

White Paper

Methods of Commercial Real Estate Building Measurement & National Trends

2021

Introduction

Savvy landlords are constantly seeking new ways to increase revenue, but some overlook the value of accurate space measurement. Measuring spaces to reflect current market conditions and measurement standards can maximize rentable square footage (RSF). However, calculating RSF is always a topic of debate, as regional markets take different approaches. This variation can be problematic for large organizations with portfolios that span multiple geographic locations.

This report was written by a group of measurement experts who have decades of collective experience in the world of building measurement and calculations. Together, they have measured **billions of square feet**.

This white paper covers:

- ✓ The different methods of measurement for office properties, including [BOMA](#) and [REBNY](#)
- ✓ Which methods certain markets favor or have adopted as standard
- ✓ The importance of maximizing RSF to increase the value of a portfolio
- ✓ Exciting updates to BOMA Retail, and what's coming next to BOMA



Part 1:

BOMA Measurement for Office

BOMA 2017 Office Standard

This is the latest edition of the measurement standard primarily designed to produce leasing data for commercial office buildings. The BOMA Office Standard is considered the de facto building measurement standard both nationally and internationally, except for the New York City area. New BOMA standards typically provide design changes and clarify existing terms. The 2017 update was no different, providing a larger glossary of terms, step-by-step measurement formats, and a section on best practices.

The new standard also emphasizes compatibility with the [International Property Measurement Standards](#) (IPMS) for office buildings. The main goal of IPMS is to provide clear and consistent measurement standards regardless of geography. IPMS does not gross-up or apply load factors, and therefore cannot be applied in leasing markets where tenant rentable area includes service areas.

How Does BOMA 2017 Impact RSF?

BOMA 2017 introduced five major changes to the office standard.

- ✔ The inclusion of exterior amenities, such as exterior balconies and roof terrace areas as part of the building's rentable area.
- ✔ The inclusion of Major Vertical Penetrations at the lowest level
- ✔ Removal of the Public Pedestrian Thoroughfare Boundary Condition found in BOMA 2010
- ✔ Inter-Building Service Areas (IBSA) can now be applied to a specific group of tenants. Previously, IBSA was applied on a floor or building-wide basis.
- ✔ Load factors capped on a tenant-by-tenant basis instead of a floor-wide option. Capping the load factor and bringing it down to the market standard enhances a building's marketability. This decision is the prerogative of the building owner or manager.

Methods of Building Measurement

Like the BOMA 2010 standard, BOMA 2017 measures buildings by applying one of two methods: Method A or B, on a building-wide basis. It is important to note both Method A and Method B will yield the same total building rentable area. The methods differ in the allocation of shared service areas to tenant areas.



Method A: Multiple Load Factor Method

Method A traces its roots to the publication of the first office floor measurement standard in 1915. This method determines rentable areas by allocating shared service and amenity areas on a pro rata basis. To allocate these shared areas, two load factors must be established: Floor service load factor and building service load factor. A load factor is defined as the ratio between rentable and usable space.

Floor service load factor proportionately allocates floor service area to any occupant area according to the configuration of each floor. This usually results in varying floor service load factors throughout the building.

The building service load factor proportionately distributes shared spaces that service the entire building to all occupant areas.

When floor and building service load factors are combined, Load Factor A is established for each floor and thus generates multiple load factors throughout the building. The result is a fair distribution of building service area throughout the building.

Method B: Single Load Factor

Method B was first established as an option under the BOMA 2010 standard. Using Method B, landlords and building operators can apply a single load factor to all tenants in a building. For this reason, Method B is also referred to as the Single Load Factor Method.

As a result, each tenant gets the same portion of floor or building service area.

The single load factor is calculated by determining and consolidating all floor service, building service and base building circulation areas as one, then allocating proportionately to occupant areas.

Base building circulation is the minimum path on a multi-occupant floor necessary for access to and egress from occupant areas, access stairs, escalators and elevators, restrooms, janitor's closets and water coolers, required areas of refuge, life safety equipment and building service and amenity areas.

This method assumes base building circulation exists on all floor levels regardless of the number of tenants residing there. Although this method requires meticulous documentation of base building and extended circulation, it offers leasing advantages and more long-term stability in the rentable area of the building.



When using the BOMA 2017 standard, one must choose either Method A or Method B and apply that method to the entire building. The two methods cannot be mixed within the same building.



BOMA 2010 and BOMA 1996 Office Standards

While the BOMA 1996 Office Standard has largely fallen out of favor due to inflexible calculation limitations, BOMA 2010 remains relevant for some properties and markets.

BOMA 2017 is the most favorable standard to landlords and generally results in the largest total building rentable area. Property teams should be warned that this standard can produce high load factors, since additional service and amenity areas are allocated to tenant RSF. For this reason, landlords may choose to apply the BOMA 2010 Standard. The BOMA 2010 Standard brings load factors in line with market conditions.

Comparison of BOMA methods

	BOMA 1996	BOMA 2010 Method A	BOMA 2010 Method B	BOMA 2017 Method A	BOMA 2017 Method B
Building-wide measurement	✓	✓	✓	✓	✓
Capped load factor/ Optional adjustment by floor		✓	✓	✓	✓
Base build circulation / Single load factor			✓		✓
Capped load factor by tenant				✓	✓
Unenclosed features (balconies, terraces, etc.)				✓	✓
Major vertical penetration at the lowest level are included				✓	✓

Part 2:

Additional BOMA Measurement Standards

Although office measurements are the primary focus of this resource, property owners and operators should also be aware there are additional measurement standards for distinct property types including Gross Areas, Industrial, Retail, Multi-Unit Residential, and Mixed-Use.

BOMA 2018 Gross Areas Standards

This standard was created for measuring forms of occupancy other than office buildings which includes industrial, retail, multi-unit residential, mixed-use, and campus-style properties. In contrast to the office standard, the gross standard measures buildings to the outside finished surface of the building enclosure.

The BOMA Gross Areas Standard includes four methods, known as Gross Area 1—Leasing Method, Gross Area 2—International Comparison Method, Gross Area 3—Volumetric Method, and Gross Area 4—Construction Method.

Gross Area 1—Leasing Method

This method is used for leasing in a single occupant building and for use with the BOMA Mixed Use Standard.

Gross Area 2—International Comparison Method

This method is fully compliant with IPMS 1 of the [International Property Measurement Standards](#) for international building transactions and

evaluations. The main goal of IPMS is to provide a common measurement language and consistent measurement standard for measurement and reporting regardless of location.

Gross Area 3—Volumetric Method

This method establishes the gross area of a building's interior areas necessary for volumetric studies, for measuring heat gain and loss, and for other environmental studies. Note—this method does not include the vertical measurements necessary to calculate the volume of a building.

Gross Area 4—Construction Method

This method establishes the necessary areas for construction cost analyses, and for the estimation of replacement costs. Gross Area 4 produces the largest area of all the Gross Area Methods.

BOMA 2019 Industrial Buildings Standard

This standard establishes a single method of measurement to determine rentable areas for industrial buildings, flex buildings, and their associated structures. It can be applied to single-tenant, multi-tenant, or multi-building configurations, and may be used to measure new, existing, and proposed buildings.

While this standard is primarily designed to produce rentable area data, it can also produce data for determining space utilization, valuation, benchmarking, and building expenses allocations.

This standard features multiple load factors for

building service, floor service area, and inter-building area. The load factors are applied to occupant areas on a pro-rata basis and provide a multi-occupant rentable area breakdown.

One of the key features of this standard is the compatibility with International Property Measurement Standards: Industrial Buildings, specifically IPMS 1. In contrast to the BOMA standards which are primarily designed for leasing purposes, IPMS 1 is primarily designed for building planning and development. Service load factors are therefore not included in the IPMS 1 standard.

BOMA 2020 Retail Properties Standard

[BOMA Retail 2020](#) is the first update to BOMA retail measurement methods since 2010. The new standard allows property owners and asset managers to do a partial measurement of at least one retail unit, or an overall measurement of the entire retail property, including all retail suites and common areas.

Certain unenclosed areas fundamental to the 'retail experience' (like permanent patio areas, balconies, finished rooftops etc.) are now included as part of Gross Leasable Area and Gross Leasable Exclusions. Even when not part of the GLA, some unenclosed areas are now measured as part of service and public areas.

There is also the option to calculate parking areas, major vertical penetrations, service areas and public areas according to a retail tenant's GLA.

The new retail standard is compatible with IPMS: Retail Buildings in 2021.

BOMA 2021 Mixed-Use Properties Standard

This standard was developed to measure floor area for properties with multiple occupancy types such as office, retail, industrial, single and multi-unit residential, hospitality, entertainment, civic and institutional buildings, and more. The main purpose of this standard is to generate mixed-use common area allocations to be integrated with the available single-use BOMA standards.

The standard classifies the different occupancy types into use components, parking components, and mixed-use common areas. The different use components are measured on a gross basis for use with this standard. However, for rentable areas, gross leasable areas, or unit areas, the use components are measured by applying the other BOMA single occupancy measurement standards.

There will be a revised BOMA 2021 Mixed-Use Properties Standard later this year. The upcoming standard will align concepts and measurement methodologies with the other single-use BOMA standards. These include the BOMA 2017 Office standard and the BOMA 2018 Gross Areas Standard.



Other Unofficial Methods

Although not officially recognized by BOMA, “Modified BOMA” has become a commonly used term, defined simply as any modification to the BOMA Standard. Many landlords use this approach to increase RSF throughout the property.

Common applications of Modified BOMA include:

- ✔ The use of a more aggressive method to measure useable footage. For example, measuring to the outside face of an exterior wall
- ✔ For buildings in New York’s tri-state area, calculating the usable areas per BOMA, then applying a REBNY loss factor

Part 3:

REBNY: Real Estate Board of New York

The REBNY standard of measurement is far more aggressive than BOMA, as usable space is measured to the outer face of the building exterior wall and the thickness of the corridor walls are included as usable footage. REBNY also allows a loss factor to be applied to usable areas. This number is market driven and varies on both a full floor and multi-tenant basis. In BOMA, the Gross Building Area (GBA) exceeds the rentable area. In REBNY it is the opposite and rentable area is almost always greater. GBA can be defined as the total floor area of the building measuring from the outer surface of exterior walls.

Landlords in New York City use different approaches to calculate the rentable area of their floors. Some examples are:

Applying a set full floor loss factor throughout the property

Note that full floor loss factors can yield a very high multi-tenant loss factor on inefficient multi-tenanted floors. In this case, most landlords decide to cap the multi-tenant loss factor (usually between 37–38 percent).

Applying set floor rentable numbers per floor to simplify leasing and marketing efforts

This may result in each floor having a different loss factor as per the relationship of the usable to rentable space.

Applying the “Four-Inch Method” to New Construction

The REBNY standard of measurement has remained the same since 1987, except for the addition of what is informally known as the “four-inch method” in 2003. This method favors landlords as more usable area is captured throughout the building.

Measure the floor to the outside surface of the building. Subtract from this area the following, including the **nominal four-inch** enclosing walls:

- ✔ Public elevator shafts and elevator machines and their enclosing walls
- ✔ Public stairs and their enclosing walls
- ✔ Heating, ventilating, and air-conditioning facilities (including pipes, ducts and shafts) and their enclosing walls, unless such equipment, mechanical room space, or shafts serve the floor in question

- ✓ Fire towers, fire tower courts, and their enclosing walls
- ✓ Main telephone equipment rooms and main electric switchgear rooms

It is standard industry practice to apply the method only to new construction. The construction drawings for new properties are used to establish and measure four inches out from the opening of shafts and other spaces specified above. Anything beyond the four-inch enclosure is included as part of the usable (office, retail, or floor common) area.

There is no binding rule that requires owners to conform to either BOMA or REBNY. However, most landlords across the CRE industry adhere to one or the other.

Measuring Retail Stores

Retail space measurement standards have often generated confusion among landlords. Contradicting statements leave aspects open to interpretation, and it's considered a grey area within the guidelines. Landlords should select the approach that best suits their building, market, or business requirements.

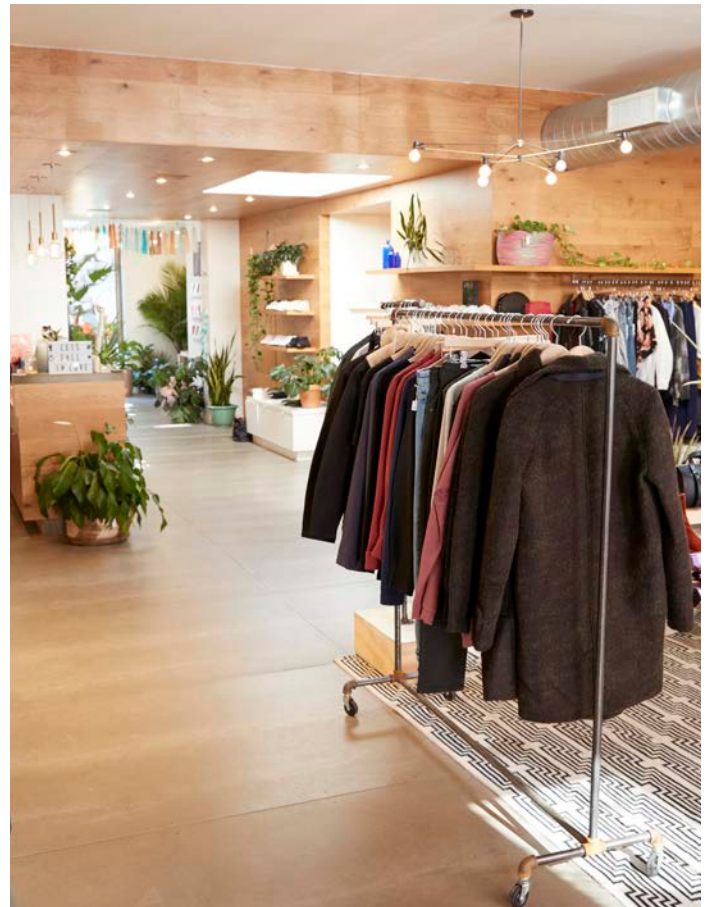
There are two main approaches, and the first is considered the less aggressive of the two—it excludes the wall thickness of the non-street fronting exterior walls. This interpretation yields less rentable area per the guideline below.

1. A store's rentable area is computed by measuring from the building line in the case of street frontages, and from the inside surface of the outer building walls to the finished surface of the corridor side of the corridor partition, and from the center of the partitions that separate

the premises from adjoining rentable area.

The second approach is more aggressive as it includes the thickness of all exterior walls, yielding more rentable area.

2. The rentable area of a store shall include all area within the outside walls, less the following within their enclosing walls if serving more than one tenant: building stairs, fire towers, elevator shafts, flues, vents, stacks, pipe shafts, and vertical ducts.



Part 4:

Select Major Markets and Re-Measurement Trends

New York City Metro Area

New York City is the most aggressive market when it comes to measuring office properties. The REBNY standard typically yields higher useable and rentable footages in NYC buildings than in any other major city in the United States.

For more than 10 years, most Class A and select Class B and C properties in Manhattan have primarily applied full floor loss factors at 27 percent and multi-tenant loss factors as high as 38-39 percent.

Building Engines expects the standard 27 percent loss factor will remain relevant for existing properties. In contrast, based on our data, new construction with high-end amenity spaces has continued to push the envelope at 28-29 percent full floor loss factor despite the pandemic's impact. This is especially true when properties are designed by renowned architects and firms.

Outside of Manhattan, loss factors in New York's other four boroughs tend to be lower. However, rentable footages are still significantly higher compared to BOMA.

Select parts of the tri-state area immediately surrounding New York City also use the REBNY method. However, thus far there has not been a wide-scale transition to REBNY in the tri-state area.

Markets outside of NYC that adopted REBNY standards:

- ✓ Jersey City, NJ with loss factors as high as 19-20 percent on a single floor basis
- ✓ Greenwich, CT with loss factors as high as 24 percent on a single floor basis
- ✓ Long Island, NY with loss factors as high as 19- 21 percent on a single floor basis
- ✓ Westchester County, NY with loss factors as high as 16-19% on a single floor basis

California, Florida, and Other States with Warm Climates

External Circulations are included in BOMA 2017 calculations. An External Circulation is a common feature in warm climates like California and Florida, where a building's primary circulation occurs outside the exterior enclosure. External Circulations include open air hallways and colonnades.

Growth Potential

Remeasured buildings grow for a variety of reasons. Probably the most common reason is that new measurement standards over the past few decades favored the landlord. We regularly see buildings measured according to BOMA 1980 grow when re-measured to adhere to BOMA 1996, BOMA 2010, or BOMA 2017. Over the past several years we have seen, on average, three to four percent growth in most markets.

Although many firms might be talented at space planning or design, the intricacies of REBNY and BOMA require a specialized skillset, or the chances of losing revenue increase dramatically.

Building architects commonly omit non-tenanted levels. Per BOMA, calculations should capture all building levels, starting from the lowest floors in the basement or parking levels to the higher floors, including enclosed penthouse mechanical levels. Adding non-tenanted floors to calculations can increase rentable area by thousands of square feet.

For example, at a property in Washington D.C., Building Engines discovered the last firm to measure the building omitted an entire penthouse level. Remeasuring the space using a later BOMA standard resulted in an additional 5,000 rentable square feet.

Due Diligence

In all markets, it's important that landlords understand the value of rentable square footage when selling or buying a property. Prior to dispositions, sellers should study rentable areas to see if they can increase the square footage to maximize the sale price. Conversely, a potential buyer should always validate the square footage the seller is listing to avoid overpaying.



Building Measurement Post-COVID-19

The COVID-19 pandemic caused a massive shift in the commercial real estate industry. (Read the eBook: [7 Keys to a Successful Post-COVID Workplace.](#))

Many commercial tenants are now eager to modify their spaces. Some wish to add office space to accommodate social distancing, others want to reduce space as their workforce stays remote. Amid this dynamic environment, it's easy for building owners and operators to measure inaccurately and miss out on revenue—or to have difficulty selling their properties because they're charging too much.

To regain a solid footing post-pandemic, building owners and operators need to ensure all new and modified spaces are measured accurately, down to the last square foot.



Leverage New Measurement Standards to Maximize Building Value

Landlords, brokers, and property managers should ensure accurate, up-to-date building measurement to maximize property value. But inaccurate measurements are rampant in commercial real estate and lead to missed revenue opportunities.

It is possible to measure spaces manually, but in-house methods are tedious, time-consuming, and notoriously error prone. This is why specialized space management and measurement firms exist.

At Building Engines, we specialize in helping commercial property teams navigate the latest building measurement standards. We measure buildings with innovative laser technology for accuracy and verify that calculations are compliant with current standards. This ensures our customers can add RSF with each new measurement standard.

For help with your remeasurement needs, learn more about Building Engines' [measurement services](#), or schedule a demo with our team of experts today.



[Schedule a demo with our team of experts.](#)

Much of the information in this white paper is based on material from <http://www.boma.org> as well as from OFFICE BUILDINGS: STANDARD METHODS OF MEASUREMENT – ENGLISH VERSION (ANSI/BOMA Z65.1-2017)

About Building Engines

Building Engines improves net operating income across the world's most successful commercial real estate (CRE) portfolios. Our customers increase revenue, deliver the best occupant experience, and reduce operating costs with **Prism**—the industry's most innovative and powerful building operations platform. Today, more than 850 customers—including Beacon Capital Partners, Cushman & Wakefield, and SL Green—rely on Building Engines to manage critical operational needs across more than three billion square feet and 30,000 properties worldwide.

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ADDRESS

Building Engines HQ
33 Arch Street, 32nd Floor
Boston, MA 02110