the success of the development. Figure 9 illustrates one possible arrangement of facilities on a new wholesale food distribution center to serve the San Diego region. The arrangement presented is reflected in the artist's conception of the new center shown in figure 5, earlier in the report. Development of the arrangement did not include consideration of the limitations frequently found on particular sites but did include an assumption that utilities and immediate road access would be available. Special construction requirements are not reflected in this arrangement. Figure 9 illustrates the arrangement as it would appear in the last stages of the new market's development, with all anticipated single-occupancy buildings constructed and all of the buildings on the center expanded to their full development.

The new center is arranged to promote efficient use of land, group compatible types of firms, ease traffic flow, and provide for orderly future development. A good design benefits each firm locating in the new facilities by minimizing investment and promoting efficient product movement to and from individual buildings.

Multiple-occupancy buildings, which will house firms considered to be major traffic generators, are located with both a separate entrance to adjoining public streets and similar access to the major market street. These buildings are grouped together to allow firms using the facilities to share streets, parking, and truck maneuvering areas. Each multiple-occupancy building would be provided with an expansion area at both ends of the structure to maximize the opportunity for firms in the structure to secure adjacent new space in later stages of development.

Each single-occupancy building is located on a defined site within the overall wholesale food distribution center. Parking, building, and expansion are arranged individually to suit the requirements of particular firms. Market street access is immediately available to each building. Heavy refrigeration users are clustered near the projected central energy or refrigeration plant to minimize the costs of pipes leading from the plant to individual buildings.

Where compatible with efficient land use, similar firms in single-occupancy buildings are grouped together in defined areas within the center. This arrangement helps promote an efficient development of different portions of the center on a commodity basis. In addition, firms may be able to share some common support facilities.

Streets and parking reflect anticipated traffic. Market lighting is planned along all streets; additional lighting would be located on individual sites.

Example Internal Arrangements

Planning is also a critical element for the companies that relocate into the new facilities on a San Diego wholesale food

Table 40.—Facility space requirements for firms included in new facility planning, San Diego, California

Type of firm	Initial space				Expansion			
	Multiple-occupancy units	Multiple-occupancy building	Single-occupancy building	Total	Multiple-occupancy biulding	Multiple-occupancy building	Single-occupancy building	Total
	Number	*Square feet*			*Number*	*Square feet*		
Bakery products and beverages	12	36,000	34,000	70,000	(3)	(9,000)	52,700	43,700
Candy and confectionery, food brokers, and food products	8	24,000	10,000	34,000	2	6,000	0	6,000
Fruits and vegetables	44	132,000	114,890	246,890	2	6,000	94,810	100,810
Meat and related products, and poultry and shell eggs	5	15,000	22,000	37,000	1	3,000	9,300	12,300
Dairy products	2	6,000	41,420	47,420	0	0	28,580	28,580
Groceries, frozen foods, and fish and shellfish	10	30,000	37,500	67,500	5	15,000	12,500	27,500
Total	81	243,000	259,810	502,810	7	21,000	197,890	218,890
Support facilities								
Total land required								

Table 40.—Facility space requirements for firms included in new facility planning, San Diego, California—Continued

Type of firm	Total space for fully developed center				
	Multiple-occupancy units	Multiple-occupancy building	Single-occupancy building	Total	Land
	Number		*Square feet*		*Acres*
Bakery products and beverages	9	27,000	86,700	113,700	18.66
Candy and confectionery, food brokers, and food products	10	30,000	10,000	40,000	6.35
Fruits and vegetables	46	138,000	209,700	347,700	42.05
Meat and related products, and poultry and shell eggs	6	18,000	31,300	49,300	7.01
Dairy products	2	6,000	70,000	76,000	13.84
Groceries, frozen foods, and fish and shellfish	15	45,000	50,000	95,000	14.95
Total	88	264,000	457,700	721,700	102.86
Support facilities					8.02
Total land required					110.88

distribution center. To make efficient use of the new, modern buildings, wholesalers and processors will often have to change operating methods and techniques, as well as make additional investments in new equipment, to take full advantage of their new facilities. The layouts included in this section of the report are examples of possible internal arrangements for the major users of space on the new market. The layouts are illustrative only and do not represent planned facilities for particular companies.

Fruit and Vegetable.-Fruit and vegetable firms on the new market are likely to differ substantially, both in the size and the nature of their operations. In general, full-line wholesalers, ripening companies, and large fruit and vegetable wholesalers both handle and process related products. Full-line wholesalers are companies that handle a wide variety of products, generally selling directly to retail outlets and restaurants. Ripening companies are specialists that buy tomatoes or bananas; ripen, sort, and repack the products; and often sell their products to other fruit and vegetable firms for subsequent sale to the final retail outlet.

Many full-line wholesalers would be expected to relocate to multiple-occupancy buildings. Figure 10 illustrates how such a firm
might arrange its facilities in two units in an open-platform multiple-occupancy building. No processing operations are anticipated in this layout. The produce storage areas are divided into two main areas: (1) general storage for items that will be held in air-conditioned space at about 50 degrees F,

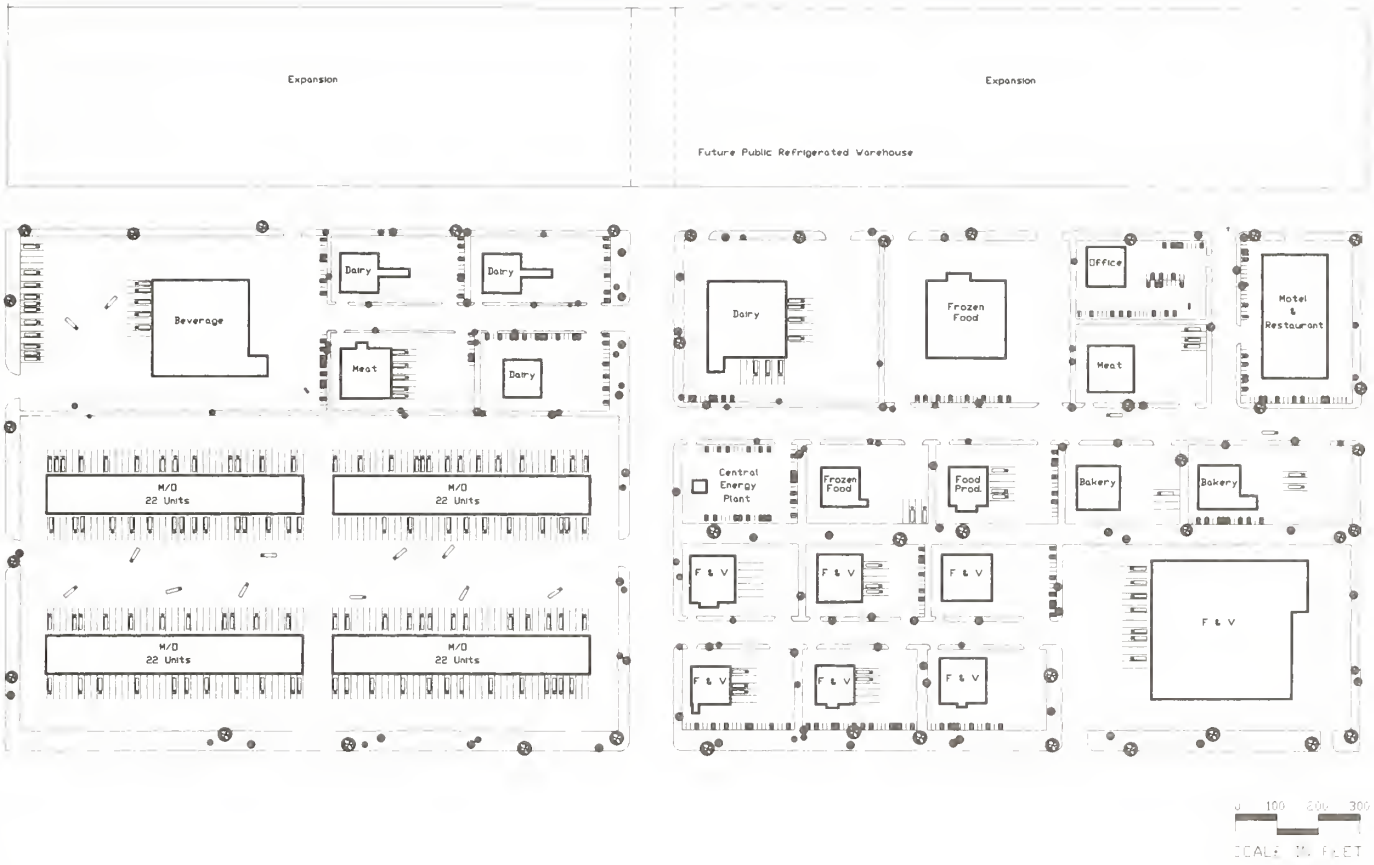


Figure 9.—Possible arrangement of facilities on a new wholesale food distribution center for San Diego, California. (NOTE: M/O = Multiple-occupancy; F&V = Fruits and Vegetables.)

and (2) cold storage for items held at about 32 degrees F. The cold storage area, in turn, is divided into wet and dry coolers for products held at different temperatures. Some research by the U.S. Department of Agriculture and others has indicated that combining wet and dry coolers into a single cooler provides some space savings.[9] Should this option be chosen, the central wall dividing the two coolers could be eliminated with little change in the basic overall layout.

Product flow is an important consideration in the layout outlined in figure 10. The design for basic product flow is a straight line from receipt through the overhead doors at the front of the facility to storage in the general and cold storage areas. As orders are selected, they generally would be placed onto empty pallets; full loads of fast movers (items sold in large quantities) may be repositioned at the front of the units. Loaded pallets would be unstacked into trucks for delivery. The open platform is typically used for assembling customers' orders, as well as display. In the interest of product control, no receiving or shipping doors are provided at the rear of the facility. An emergency exit is provided at the rear of the warehouse.

Offices are also an important part of the facility shown in figure 10. Floor operations would be controlled from a small office on the first floor. Orders can be placed at this office; a window opens onto the front platform. Salespeople can use this office as a "base of operations" during the selling day. General offices are located on the overhead mezzanine. The stairs open to a reception area, a manager's office, and an office for selling by telephone. Restrooms are also located on the mezzanine.

Figure 11 illustrates how the same basic building could serve a company specializing in ripening operations. This type of company represents processing operations but includes some elements of conventional wholesaling. In this illustrative layout, eight ripening rooms are located along the back wall of the warehouse. Each room encloses a one-pallet-wide drive-in pallet rack three to five pallets high and is airtight to allow the introduction of special mixtures of ripening gases into the enclosed area to control the rate at which the products move toward maturity. Typically, each room contains about 1 day's supply of product anticipated to be distributed to the company's customers. As not all of the produce in each of the ripening rooms will ripen at a completely even rate, the products may have to be sorted for color and then returned to

[9]Ferris, Richard T., et al. *Storing Fruits and Vegetables on Pallets in Wholesale Warehouses,* MRR 622, USDA, 38 pp., ill., USDA, 1964.

one room or the other for further ripening or sale. The ripening rooms can also be used to supplement the product storage in the facility.

Conventional storage is featured in the facility. This illustrative layout includes provision for a small cooler for holding incoming products before ripening. Some products that have ripened may also be held in this area.

Sales by this type of company are generally in fairly large quantities—pallet loads or greater. Orders are usually moved directly from the ripening rooms or holding cooler onto trucks for delivery. To the extent that such an area is needed, the front platform is used as an order assembly area.

All of the company offices are located on the overhead mezzanine. Ripening companies are specialists in the San Diego fruit and vegetable industry, and many sales are made by on-the-road company sales personnel. Telephone orders play an important part in the selling function. The mezzanine shares a general sales area with the owners' office.

Some of the fruit and vegetable firms anticipated on the new San Diego market will be housed in single-occupancy buildings. Figure 12 illustrates one possible arrangement of one of the fruit and vegetable single-occupancy buildings anticipated on the new market. As with many large fruit and vegetable companies, the firm that would utilize this illustrative layout has branched out into several related market opportunities. The firm supplements its fruit and vegetable wholesaling by processing and handling frozen foods.

A U-shaped design for product flow dominates the layout illustrated in figure 12. Products, including both fruits and vegetables and frozen food items, would be received in a specially defined area along one side of the building and

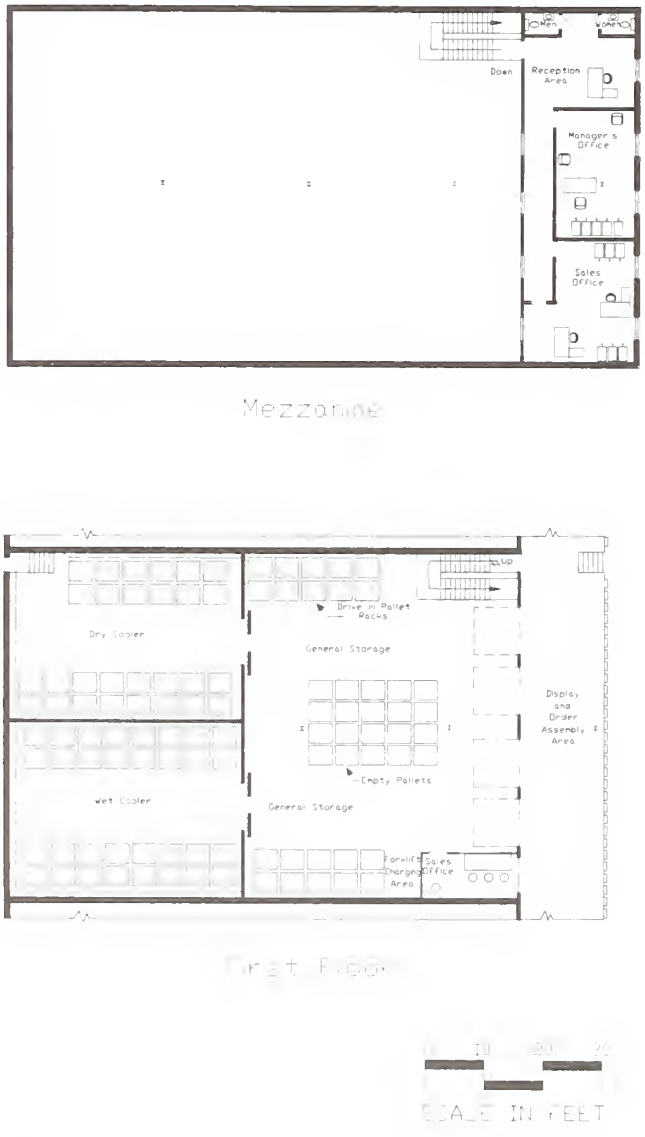


Figure 10.—Layout for fruit and vegetable full-line wholesalers in a multiple-occupancy building.

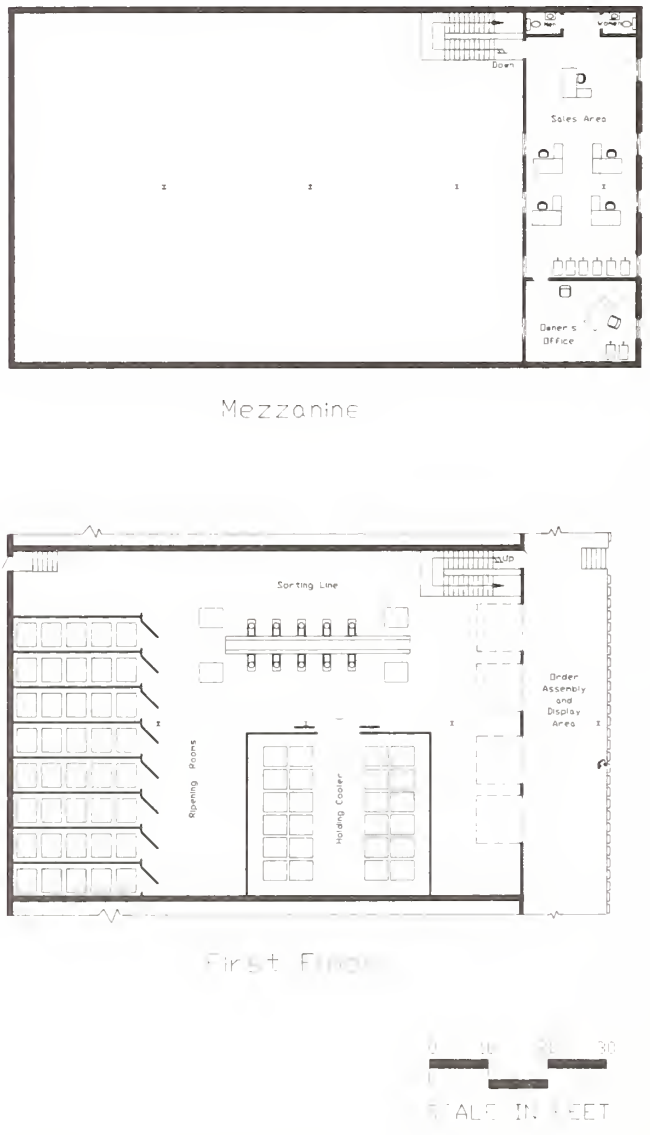


Figure 11.—Layout for fruit and vegetable ripening company in a multiple-occupancy building.

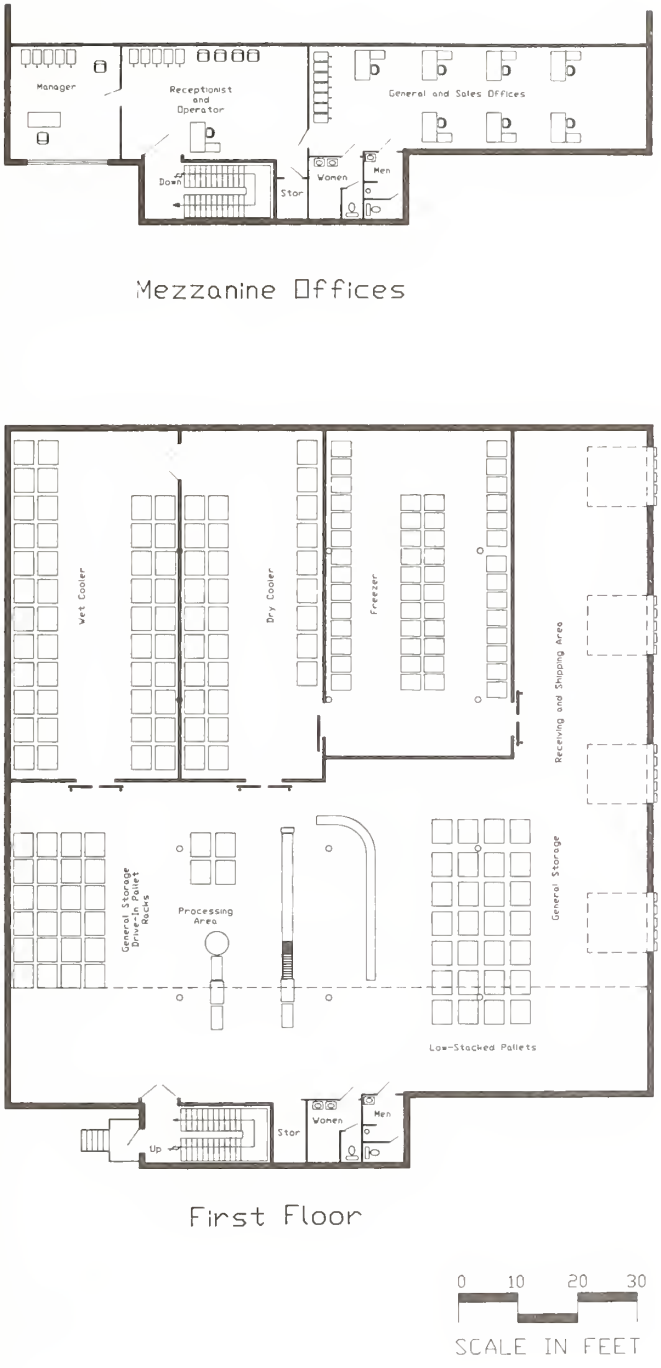


Figure 12.—Layout for fruit and vegetable wholesale and processing company in a single-occupancy building.

move directly into a freezer or indirectly into produce coolers at the other end of the building. The general interior of the building would be air-conditioned and used both to support a processing area and to store fruits and vegetables. General access to the freezer with forklift trucks would be through the dry produce cold storage cooler, which would act as a vestibule. Incoming frozen products could be moved directly into the freezer.

One of the main functions of the storage areas in the layout illustrated in figure 12 is to provide support for processing operations. Products would be removed from storage, sent to the processing lines for value-added manufacturing operations, and then returned to storage for later sale.

Building design affects the location and size of equipment and storage areas. Building columns, where possible, are incorporated within walls of coolers, used as supports for pallet rack up rights or located within large open areas within the interior of the building so as not to hamper storage, handling, or processing operations. Conventional column arrangements are used to avoid expensive custom construction.

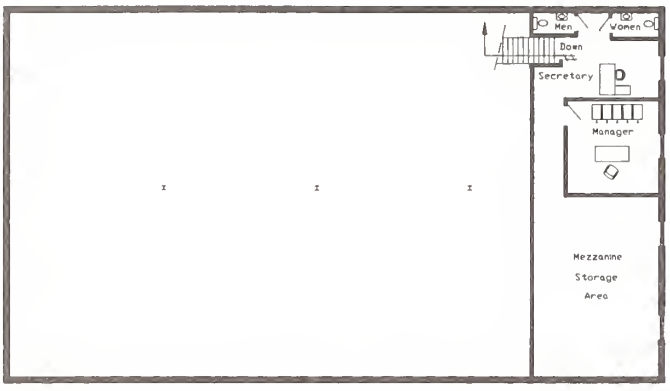
Functions are located to make use of building design characteristics. Processing is located partly below an overhead mezzanine; storage and equipment associated with this function do not require a ceiling beyond the 10 to 12 feet available within the area. In contrast, storage areas are located in portions of the building where the full 23- to 26-foot clear stacking height is available between the warehouse floor and the bottom of the overhead beams.

Efficiency in materials handling is also an important consideration in the design of the layout shown in figure 12. Aisles are wide and designed for high-speed, high-lift forklift trucks. Doors are electrically operated with pull controls. Bumper posts protect the door tracks from damage.

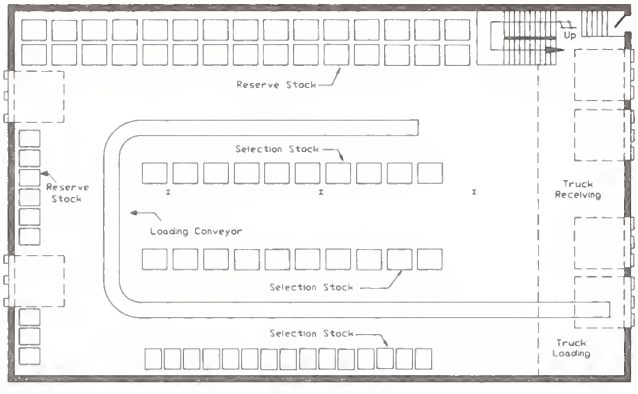
All of the company offices illustrated in figure 12 are located on an overhead mezzanine. This arrangement frees valuable first-floor space for operations, isolates the offices from operating equipment, and improves product storage security. The mezzanine is shared by general and sales offices, a reception area, and the manager's office. Restrooms are located on both the mezzanine and the first floor.

Bakery Products.—Bakery companies also offer the potential to be an important element on a new San Diego wholesale food distribution center. For the purposes of this report, the illustrative layouts for bakery product companies feature firms acting as distribution points for products processed outside the immediate study area. Bakery plants, however, are also included among the buildings planned for the new center; these plants are specialized in design by type of bakery and are not included in this report. Readers can consult trade and technical journals concerning the arrangement of equipment for specialized bakeries.

The redistribution of products received from other manufacturing operations also requires specialized internal layouts, but such layouts for different bakeries are often similar. Some operations require only a limited amount of space, ideally suited for multiple-occupancy buildings. Figure 13 illustrates how a facility for the redistribution of packaged bakery products might be arranged in two adjacent units of a multiple-occupancy building. Such an operation would consist of receiving a limited number of items in fairly substantial quantities, storing these products for short times within the two units, and assembling customer's orders from



Mezzanine



First Floor

Figure 13.—Layout for redistribution firm for bakery products in a multiple-occupancy building.

the accumulated supplies. Typically, individual customer's orders are large, but the individual items involved are contained in few cases. Cases are usually not split to fill such orders.

The bakery redistribution firm is housed in a completely enclosed multiple-occupancy building. The company typically delivers products on route trucks. Platforms are not needed for buyers visiting the company or for displays.

For the purposes of developing this layout, an electrically powered pallet transporter or small forklift truck guided by an in-floor wire is assumed to be the major piece of handling equipment in the warehouse. During the selection process, the operator would only start and stop the vehicle as the forklift follows the floor-mounted guide wire. The operator would walk beside the vehicle and load packages from the selection line in the center of the facility. Reserve stock would be located along one side wall and the back wall of the facility. Trucks would be loaded at a shipping door at the end of the guide wire. Receiving operations could be assigned to the other truck doors at both the front and rear of the facility. Usually, one employee would select merchandise, and the driver of the delivery vehicle would assist the operation by moving loaded pallets or racks into the interior of the delivery vehicle. Conventional 40- by 48-inch and 40- by 32-inch pallets, depending on the minimum inventory of particular products, would be used for product storage. As product items to fill an order are selected, they are placed on plywood sheets or 40-by 48-inch pallets.

Redistribution points need very little office space. Sales are usually made by route salespeople or sales personnel who operate from other locations. Orders and invoices are prepared through computers, limiting the need for clerical personnel. Such offices as needed, in the layout illustrated in figure 13, are on an overhead mezzanine; much of the space on the mezzanine would be used for light storage or held in reserve. A manager's office with space for a secretary would occupy a portion of the mezzanine. All restrooms would also be located on the mezzanine.

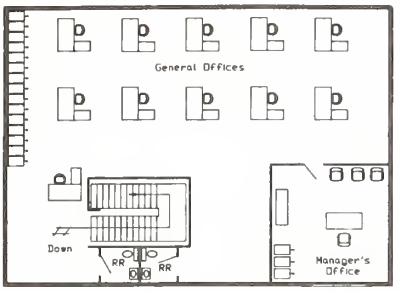
Food products.—Food products firms are engaged in a wide variety of different types of processing and warehousing functions. Usually, these companies manufacture some specialized food or food-related product, warehouse the product, and later distribute the product line to other, more conventional wholesalers. The layout illustrated in figure 14 is an example arrangement that a food products manufacturer locating on the new San Diego wholesale food distribution center may employ in designing its new facilities.

In analyzing basic product flow through the layout, products would be received at the receiving door (lower right of the building), moved to the supply storage cooler and general storage area, withdrawn from storage and movement in support of a processing line, moved from the processing line to a finished product storage area, assembled into customer orders, and loaded into commercial carriers for delivery. Materials handling would also include specific palletizing and depalletizing areas and equipment storage and recharging space. Refrigeration and other building-related mechanical equipment would be located on the roof.

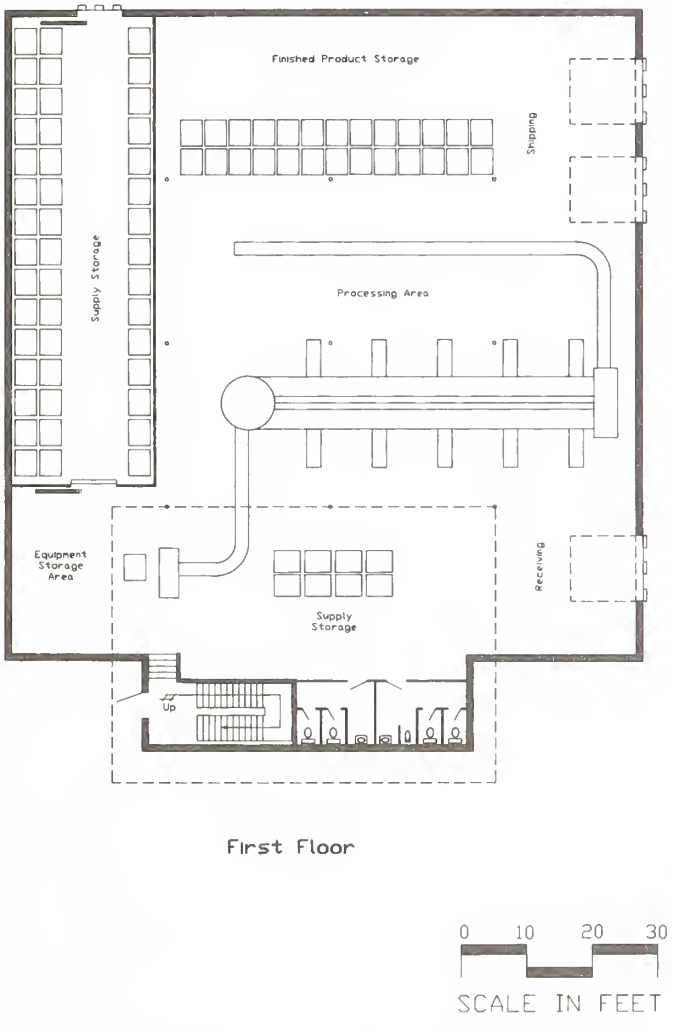
Offices are located on an overhead mezzanine that forms a partial second floor in the building. Mezzanine space is divided among a general sales office, files, a manager's office, and restrooms. Additional restrooms are located on the first floor.

The entrance to the building is designed to provide immediate access to both the mezzanine offices and the floor of the warehouse. This entrance would be located adjacent to a car parking area; receiving and shipping doors face the truck maneuvering and parking area.

Meat and meat products.-Figure 15 illustrates an arrangement for two units in a building designed for a meat



Mezzanine Offices

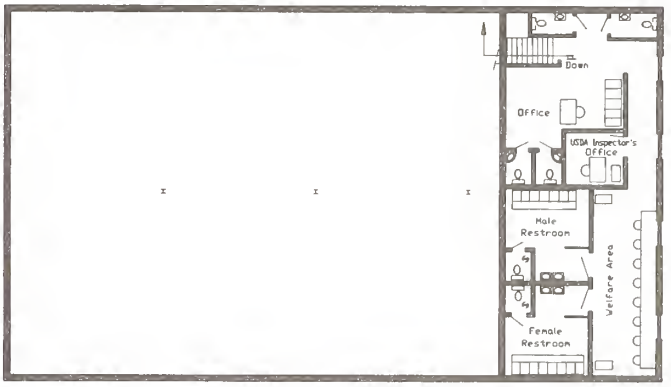


First Floor

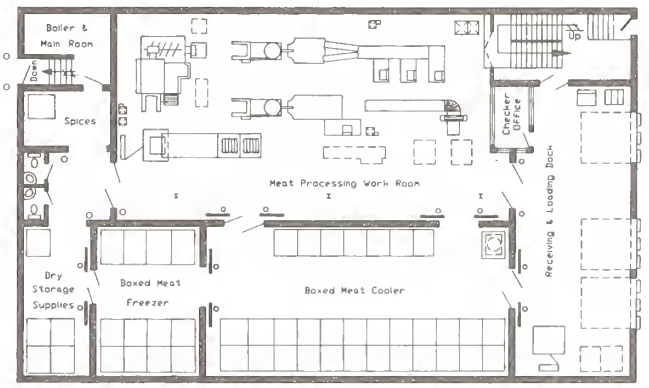
Figure 14.—Layout for manufacturers of food products manufacturer in a single-occupancy building.

processing firm that manufacturers fresh sausage. The layout features an enclosed and refrigerated receiving and shipping dock at the front of the building. Processing and storage areas share the remainder of the first floor, with aisles and passageways between rooms located to provide rapid passage between appropriate storage and processing functions. Major storage areas are fitted with three-tier drive-in pallet racks for palletizing all boxed meat products. Raw materials used in meat processing also are received in boxes and are palletized.

Interior surfaces are finished in accordance with Federal meat inspection regulations, such as the following: All parts of the processing room floor should be well drained. As a general rule, one drainage floor drain should be provided for each 400 square feet of floor space. A slope of about one-fourth inch per foot to drainage inlets is usually required. Acceptable construction materials include concrete, ceramic floor tile, floor brick, and approved synthetic materials. Walls should be smooth, flat, and constructed of impervious materials such as glazed brick, glazed tile, smooth-surfaced port-



Mezzanine



First Floor Layout

Figure 15.—Layout for meat and meat products firm in a multiple-occupancy building.

land cement plaster, plastic, or other nontoxic, nonabsorbent material applied to a suitable base.[10]

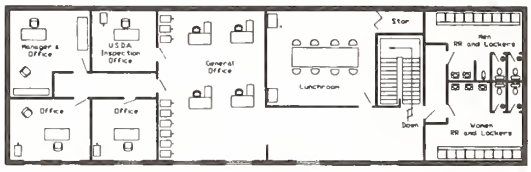
Employee safety features are also incorporated. For example, floors must be surfaced with skid-proof finishes to help prevent accidents. The type of construction materials selected must also be able to absorb sound to minimize the noise level and comply with other employee protection standards.[11] Equipment with moving parts should have guards or covers to protect employees from injury. Likewise, forklift trucks should be equipped with overhead guards and load backrests to protect operators during high stacking operations.

Facility interiors should be well lighted with a readily accessible control panel available for all utilities, including the plant's lighting system. Well-distributed artificial lighting is required where adequate natural light is either not available or insufficient. The overall intensity of artificial illumination in all coolers and order staging areas should be not less than 20 foot-candles. In all processing areas where U.S. Department of Agriculture (USDA) inspections are being conducted, the workroom illumination must be not less than 50 foot-candles. Additional regulations govern the construction and design of processing facilities for meat, as well as for poultry products.

Figure 16 illustrates the interior arrangement for a large meat firm specializing in manufacturing and fabricating portion-controlled meat products for hotels, restaurants, and institutions. This single-occupancy building layout is designed to provide a U-shaped product flow for both fresh and frozen boxed meats. It provides maximum inventory flexibility and product movement free of backtracking, bottlenecks, and excessive rehandling.

The workroom for fabricating and packaging is conveniently situated and is accessible to all other areas. Its location permits optimum product flow, as well as providing employees with nearby access to the welfare areas located within the buildings. Interior finishes and lighting should also be consistent with safety regulations of the U.S. Department of Agriculture (USDA).

The dimensions of the workroom are designed to accommodate all of the firm's necessary processing and packaging equipment with ample space remaining for employees' work stations and movement, as well as for USDA inspections. The workroom should be maintained between 38 and 40 degrees F and should not exceed 50 degrees F during any production shift. It should have a clearly defined room separation from product holding-coolers to avoid contamination of products by cleanup water and condensation during the cleanup cycle. Sufficient connections for cleanup hoses also



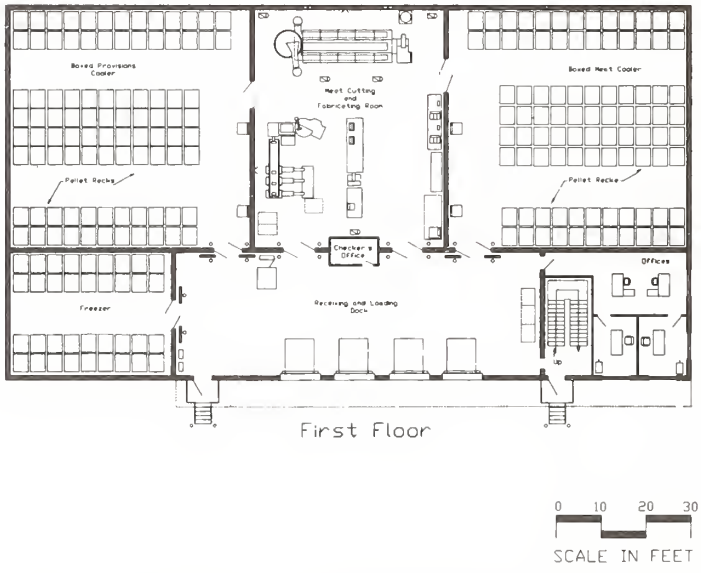


Figure 16.—Layout for meat and meat products firm in a single-occupancy building.

are required to ensure adequate sanitation control in the plant.

Traffic lanes have been designed as unobstructed passageways having a minimum width of 5 feet. Such well-defined traffic lanes will help ensure rapid and efficient product flow to further improve handling efficiency and lower per-unit operating costs.

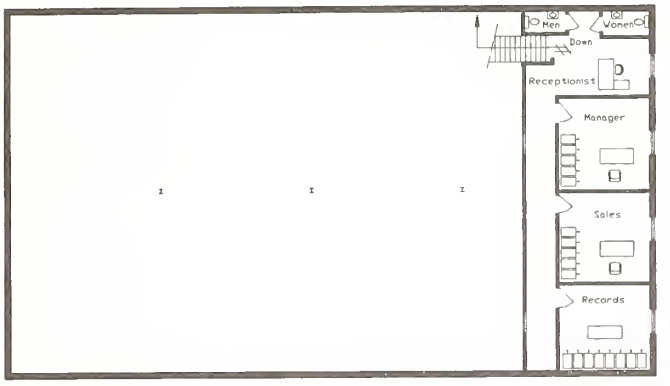
Offices, restrooms, and lunchrooms are located on the second floor directly above the receiving and shipping platform at the front of the building. These areas are arranged for the convenience of the employees and to make use of overhead space in areas on the first floor that do not require a high ceiling. Approximately one toilet for every 15 persons of each sex is considered a minimal requirement. The USDA also has specific requirements for Department personnel who will provide meat inspection service for the establishment.

Specialized storage equipment makes efficient use of available space. Boxed meat coolers and freezer storage areas include three-tier drive-in pallet racks as well as conventional racks that are both aligned and arranged for efficient order selection. Mobile platform scales (the small rectangles along the walls) also are shown in these rooms.

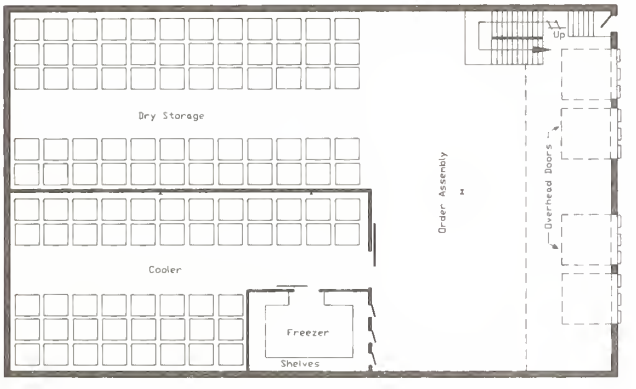
[11]Staff, *Williams-Sheiger Occupational Safety and Health Act of 1970,* Vol. 36, Nos. 105, U.S. Department of Labor.

[10]Staff, *U.S. Inspected Meat and Poultry Packing Plants: A Guide to Construction and Layout,* Agricultural Handbook 570, USDA, 1981

The foundation and basic building shell of this facility must be engineered both to meet the building's structural needs and to withstand the weight stress forces created by all anticipated equipment and by product storage loads. Generally, all work floor and traffic areas should be designed for a live load of at least 350 to 400 pounds per square foot. Second floor office and welfare areas should be designed to support at least 200 to 250 pounds per square foot.



Mezzanine



First Floor

0 10 20 30

SCALE IN FEET

Figure 17.—Layout for a dairy, poultry, or egg firm in a multiple-occupancy building.

Dairy, poultry, and eggs.—Figure 17 illustrates a typical wholesale facility layout that is applicable to a dairy, poultry, or egg wholesaler and consists of two adjoining units in a multiple-occupancy building. The facility has two floor levels, with the storage and handling operations on the first floor and the offices at the front of the building on the second floor. The individual areas on the first floor consist of a cooler, a freezer, a dry storage area, an order assembly area, and a loading and unloading area. The plant areas on the second floor consist of a reception area, three offices, and restrooms. The individual areas will vary in size, depending on the type and volume of products handled. The basic layout has the areas arranged in a flow sequence that minimizes the total cost of operation.

A typical single-occupancy building is illustrated by the layout of a dairy processing plant (fig. 18). The plant is designed for processing a full line of fluid milk products packaged in paper, plastic, and glass containers. The layout provides a good flow of products and supplies; the individual areas are arranged in an operational sequence to minimize costs. The location and arrangement of the major equipment items are shown, but such items as water and electrical outlets and hand-washing facilities are excluded. The layout is not intended for any specific firm, but it could be used as a guide in developing a layout for a particular operation.

Many design characteristics must be incorporated into the construction of the plant. The floors must have smooth surfaces that are impervious to moisture and easily cleaned. They must be constructed to have sufficient strength to support maximum equipment and vehicle weight. The type, size, and location of floor drains and the slope of the floor must be adequate for removing water that is normally discharged in a processing operation. The walls and ceiling must be smooth, washable, light in color, and moisture resistant. Hot and cold water outlets and hand-washing facilities must be provided and conveniently located in areas where they are needed. For additional details, refer to the regulations.[12]

Safety factors must be incorporated into the plant design for employee protection. Also, the construction materials selected must absorb sound in order to minimize the noise level and comply with the standards (see footnote 11). Adequate lighting, heating, air conditioning, ventilation, and plumbing and electrical facilities must be provided throughout the plant. Provision must also be made to handle the effluent discharged from the plant. In some instances, waste-treatment facilities are needed to comply with the Environmental Protection Agency guidelines.[13] Because of the complex issues involved, qualified personnel should be consulted to determine these requirements.

Grocery.—Specialized grocery firms are among the firms included in new facility planning for a new San Diego wholesale food distribution center. Companies of this type often handle a somewhat limited line of grocery products directed toward a particular group of customers, often ethnic restaurants and small retail food stores. Figure 19 illustrates

[12]*Grade "A" Pasteurized Milk Ordinance,* 1965. Recommendations of the United States Public Health Service of the U.S. Department of Health, Education, and Welfare.

[13]Effluent Limitation Guidelines for the Environmental Protection Agency, Pre-Treatment Standards Applications for the Dairy Products Processing Industry, Point Source Category. Fed. Reg., vol. 39, p. 18594.

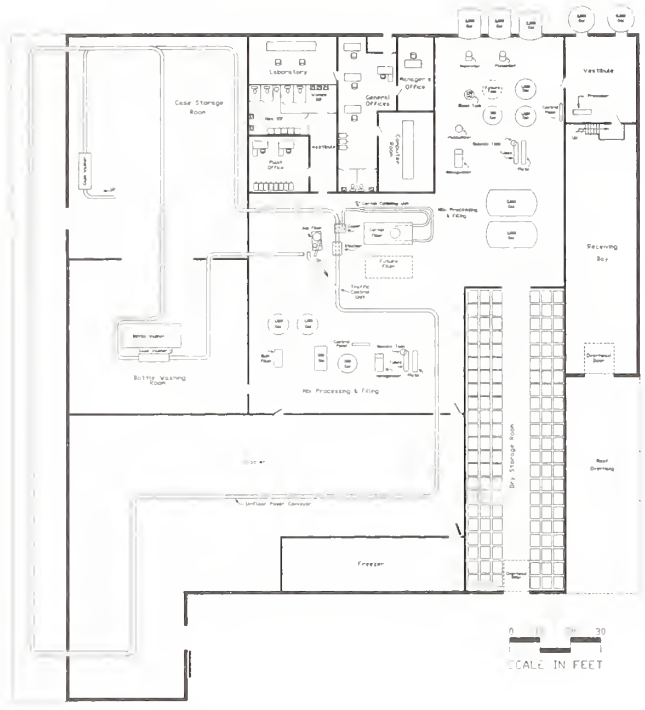


Figure 18.—Layout for dairy processing plant in a single-occupancy building.

an example layout that might be employed by such a company locating in two adjacent units in a multiple-occupancy building. As this type of firm usually delivers purchases to its customers, an open platform is not needed for buyers visiting the firm.

Maximizing selection opportunity is the main objective of the layout illustrated in figure 19. Extensive use is made of live storage (cases mounted on inclined roller conveyors). U-shaped selection aisles allow selectors to quickly bypass unwanted merchandise while assembling customers' orders. Cases are loaded onto the storage racks from the rear; cases going to reserve storage are stacked on the upper tiers of the racks by forklift truck. Additional use is made of plywood shelves mounted in conventional pallet racks for items handled in less than case quantities. Often, the selector is expected to cut cases during the selection process for customers who order limited amounts of particular products. Small items are assembled into empty cases. Pallet jacks and plywood sheets or four-wheel handtrucks are used for selection.

Receiving and shipping can be scheduled through the six doors available in the warehouse. Generally, receipts would be represented by partial truckloads. Small straight trucks are used for delivery; load levelers (not shown) would be a useful accessory for specialty grocery firms operating in a completely enclosed multiple-occupancy building for accommodating different truck heights.

Specialty grocery companies have a limited need for offices. All of the offices illustrated in figure 19 are located on an overhead mezzanine. This space is shared by a secretarial

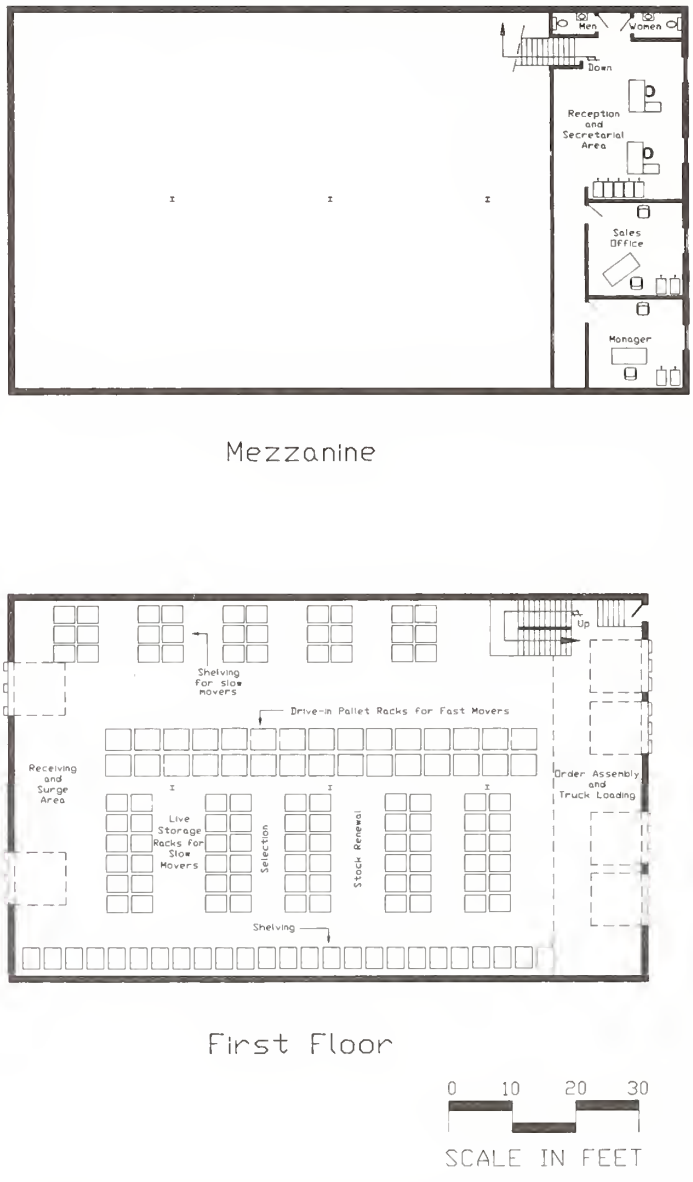
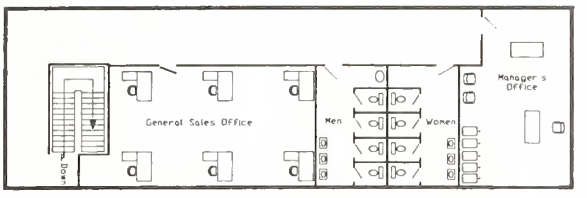


Figure 19.—Layout for specialty grocery company in a multiple-occupancy building.

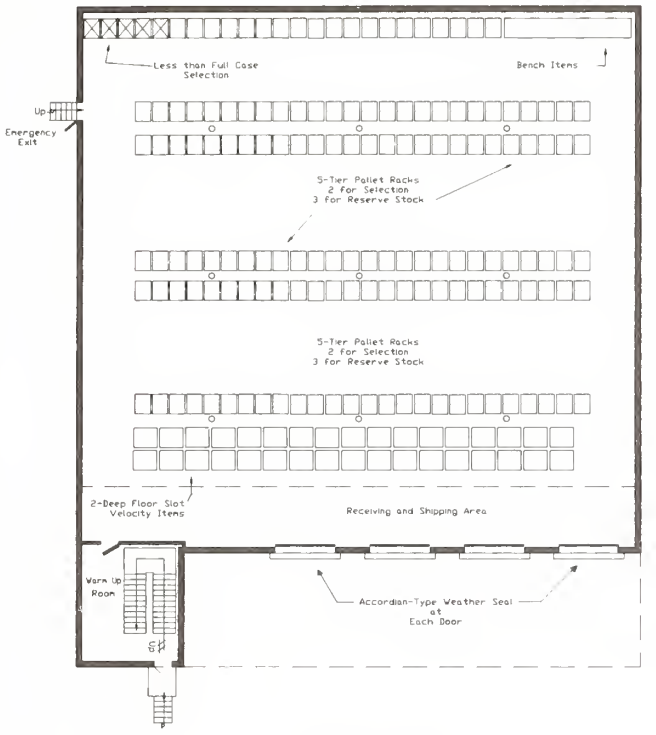
area and sales and manager's offices. All of the restrooms in the warehouse are located on the mezzanine.

Frozen food.—One of the frozen food firms on the planned market is anticipated to locate in a single-occupancy building. Figure 20 illustrates one possible arrangement for this facility.

The layout illustrated in figure 20 would be used by a frozen food wholesale firm that sells primarily to the institutional trade. In general, the warehouse layout would be similar to that for a dry storage grocery firm, except for the special environmental requirements posed by the refrigeration equipment. Fast movers are located near a receiving and shipping area. Typically, 32- by 40-inch pallets are used to store merchandise; some products would be stored on shelves to accommodate less-than-case quantities. An additional area



Mezzanine Offices



First Floor

Figure 20.—Layout for frozen food firm in a single-occupancy building.

would be needed for bench items. Selection opportunities are available throughout the warehouse on the bottom two pallet positions; the upper three pallet positions are used for reserve storage. A warm up room shares accommodations with stairs to a partial second floor located over the receiving and shipping area. All receiving and shipping slots are equipped with seals, air doors, and vertical freezer doors to minimize refrigeration loss during truck loading and unloading. An emergency door provides access to the ground from the rear of the building. Aisles are designed for high-speed conventional forklift trucks. An alternative arrangement could provide for denser storage and narrow aisle equipment.

[14]See table 40.

A frozen food firm may have substantial office space requirements for sales and management. Offices for those functions are located on the mezzanine. Restrooms are also located on the mezzanine.

Fish and shellfish.—All of the fish and shellfish firms anticipated to relocate to a new San Diego wholesale food distribution center would use enclosed units in multiple-occupancy buildings for their new facilities. These companies deliver their products and do not need an open platform for customer access and display. Figure 21 illustrates how a fish and shellfish firm could arrange the interior of two adjoining units in a multiple-occupancy building. The layout is designed so that product-storage areas are near receiving, shipping, and processing areas; the design also isolates processing areas from each other where necessary. This arrangement minimizes the distances products must be moved during receiving, order assembly, and processing.

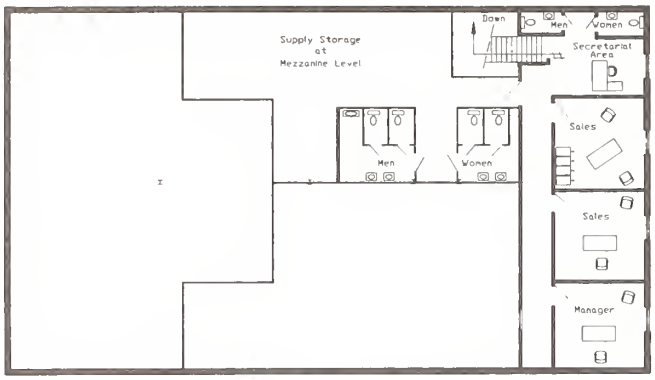
The interior of fish and shellfish units in a multiple-occupancy building should be finished to minimize the effort required to maintain good sanitation. Drains should be provided in appropriate areas to facilitate cleaning and disposal of water from ice that has melted from stored and processed products. Office and support facilities are located on the mezzanine to avoid conflict with processing and handling operations. An inspector's office (voluntary) is located adjacent to the major processing area.

Selecting a Site

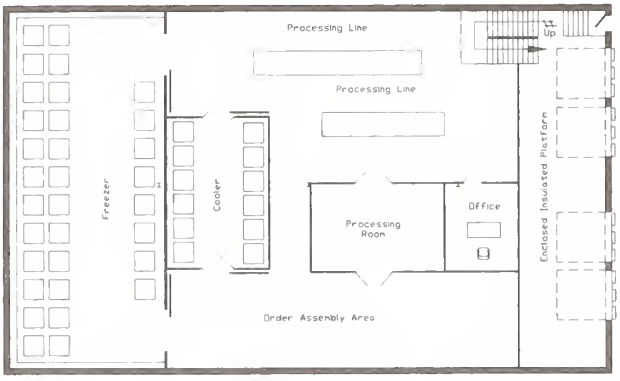
Sufficient land is an important consideration in developing the new center because later acquisition of adjacent suitable land might be very difficult to acquire at a later date.[14] Expansion land can be held by the developer of the project; the cost of this extra land can later be recovered, at an appropriate rate of return, from the firms locating on the new center in later stages of development.

Many individuals and groups are extremely interested in where a new San Diego wholesale food center might be located. The firms included in new facility planning will be affected by investment requirements and changes in operating costs as the result of site location. Employees will be affected by changes in their working conditions and transportation. Indirectly, other groups are interested, especially consumers, who in the long run will help pay for the new center by their purchases of food products. Local producers have an interest because a change in the location of wholesale food firms that buy their products could affect their cost of transporting products to these firms. The communities involved would have an interest because of the effects a new market might have on urban and industrial development plans; on zoning, traffic control, street and highway planning; and on police and fire protection and other services. Public service firms, such as transportation companies, utilities, and other service-oriented groups and firms, are also due proper consideration.

In selecting a site for a food distribution center, the following factors should be considered.



Second Floor



First Floor

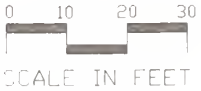


Figure 21.—Layout for a fish and shellfish processor in a multiple-occupancy building

(1) Convenience to retail and other sales outlets.
(2) Convenience to highways.
(3) Convenience to local and other nearby producers.
(4) Availability of adequate land at reasonable cost.
(5) Accessibility to utilities.
(6) Avoidance of outside traffic.
(7) Land use, topography, shape of tract, and environmental considerations.
(8) Number of owners.

Convenience to Outlets

Transportation or delivery costs can be expected to vary substantially, depending on the part of the city or county chosen for the location of the new center. Figure 22 illustrates the way such costs would vary depending on which of the eight distribution areas (see fig. 1A and 1B) is selected for construction of the center. These distribution costs do not represent charges from specific sites but rather from a center assumed to be constructed on or near the center of population in each of the distribution zones. In addition to a first-year analysis, a similar analysis was conducted based on an assumption that the center was nearing the end of a 30-year development life. In this second analysis, anticipated changes in population and transportation resources at the end of 30 years were utilized in developing the 30-year data also illustrated in figure 22. The methodology, with the preceding exception, is outlined in a previous USDA report.[15] The distances and driving times used in these calculations were provided for a set period based on projections obtained from the San Diego Association of Governments Transportation Models.

Transportation costs vary widely, depending on the potential location for the new center. Table 41 gives projected 1987 delivery costs based on the data given in figure 22 for the base year of the study. This variation ranges from a low of $9.2 million (1984 dollars) from a potential site in distribution zone 1 (see fig. 1) to a high of $40.1 million from a site located at the center of population in distribution zone 6. These costs are based on a projected annual delivered volume of 473,021 tons distributed both to the original customers of firms included in new facility planning and to potential new customers located in areas of new population growth within the study area. Some additional economies may be possible in delivery costs with consolidated delivery (one truck delivering orders for more than one company) by some of the firms on the new center. This practice has been successfully employed on new wholesale food distribution centers, with corresponding savings in both drivers' time and equipment investment.

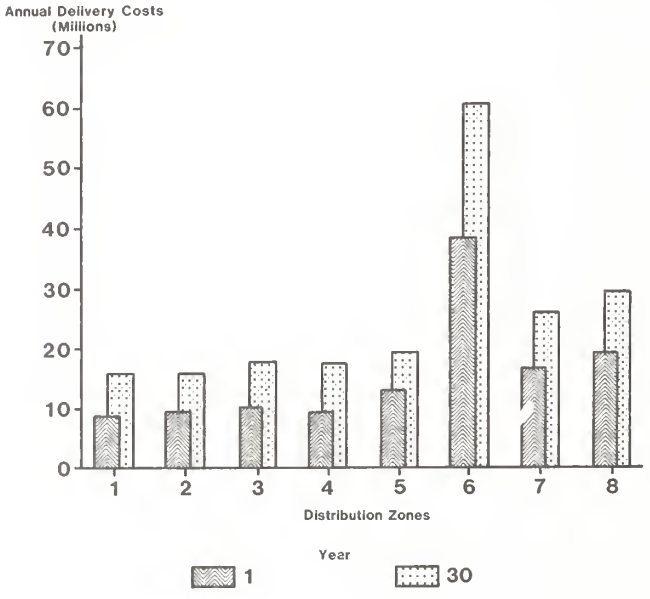


Figure 22.—Costs of distribution from potential sites for a new wholesale food distribution center in various distribution zones, San Diego, California.

[15]Overheim R. K., et al, *Improved Food Distribution Facilities for Central North Carolina,* MRR 1143, USDA, 68 pp., ill., 1984.

Table 41.—Projected delivery costs from centers of population to existing and anticipated customers of firms included in new facility planning, San Diego, California[1]

Distribution zone[2]	Projected 1987 delivery cost[3]	
	Per ton	Total
	Dollars	
1	19.35	9,152,708
2	21.00	9,931,654
3	22.54	10,664,116
4	20.95	9,911,937
5	28.73	13,589,450
6	84.60	40,015,539
7	36.75	17,383,383
8	42.52	20,111,296

[1]Based on a projected volume for 1987 of 473,021 tons.
[2]See figure 1.
[3]Base year dollars.

Convenience to Highways
The large volume of products distributed from a modern wholesale food distribution center makes effective access to major regional highways an absolute necessity in evaluating potential sites for a new San Diego center. Where possible, use of residential streets and secondary roads should be avoided. Overpasses and bridges near the new market should be capable of sustaining the heavy truck traffic associated with modern wholesale food distribution and processing operations. Rail may be important to some of the individual firms included in new facility planning, and rail access should be considered in evaluating potential sites. Access to airports is also important, but secondary to efficient truck access.

Convenience to Local Producers
The importance of agriculture in the San Diego area increases the importance of locating a new wholesale food distribution center close to local producers. Such location is particularly important to the fruit and vegetable firms included in new facility planning because many of them are engaged in both growing and marketing. The local producers rely on trucks to deliver merchandise to buyers, another reason why a new market should be located on or near major highways.

Adequate Land at Reasonable Cost
The cost of land is important to the development of a new center. For the new center to grow and respond to changing future conditions, all or most of the land for the complete development must be purchased at the time of initial construction. Land reserved for expansion will be held until needed, resulting in considerable annual expense. However, if not bought initially, such land can become increasing costly over time until it may price itself out of consideration for food companies. As a result, space for orderly expansion of the market in the later stages of development could be severely limited. Buying all of the land initially that will be needed for later expansion will not only benefit the firms locating on the market in the future, but also those initially locating on the center. In almost every city where a new wholesale food distribution center has been constructed, the land on the center and surrounding it has appreciated sharply.

Accessibility to Utilities
Electricity, gas, water, and sanitary and storm sewer facilities should be sufficient for commercial service and close enough to the site that extending them to the site would not be prohibitively expensive.

Avoidance of Nonmarket Traffic
Moving food products through a wholesale food distribution center involves a large number of many kinds of motor vehicles. The routing of normal and necessary traffic, even in a well-planned facility, can be a serious and complicated problem. If vehicles not related to business on the center move through the market area, traffic problems are further complicated. Most food products coming into a food center have already been transported over a considerable distance, and a few extra miles on routes free of congestion will consume less time than travel by a somewhat shorter route in a highly congested area. Similarly, delivery trucks can move quickly over high-speed highways to urban areas without undue delay. The center should be located where there is little or no off-site traffic.

Land Use, Topography, Tract Shape, Zoning, and Number of Owners
Current land use is very important in selecting a site for a new wholesale food distribution center to serve San Diego. Sites available to both existing customers and potential new customers that can result from anticipated population growth may not be easy to find.

The topography and soil conditions of some potential sites could entail costs of filing, leveling, and other site preparation that would make some locations undesirable. The possibility of adapting the planned facilities to the topography of some sites should be thoroughly investigated before making commitments to purchase or build.

Irregularly shaped sites may not only require more acreage but may also prevent the orderly arrangement of buildings and streets. These problems will increase the cost of a new center, require higher investments, and inconvenience users of the market.

A food distribution center should be properly zoned so that neither the market nor the surrounding property will detract from the other's value.

The problem of acquiring a particular site will be reduced considerably if the entire site is owned by only one organization or only a few entities.

Potential Sites
Figure 23 identifies 12 representative locations for a potential wholesale food distribution center to serve the San Diego region. These potential site locations are the result of an informal survey and do not represent the total number of potential locations for a new market or commitments to sell on the part of the present owners. A new, more complete survey

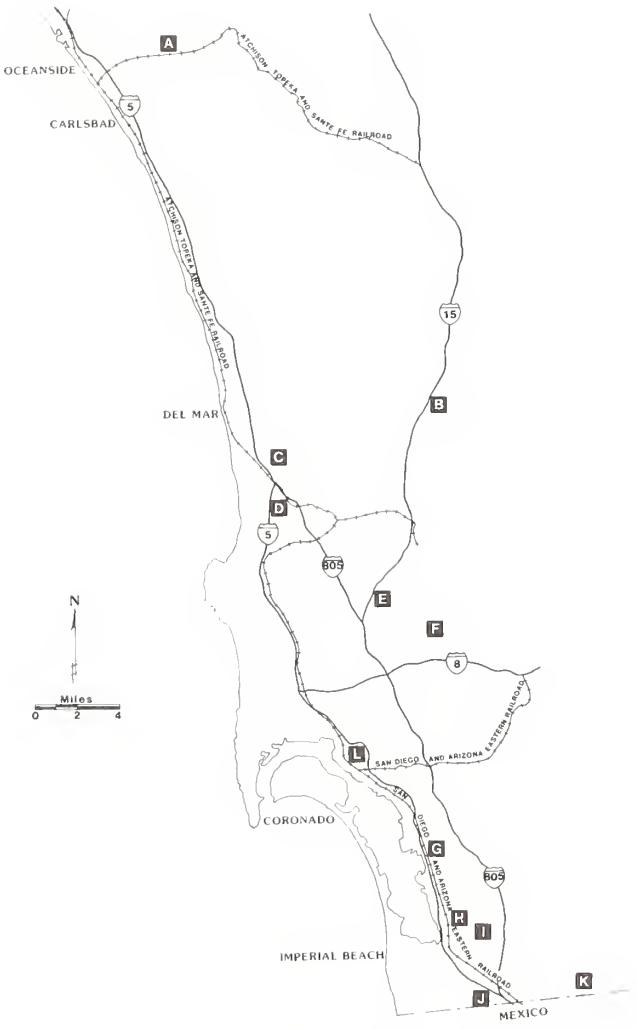


Figure 23.—Representative sites for a new wholesale food distribution center for San Diego, California.

should be conducted before actual land purchase. Boundaries and other specifics concerning these sites are not shown in detail because these potential locations are presented for illustration only. Also, although sufficient land for a new market was available at the time of the original survey, portions of individual sites may be sold during the interim period before final site selection. Land requirements for each type of firm, including an allocated share of streets, parking, and other immediately related support functions, that are included in new facility planning were summarized in table 40, earlier in this report, under *"Improving Marketing Facilities"*.

Investment and Revenue Requirements

Two major elements, closely related, define the annual facility costs anticipated for the wholesalers relocating to new buildings on a San Diego market. These elements are (1) the investments required for the new buildings, support facilities, and land for the new development and (2) the annual revenues required to support and retire these investments. These costs were calculated based on both standard construction cost references, adjusted for San Diego, and methodology outlined in an earlier USDA report (see footnote 14). The construction costs presented in the interim report (see footnote 3) were based on information available at the time of the study; however, revised estimates are outlined in this section to provide more timely data.

A substantial investment will be required for the development of a new wholesale food distribution center to serve the San Diego area. Figure 24 illustrates the investment requirements originally developed and published in the interim report (see footnote 3) concerning a new San Diego wholesale food market and used in subsequent analysis of cost and benefits associated with a new center. These investments, depending on the cost of land, range from a low of less than $50 million to more than $100 million. For the purposes of this study, construction costs are expected to be the same at each of the different sites. Land costs are assumed to represent land in condition to build.

Figure 25 summarizes initial facility investment requirements, excluding land, by type of firm and building. Initial investment in buildings and associated facilities, excluding operating equipment, totals approximately $35 million. Of this total, facilities for: (1) Bakery products and beverage firms total $4.8 million; (2) candy and confectionery, food brokers, and food product firms, $2.4 million; (3) fruit and vegetable firms, $17.1 million; (4) meat and related products and poultry and shell egg firms, $2.5 million; (5) dairy products firms, $3.2 million; and (6) groceries, frozen foods, and fish and shellfish firms, $4.7 million.

The investment requirements identified represent a "worst case." Some circumstances, depending on the method of development and organization, may tend to reduce revenue requirements. For example, equity money invested in the development from the sale of existing facilities, participation

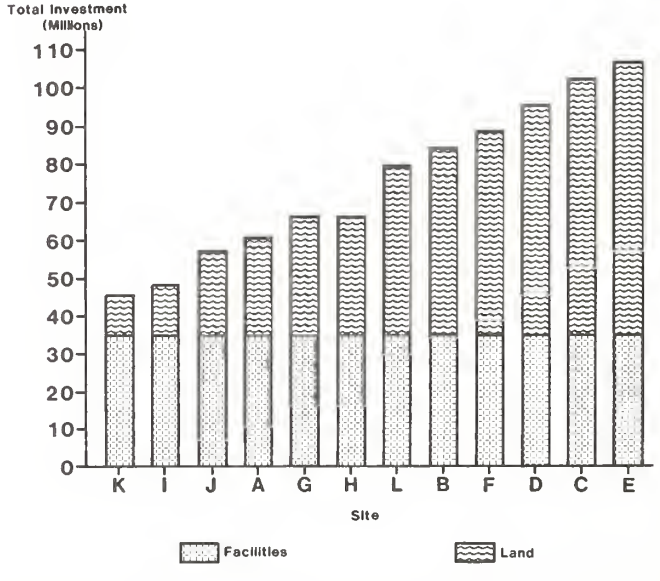


Figure 24.—Investment in land and facilities for a new wholesale food distribution center, San Diego, California.

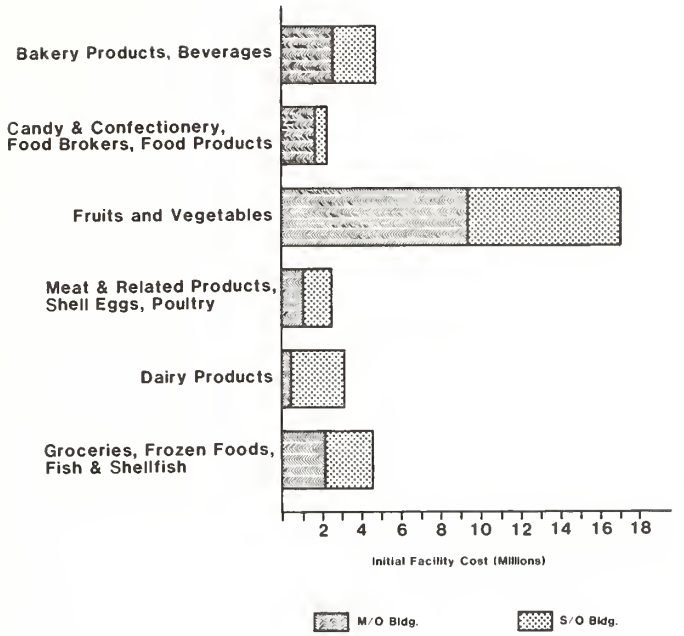


Figure 25.—Investment in facilities, by type of firm and building, for a new wholesale food distribution center, San Diego, California

in the project by groups other than the food industry, or concessions by the local governments or the existing owners of the property may minimize the actual investments in the projects.

Table 42 presents the 1987 construction costs of a new market. Standard references and indexes for construction costs in San Diego were used as the basis for the update. Land costs are also adjusted in table 42, assuming a 6-percent annual increase in land values. *Land Costs are Determined by Negotiation at the Time of Sale and Do Not Include Unanticipated Special Site Preparation That May Be Necessary Before Actual Construction Can Begin for the New Center. Facility Investment Requirements Outlined in this Report are for Illustrative Purposes Only and Should Not be Substituted for Firm Estimates by Local Architects and Engineers Before Actual Construction.*

Figure 26 illustrates the different revenue requirements, assuming base year construction costs, at the various sites. These revenue requirements differ depending on the method of development chosen to finance and organize the new market. It was assumed that both private and public development were reasonable alternatives for organizing a San Diego wholesale food distribution center. Interest rates for private development were assumed to be 13 percent per year; public development is assumed to require interest rates of 9 percent per year. If revenue requirements are adjusted for updated construction costs (tables 43 and 44), these charges would similarly range from a high of $34.72 per square foot at site E with private development, to a low of $12.04 per square foot at site K with public financing. The difference in revenue requirements results from the lower interest rates possible with public financing when compared with those required with private alternatives and land costs at the various sites.

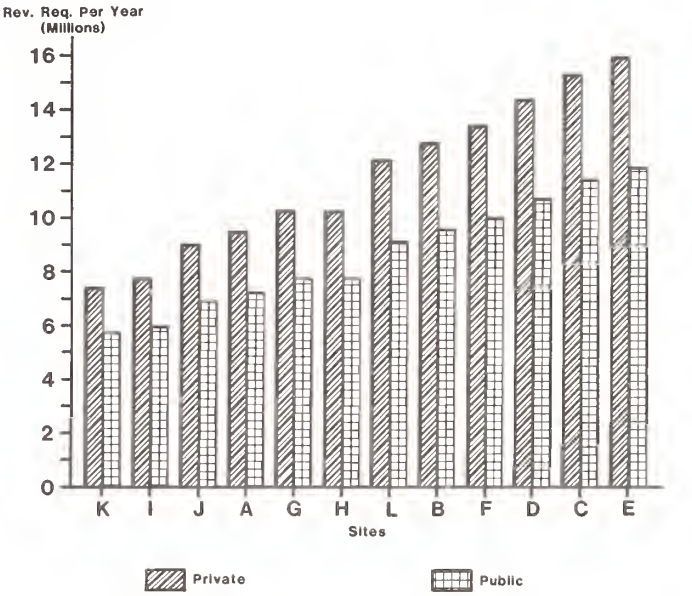


Figure 26.—Annual revenue requirements, by site, for a new wholesale food distribution center, San Diego, California.

Table 42.—Investment requirements of firms included in planning for new facilities on a new wholesale food distribution center, San Diego, California[1]

Type of firm	Site A	Site B	Site C	Site D	Site E	Site F	Site G	Site H	Site I	Site J	Site K	Site L
						Dollars						
Bakery products and beverages:												
Multiple-occupancy . . .	5,410,771	7,876,668	9,755,447	9,050,905	10,225,142	8,346,363	5,997,889	5,997,889	4,119,110	5,058,500	3,884,263	7,406,974
Single-occupancy	4,930,122	7,259,025	9,033,427	8,368,026	9,477,028	7,702,626	5,484,623	5,484,623	3,710,220	4,597,421	3,448,420	6,815,424
Subtotal	10,340,893	15,135,693	18,788,874	17,418,931	19,702,170	16,048,989	11,482,512	11,482,512	7,829,330	9,655,921	7,332,683	14,222,398
Candy and confectionery, food brokers, and food products:	3,068,144	4,219,912	5,097,449	4,768,373	5,316,834	4,439,296	3,342,375	3,342,375	2,464,837	2,903,606	2,355,145	4,000,528
Multiple-occupancy . . .												
Single-occupancy	1,225,437	1,705,341	2,070,981	1,933,866	2,162,391	1,796,751	1,339,700	1,339,700	974,059	1,156,880	928,354	1,613,930
Subtotal	4,293,581	5,925,253	7,168,430	6,702,239	7,479,225	6,236,047	4,682,075	4,682,075	3,438,897	4,060,486	3,283,499	5,614,458
Fruits and vegetables:												
Multiple-occupancy . . .	16,263,851	22,040,757	26,442,210	24,791,665	27,542,573	23,141,120	17,639,304	17,639,304	13,237,852	15,438,578	12,687,670	20,940,394
Single-occupancy	13,547,298	18,575,395	22,406,326	20,969,727	23,364,058	19,533,128	14,744,464	14,744,464	10,913,533	12,828,998	10,434,667	17,617,662
Subtotal	29,811,149	40,616,152	48,848,536	45,761,392	50,906,631	42,674,248	32,383,768	32,383,768	24,151,385	28,267,576	23,122,337	38,558,056
Meat and related products and poultry and shell eggs:												
Multiple-occupancy . . .	1,928,966	2,659,207	3,215,582	3,006,941	3,354,675	2,798,301	2,102,833	2,102,833	1,546,458	1,824,646	1,476,912	2,520,114
Single-occupancy	2,712,646	3,783,667	4,599,683	4,293,677	4,803,687	3,987,671	2,967,651	2,967,651	2,151,636	2,559,643	2,049,634	3,579,663
Subtotal	4,641,612	6,442,874	7,815,265	7,300,618	8,158,362	6,785,972	5,070,484	5,070,484	3,698,094	4,384,289	3,526,546	6,099,777
Dairy products:												
Multiple-occupancy . . .	944,497	1,394,468	1,737,303	1,608,740	1,823,012	1,480,177	1,051,633	1,051,633	708,797	880,215	665,943	1,308,759
Single-occupancy	6,300,831	9,407,132	11,773,837	10,886,323	12,365,514	9,998,808	7,040,426	7,040,426	4,673,721	5,857,073	4,377,882	8,815,455
Subtotal	7,245,328	10,801,600	13,511,140	12,495,063	14,188,526	11,478,985	8,092,059	8,092,059	5,382,518	6,737,288	5,043,825	10,124,214
Groceries, frozen foods, and fish and shellfish:												
Multiple-occupancy . . .	4,128,288	5,835,619	7,136,442	6,648,633	7,461,648	6,160,825	4,534,796	4,534,796	3,233,972	3,884,384	3,071,370	5,510,413
Single-occupancy	4,961,775	7,095,938	8,721,967	8,112,206	9,128,474	7,502,445	5,469,909	5,469,909	3,843,880	4,656,895	3,640,627	6,689,431
Subtotal	9,090,063	12,931,557	15,858,409	14,760,839	16,590,122	13,663,270	10,004,705	10,004,705	7,007,852	8,541,279	6,711,997	12,199,844
Total:												
Multiple-occupancy . . .	31,744,517	44,026,631	53,384,433	49,857,257	55,723,883	46,366,082	34,668,829	34,668,829	25,311,028	29,989,929	24,141,302	41,687,181
Single-occupancy	33,678,109	47,826,498	58,606,222	54,563,825	61,301,153	50,521,428	37,046,773	37,046,773	26,267,049	31,656,911	24,919,583	45,131,566
Grand total	65,422,626	91,853,129	111,990,654	104,439,082	117,025,036	96,887,511	71,715,603	71,715,603	51,578,076	61,646,839	49,020,887	86,818,747

[1]Based on 1987 construction costs, initial facility requirements and land held for expansion.

Table 43.—Annual total revenue requirements by methods of financing for firms included in planning for new facilities on a new wholesale food distribution center, San Diego, California[1]

Type of firm	Building space	Site A		Site B		Site C	
		Private	Public	Private	Public	Private	Public
	Square feet			*-Dollars-*			
Bakery products and beverages:							
Multiple-occupancy	36,000	831,886	625,782	1,179,578	874,838	1,444,485	1,064,595
Single-occupancy	34,000	759,580	571,442	1,087,955	806,662	1,338,146	985,876
Subtotal	70,000	1,591,466	1,197,224	2,267,533	1,681,500	2,782,631	2,050,471
Candy and confectionery, food brokers, and food products:							
Multiple-occupancy	24,000	478,587	362,746	640,986	479,074	764,719	567,705
Single-occupancy	10,000	191,737	145,387	259,404	193,857	310,959	230,787
Subtotal	34,000	670,324	508,133	900,390	672,931	1,075,678	798,492
Fruits and vegetables:							
Multiple-occupancy	132,000	2,546,083	1,933,396	3,360,627	2,516,863	3,981,232	2,961,410
Single-occupancy	114,890	2,127,895	1,616,643	2,836,856	2,124,481	3,377,018	2,511,405
Subtotal	246,890	4,673,978	3,550,039	6,197,483	4,641,344	7,358,250	5,472,815
Meat and related products and poultry and shell eggs:							
Multiple-occupancy	15,000	300,721	227,865	403,685	301,619	482,133	357,813
Single-occupancy	22,000	424,175	321,536	575,189	429,709	690,247	512,127
Subtotal	37,000	724,896	549,401	978,874	731,328	1,172,380	869,940
Dairy products:							
Multiple-occupancy	6,000	144,669	108,610	208,115	154,057	256,454	188,683
Single-occupancy	41,420	966,911	725,924	1,404,900	1,039,661	1,738,605	1,278,698
Subtotal	47,420	1,111,580	834,534	1,613,015	1,193,718	1,995,059	1,467,381
Groceries, frozen foods, and fish and shellfish:							
Multiple-occupancy	30,000	639,561	483,036	880,295	655,476	1,063,711	786,859
Single-occupancy	37,500	770,676	582,206	1,071,593	797,756	1,300,863	961,985
Subtotal	67,500	1,410,237	1,065,242	1,951,888	1,453,232	2,364,574	
Total:							
Multiple-occupancy	243,000	4,941,507	3,741,435	6,673,286	4,981,927	7,992,734	5,927,065
Single-occupancy	259,810	5,240,974	3,963,138	7,235,897	5,392,126	8,755,838	6,480,878
Total	502,810	10,182,481	7,704,573	13,909,183	10,374,053	16,748,572	12,407,943

[1]Based on 1987 construction costs, initial facility requirements, and land held for expansion.

Table 43.—Annual total revenue requirements by methods of financing for firms included in planning for new facilities on a new wholesale food distribution center, San Diego, California—Continued

Type of firm	Site D		Site E		Site F		Site G	
	Private	Public	Private	Public	Private	Public	Private	Public
	Dollars							
Bakery products and beverages:								
Multiple-occupancy	1,345,145	993,436	1,510,712	1,112,034	1,245,804	922,277	914,670	685,081
Single-occupancy	1,244,324	918,671	1,400,694	1,030,680	1,150,503	851,465	837,765	627,447
Subtotal	2,529,469	1,912,107	2,911,406	2,142,714	2,396,307	1,773,742	1,752,435	1,312,528
Candy and confectionery, food brokers, and food products:								
Multiple-occupancy	78,319	534,469	795,652	589,863	671,919	501,232	517,253	390,443
Single-occupancy	291,626	216,938	323,848	240,019	272,293	203,090	207,849	156,927
Subtotal	1,009,945	751,407	1,119,500	829,882	944,212	704,322	725,102	547,370
Fruits and vegetables:								
Multiple-occupancy	3,748,505	2,794,705	4,136,383	3,072,547	3,515,778	2,628,000	2,740,022	2,072,317
Single-occupancy	3,174,457	2,366,308	3,512,058	2,608,136	2,971,897	2,221,212	2,296,695	1,737,557
Subtotal	6,922,962	5,161,013	7,648,441	5,680,683	6,487,675	4,849,212	5,036,717	3,809,874
Meat and related products and poultry and shell eggs:								
Multiple-occupancy	452,715	336,740	501,746	371,862	423,297	315,668	325,236	245,426
Single-occupancy	647,100	481,220	719,012	532,731	603,953	450,314	460,131	347,292
Subtotal	1,099,815	817,960	1,220,758	904,593	1,027,250	765,982	785,367	592,718
Dairy products:								
Multiple-occupancy	238,327	175,698	268,539	197,340	220,199	162,714	159,775	119,431
Single-occupancy	1,613,466	1,189,059	1,822,032	1,338,457	1,488,326	1,099,420	1,071,194	800,624
Subtotal	1,851,793	1,364,757	2,090,571	1,535,797	1,708,525	1,262,134	1,230,969	920,055
Groceries, frozen foods, and fish and shellfish:								
Multiple-occupancy	994,930	737,591	1,109,565	819,705	926,149	688,322	696,879	524,093
Single-occupancy	1,214,887	900,399	1,358,180	1,003,042	1,128,910	838,813	842,323	633,527
Subtotal	2,209,817	1,637,990	2,467,745	1,822,747	2,055,059	1,527,135	1,539,202	1,157,620
Total:								
Multiple-occupancy	7,497,941	5,572,639	8,322,597	6,163,351	7,003,146	5,218,213	5,353,835	4,036,791
Single-occupancy	8,185,860	6,072,595	9,135,824	6,753,065	7,615,882	5,664,314	5,715,957	4,303,374
Total	15,683,801	11,645,234	17,458,421	12,916,416	14,619,028	10,882,527	11,069,792	8,340,165

Table 43.—Annual total revenue requirements by methods of financing for firms included in planning for new facilities on a new wholesale food distribution center, San Diego, California—Continued

Type of firm	Site H		Site I		Site J		Site K		Site L	
	Private	Public	Private	Public	Private	Public	Private	Public	Private	Public
	-Dollars-									
Bakery products and beverages:										
Multiple-occupancy	914,670	685,081	649,762	495,325	782,216	590,203	616,648	471,605	1,113,351	827,399
Single-occupancy	837,765	627,447	587,574	448,232	712,669	537,840	556,300	425,831	1,025,408	761,858
Subtotal	1,752,435	1,312,528	1,237,336	943,557	1,494,885	1,128,043	1,172,948	897,436	2,138,759	1,589,257
Candy and confectionery, food brokers, and food products:										
Multiple-occupancy	517,253	390,443	393,520	301,812	455,387	346,127	378,054	290,733	610,053	456,915
Single-occupancy	207,849	156,927	156,293	119,998	182,071	138,463	149,849	115,381	246,515	184,625
Subtotal	725,102	547,370	549,813	421,810	637,458	484,590	527,903	406,114	856,568	641,541
Fruits and vegetables:										
Multiple-occupancy	2,740,022	2,072,317	2,119,417	1,627,770	2,429,720	1,850,043	2,041,842	1,572,202	3,205,476	2,405,727
Single-occupancy	2,296,695	1,737,557	1,756,534	1,350,633	2,026,615	1,544,095	1,689,014	1,302,267	2,701,816	2,027,750
Subtotal	5,036,717	3,809,874	3,875,951	2,978,403	4,456,335	3,394,138	3,730,856	2,874,469	5,907,292	4,433,477
Meat and related products and poultry and shell eggs:										
Multiple-occupancy	325,236	245,426	246,787	189,232	286,011	217,329	236,981	182,207	384,072	287,571
Single-occupancy	460,131	347,292	345,072	264,874	402,601	306,083	330,690	254,572	546,424	409,105
Subtotal	785,367	592,718	591,859	454,106	688,612	523,412	567,671	436,779	930,496	696,676
Dairy products:										
Multiple-occupancy	159,775	119,431	111,435	84,804	135,605	102,117	105,393	80,476	196,030	145,400
Single-occupancy	1,071,194	800,624	737,489	561,586	904,342	681,105	695,776	531,707	1,321,473	979,901
Subtotal	1,230,969	920,055	848,924	646,390	1,039,947	783,222	801,169	612,183	1,517,503	1,125,301
Groceries, frozen foods, and fish and shellfish:										
Multiple-occupancy	696,879	524,093	513,463	392,710	605,171	458,402	490,536	376,287	834,441	622,631
Single-occupancy	842,323	633,527	613,053	469,298	727,688	551,413	584,394	448,770	1,014,275	756,699
Subtotal	1,539,202	1,157,620	1,126,516	862,008	1,332,859	1,009,815	1,074,930	825,057	1,848,716	1,379,330
Total:										
Multiple-occupancy	5,353,835	4,036,791	4,034,384	3,091,653	4,694,110	3,564,221	3,869,454	2,973,510	6,343,423	4,745,644
Single-occupancy	5,715,957	4,303,374	4,196,015	3,214,621	4,955,986	3,758,999	4,006,023	3,078,528	6,855,911	5,119,938
Total	11,069,792	8,340,165	8,230,399	6,306,274	9,650,096	7,323,220	7,875,477	6,052,038	13,199,334	9,965,582

Table 44.—Annual revenue requirements per square foot, by methods of financing for firms included in planning for new facilities on a new wholesale food distribution center, San Diego, California[1]

Type of firm	Site A		Site B		Site C		Site D	
	Private	Public	Private	Public	Private	Public	Private	Public
	Dollars							
Bakery products and beverages:								
Multiple-occupancy	23.11	17.38	32.77	24.30	40.12	29.57	37.37	27.60
Single-occupancy	22.34	16.81	32.00	23.73	39.36	29.00	36.60	27.02
Average	22.74	17.10	32.39	24.02	39.75	29.29	36.99	27.32
Candy and confectionery, food brokers, and food products:								
Multiple-occupancy	19.94	15.11	26.71	19.96	31.86	23.65	29.93	22.27
Single-occupancy	19.17	14.54	25.94	19.39	31.10	23.08	29.16	21.69
Average	19.72	14.95	26.48	19.79	31.64	23.49	29.70	22.10
Fruits and vegetables:								
Multiple-occupancy	19.29	14.65	25.46	19.07	30.16	22.43	28.40	21.17
Single-occupancy	18.52	14.07	24.69	18.49	29.39	21.86	27.63	20.60
Average	18.93	14.38	25.10	18.80	29.80	22.17	28.04	20.90
Meat and related products and poultry and shell eggs:								
Multiple-occupancy	20.05	15.19	26.91	20.11	32.14	23.85	30.18	22.45
Single-occupancy	19.28	14.62	26.14	19.53	31.37	23.28	29.41	21.87
Average	19.59	14.85	26.46	19.77	31.69	23.51	29.72	22.11
Dairy products:								
Multiple-occupancy	24.11	18.10	34.69	25.68	42.74	31.45	39.72	29.28
Single-occupancy	23.34	17.53	33.92	25.10	41.98	30.87	38.95	28.71
Average	23.44	17.60	34.02	25.17	42.07	30.94	39.05	28.78
Groceries, frozen foods, and fish and shellfish:								
Multiple-occupancy	21.32	16.10	29.34	21.85	35.46	26.23	33.16	24.59
Single-occupancy	20.55	15.53	28.58	21.27	34.69	25.65	32.40	24.01
Average	20.89	15.78	28.92	21.53	35.03	25.91	32.74	24.27
Average:								
Multiple-occupancy	20.34	15.40	27.46	20.50	32.89	24.39	30.86	22.93
Single-occupancy	20.17	15.25	27.85	20.75	33.70	24.94	31.51	23.37
Average	20.25	15.32	27.66	20.63	33.31	24.68	31.19	23.16

Table 44.—Annual revenue requirements per square foot, by methods of financing for firms included in planning for new facilities on a new wholesale food distribution center, San Diego, California—Continued.

	Site E		Site F		Site G		Site H	
	Private	Public	Private	Public	Private	Public	Private	Public
	Dollars							
Bakery products and beverages:								
Multiple-occupancy	41.96	30.89	34.61	25.62	25.41	19.03	25.41	19.03
Single-occupancy	41.20	30.31	33.84	25.04	24.64	18.45	24.64	18.45
Average	41.59	30.61	34.23	25.34	25.03	18.75	25.03	18.75
Candy and confectionery, food brokers, and food products:								
Multiple-occupancy	33.15	24.58	28.00	20.88	21.55	16.27	21.55	16.27
Single-occupancy	32.38	24.00	27.23	20.31	20.78	15.69	20.78	15.69
Average	32.93	24.41	27.77	20.72	21.33	16.10	21.33	16.10
Fruits and vegetables:								
Multiple-occupancy	31.34	23.28	26.63	19.91	20.76	15.70	20.76	15.70
Single-occupancy	30.57	22.70	25.87	19.33	19.99	15.12	19.99	15.12
Average	30.98	23.01	26.28	19.64	20.40	15.43	20.40	15.43
Meat and related products and poultry and shell eggs:								
Multiple-occupancy	33.45	24.79	28.22	21.04	21.68	16.36	21.68	16.36
Single-occupancy	32.68	24.22	27.45	20.47	20.92	15.79	20.92	15.79
Average	32.99	24.45	27.76	20.70	21.23	16.02	21.23	16.02
Dairy products:								
Multiple-occupancy	44.76	32.89	36.70	27.12	26.63	19.91	26.63	19.91
Single-occupancy	43.99	32.31	35.93	26.54	25.86	19.33	25.86	19.33
Average	44.09	32.39	36.03	26.62	25.96	19.40	25.96	19.40
Groceries, frozen foods, and fish and shellfish:								
Multiple-occupancy	36.99	27.32	30.87	22.94	23.23	17.47	23.23	17.47
Single-occupancy	36.22	26.75	30.10	22.37	22.46	16.89	22.46	16.89
Average	36.56	27.00	30.45	22.62	22.80	17.15	22.80	17.15
Average:								
Multiple-occupancy	34.25	25.36	28.82	21.47	22.03	16.61	22.03	16.61
Single-occupancy	35.16	25.99	29.31	21.80	22.00	16.56	22.00	16.56
Average	34.72	25.69	29.07	21.64	22.02	16.59	22.02	16.59

Table 44.—Annual revenue requirements per square foot, by methods of financing for firms included in planning for new facilities on a new wholesale food distribution center, San Diego, California—Continued.

Type of firm	Site I		Site J		Site K		Site L	
	Private	Public	Private	Public	Private	Public	Private	Public
	Dollars							
Bakery products and beverages:								
Multiple-occupancy	18.05	13.76	21.73	16.39	17.13	13.10	30.93	22.98
Single-occupancy	17.28	13.18	20.96	15.82	16.36	12.52	30.16	22.41
Average	17.68	13.48	21.36	16.11	16.76	12.82	30.55	22.70
Candy and confectionery, food brokers, and food products:								
Multiple-occupancy	16.40	12.58	18.97	14.42	15.75	12.11	25.42	19.04
Single-occupancy	15.63	12.00	18.21	13.85	14.98	11.54	24.65	18.46
Average	16.17	12.41	18.75	14.25	15.53	11.94	25.19	18.87
Fruits and vegetables:								
Multiple-occupancy	16.06	12.33	18.41	14.02	15.47	11.91	24.28	18.23
Single-occupancy	15.29	11.76	17.64	13.44	14.70	11.33	23.52	17.65
Average	15.70	12.06	18.05	13.75	15.11	11.64	23.93	17.96
Meat and related products, and poultry and shell eggs:								
Multiple-occupancy	16.45	12.62	19.07	14.49	15.80	12.15	25.60	19.17
Single-occupancy	15.69	12.04	18.30	13.91	15.03	11.57	24.84	18.60
Average	16.00	12.27	18.61	14.15	15.34	11.80	25.15	18.83
Dairy products:								
Multiple-occupancy	18.57	14.13	22.60	17.02	17.57	13.41	32.67	24.23
Single-occupancy	17.81	13.56	21.83	16.44	16.80	12.84	31.90	23.66
Average	17.90	13.63	21.93	16.52	16.90	12.91	32.00	23.73
Groceries, frozen foods, and fish and shellfish:								
Multiple-occupancy	17.12	13.09	20.17	15.28	16.35	12.54	27.81	20.75
Single-occupancy	16.35	12.51	19.41	14.70	15.58	11.97	27.05	20.18
Average	16.69	12.77	19.75	14.96	15.92	12.22	27.39	20.43
Average:								
Multiple-occupancy	16.60	12.72	19.32	14.67	15.92	12.24	26.10	19.53
Single-occupancy	16.15	12.37	19.08	14.47	15.42	11.85	26.39	19.71
Average	16.37	12.54	19.19	14.56	15.66	12.04	26.25	19.62

[1]Based on 1987 construction costs, initial facility requirements, and land held for expansion.

The construction of a new wholesale food distribution center to serve San Diego should bring both measurable and non-measurable benefits. Some of these benefits may accrue to the wholesalers through increased profitability of their operations. San Diego area governments, auxiliary business organizations, and the food buying public also would benefit from the economic development and competitive food prices associated with a healthy and efficient regional food industry. In addition, agricultural producers and processors both within and outside the region would realize an improved product demand from a more efficient and progressive food distribution system in the San Diego area.

Measurable Benefits

Some measurable benefits would result for firms located in new wholesale facilities. Figure 27 illustrates the savings or additional costs for some items in new facilities compared with costs for the same items in existing facilities. Some of the costs reflected in figure 27 could be expected to decrease in later years because initial costs include initial investments required to accommodate anticipated business increases. Immediate savings can be expected in labor and energy required to move specific quantities of food and food-related products through the new center. The total labor and energy costs, however, may actually increase as increasing volumes of food products move through a new center designed to efficiently accommodate larger volumes of business. Increased refrigeration and equipment costs represent the investment that companies will make to accommodate this new business.

For an estimate of measurable benefits, operating costs of the firms included in new facility planning were compared in detail with estimated costs for the same operation items on

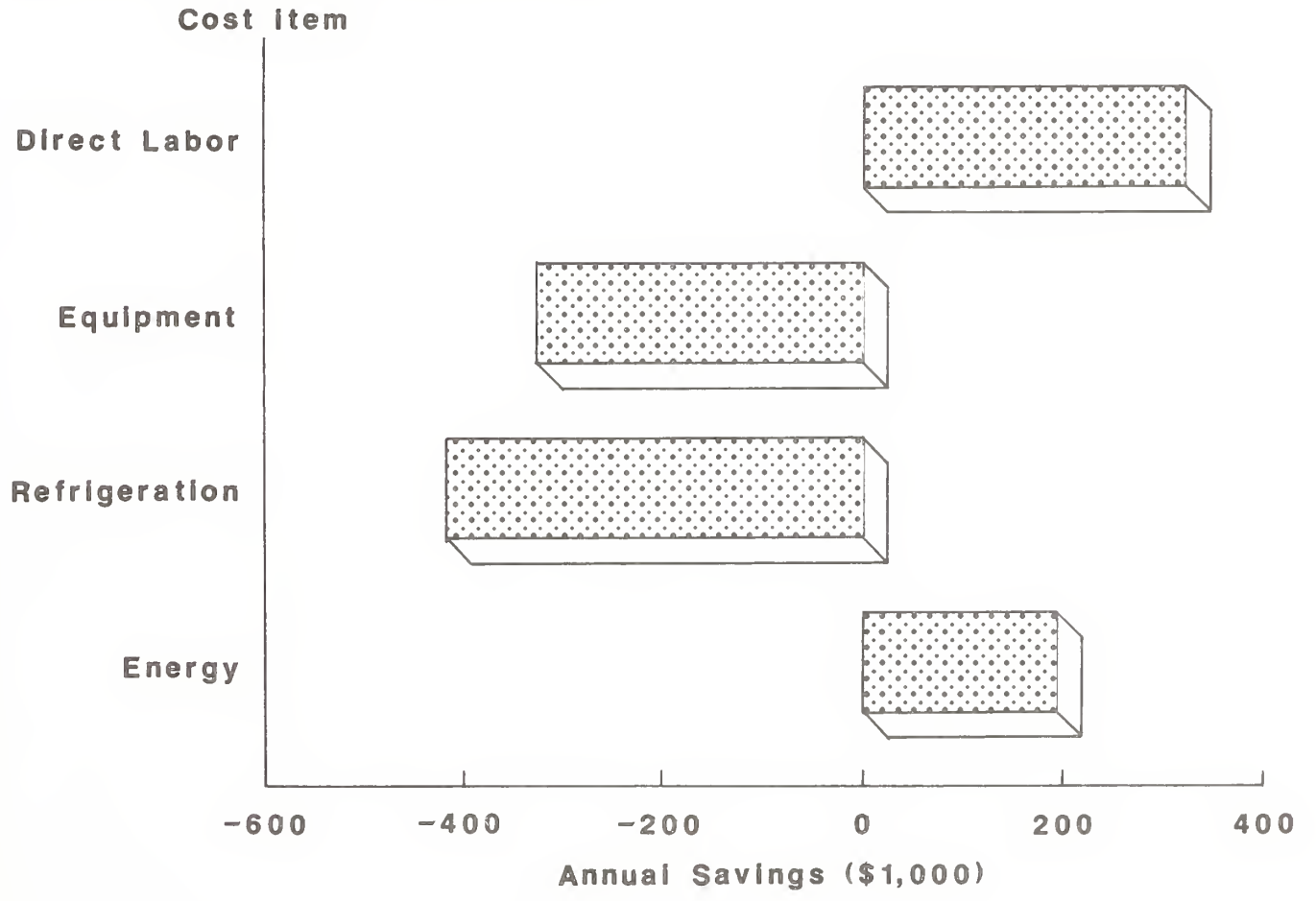


Figure 27.—Projected decreases or increases in selected operating costs in planned facilities on a new wholesale food distribution center, San Diego, California, compared to estimated costs in existing facilities.

a new San Diego wholesale food distribution center. Operating costs in both present and new facilities were grouped into (1) costs of goods sold, (2) labor costs, (3) equipment costs, (4) refrigeration costs, (5) occupancy or facility-related costs (including revenue required), (6) energy costs, (7) transportation or distribution costs, and (8) all other costs. Together, these costs represent the total expenses of the firms included in new facility planning. These costs were projected for a 30-year analysis period, the assumed life of a new San Diego wholesale food distribution center.

Different methods were used to develop operating costs in existing and in planned facilities. Costs in existing facilities were based on interviews with company management and on other general information. Equivalent costs in new facilities were based on reported experiences of similar firms that have located on modern wholesale food distribution centers, on U.S. Department of Agriculture and other research, and on estimates prepared by commodity specialists participating in this project.

Through estimates of operating costs and incomes, we were able to derive estimated projections of the net incomes of the firms included in new facility planning both in new, anticipated buildings and in their existing buildings. Figures 28a and 28b illustrate how the
projected net incomes are expected to change in comparison with potential net incomes assumed if the firms should remain in their existing buildings during the first year of a new center (year 1), during the 10th year (year 10), and during the 20th year (year 20) of operation. In the first year, projected net revenues in new facilities would be less than estimated revenues in existing facilities. Net revenues would be even lower if private financing were chosen as the method for developing the new market rather than public financing. Increases over present levels in occupancy, delivery, refrigeration, and equipment costs more than offset potential savings from labor, energy, and other efficiencies in planned facilities during the first year. This decrease in annual net revenues would range from a low of $0.8 million to as much as $8.2 million, depending on the location of the new facilities. However, the lower interest rates assumed for public financing would result in small increases in first-year net revenues at two of the representative locations. If any of the other example sites were selected, first-year net revenue would be lower but by a smaller margin than would be expected with higher interest rates under private financing. Net revenues in existing facilities were estimated to be about $15.6 million for the first year considered in the analysis.

Projections of net revenues for the firms included in new facility planning in later years of the center's development strongly illustrate the future advantages of moving to new facilities. After the first 10 years of the new center's life, all but two of the sites would offer the potential for net revenues higher than those of firms remaining in existing facilities. The increases would range from a low of about $1 million annually to a high of $8 million. The lower interest rates assumed for public development of the new center would promote increases in net revenues regardless of the site selected. Increases in net revenues on a publicly financed site would range from a low of $1.2 million per year to a

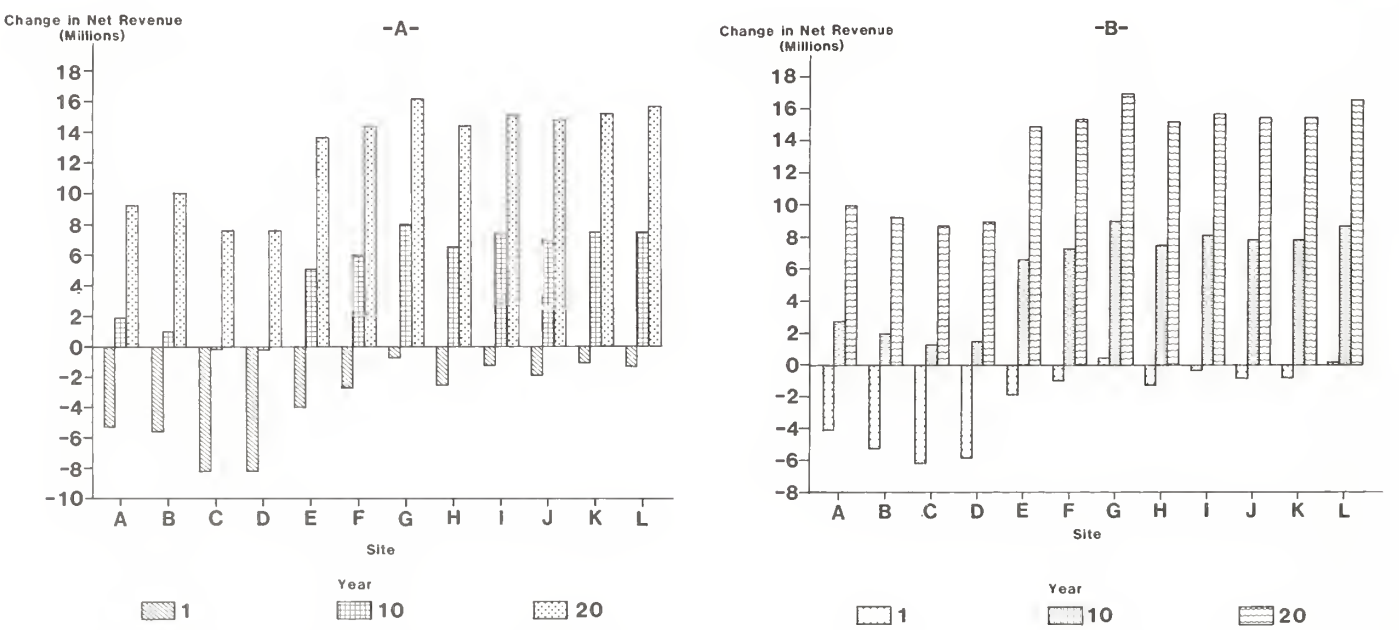


Figure 28.—(A) Changes in projected net revenues in planned facilities assuming private financing, compared with estimated net revenues in existing facilities, San Diego, California; (B) Changes in projected net revenues in planned facilities assuming public financing, compared with estimated net revenues in existing facilities, San Diego, California.

high of $9 million. By the end of the third decade of a San Diego center's operation, all of the potential illustrative sites included in the scope of this report would offer the potential of substantially increasing the net revenues of the food firms included in new facility planning when compared with equivalent revenues possible in existing facilities. Figure 29 illustrates how the differences between the potential net revenues in existing and planned facilities could be expected to change during the 30-year analysis period for sites A and L.

In a comparison of investment alternatives, it is important to recognize that income which can be realized in an earlier time period is worth more than equivalent income generated at a later time period. To address this issue, we have included an additional analysis in this report that compares the present worth (the equivalent value at the present based on the time value of money[16]) of potential net revenues over the 30-year analysis period for firms needing new buildings if they should continue operating in existing facilities or move to a new San Diego wholesale food distribution center located at each of the potential illustrative sites cited earlier in this report.

Projected costs in both present and planned facilities were adjusted for estimated inflation during the analysis period. Each year's costs and incomes were totaled to produce a yearly estimate of annual net income. These incomes were then discounted at various rates and totaled to produce the present worth of these discounted net incomes for each alternative site and development method. These present worth values are outlined in figures 30A and 30B, assuming discount rates of 9 and 13 percent, respectively. Comparisons between present worth values at present facilities and at a new market at each site were based on the present values of net incomes at each location. This analysis and the illustrations indicate that a privately developed center offers some potential increase in benefits over those with existing facilities if such a center is located at one of a number of the

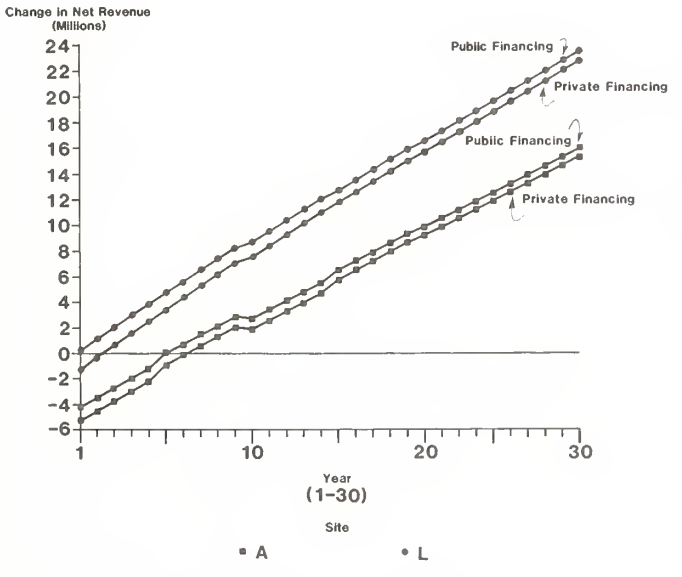
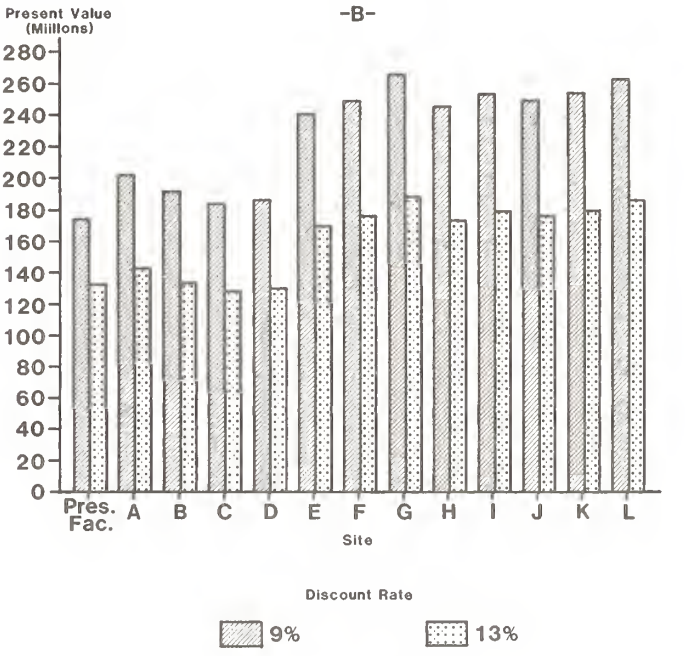


Figure 29.—Annual change in projected net incomes for planned facilities at example sites, compared with estimated revenues for equivalent operations in existing facilities.



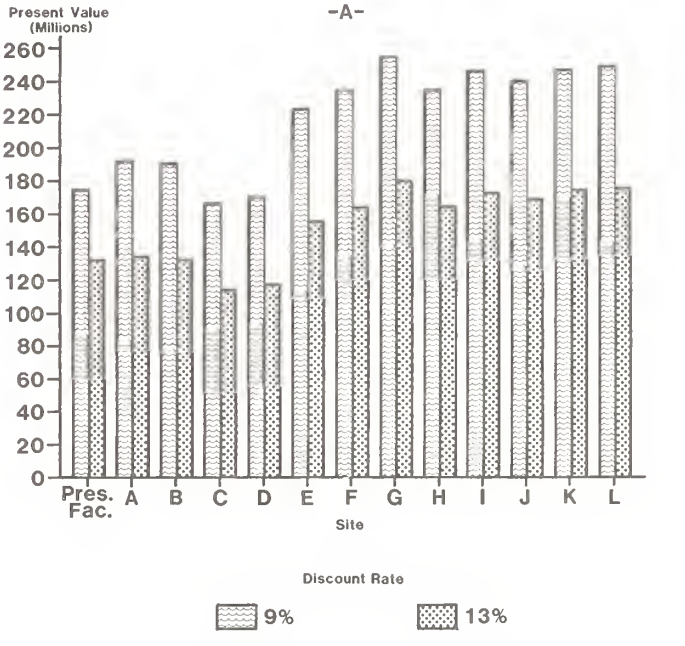


Figure 30.—(A) Present worth of projected net incomes, assuming private development of a new wholesale food distribution center, San Diego, California; (B) Present worth of projected net incomes, assuming public development of a new wholesale food distribution center, San Diego, California.

[16] *Industrial Engineering Terminology,* Institute of Industrial Engineers, 398 pp., ill., 1983

illustrative potential sites. Public development of a new center would offer a wider potential choice of locations at which projected revenues would exceed projected costs.

Each type of examination of the potential measurable benefits of a new San Diego wholesale food distribution center was based on the assumption that the same basic wholesale operations would be conducted regardless of the site selected. Some of the sites offer unique opportunities for new wholesale operations beyond the scope of the current activities of the firms included in new facility planning. For example, some of the sites located in the southern part of the study area may offer an opportunity for efficiently conducting specialized receiving, processing, and forwarding operations for imported produce.

Nonmeasurable Benefits

This study has focused primarily on the need for new facilities by wholesale food firms presently operating in the Greater San Diego area. However, some of the potential benefits of a new wholesale food distribution center would extend beyond the wholesale firms included in new facility planning. Although a complete analysis of these benefits is beyond the major scope of this study, examples of such additional benefits include:

(1) Improved selling environment—New facilities present a modern, attractive atmosphere to potential customers and may help promote the acquisition of new accounts.

(2) Better working conditions—New facilities offer an opportunity to develop pleasant working conditions that will not only be helpful to the employees but also promote an atmosphere conducive to efficient and safe operations.

(3) Adherence to health and safety regulations—Companies operating in modern facilities designed for food warehousing and processing operations find that compliance with health and safety regulations is both easier and less expensive than in antiquated facilities.

(4) Increasing opportunity for employment—Many of the firms included in new facility planning need to expand and modernize to remain active in the industry. Their ability to continue to offer employment may be dependent on successfully relocating to new facilities.

Community Impact

Some of the benefits that result from the construction of a food center accrue both to the wholesalers located there and to the community. One such benefit is the improved healthfulness and quality of the food moving through the distribution system as a result of improved adherence to health and safety standards. The ability to handle perishable products more expeditiously is also a shared benefit. The products not only move more quickly through the facilities but also move more efficiently to and from the facilities. Better control of traffic patterns can be accomplished through a facility design center that is coordinated with existing artery systems. Such design consideration can relieve pressure on older, urban streets, lessening traffic congestion for everyone. The combined effect of these benefits is reduced product spoilage and damage, evidenced by reduced losses for wholesalers and improved quality for consumers.

In addition to bringing benefits to both wholesalers and the community, the construction of a new food center generates benefits that directly affect the general public. Of these community benefits, many are tangible and can be measured directly. Others, although just as real, are not easily quantified and measured but are important factors in determining the need for a new food center.

Measurable Benefits

In general, the most immediate measurable public benefits of a new San Diego wholesale food distribution center will arise, as described below, from the construction of the new development and from tax and other revenues from the yearly operation of the developed center.

Benefits Accruing From Facility Construction.—On sites in areas of limited economic development and higher rates of unemployment, the construction of the new facility will provide benefits in terms of money generated within the local economy. The need for building materials will create new business opportunities for local suppliers and merchants. The construction of the facility will also create jobs—from engineering to labor—in the building trades. These jobs and their subsequent incomes will provide money for local economic expansion in the sales of goods and services. On sites in areas of active economic development, benefits accruing from facility construction would be of limited impact and might not offset infrastructure costs necessary to accommodate the new center.

In addition to providing growth in the private sector, this construction will provide increased Federal, State, and local tax revenues. Income tax revenues will be generated from the new jobs in the building industry, and sales taxes will be generated from the sales of building supplies. Additional tax revenues will be generated from the expansionary effects of economic growth.

Benefits Accruing From Facility Operation.—The generation of long-term tax revenues by the new food center is site dependent and contingent upon financing arrangements. The moving of existing wholesale operations can result in large shifts in local sales and income tax revenues. If the financing arrangement is such that a nonexempt property tax status is maintained, the facility can also provide an important source of local property tax throughout the useful life of the structure.

Nonmeasurable Benefits

Nonmeasurable benefits will accrue from increased food marketing efficiencies.—The development of a new food center with modern food-handling systems will provide an atmosphere for increased competition in the local food industry. With the increased competition, consumers can expect higher quality foods in greater variety at lower cost.

Appendix table 1.—Location of firms by their type and zip code, San Diego, California

Type of firm	92001	92003	92008	92010	92011	92012	92020	92021	92024	92025	92027
						Number					
Bakery products	0	0	0	1	0	0	1	0	1	0	0
Beverages	0	0	0	0	0	0	0	0	0	0	0
Candy and confectionery	0	0	0	0	0	0	0	0	0	0	0
Dairy products	0	0	0	0	0	0	1	0	0	0	0
Fish and shellfish	0	0	1	0	0	0	1	0	0	0	0
Florists	0	0	6	0	0	0	0	0	14	0	0
Food brokers	0	0	0	0	0	0	0	0	0	0	0
Food products	0	0	0	0	2	0	0	2	0	3	0
Frozen foods	0	0	0	0	0	0	0	0	0	1	0
Fruits and vegetables	1	2	0	2	8	1	0	0	0	4	2
Groceries	0	0	0	0	0	0	0	0	0	0	0
Meat and related products	0	0	0	0	0	0	2	2	0	0	0
Poultry and shell eggs	1	0	0	0	0	0	1	1	0	0	0
Total	2	2	7	3	10	1	6	5	15	8	2

Appendix table 1.—Location of firms by their type and zip code, San Diego, California—Continued

Type of firm	92028	92037	92040	92041	92045	92050	92052	92053	92054	92063	92065
						Number					
Bakery products	0	0	0	0	2	1	1	0	0	0	0
Beverages	0	0	0	0	0	0	0	0	0	0	0
Candy and confectionery	0	0	0	0	0	1	0	0	0	0	0
Dairy products	0	1	1	0	0	2	0	0	0	0	0
Fish and shellfish	0	0	0	0	0	0	0	0	0	0	0
Florists	0	0	0	1	0	1	0	0	1	0	0
Food brokers	0	0	0	0	0	0	0	0	0	0	0
Food products	0	0	0	1	1	1	0	0	0	1	0
Frozen foods	0	0	0	0	0	1	0	0	0	0	0
Fruits and vegetables	4	1	2	0	0	2	0	1	1	1	1
Groceries	0	0	0	1	0	2	0	0	0	0	0
Meat and related products	0	0	0	0	0	3	0	0	0	0	0
Poultry and shell eggs	0	0	3	0	0	1	0	0	0	0	1
Total	4	2	6	3	3	15	1	1	2	2	2

Appendix table 1.—Location of firms by their type and zip code, San Diego, California—Continued

Type of firm	92068	92069	92070	92073	92077	92083	Total county	92101	92102	92103	92105
						Number					
Bakery products	0	0	0	0	0	0	7	3	0	0	1
Beverages	0	0	0	0	0	0	0	2	0	0	0
Candy and confectionery	0	0	0	0	0	0	1	0	0	0	0
Dairy products	0	1	0	0	0	0	6	2	0	0	0
Fish and shellfish	0	0	0	0	0	0	2	5	0	0	0
Florists	1	0	0	0	0	1	25	0	0	0	0
Food brokers	0	0	0	0	0	0	0	1	0	0	0
Food products	0	0	0	0	1	0	12	2	0	1	1
Frozen foods	0	0	0	0	0	0	2	0	1	0	0
Fruits and vegetables	0	0	0	1	0	3	37	18	1	0	0
Groceries	0	0	1	0	0	0	4	1	1	0	1
Meat and related products	0	0	0	0	0	0	7	5	0	0	1
Poultry and shell eggs	0	1	0	0	0	0	9	0	0	0	0
Total	1	2	1	1	1	4	112	39	3	1	4

Continued

Appendix table 1.—Location of firms by their type and zip code, San Diego, California—Continued

Type of firm	92107	92110	92111	92112	92113	92114	92115	92116	92117	92120	92121
						Number					
Bakery products	1	1	3	0	2	0	2	0	1	1	2
Beverages	0	0	3	0	0	0	0	0	0	0	1
Candy and confectionery	0	1	0	0	0	0	0	1	0	0	0
Dairy products	0	3	1	0	2	0	0	0	0	0	0
Fish and shellfish	0	3	0	0	0	0	0	0	0	0	0
Florists	0	1	0	0	0	0	0	0	0	0	1
Food brokers	0	0	0	2	0	0	0	0	0	0	0
Food products	0	1	2	1	0	1	0	0	0	1	4
Frozen foods	0	0	0	0	0	0	0	0	0	0	1
Fruits and vegetables	0	1	0	0	3	0	0	0	0	0	3
Groceries	0	0	1	0	0	0	0	0	0	1	1
Meat and related products	0	2	2	2	3	0	0	0	0	0	1
Poultry and shell eggs	0	0	0	0	1	0	0	0	0	0	0
Total	1	13	12	5	11	1	2	1	1	3	14

Appendix table 1.—Location of firms by their type and zip code, San Diego, California—Continued

Type of firm	92123	92126	92127	92128	92145	Total city	Grand total
				Number			
Bakery products	0	1	0	0	0	18	25
Beverages	1	0	0	0	0	7	7
Candy and confectionery	0	0	0	0	0	2	3
Dairy products	1	0	1	0	0	10	16
Fish and shellfish	0	0	0	1	1	10	12
Florists	0	0	0	0	0	2	27
Food brokers	0	0	0	0	0	3	3
Food products	0	0	0	0	0	14	26
Frozen foods	0	1	0	0	0	3	5
Fruits and vegetables	0	0	0	0	0	26	63
Groceries	0	0	0	0	0	6	10
Meat and related products	0	0	0	0	0	16	23
Poultry and shell eggs	0	0	0	0	0	1	10
Total	2	2	1	1	1	118	230

Appendix table 2.—Present space by type, floor level, and type of firm, San Diego, California

Type of firm	Type of primary space						Secondary space	Type of total space	
	Non-refrigerated	Cooler	Freezer	Office	Other	Total		Non-refrigerated	Cooler
					Square feet				
Bakery products:									
Basement	0	0	0	0	0	0	0	0	0
First floor	100,433	4,124	8,747	17,360	118,686	249,350	13,050	113,233	4,374
Second floor	0	0	0	9,950	18,400	28,350	0	0	0
Other	0	0	0	0	0	0	0	0	0
Total	100,433	4,124	8,747	27,310	137,086	277,700	13,050	113,233	4,374
Beverages:									
Basement	0	0	0	0	0	0	0	0	0
First floor	261,674	0	0	36,896	94,850	393,420	36,990	261,964	0
Second floor	1,000	0	0	0	0	1,000	0	1,000	0
Other	0	0	0	0	0	0	0	0	0
Total	262,674	0	0	36,896	94,850	394,420	36,990	262,964	0

Appendix table 2.—Present space by type, floor level, and type of firm, San Diego, California —Continued

Type of firm	Type of primary space						Secondary space	Type of total space	
	Non-refrigerated	Cooler	Freezer	Office	Other	Total		Non-refrigerated	Cooler
	Square feet								
Candy and confectionery:									
Basement	0	0	0	0	0	0	0	0	0
First floor	9,650	0	0	450	0	10,100	0	9,650	0
Second floor	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
Total	9,650	0	0	450	0	10,100	0	9,650	0
Dairy products:									
Basement	0	0	0	0	0	0	0	0	0
First floor	32,450	40,920	22,009	21,620	53,800	170,799	0	32,450	40,920
Second floor	20,900	0	0	14,800	0	35,700	0	20,900	0
Other	0	0	0	0	0	0	0	0	0
Total	53,350	40,920	22,009	36,420	53,800	206,499	0	53,350	40,920
Fish and shellfish:									
Basement	0	0	0	0	0	0	0	0	0
First floor	39,417	12,350	17,756	7,345	25,232	102,100	4,500	43,917	12,350
Second floor	1,000	0	0	4,600	0	5,600	0	1,000	0
Other	0	0	0	0	0	0	2,000	0	0
Total	40,417	12,350	17,756	11,945	25,232	107,700	6,500	44,917	12,350
Florists:									
Basement	0	0	0	0	0	0	0	0	0
First floor	22,356	41,006	0	11,075	155,849	230,286	16,692	34,356	45,698
Second floor	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
Total	22,356	41,006	0	11,075	155,849	230,286	16,692	34,356	45,698
Food brokers:									
Basement	0	0	0	0	0	0	0	0	0
First floor	8,600	400	0	2,500	0	11,500	0	8,600	400
Second floor	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
Total	8,600	400	0	2,500	0	11,500	0	8,600	400
Food products:									
Basement	0	0	0	0	0	0	0	0	0
First floor	113,616	18,810	9,250	16,630	36,478	194,784	12,000	125,616	18,810
Second floor	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
Total	113,616	18,810	9,250	16,630	36,478	194,784	12,000	125,616	18,810
Frozen foods:									
Basement	0	0	0	0	0	0	0	0	0
First floor	34,450	8,700	16,650	5,470	6,500	71,770	0	34,450	8,700
Second floor	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
Total	34,450	8,700	16,650	5,470	6,500	71,770	0	34,450	8,700
Fruits and vegetables:									
Basement	36,730	2,520	0	750	0	40,000	0	36,730	2,520
First floor	775,270	208,118	10,510	29,629	167,127	1,190,654	15,500	787,770	211,118
Second floor	0	0	0	10,578	400	10,978	200	0	0
Other	0	0	0	0	0	0	0	0	0
Total	812,000	210,638	10,510	40,957	167,527	1,241,632	15,700	824,500	213,638
Groceries:									
Basement	0	0	0	0	0	0	0	0	0
First floor	681,985	40,020	2,890	9,200	7,305	741,400	95,000	725,985	61,020
Second floor	0	0	0	5,200	0	5,200	0	0	0
Other	0	0	0	0	0	0	0	0	0
Total	681,985	40,020	2,890	14,400	7,305	746,600	95,000	725,985	61,020

Appendix table 2.—Present space by type, floor level, and type of firm, San Diego, California —Continued

Type of firm	Type of primary space						Secondary space	Type of total space	
	Non-refrigerated	Cooler	Freezer	Office	Other	Total		Non-refrigerated	Cooler
	Square feet								
Meat and related products:									
Basement	1,565	500	500	0	0	2,565	0	1,565	500
First floor	17,095	77,530	32,630	13,114	42,734	183,103	0	17,095	77,530
Second floor	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0
Total	18,660	78,030	33,130	13,114	42,734	185,668	0	18,660	78,030
Poultry and shell eggs:									
Basement	0	0	0	0	0	0	0	0	0
First floor	61,920	24,650	11,900	1,080	26,450	126,000	0	61,920	24,650
Second floor	0	0	0	600	200	800	0	0	0
Other	0	0	0	0	0	0	0	0	0
Total	61,920	24,650	11,900	1,680	26,650	126,800	0	61,920	24,650
Grand total:									
Basement	38,295	3,020	500	750	0	42,565	0	38,295	3,020
First floor	2,158,916	476,628	132,342	172,369	735,011	3,675,266	193,732	2,257,006	505,570
Second floor	22,900	0	0	45,728	19,000	87,628	200	22,900	0
Other	0	0	0	0	0	0	2,000	0	0
Total	2,220,111	479,648	132,842	218,847	754,011	3,805,459	195,932	2,318,201	508,590

Appendix table 2.—Present space by type, floor level, and type of firm, San Diego, California—Continued

Type of firm	Type of total space-continued			
	Freezer	Office	Other	Total
	Square feet			
Bakery products:				
Basement	0	0	0	0
First floor	8,747	17,360	118,686	262,400
Second floor	0	9,950	18,400	28,350
Other	0	0	0	0
Total	8,747	27,310	137,086	290,750
Beverages:				
Basement	0	0	0	0
First floor	0	38,596	129,850	430,410
Second floor	0	0	0	1,000
Other	0	0	0	0
Total	0	38,596	129,850	431,410
Candy and confectionery:				
Basement	0	0	0	0
First floor	0	450	0	10,100
Second floor	0	0	0	0
Other	0	0	0	0
Total	0	450	0	10,100
Dairy products:				
Basement	0	0	0	0
First floor	22,009	21,620	53,800	170,799
Second floor	0	14,800	0	35,700
Other	0	0	0	0
Total	22,009	36,420	53,800	206,499
Fish and shellfish:				
Basement	0	0	0	0
First floor	17,756	7,345	25,232	106,600
Second floor	0	4,600	0	5,600
Other	0	0	2,000	2,000
Total	17,756	11,945	27,232	114,200

Appendix table 2.—Present space by type, floor level, and type of firm, San Diego, California—Continued

Type of firm	Type of total space-continued			
	Freezer	Office	Other	Total
		Square feet		
Florists:				
Basement	0	0	0	0
First floor	0	11,075	155,849	246,978
Second floor	0	0	0	0
Other	0	0	0	0
Total	0	11,075	155,849	246,978
Food brokers:				
Basement	0	0	0	0
First floor	0	2,500	0	11,500
Second floor	0	0	0	0
Other	0	0	0	0
Total	0	2,500	0	11,500
Food products:				
Basement	0	0	0	0
First floor	9,250	16,630	36,478	206,784
Second floor	0	0	0	0
Other	0	0	0	0
Total	9,250	16,630	36,478	206,784
Frozen foods:				
Basement	0	0	0	0
First floor	16,650	5,470	6,500	71,770
Second floor	0	0	0	0
Other	0	0	0	0
Total	16,650	5,470	6,500	71,770
Fruits and vegetables:				
Basement	0	750	0	40,000
First floor	10,510	29,629	167,127	1,206,154
Second floor	0	10,778	400	11,178
Other	0	0	0	0
Total	10,510	41,157	167,527	1,257,332
Groceries:				
Basement	0	0	0	0
First floor	32,890	9,200	7,305	836,400
Second floor	0	5,200	0	5,200
Other	0	0	0	0
Total	32,890	14,400	7,305	841,600
Meat and related products:				
Basement	500	0	0	2,565
First floor	32,630	13,114	42,734	183,103
Second floor	0	0	0	0
Other	0	0	0	0
Total	33,130	13,114	42,734	185,668
Poultry and shell eggs:				
Basement	0	0	0	0
First floor	11,900	1,080	26,450	126,000
Second floor	0	600	200	800
Other	0	0	0	0
Total	11,900	1,680	26,650	126,800
Grand total:				
Basement	500	750	0	42,565
First floor	162,342	174,069	770,011	3,868,998
Second floor	0	45,928	19,000	87,828
Other	0	0	2,000	2,000
Total	162,842	220,747	791,011	4,001,391