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DEMAND FOR OFFICE SPACE

BY

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Summary and Conclusions

*** In the period 1972-1988, office space (as defined for this study) grew on average by 173 million square feet per year, or at a compound rate of nearly 8 percent a year. However, the earlier and later parts of this period differed considerably from each other. In 1972-79, office space expanded by 104 million square feet a year. In the period 1979-88, production jumped by over 120 percent to an average of 227 million square feet per year.

*** During this 16-year period, growth of the adult population created a demand for about 17 percent of the increased supply. The rapid rise in the share of the population working in offices required about 44 percent of the added space. The amount of space each office employee used also rose sharply. This factor filled 24 percent of the new supply. Finally, 15 percent of the increased space was not used. As the period ended, it was still vacant.

*** While the demand for space will continue to grow, we project for the period 1988-2000 a 50-percent decline in the rate of growth in the supply. In these years, we expect supply to grow by 113 million square feet a year--somewhat more than the pace of the 1972-79 period, but only half that of 1979-88.

*** Over 57 percent of this drop is due to an anticipated drastic reversal in the role to be played by changes in vacancies. The vacancy rate is expected to fall by 60 percent by the year 2000,

thus reversing the steady climb to the high reached in 1986. The large increase in vacancies caused production in the 1980s to surpass by far changes in final demand. In the 1990s, falling vacancies will cause production to trail absorptions.

*** Among the other factors, the amount of additional space required by population increases will be about 15 percent higher than in the last decade. The share of office workers in the adult population and their total number will continue to expand rapidly, but at a decidedly slower pace. This deceleration will account for about 20 percent of the decline. We believe the increase in space used per employee will also decelerate to only about 40 percent of its recent pace. Combining these three sources means an expected continued expansion of 132 million square feet a year in the occupancy level, but roughly 25 percent less than the pace at which occupancy grew in the 1980s.

Methodology and Data

Widely differing estimates of office space appear because no complete census or survey exists for the United States. As a result, all estimates must be derived from related data. Depending on how defined and the sources used, estimates of new and existing office space and demand for it vary by over 100 percent.

For this report, since it is concerned primarily with analyzing the demand for space, we have used a consistent set of data based on the number of office workers employed in the primary office industries. Appendix A contains a more complete explanation of the methodology used. Detailed projections for

this group in the year 2000 are available from the U.S. Department of Labor.[1] [Footnote 1: U.S. Department of Labor, Bureau of Labor Statistics, Projections 2000 (BLS Bulletin 2302, March 1988, U.S. Government Printing Office, Washington D.C.)]

As explained in Appendix A, the data on employment in the selected office industries are converted to occupancy data through the use of fairly reliable information on the use of space per employee. The estimates of total space are weaker, since they utilize data on vacancies which contain larger measurement errors. The need to use these additional sources lowers the reliability of short-run estimates. However, over longer periods, most of the demand arises from population and labor force movements. Estimates in these spheres are based either on complete censuses or on the Current Population Surveys and annual employment data.

We can compare the supply of office space as used in this report with the broader universe of office space found in current construction data issued by the Bureau of Labor Statistics or the F.W. Dodge reports. Since these sources contain no data on the stock of buildings, comparisons can only be approximate. We estimate that the changes in office space as defined for this report account for over 80 percent of these broader universes. Primary differences arise from the construction of office space for workers not in the main office industries. Other differences occur because new construction data do not cover removals from the existing space.

According to our estimates, the amount of competitive office

space contained in the continuing studies of the competitive office market by Salomon Brothers (cf. Real Estate Market Review, Jan. 1989, p.26) accounts for about 60 percent of the space occupied by office workers in the selected industries considered in this report. The differences arise because the competitive office market includes only multi-tenant buildings of 20,000 square feet or larger in 50 metropolitan statistical areas. It excludes owner-occupied buildings, medical and professional buildings, the smaller buildings, and all office space in other geographic areas. While these differences will affect the specific numbers, the general trends and types of movement in both markets should be similar.

Movements in Supply and Demand

Figure 1 details information familiar to all interested in the market for office properties. A steady expansion of the total amount of office space has occurred since 1972. Moreover, the rate of the expansion has varied greatly.

In the years 1972-79, office space expanded at a compound rate of 7.1 percent per year. Because the base was comparatively small, this meant additions of about 100 million square feet a year (Figure 2). Since this did not quite match the growth in occupancy, both the number and rate of vacancies fell.

In the period 1979-86, the pace at which space was being added rose to 9.3 percent compounded, or to 235 million square feet per year--a spurt of over 120 percent. In 1986, the amount of new space added compared with 1979 was over 250 percent higher.

Figure 1

THE SUPPLY OF OFFICE SPACE, 1972-2000

Amount of Space
(in millions of square feet)

	1972	1979	1986	1988e	2000p
Occupied space	1,081	1,814	3,035	3,433	5,016
Vacant space	89	80	494	508	281
Total	1,170	1,894	3,529	3,941	5,297
Vacancy rate	7.6%	4.2%	14.0%	12.9%	5.3%

e estimated
p projected

ANNUAL COMPOUND GROWTH RATE
(in percent)

	1972-79	1979-86	1986-88	1988-2000
Occupied space	7.68%	7.63%	6.35%	3.21%
Vacant space	(-1.51%)	29.70%	1.41%	(-4.81%)
Total	7.12%	9.30%	5.68%	2.50%

Source: Estimated for this study. Cf. Appendix A.

Figure 2

FORCES ALTERING THE USE OF OFFICE SPACE

Annual Average Growth in Period (in millions of square feet)

	1972-79	1979-86	1986-88	1988-2000
Vacant space	(-1)	60	7	(-19)
Occupied space	105	175	199	132
Population	28	30	35	35
Economic & social	77	145	164	97
Total	104	235	206	113

Percent Distribution

Vacant space	(-1%)	25%	3%	(-17%)
Occupied space	101	75	97	117
Population	27	13	17	31
Economic & social	74	62	80	86
Total	100%	100%	100%	100%

Source: Derived from Figures 1 and 3.

Even though the rate of absorption hit record levels it failed to keep up with the new supply. As a result, vacancies more than tripled by 1986.[2] [Footnote 2: As noted in Appendix A, since there are little data for vacancies outside the market for competitive office space, the vacancy estimates are potentially the least accurate.] In 1987 and 1988 the pace of additions to supply dropped, while absorptions continued to expand. The vacancy rate began to decline.

What of the future? Figures 1 and 2 project a drop in the vacancy rate combined with a high but somewhat reduced level of absorptions, leading to a continued expansion of supply, but at a far slower pace.

In this report, we contrast the additions to the office total with movements in absorptions and vacancies. Figure 2 details the changes in demand resulting from population growth and economic and social forces. We utilize knowledge of these variables to project the demand for competitive space between now and the year 2000.[3] [Footnote 3: The projection of a demand for occupied space of 5,016 million square feet in the year 2000 is based on moderate or middle projections of population, changes in the labor force, changes in the number of office workers, and space used per office worker, as described in Appendix A. We have also made similar projections under low and high assumptions. The moderate occupancy levels discussed in this report fall in the middle of a range based on the high or low projections of plus or minus 10 percent.]

Vacancies

As final demand accelerated in the 1970s, the number of vacancies actually fell. In contrast, from 1979 through 1986, the pace of construction exceeded the rate at which occupancy was growing by over 30 percent. The amount of vacant space grew by an annual average of nearly 60 million square feet per year. Since then, the amount of construction has fallen while absorption has remained high. A slight drop in the vacancy rate occured because, while vacancies continued to grow, their rate of expansion was less than that for new occupancies. This year, because absorption is expected to outrun additions to the supply, an actual contraction in vacancies will occur.

Because so much of new demand will flow into existing vacancies, the amount of new office construction in the 1990s will fall well below that of the 1980s. We assume, as shown in Figure 1, that by the year 2000 vacancies will return to a more normal level. Of course, the actual rate in that year is likely to differ somewhat from that assumed because the figure in each specific year depends so much on that year's economic events as well as on year-to-year variations in completions.

As a result of the expected decline in vacancies, additions to office space are projected to run at only 85 percent of the growth in occupied space. In place of the average of 60 million new square feet added to vacancies in each year from 1979 to 1986, Figure 2 shows that actual occupancy should outrun additions to office supply by about 19 million square feet per year.

The Absorption Rate for Space

Figure 2 also shows that the absorption of added space grew from an average rate of 105 million square feet per year for 1972-79 to over 199 million per year in 1986-88. Because the base of occupied space against which the growth rate is calculated was expanding also, the percentage of growth in occupied space fell somewhat.

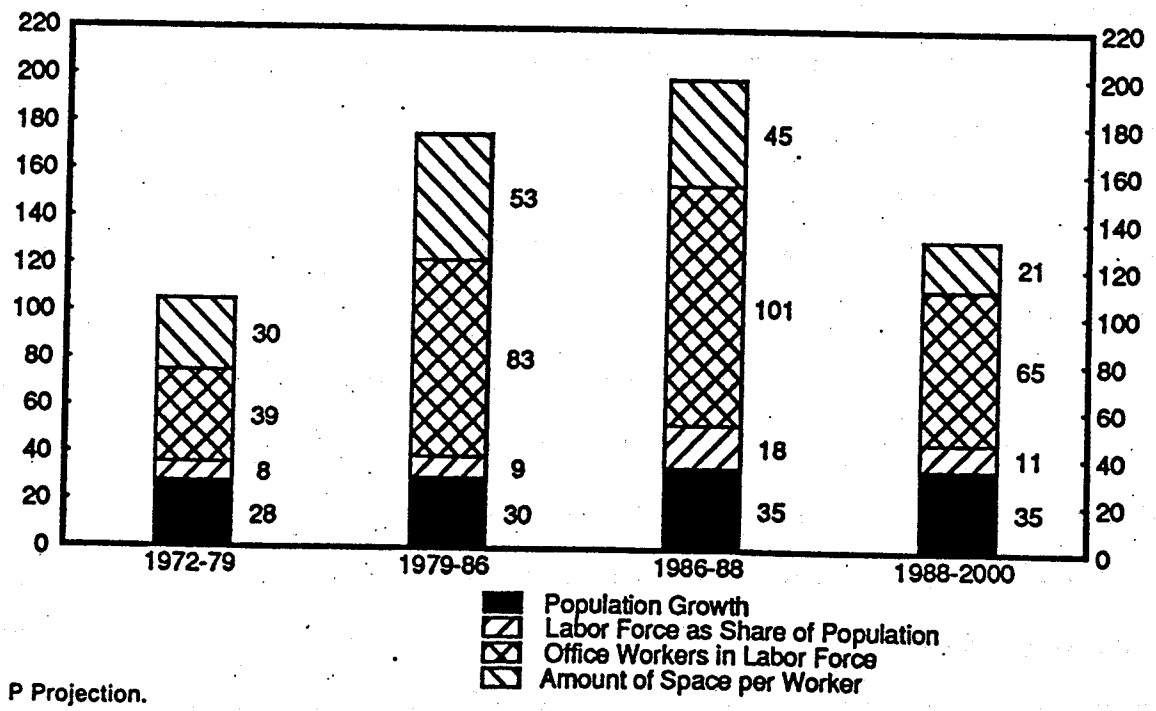
The projection for 1988-2000 shows decreased absorption, both in square feet and in its rate of growth. This projected fall, as illustrated by Figure 3, arises from rather disparate movements in the four factors which we use to explain movements in occupied space.

The amount of space demanded as a result of a larger adult population, accompanied by a growing participation rate in the labor force, continues at roughly the same pace as in the 1980s. Office workers' share of the labor force continues to expand rapidly, even though at a slower pace. However, the projection assumes a rather sharp decline in the rate at which occupied space per employee expands. As will be noted shortly, knowledge is minimal as to the factors that have caused the rapid increase in this category. If we assumed that its previous rate of expansion would continue, the total projection of the demand for additional space would be about 143 million square feet a year, in contrast to the indicated 113 million.

What are the forces behind these varied movements?

Figure 3

FACTORS IN THE ABSORPTION RATE FOR OFFICE SPACE, 1972-2000P



P Projection.

Population

In any projection of demand, one of the more accurate segments is that based on population growth. All those who will be 16 and over in the year 2000 are already alive. The actual number in this category will differ somewhat from the Census Bureau's projections because of fluctuations in the death rate and in net migrations, but historically such movements have not caused major errors in expected growth.

Figures 4 and 5 contain data for the past as well as a projection for the working age population. They show a gradual deceleration in the yearly increase of this group and, consequently, a still faster decline in its growth rate. However, the projected expansion in the adult population remains large, averaging over 1.68 million people per year.

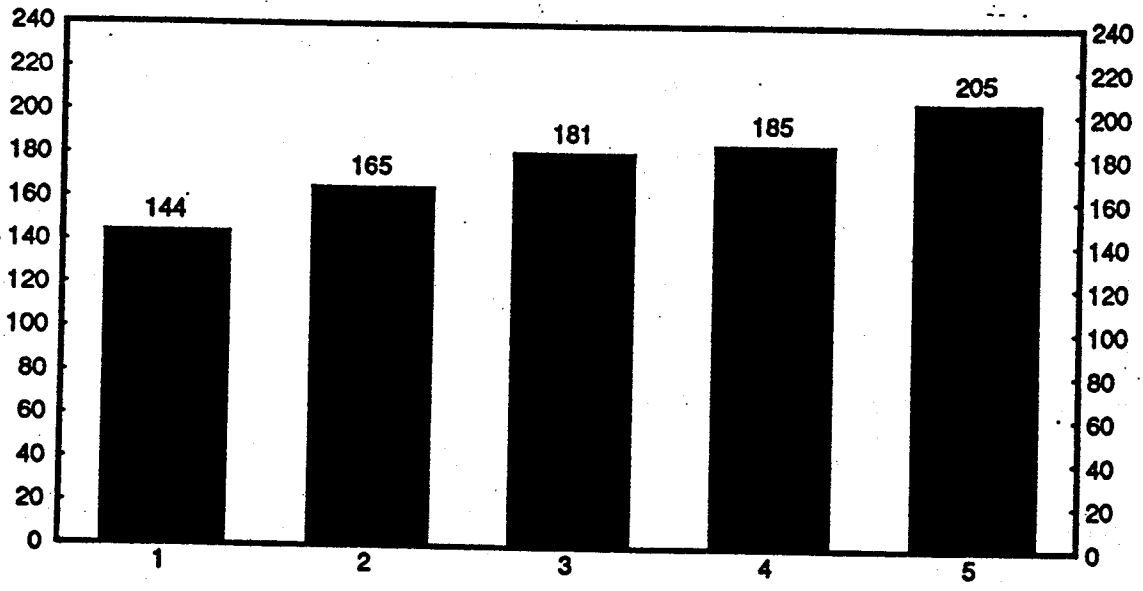
Moreover, Figure 3 shows an even more significant impact from population growth. Because the use of office space per employee has grown steadily, each addition to the adult population is matched by a larger demand for office space than in previous periods. Even with population growing by smaller amounts, the demand for space increases. Population growth has accounted for from 28 to 35 million square feet per year of added demand. The projections indicate that this level of demand should continue.

Social and Economic Forces

The percentage of the adult population who work in offices and the amount of space each uses have been and will continue to be the most dynamic forces in the market for space. As Figure 2

Figure 4

THE POPULATION OF THE UNITED STATES AGED 16 YEARS AND OLDER, 1972-2000P



P Projection.
Sources: *Projections 2000*, U.S. Department of Labor, Bureau of Labor Statistics, BLS Bulletin 2302, March 1988, U.S. Government Printing Office, Washington D.C., p.21.

Figure 5

GROWTH OF THE POPULATION 16 YEARS AND OVER
1972-2000

Average Annual Growth (in millions of people)

	1972-79	1979-86	1986-88	1988-2000
Total	2.97	2.24	2.00	1.68

Average Annual Growth (in percent, compounded annually)

Total	1.94%	1.31%	1.10%	0.86%

Source: Figure 4

shows, the economic and social forces driving space utilization--in contrast to population and vacancies--equaled about 62 percent of the added supply of office space. They are projected to account for over 85 percent of the space to be added between now and the year 2000.

Along with an increasing adult population, the percentage of adults who want to work and do so has also grown. Figure 6 shows that the civilian labor force grew by nearly 35 million between 1972 and 1988, partly from the increased population, but also from a higher participation rate. As the percentage participation of adults in the civilian labor force expands, the number of workers grows faster than the population. Figure 3 shows that this factor has increased demand by 8 to 18 million square feet a year. While declining from current levels, increased participation will continue to contribute to final demand.

The largest shift in demand arises from the movement in the labor force into office occupations. As Figure 6 shows, growth of office workers in the selected industries rose by over 8 million people between 1972 and 1988, or at a compound growth rate of over 5 percent per year. This shift has been and is expected to be the basis for about half of the total absorption of space. Our economy has steadily expanded the share of the work force in the service sector. Information and information management have become far more important. Computer and data processing services, research and consulting, legal services, credit agencies and reporting, as well as a host of other business and financial services, are all among our fastest growing

Figure 6

SOCIAL AND ECONOMIC FACTORS
INFLUENCING ABSORPTION OF OFFICE SPACE, 1976-2000

	1972	1979	1986	1988e	2000p
Civilian Labor Force (in millions)	87.0	105.0	117.8	121.7	138.8
Participation rate (% of population 16+)	60.4%	63.7%	65.2%	65.9%	67.8%
Office Workers in Selected Industries (in millions)	6.53	9.34	13.23	14.54	19.87
(% of population 16+)	4.53%	5.66%	7.33%	7.88%	9.71%
Participation rate (% of civilian labor force)	7.50%	8.90%	11.23%	11.90%	14.32%
Space per Office Worker (square feet)	165.6	194.2	229.4	236.1	252.5

e estimated
p projected

Annual Compound Growth Rate
(in percent)

	1972-79	1979-86	1986-88	1988-2000
Civilian Labor Force	2.71%	1.66%	1.64%	1.10%
Office Workers in Selected Industries	5.25%	5.10%	4.83%	2.64%
Space per Worker	2.31%	2.41%	1.45%	0.56%

Source: Projections 2000 and this study.

industries. All of these consume large volumes of office space. Their rapid growth is expected to continue and to comprise much of new demand.

A final major factor increasing the need for more office space, as shown in Figure 6, has been the growth in the amount of space used per employee. Figure 3 shows that this factor has increased occupancy by from 30 to 53 million square feet a year. However, an examination of the forces behind this change leads us to assume that this demand will not continue to expand as fast. Absorption from this factor is projected to fall about 30 million square feet a year below its pace for the 1980s.

Labor Force Participation. The second line in Figure 6 shows that the ratio of workers to the adult population (labor force participation) grew from 60.4 percent in 1972 to 65.9 percent in 1988. It is the impact of this factor on space demanded that we consider here.

Some of the forces at work seem clear. Most significant has been the growth in the number of employed women. Currently, the percentage of women between the ages of 25 and 54 in the labor force is about 40 percent higher than in 1972. By 2000, it should be nearly 60 percent greater. In contrast, the percentage of employed men--particularly those over 55--has been falling. Higher social security and other pension benefits have led to an exodus from the labor force for this group.

As with the population factor, although the rate of growth will slow somewhat, each new worker will occuply more space. The net result, as shown in Figure 3, is that the increased labor

force participation is expected to add 11 million square feet to demand--identical to the average amount added for the period 1979-88.

More Office Workers. By far the largest amount of absorption arising from economic and social change has flowed from the rapid expansion in the share of the population and labor force who work in offices. In Figure 6, we see that office workers in the primary office industries (cf. Appendix A)rose from 4.5 percent of the adult population and 7.5 percent of the labor force in 1972 to 7.9 and 11.9 percent respectively in 1988. These shares are projected to increase to 9.7 and 14.3 percent by the year 2000.

Combining this more than doubling of the selected office workers' share of the larger labor force results in more than tripling the number of office workers between 1972 and 2000. This occupational switch has accounted for about 48 percent of the demand for space in recent years.

While the switch to office employment will slow somewhat, based on the Department of Labor's detailed projections of employment by industries in the year 2000, its share of the total demand for space will increase slightly, as shown in Figure 3.

Space per Office Worker. We lack sufficient information to explain the specific reasons why the amount of space used per worker has increased so rapidly. From 1972 through 1988, this component grew at a compound annual rate of 2.24 percent a year.

During this period, higher real income in corporations led

to a greater willingness to spend money on employee amenities and satisfaction as well as to enjoying the enhanced status gained from larger offices. Equipment in offices has also proliferated. On the other hand, better design has supposedly led to more efficient space utilization. Since these trends are offsetting, the degree to which they would raise or lower space use is uncertain.

The need for space did grow because the share of higher-paid executives, managers, and professionals in the work force rose, and they occupy larger offices. This factor accounted for about 10 percent of the total increase in space used per employee. Its role is a good deal smaller in the projections to 2000.

Another important variable raising the amount of space used per employee results from the much higher vacancy levels of recent years. When rents were rising and vacancies falling, it seemed prudent to plan ahead. Larger offices were occupied now to handle more employees in the future. Renting extra space--even though it meant increasing the amount per current employee--seemed sensible since it solved the problem of future growth at guaranteed rents. If growth lagged expectations, it would be easy to sublease the extra space.

When supply outran demand and rents fell, this strategy failed. Space became harder to sublease. As many firms down-sized their overhead, expansion fell below expectations. As a result, some of the increase in space per employee has been unwanted. In addition, with lower rents, some firms are again taking extra space for future expansion. Some future growth of office workers will be accommodated by a more efficient use of

space already occupied. As with undesired vacancies, the pressure to fill current excess rented space will partially offset other growth factors.

Projections of space per worker appear less certain than are those for the other variables. Some expect that this rate will not increase at all, since so much of new growth can be absorbed by current excesses. While agreeing that annual growth in this factor should decline, others see changes occurring at about the same pace as for the other factors. This would mean that space per employee would grow at about half its 1972-88 pace.

We take an intermediate position. It assumes that excesses in current utilization patterns will cause a drop in the rate of growth, but only to one-quarter of its previous level, not to zero. This is the basis of our main or moderate projection. The other assumptions are utilized in the low and high projections and are among the factors that yield the range of plus or minus 10 percent around our basic projection.

Appendix A

As noted, the estimates in this report are for space occupied by office workers in the major office-occupying industries. These selected industries account for over 80 percent of all office use. To project the number of workers in these industries and their space, we utilize four main sources:

1. Population, the civilian labor force, and the number of office workers are derived from the Bureau of the Census Current Population Reports and the Bureau of Labor Statistics Employment and Earnings. These data are summarized and projected in Bureau of Labor Statistics Projection 2000, BLS Bulletin 2302 (U.S. Government Printing Office, March 1988).

2. Space used per type of employee is based on a Dun and Bradstreet survey of 22,000 establishments as reported in D. L. Birch, America's Office Needs 1985-1995, p.13 (Massachusetts Institute of Technology Center for Real Estate Development, 1986).

3. The estimates for vacancy rates are weak because of the paucity of data concerning the actual amount of vacancies in non-competitive space. Overall vacancy rates for competitive office space are from Salomon Brothers' survey of local market conditions in 50 metropolitan statistical areas and over 400 individual markets, as reported in David Shulman et al., Real Estate Market Review (Salomon Brothers, October 1988). The vacancy rates for non-competitive space are assumed to be at 20 percent of the level of competitive space.

4. The vacancy and square feet per employee data for years other than 1986 are based on indexes derived from a special computer run furnished by William Wheaton from information contained in the Coldwell Banker/Torto Wheaton Service data base.

Population, Labor Force, and Office Workers. The estimates and projections for population and the civilian labor force are from Projections 2000, pages 19, 21, 23. The number of office workers occupying space is derived from the data and projections of employment by selected industries and occupations, Projections 2000, pages 41, 42, 46, and 47.

The estimates used from Projections 2000 are those for white collar workers in standard industrial classifications, 60-67, 73, 801-4, 81, 861-2, 891, 893, 899. We have reduced the total estimated employment in these industries by 10.4 percent to account for cleaners, drivers, and other non-users of office space employed in these industries.

In dividing the changes in the use of space among the individual factors (population, participation rates, space per employee), we have assigned the growth resulting from the interaction of two growth rates in a period proportionately to their direct contributions.

Vacancies and Space Used per Worker. The data for vacancies for 1986 are based on the Salomon data averaged together with an assumed vacancy rate for non-competitive space of 20 percent of the Salomon rate. The two estimates are combined to obtain the overall vacancy rate. In this averaging, constant weights of

58.1 percent are used for the competitive vacancies and 41.9 percent for the non-competitive. The data for the amount of space per worker in 1986 are calculated from the Birch data on square feet per worker in different occupations.

The 1972, 1979, and 1988 estimates for each factor separately are based upon indexes of changes in vacancies and changes in space per employee in those years compared to 1986, derived from the Torto-Wheaton data. The assumptions for 2000 are our own, utilizing an analysis of the underlying movements.

When high and low assumptions for these factors are combined with the high and low employment projections found in Projections 2000, the result is a range of estimates of occupied space of plus and minus 10 percent of the moderate estimates contained in the tables of this report.