

THOUGHT LEADERSHIP SERIES



THE IMPACT OF OFFICE SPACE ON
**EMPLOYEE
PRODUCTIVITY**
AND IMPLICATIONS FOR OCCUPANCY COSTS

**Newmark Grubb
Knight Frank**

February 2016

www.ngkf.com

TABLE OF CONTENTS

I

PRODUCTIVITY IN THE ERA OF THE OPEN FLOOR PLAN
PAGE: 4

THE DRAWBACKS OF OVER-DENSIFICATION
PAGE: 5

THE FLIP-SIDE: HOW OCCUPYING TOP QUALITY SPACE CAN BOOST PRODUCTIVITY
PAGE: 6

THE EFFECT OF HIGH-QUALITY OFFICE SPACE ON EMPLOYEE RETENTION
PAGE: 7

II

THE RESULTS: CHANGE IN PRODUCTIVITY OFFSETS CHANGE
IN RENT COSTS
PAGE: 8

PRODUCTIVITY IN BUSINESS AND FINANCIAL SERVICES
PAGE: 10

PRODUCTIVITY IN LEGAL SERVICES
PAGE: 12



KEY FINDINGS AND ACTION STEPS

- ◆ Office space densification, when over-done, or undertaken by a firm in an industry ill-suited to an open floor plan, can lead to a decline in employee productivity. Under these circumstances, occupancy cost savings that can be achieved as a result of densification may be more than wiped out by a decline in productivity.
- ◆ On the other hand, attributes of trophy office space — such as a prime location, access to top-notch amenities, LEED certification, and appealing common areas — can lead to an increase in employee productivity. Under these circumstances, the added occupancy cost of upgrading to best-in-class office space may be recouped in the form of increased productivity.
- ◆ In six out of ten major metropolitan areas, including Atlanta, Chicago and Los Angeles, a mere 1% decline in productivity would wipe out the cost savings achieved from over-densifying office space. In the remaining four major metropolitan areas, a 2% decline in productivity would offset those savings.
- ◆ In eight out of ten major metropolitan areas, a 3% productivity gain achieved by occupying efficient trophy office space would recoup the added cost of upgrading to such space.
- ◆ Implications for tenants: While reducing the square footage occupied per worker appears to be a simple way to cut costs, it is important to be aware of its potential negative impact on productivity. Just a 2% decline in productivity can wipe out a tenant's cost savings, so tenants need to consider carefully whether sharp reductions in space are in the company's best long-term interests.
- ◆ Implications for best-in-class owners: Often it is difficult to move space priced at the top of the market. However, the associated productivity gains for a potential tenant may be enough to more than recoup the added costs. Selecting an appropriate office location and layout is a major business decision with many factors and variables to be considered. The impact on productivity is an important factor to be highlighted.

I.

PRODUCTIVITY IN THE ERA OF THE OPEN FLOOR PLAN

The trends of office space densification and flight-to-quality are hot topics in commercial real estate markets across the United States. The financial crisis that incited the Great Recession led to widespread acceptance and acceleration of these trends. Densification – the reduction in square feet occupied per employee – proved to be a simple way for companies to cut costs. At the same time, rising vacancy and flat-to-declining rents in office markets across the U.S. allowed many tenants to lease higher-quality space while still achieving cost savings. These trends have garnered much attention in the commercial real estate industry, and while there has been increasing anecdotal evidence of their impact on productivity, there has been little empirical study.

As illustrated in the adjacent chart, U.S. nonfarm business productivity increased at

an average annual rate of 2.8% in the ten years leading up to the Great Recession. In the years since – from 2008 to 2014 – productivity has averaged only a 1.3% annual increase. Theories differ as to what has caused this dramatic deceleration, given that productivity typically increases after periods of layoffs or slow employment growth. Interestingly, the start of the decline coincides with the widespread adoption of the densification of office space. It is our theory that business productivity has been stunted by businesses' shift toward densification and the popularity of the open office floor plan.

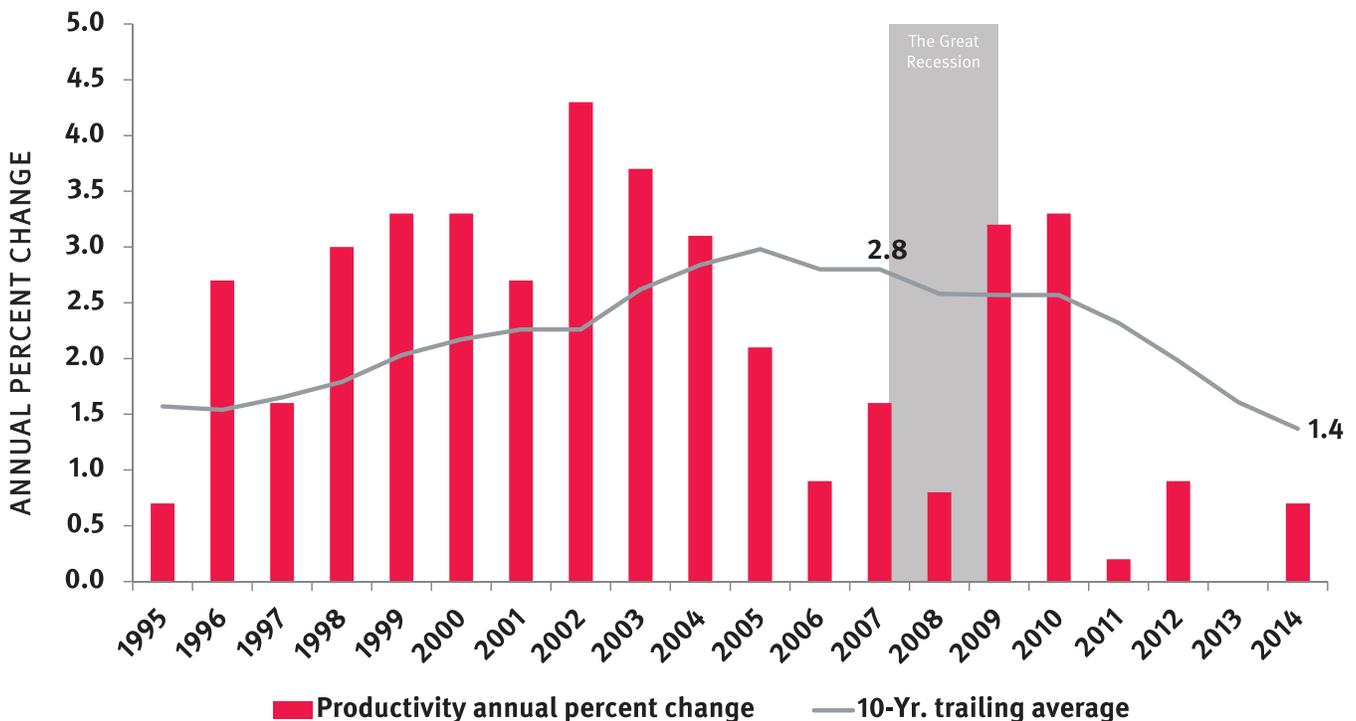
This report analyzes the effect of densification on worker productivity. Further, we look at the ways in which occupying best-in-class office space can lead to increased

“IT IS OUR THEORY THAT BUSINESS PRODUCTIVITY HAS BEEN STUNTED BY BUSINESSES’ SHIFT TOWARD DENSIFICATION AND THE POPULARITY OF THE OPEN OFFICE FLOOR PLAN.”

productivity. Beyond analyzing these trends, we examined data for ten major metropolitan areas to determine how productivity loss or gain compares to savings or additional costs from over-densification or the flight to quality. In short: Does better office space yield more productive workers?

THE DECLINE IN U.S. BUSINESS PRODUCTIVITY

U.S. NONFARM BUSINESS LABOR PRODUCTIVITY | 1995 - 2014



Source: U.S. Bureau of Labor Statistics, NGKF Research; February 2016

THE DRAWBACKS OF OVER-DENSIFICATION

There is copious evidence that work environment has a significant impact on employees' job satisfaction and overall well-being. Numerous studies have cited this correlation in studying everything from the noise distractions in an open floor plan to the positive effect of natural light and air on employee productivity. As the densification trend has grown in popularity, many U.S. companies have adopted the open floor plan and moved away from private offices. According to the International Facility Management Association, 70% of U.S. employees work in an open floor plan. While this approach has been very popular with company decision-makers because of the potential cost savings, the employees who work in the open plan environment have given it mixed reviews. Architecture firm Gensler's annual survey of workplace performance found that workers' overall satisfaction with their office environments had dropped 6% between 2008 and 2013.

One widely noted detractor to productivity in an open office layout is distraction as a result of a lack of sound privacy. A University of Sydney study surveyed office workers on their satisfaction with various workplace factors. Lack of sound privacy was the greatest frustration, with nearly 60% of workers in cubicles and open offices citing it as a

concern. Further, a Danish academic study found that occupants of open-plan offices had 62% more sick days than those in private offices. If employees are constantly distracted by noise and become sick more often as a result of an open floor plan, surely productivity suffers as a result. An experiment that surveyed and studied hundreds of software developers across different companies found that those who performed in the top quartile of productivity had much higher ratings of their work environment than those who performed in the bottom quartile. Fifty-seven percent of the top quartile workers rated their workspace as acceptably quiet compared with only 29% for the bottom quartile.

It is clear that work environment has a profound effect on employees' job satisfaction and that overall workplace satisfaction has a significant effect on productivity. These studies strongly suggest that workers who are happy with their work environment are more productive. It is likely no coincidence that the sharp decline in U.S. productivity since the Great Recession closely coincides with the increasing adoption of the open floor plan.

This is not to say that there is no situation in which an open floor plan can be effective. Every company and industry is different and for some employees and some companies,

an open floor plan makes sense. With an effective and well-designed space plan, an open layout can work quite well. This has been demonstrated in the accounting and consulting industries. However, the practice of over-densification – drastically reducing the square footage per worker without the forethought of how it will affect employee morale and productivity – is unwise. Trying to fit too many employees into too small a space with the singular goal of achieving cost savings can be counterproductive since the resulting loss of productivity more than offsets any cost savings achieved. Section II of this report illustrates how this math works for ten of the largest U.S. metropolitan areas.

“TRYING TO FIT TOO MANY EMPLOYEES INTO TOO SMALL A SPACE WITH THE SINGULAR GOAL OF ACHIEVING COST SAVINGS CAN BE COUNTERPRODUCTIVE SINCE THE RESULTING LOSS OF PRODUCTIVITY MORE THAN OFFSETS ANY COST SAVINGS ACHIEVED.”



THE FLIP-SIDE: HOW OCCUPYING TOP QUALITY SPACE CAN BOOST PRODUCTIVITY

In the same way that over-densification and a poorly designed layout can negatively impact productivity, some of the attributes of top-quality office space appear to boost productivity. One of the primary factors that determines the desirability of an office asset is location. Well-located properties outperform across every metric from occupancy rates to asking rents. One less-discussed factor is how location can lead to increased productivity. A significant detractor to productivity – particularly in suburban environments – is the need to get in a car and leave the office to attend meetings, eat lunch, or exercise. Well-located and highly amenitized properties contribute to increased productivity by minimizing the time employees need to be away from the office for professional or personal errands. Another benefit of occupying a well-located property is access to mass-transit, which allows employees to avoid traffic congestion in commuting to and from work, further maximizing time spent in the office and increasing productivity.

Beyond easy and quick access to lunch, fitness and conferencing options, there are additional ways in which office amenities can boost productivity. The availability of

Wi-Fi in common areas can allow employees who suffer distractions from an open floor plan to find a remote place on the premises to continue working. Gensler's *2013 U.S. Workplace Survey* found that employees who are offered a choice of when and where to work were 12% more satisfied with their jobs. Office spaces that allow flexibility can provide a significant benefit in the form of increased productivity. This benefit can come from a well-designed layout with private pods where workers can have sound privacy or from a trophy-quality office building that offers usable, Wi-Fi enabled common areas so employees are able to work away from their desks.

Another feature of best-in-class office buildings that can increase productivity is LEED (Leadership in Energy and Environmental Design) – the U.S. Green Building Council's certification system for environmentally-sustainable office buildings. The points-based system assigns credits for various building attributes, including those that contribute to wellness of the occupants, such as access to natural light and fresh air. A Carnegie Mellon University study found that buildings with more natural light and access to outdoor space

increased productivity by up to 18%. The LEED system also focuses on energy efficiency. Upgraded and efficient HVAC systems reduce thermal discomfort – another factor that has been cited in reduced employee productivity.

It becomes clear that many of the attributes that define best-in-class or trophy office buildings – prime location, access to top-notch amenities, LEED certification, and appealing common areas – are the same attributes that contribute to increased employee productivity. This is further evidence that the higher cost of upgrading to best-in-class space can be recouped in the form of increased productivity.

“IT BECOMES CLEAR THAT MANY OF THE ATTRIBUTES THAT DEFINE BEST-IN-CLASS OR TROPHY OFFICE BUILDINGS – PRIME LOCATION, ACCESS TO TOP-NOTCH AMENITIES, LEED CERTIFICATION, AND APPEALING COMMON AREAS – ARE THE SAME ATTRIBUTES THAT CONTRIBUTE TO INCREASED EMPLOYEE PRODUCTIVITY.”



THE EFFECT OF HIGH-QUALITY OFFICE SPACE ON EMPLOYEE RETENTION

As the job market continues to improve, attracting and retaining top talent is increasingly important for U.S. companies. It is difficult to quantify the hard and soft costs of replacing an employee, but a study by the Center for American Progress concluded it could be upward of 120% of the employee's salary for those in higher-level positions. Included in the soft costs of these estimates is the effect of employee turnover on productivity. The time dedicated to picking up the duties of a former coworker and to training new employees is a significant drain on productivity.

For these reasons, employee retention should be among a company's top priorities. With all other factors being equal, work environment could very well tip the scale for an employee's decision whether to stay with his or her current

company or accept a new position. While it is unlikely an employee would quit simply because he or she was unhappy with the work space, today's competitive environment means the most talented employees are likely to get unsolicited job offers, and office environment is surely a consideration that goes into the decision to stay or go.

The importance of employee retention provides further argument that over-densifying may not be a smart decision. Even with the cost savings from reducing the amount of space per worker, increased turnover from employees unhappy with the work environment will counteract these savings. While many of the preferences on work environment vary across generational lines, private offices allow for greater focus than open plans.

In the same way that over-densification can lead to increased employee turnover, occupying best-in-class space can lead to increased employee retention. Office space with an abundance of natural light, flexible options for sound privacy, and a convenient and highly amenitized location is likely to go a long way in attracting and retaining talent.



II.

THE RESULTS: CHANGE IN PRODUCTIVITY OFFSETS CHANGE IN RENT COSTS

It is clear that there is a correlation between over-densification and loss of productivity and between best-in-class office space and increased productivity. We simulated these two scenarios for a mock business and applied them to office market data for ten major metropolitan areas across the U.S. This allowed us to compare how a change in rental costs can be offset by a change in productivity and the amount of productivity loss or gain that would be required to reach that equilibrium.

To assess these comparisons, we took a prototypical business and financial services firm of 250 employees that occupies Class A office space in the downtown or Central Business District of each city and ran two scenarios:

- Scenario 1: The company relocates to another Class A building and over-densifies by reducing the space per employee from 200 to 180 square feet.

- Scenario 2: The company upgrades to trophy office space in an efficient layout which allows it to reduce the space per employee from 200 to 190 square feet.

We then examined the amount of productivity loss or gain that would be required to offset the rent change in these two scenarios when accounting for differing rental rate and wage levels in the various metropolitan areas. We are translating a loss of productivity into dollars by estimating the equivalent share of that employee's annual salary – for example, a 1% loss in productivity for a given employee yields a loss to the company of 1% of that employee's yearly wages. The table on pages 10-11 illustrates the results.

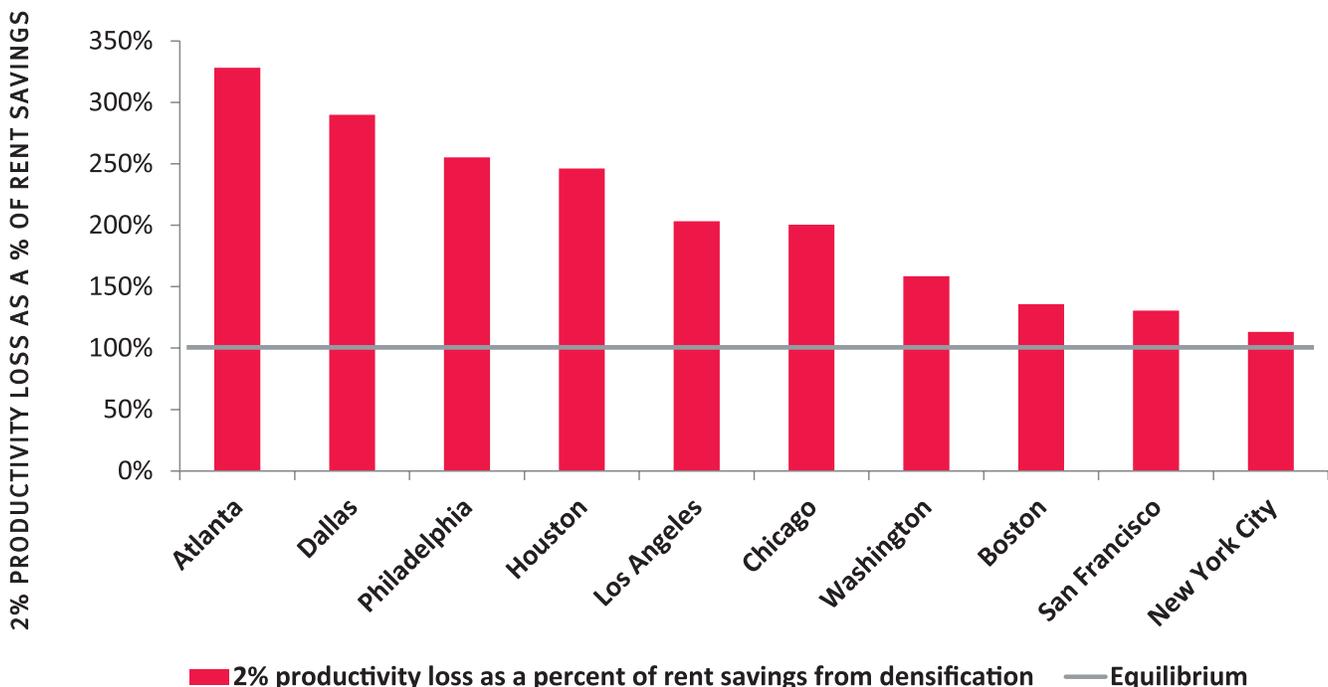
Our findings are notable. In Scenario 1, across every metro studied, a mere 2% loss of productivity is enough to fully offset the cost savings achieved by reducing leased space

from 200 to 180 square feet per employee. These findings are illustrated in the chart below. For metro areas with lower rents, such as Dallas and Atlanta, only a 1% loss of productivity is required to fully offset the rent savings accrued through such a densification program.

The findings for Scenario 2 were similar. As illustrated in the chart at right, in all of the cities with the exception of San Francisco and New York City – where trophy rents are the highest in the country – a 3% increase in productivity is enough to offset the added cost of upgrading to trophy space. Even in the two most expensive cities, upgrading may make sense; it would take only a 4% productivity increase in New York and 6% in San Francisco to offset the additional cost of occupying trophy space.

OVER-DENSIFYING MAY NOT BE SMART

2% LOSS OF PRODUCTIVITY OFFSETS COST SAVINGS FROM OVER-DENSIFICATION
TEN LARGEST METROPOLITAN AREAS BY EMPLOYMENT BASE | 2015



Source: U.S. Bureau of Labor Statistics, NGKF Research; February 2016

COST OF TROPHY UPGRADE RECOUPED BY INCREASED PRODUCTIVITY
 GAINS IN PRODUCTIVITY CAN OFFSET ADDITIONAL COSTS
 TEN LARGEST METROPOLITAN AREAS BY EMPLOYMENT BASE | 2015



Source: U.S. Bureau of Labor Statistics, NGKF Research; February 2016

Importantly, there is a limit to the costs of declining productivity or to the savings from increasing productivity. Our tables show the potential cost or benefit, up to 5% of employees’ time, from a changed work environment. There are diminishing returns to creating spectacular space – eventually, employees are limited by their natural talents and the number of hours in a day – so productivity gains are not infinite. Similarly, the loss of productivity due to an inferior work environment will not continue indefinitely. Nevertheless, the critical point is that even a modest impact on productivity by a change in work environment – for better or worse – can have significant savings/cost implications for tenants.

“IMPORTANTLY, THERE IS A LIMIT TO THE COSTS OF DECLINING PRODUCTIVITY OR TO THE SAVINGS FROM INCREASING PRODUCTIVITY.”

“EVEN A MODEST IMPACT ON PRODUCTIVITY BY A CHANGE IN WORK ENVIRONMENT – FOR BETTER OR WORSE – CAN HAVE SIGNIFICANT SAVINGS/COST IMPLICATIONS FOR TENANTS.”

While reducing the square footage occupied per worker appears to be a simple way to cut costs, it is important to be aware of its potential negative impact on productivity. Just a 2% decline in productivity can wipe out a tenant’s rent savings, so tenants need to consider carefully whether sharp reductions in space are in the company’s best long-term interests. Likewise, while it will certainly add to occupancy costs to upgrade to best-in-class space, the associated productivity gains may be enough to more than recoup those added rent costs. Selecting an appropriate office location and layout is a major business decision with many

factors and variables to be considered. These findings make it clear that potential changes in productivity due to the comfort and structure of a new work environment should be among the foremost of those considerations.

PRODUCTIVITY IN BUSINESS AND FINANCIAL SERVICES

PROTOTYPICAL 250-EMPLOYEE BUSINESS/FINANCIAL SERVICES FIRM

CURRENT SITUATION: CLASS A BUILDING
200 SF/EMPLOYEE = 50,000 SF OCCUPIED

SCENARIO 1: OVER-DENSIFY AND RELOCATE TO CLASS A SPACE

CLASS A BUILDING

180 SF/ EMPLOYEE = 45,000 SF OCCUPIED

	ATLANTA	BOSTON	CHICAGO	DALLAS
CLASS A RENT PSF, FULL SERVICE	\$22.50	\$61.26	\$37.02	\$26.01
CURRENT ANNUAL RENT	\$1,125,000	\$3,063,000	\$1,851,000	\$1,300,500
NEW ANNUAL RENT	\$1,012,500	\$2,756,700	\$1,665,900	\$1,170,450
RENT SAVINGS (YEAR 1)	\$112,500	\$306,300	\$185,100	\$130,050
RENT SAVINGS PER EMPLOYEE	\$450.00	\$1,225.20	\$740.40	\$520.20
ANNUAL MEAN WAGE*	\$73,840	\$83,200	\$74,200	\$75,400
POTENTIAL LOSS OF PRODUCTIVITY**:				
1%	\$738.40	\$832.00	\$742.00	\$754.00
2%	\$1,476.80	\$1,664.00	\$1,484.00	\$1,508.00
3%	\$2,215.20	\$2,496.00	\$2,226.00	\$2,262.00
4%	\$2,953.60	\$3,328.00	\$2,968.00	\$3,016.00
5%	\$3,692.00	\$4,160.00	\$3,710.00	\$3,770.00
PRODUCTIVITY LOSS AS A PERCENT OF RENT SAVINGS AT:				
1%	164%	68%	100%	145%
2%	328%	136%	200%	290%
3%	492%	204%	301%	435%
4%	656%	272%	401%	580%
5%	820%	340%	501%	725%

SCENARIO 2: DENSIFY AND RELOCATE TO MORE EFFICIENT TROPHY SPACE

TROPHY BUILDING

190 SF/ EMPLOYEE = 47,500 SF OCCUPIED

	ATLANTA	BOSTON	CHICAGO	DALLAS
CLASS A RENT PSF, FULL SERVICE	\$22.50	\$61.26	\$37.02	\$26.01
TROPHY RENT PSF, FULL SERVICE	\$28.00	\$71.40	\$43.07	\$36.03
CURRENT ANNUAL RENT	\$1,125,000	\$3,063,000	\$1,851,000	\$1,300,500
NEW ANNUAL RENT	\$1,330,000	\$3,391,500	\$2,045,825	\$1,711,425
RENT INCREASE (YEAR 1)	\$205,000	\$328,500	\$194,825	\$410,925
ADDITIONAL RENT PER EMPLOYEE	\$820.00	\$1,314.00	\$779.30	\$1,643.70
ANNUAL MEAN WAGE*	\$73,840	\$83,200	\$74,200	\$75,400
POTENTIAL PRODUCTIVITY GAIN**:				
1%	\$738.40	\$832.00	\$742.00	\$754.00
2%	\$1,476.80	\$1,664.00	\$1,484.00	\$1,508.00
3%	\$2,215.20	\$2,496.00	\$2,226.00	\$2,262.00
4%	\$2,953.60	\$3,328.00	\$2,968.00	\$3,016.00
5%	\$3,692.00	\$4,160.00	\$3,710.00	\$3,770.00
PRODUCTIVITY GAIN AS A PERCENT OF RENT INCREASE AT:				
1%	90%	63%	95%	46%
2%	180%	127%	190%	92%
3%	270%	190%	286%	138%
4%	360%	253%	381%	183%
5%	450%	317%	476%	229%

*Business and Financial Occupations ** Expressed as a percentage of annual wage

Source: NGKF Research; U.S. Bureau of Labor Statistics

HOUSTON	LOS ANGELES	NEW YORK CITY	PHILADELPHIA	SAN FRANCISCO	WASHINGTON
\$33.57	\$38.40	\$79.32	\$29.86	\$70.52	\$56.44
\$1,678,500	\$1,920,000	\$3,966,000	\$1,493,000	\$3,526,000	\$2,822,000
\$1,510,650	\$1,728,000	\$3,569,400	\$1,343,700	\$3,173,400	\$2,539,800
\$167,850	\$192,000	\$396,600	\$149,300	\$352,600	\$282,200
\$671.40	\$768.00	\$1,586.40	\$597.20	\$1,410.40	\$1,128.80
\$82,620	\$78,060	\$89,830	\$76,240	\$91,990	\$89,450
\$826.20	\$780.60	\$898	\$762.40	\$919.90	\$894.50
\$1,652.40	\$1,561.20	\$1,797	\$1,524.80	\$1,839.80	\$1,789.00
\$2,478.60	\$2,341.80	\$2,695	\$2,287.20	\$2,759.70	\$2,683.50
\$3,304.80	\$3,122.40	\$3,593	\$3,049.60	\$3,679.60	\$3,578.00
\$4,131.00	\$3,903.00	\$4,492	\$3,812.00	\$4,599.50	\$4,472.50
123%	102%	57%	128%	65%	79%
246%	203%	113%	255%	130%	158%
369%	305%	170%	383%	196%	238%
492%	407%	227%	511%	261%	317%
615%	508%	283%	638%	326%	396%

HOUSTON	LOS ANGELES	NEW YORK CITY	PHILADELPHIA	SAN FRANCISCO	WASHINGTON
\$33.57	\$38.40	\$79.32	\$29.86	\$70.52	\$56.44
\$44.53	\$42.46	\$101.96	\$36.09	\$100.00	\$71.05
\$1,678,500	\$1,920,000	\$3,966,000	\$1,493,000	\$3,526,000	\$2,822,000
\$2,115,175	\$2,016,850	\$4,843,100	\$1,714,275	\$4,750,000	\$3,374,875
\$436,675	\$96,850	\$877,100	\$221,275	\$1,224,000	\$552,875
\$1,746.70	\$387.40	\$3,508.40	\$885.10	\$4,896.00	\$2,211.50
\$82,620	\$78,060	\$89,830	\$76,240	\$91,990	\$89,450
\$826.20	\$780.60	\$898	\$762.40	\$919.90	\$894.50
\$1,652.40	\$1,561.20	\$1,797	\$1,524.80	\$1,839.80	\$1,789.00
\$2,478.60	\$2,341.80	\$2,695	\$2,287.20	\$2,759.70	\$2,683.50
\$3,304.80	\$3,122.40	\$3,593	\$3,049.60	\$3,679.60	\$3,578.00
\$4,131.00	\$3,903.00	\$4,492	\$3,812.00	\$4,599.50	\$4,472.50
47%	201%	26%	86%	19%	40%
95%	403%	51%	172%	38%	81%
142%	604%	77%	258%	56%	121%
189%	806%	102%	345%	75%	162%
237%	1007%	128%	431%	94%	202%

PRODUCTIVITY IN LEGAL SERVICES

With the intent of covering a broad base of U.S. businesses, this study focuses on business and financial services firms. While the trends likely are similar in most office-using industries, the relationship between rent change and productivity change is even more pronounced in higher-paying industries. We examined data for a prototypical law firm in three metropolitan areas, each with a high concentration of legal services firms: New York, San Francisco, and Washington.

The results are illustrated in the adjacent table. In Scenario 1, as with business and financial services firms, just a 2% loss of productivity is enough to fully offset rent savings from over-density in each of these cities. It would take only a 1% loss to fully offset the savings in Washington. In Scenario 2, the productivity gains required to recoup the cost of a trophy upgrade range from 2% in Washington to 4% in San Francisco.

PROTOTYPICAL 250-EMPLOYEE LEGAL SERVICES FIRM CURRENT SITUATION: CLASS A BUILDING 200 SF/EMPLOYEE = 50,000 SF OCCUPIED

SCENARIO 1: OVER-DENSIFY AND RELOCATE TO CLASS A SPACE

CLASS A BUILDING				
180 SF/ EMPLOYEE = 45,000 SF OCCUPIED				
	NEW YORK CITY	SAN FRANCISCO	WASHINGTON	
CLASS A RENT PSF, FULL SERVICE	\$79.32	\$70.52	\$56.44	
CURRENT ANNUAL RENT	\$3,966,000	\$3,526,000	\$2,822,000	
NEW ANNUAL RENT	\$3,569,400	\$3,173,400	\$2,539,800	
RENT SAVINGS (YEAR 1)	\$396,600	\$352,600	\$282,200	
RENT SAVINGS PER EMPLOYEE	\$1,586.40	\$1,410.40	\$1,128.80	
ANNUAL MEAN WAGE*	\$132,020	\$130,810	\$132,870	
POTENTIAL LOSS OF PRODUCTIVITY**:				
1%	\$1,320.20	\$1,308.10	\$1,328.70	
2%	\$2,640.40	\$2,616.20	\$2,657.40	
3%	\$3,960.60	\$3,924.30	\$3,986.10	
4%	\$5,280.80	\$5,232.40	\$5,314.80	
5%	\$6,601.00	\$6,540.50	\$6,643.50	
PRODUCTIVITY LOSS AS A PERCENT OF RENT SAVINGS AT:				
1%	83%	93%	118%	
2%	166%	185%	235%	
3%	250%	278%	353%	
4%	333%	371%	471%	
5%	416%	464%	589%	

SCENARIO 2: DENSIFY AND RELOCATE TO MORE EFFICIENT TROPHY SPACE

TROPHY BUILDING				
190 SF/ EMPLOYEE = 47,500 SF OCCUPIED				
	NEW YORK CITY	SAN FRANCISCO	WASHINGTON	
CLASS A RENT PSF, FULL SERVICE	\$79.32	\$70.52	\$56.44	
TROPHY RENT PSF, FULL SERVICE	\$101.96	\$100.00	\$71.05	
CURRENT ANNUAL RENT	\$3,966,000	\$3,526,000	\$2,822,000	
NEW ANNUAL RENT	\$4,843,100	\$4,750,000	\$3,374,875	
RENT INCREASE (YEAR 1)	\$877,100	\$1,224,000	\$552,875	
ADDITIONAL RENT PER EMPLOYEE	\$3,508.40	\$4,896.00	\$2,211.50	
ANNUAL MEAN WAGE*	\$132,020	\$130,810	\$132,870	
POTENTIAL PRODUCTIVITY GAIN**:				
1%	\$1,320.20	\$1,308.10	\$1,328.70	
2%	\$2,640.40	\$2,616.20	\$2,657.40	
3%	\$3,960.60	\$3,924.30	\$3,986.10	
4%	\$5,280.80	\$5,232.40	\$5,314.80	
5%	\$6,601.00	\$6,540.50	\$6,643.50	
PRODUCTIVITY GAIN AS A PERCENT OF RENT INCREASE AT:				
1%	38%	27%	60%	
2%	75%	53%	120%	
3%	113%	80%	180%	
4%	151%	107%	240%	
5%	188%	134%	300%	

*Legal Services Occupations ** Expressed as a percentage of annual wage
Source: NGKF Research; U.S. Bureau of Labor Statistics

SOURCES

In addition to NGKF's proprietary database of office market transactions and data from the U.S. Bureau of Labor Statistics, the following sources were used in this analysis:

Boushey, H., & Glynn, S. (2012, November 16). There Are Significant Business Costs to Replacing Employees. Retrieved January 13, 2016, from <https://www.americanprogress.org/>

DeMarco, T., & Lister, T. (1987). *Peopleware: Productive projects and teams*. New York, NY: Dorset House Pub.

Gensler. (n.d.). The 2013 US Workplace Survey. Retrieved January 13, 2016, from <http://www.gensler.com/>

Kim, J., & Dear, R. (n.d.). Workspace satisfaction: The privacy-communication trade-off in open-plan offices. *Journal of Environmental Psychology*, 18-26.

Moloney, C. (n.d.). Workplace Productivity: Are LEED Buildings the Key? Retrieved January 13, 2016, from <https://www.green-buildings.com/articles/>

Pejtersen, J., Feveile, H., Christensen, K., & Burr, H. (2011). Sickness absence associated with shared and open-plan offices – a national cross sectional questionnaire survey. *Scandinavian Journal of Work, Environment & Health*, 376-382.

Vogel, J. (2013, April 19). Is the Corner Office Worth It? Retrieved January 13, 2016, from <http://www.usnews.com/>

Wong, V. (2013, July 1). Ending the Tyranny of the Open-Plan Office. Retrieved January 12, 2016, from <http://www.bloomberg.com/>







04



Gregory H. Leisch, CRE

Senior Managing Director
Market Research
gleisch@ngkf.com

Alexander (Sandy) Paul, CRE

Managing Director
National Market Research
apaul@ngkf.com

Marianne (Swearingen) Skorupski

Research Manager
mskorupski@ngkf.com

Bethany Schneider

Senior Research Analyst
bschneider@ngkf.com

Washington, DC

1899 Pennsylvania Avenue, NW
Suite 300
Washington, DC 20006
202.331.7000

Tysons Corner

1410 Spring Hill Road
Suite 600
McLean, VA 22102
703.448.2000

Baltimore

400 East Pratt Street
Suite 710
Baltimore, MD 21202
410.625.4200

USA

Alabama
Mobile

Arizona
Phoenix

Arkansas
Bentonville
Little Rock

California
Bakersfield
Emeryville
Fresno
Hayward
Los Angeles
Newport Beach
Ontario
Palo Alto
Pleasanton
Roseville
Sacramento
San Diego
San Francisco
San Mateo
San Rafael
Santa Ana
Santa Clara
Santa Rosa
Visalia
Walnut Creek

Colorado
Colorado Springs
Denver

Connecticut
Hartford
Stamford

Delaware
Wilmington

District of Columbia
Washington, DC

Florida
Boca Raton
Jacksonville
Miami
Orlando
Sarasota
Tampa

Georgia
Atlanta
St. Simons Island

Hawaii
Honolulu

Illinois
Chicago

Indiana
Indianapolis
Mishawaka

Maryland
Baltimore

Massachusetts
Boston

Michigan
Detroit
Grand Rapids

Missouri
Kansas City
St. Louis

Nevada
Las Vegas

New Jersey
Central, East Brunswick
Northern, Rutherford
Southern, Marlton

New York
New York
Long Island
Westchester

North Carolina
Charlotte
Raleigh

North Dakota
Fargo

Ohio
Cleveland
Columbus

Oklahoma
Oklahoma City
Tulsa

Oregon
Portland

Pennsylvania
Philadelphia
Pittsburgh
Wayne

South Carolina
Charleston
Columbia
Greenville
Myrtle Beach

Tennessee
Memphis

Texas
Austin
Dallas
Houston
McAllen

Utah
American Fork
Clearfield
Salt Lake City

Virginia
Tysons Corner

Washington
Seattle

Wisconsin
Appleton
Green Bay
Madison
Wausau

CANADA
Calgary
Edmonton
Halifax
Moncton
Montreal
Ottawa
Québec City
Toronto
Vancouver

MEXICO
Ciudad Juarez
Guanajuato
Mexico City
Monterrey
Queretaro
Saltillo
San Luis Potosi

NEWMARK GRUBB KNIGHT FRANK RESEARCH REPORTS ARE ALSO AVAILABLE AT WWW.NGKF.COM/RESEARCH.

All information contained in this publication is derived from sources that are deemed to be reliable. However, Newmark Grubb Knight Frank (NGKF) has not verified any such information, and the same constitutes the statements and representations only of the source thereof, and not of NGKF. Any recipient of this publication should independently verify such information and all other information that may be material to any decision that recipient may make in response to this publication, and should consult with professionals of the recipient's choice with regard to all aspects of that decision, including its legal, financial, and tax aspects and implications. Any recipient of this publication may not, without the prior written approval of NGKF, distribute, disseminate, publish, transmit, copy, broadcast, upload, download, or in any other way reproduce this publication or any of the information it contains.



Please recycle,
whenever possible
Sustainably
Newmark Grubb Knight Frank

www.ngkf.com/research