



# 18 Ways to Increase Density in Multifamily Housing

In multifamily housing, improving density of your site is critical to the success of your deals.

Here at TestFit, we specialize in maximizing schemes for multifamily developers. Along the way, we've learned a number of ways you can maximize net rentability, as well as the advantages and disadvantages of these different methods IRL. The more experienced folks in your firm may know many of these tricks, but we hope you'll learn a thing or two, and have a handy list to reference.

We all know more units = more revenue but we also know it's not that simple. So we've laid out the pros and cons for each method, as well as their impact on core metrics like NRSF, Capex, Building Efficiency, Risk etc. We've also included data from 222 TestFit site plans that truly show the relationships between design changes and core development metrics.

We've also included examples of these changes being executed in TestFit. TestFit is the building configurator to help you win deals faster. All design changes instantly retabulate your core financial metrics in the software. Read on to find out more!

# The TestFit Checklist

- 1 Setback variances
- 2 Balconies & setbacks
- 3 Below grade parking
- 4 Lower floor-to-floor height
- 5 Fire & vertical transport
- 6 Unit depth
- 7 Narrowing corridors
- 8 Single loaded Corridors
- 9 Courtyard sizing
- 10 Reduce amenity spaces
- 11 In-unit laundry
- 12 Reinvent operational spaces
- 13 Lower unit SF average
- 14 Unit mix allocation
- 15 Add bays on units
- 16 Utilize inside corners
- 17 Add end cap units
- 18 Yield on cost

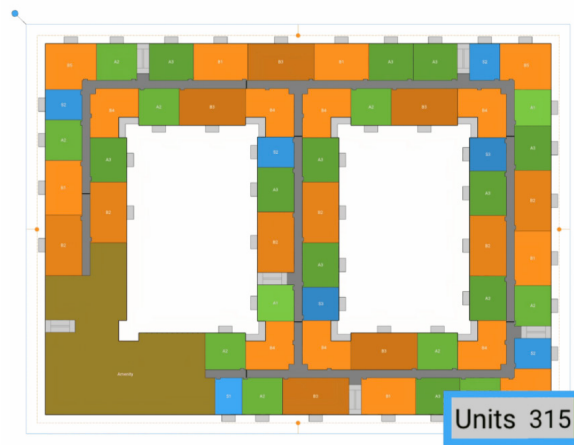
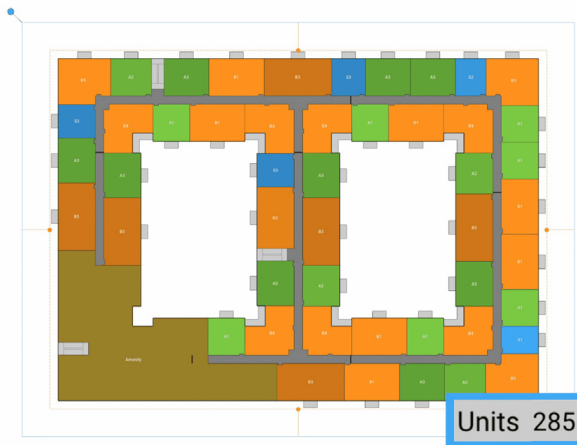
## 1 SETBACKS & VARIANCES

### PROS

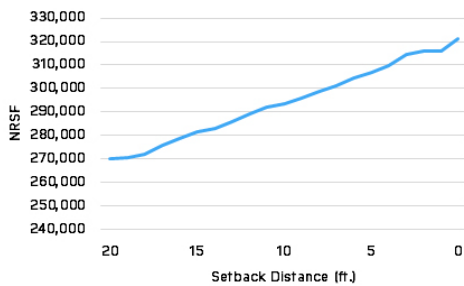
Decreasing the setbacks on the site can increase your density by maximizing buildable square footage.

### CONS

Being granted a variance for a decrease in setbacks can be a tenuous process with the local jurisdictions. It can trigger longer review processes and increases fire suppression requirements among other measures.



Comparison unparked (not wrap) site plans with lower and higher setback dimensions



Comparison between NRSF vs units within setback dimensions

### CORE METRICS

Decreasing setbacks affects core metrics in the following ways:

DECREASE SETBACKS	IMPACT	NOTES
NRSF	+++	Significant increase in NRSF
Risk	+	Might need to spend political capital
Intangibles	+	New Urbanism promotes holding down property line edges

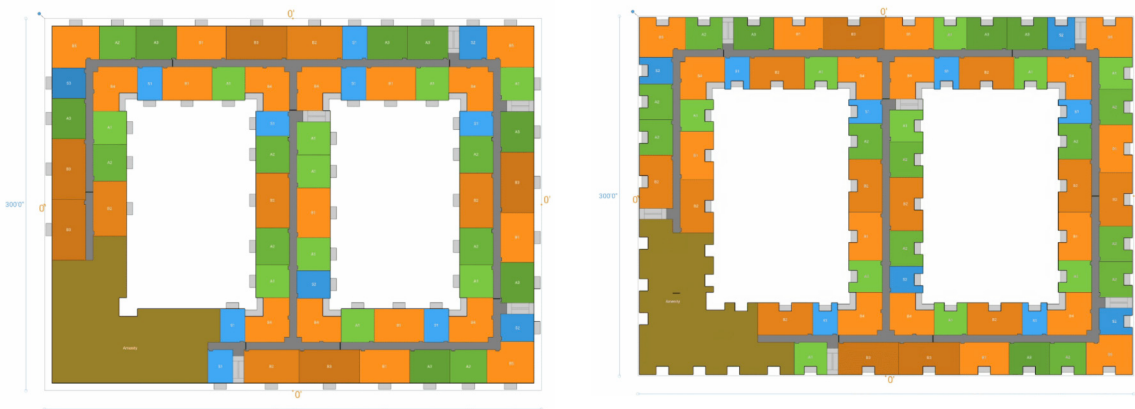
## 2 BALCONIES & SETBACKS

### PROS

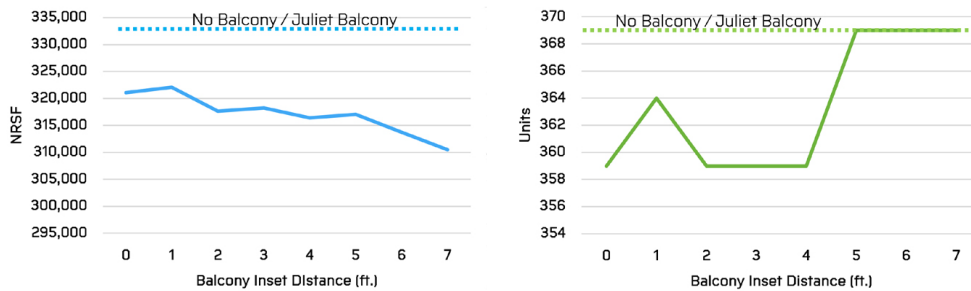
Similar to decreasing setbacks, switching to juliet or inset balconies allows your building footprint to get closer to the setback rather than being pushed back when balconies are present. they can also feel more comfortable, with less sensation of floating in the air.

### CONS

Balconies can serve as a value add to units, especially in warmer climates. While you may not see the value in NRSF, the perceived value of personal outdoor space can increase your overall rent/sf.



Comparison between outset and inset balconies within the same setback dimensions



Comparison between NRSF vs units within inset balconies, juliet balconies, and no balconies

### CORE METRICS

Manipulating balconies closer to setbacks affects core metrics in the following ways:

INSET BALCONIES	IMPACT	NOTES
NRSF	+	Increase net rentable
Capex	+++	Significant facade cost increase
Risk	++	Water infiltration
Building Efficiency	-	Using floor area footprint for something aside from units
Intangibles	+	Much easier from a constructability point of view



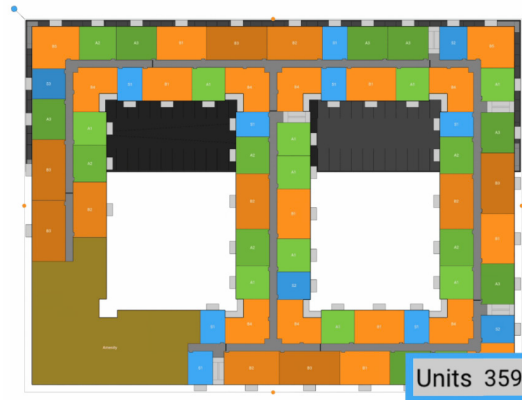
## 3 BELOW GRADE PARKING

### PROS

Putting parking below grade frees up more vertical space for residential levels.

### CONS

Structured parking is an expense as is. But adding in the cost of excavation and retaining walls among other aspects significantly increases the cost per stall. You could be looking at a 50-100% increase in cost per stall depending on your market



Comparison between above and below grade parking that allows for more residential

### CORE METRICS

Adding below grade parking affects core metrics as follows:

BELOW GRADE PARKING	IMPACT	NOTES
NRSF	+++	Significant increase
Capex	+++	Digging is very expensive
Risk	+++	Water & construction timetable increase

# BUILDING

## 4 LOWER FLOOR-TO-FLOOR HEIGHT

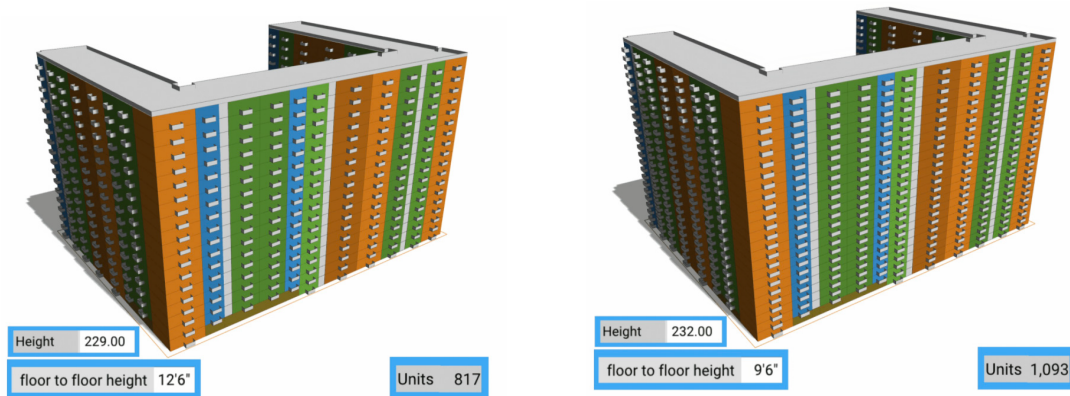
### PROS

Lowering your floor to floor height can help in a couple of ways. First, it can allow you to get more residential floors under a strict height requirement. Similarly, if building a tower, a shorter floor-to-floor height can add levels when compared to a more traditional height.

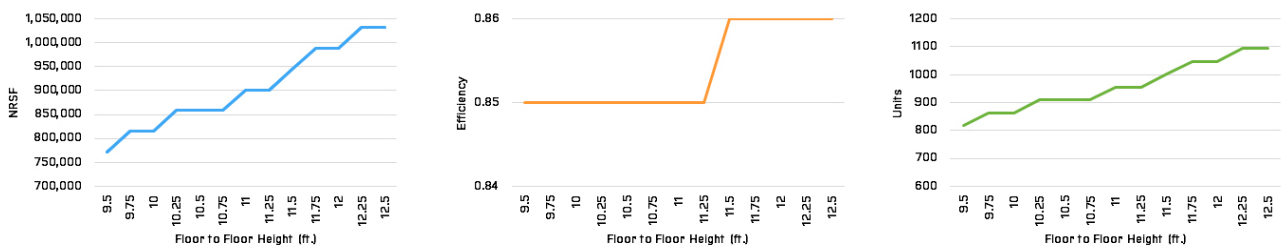
For example, a building with a F2F of 12' can get 16 residential levels up to a 200' limit. But if we switch to a 10' F2F you can get 20 levels in the same height restriction. That translates to more NRSF and more units and more revenue.

### CONS

Livability. Be careful with your F2F. You want to ensure that your ceiling height is something that drives highest possible market rents as well as is buildable/liveable. Construction type will likely ultimately drive this decision.



Comparison of data between lower and higher floor-to-floor heights



Comparison between NRSF, efficiency, and units within floor-to-floor height

### CORE METRICS

Decreasing floor-to-floor height affects core metrics as follow:

DECREASING F2F HEIGHT	IMPACT	NOTES
NRSF	+	Can be significant (four floors to five)
Capex		Minimal changes
Risk	+++	Shifts risk to lease up (may affect tenant interest)

# BUILDING

## 5

## FIRE & VERTICAL TRANSPORT

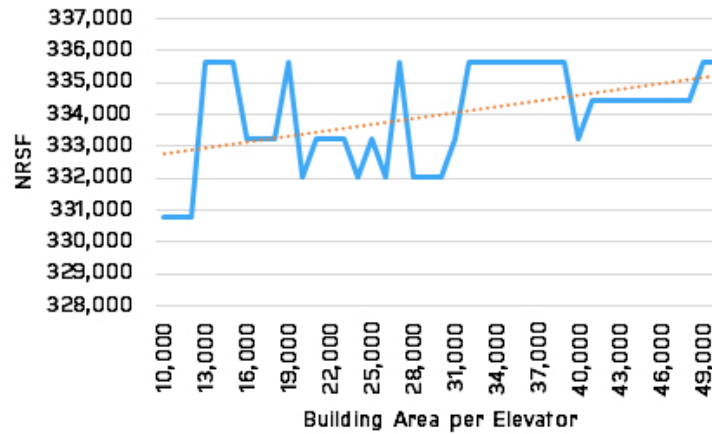
Example: The NFPA 13 standard for the installation of sprinkler systems.

### PROS

Better life safety. Fewer staircases and fewer expensive fire walls.

### CONS

More expensive systems, higher capital expenditure.



Relationship between NRSF and building area per elevator.

### CORE METRICS

Upgrading fire safety equipment can impact your metrics as follow:

FIRE SAFETY UPGRADE	IMPACT	NOTES
NRSF	+	Fewer staircases
Capex	+	Marginal increase
Risk	--	Less likely to burn down, lower opex (insurance)

# BUILDING

## 6 UNIT DEPTH (DYNAMIC OR OTHERWISE)

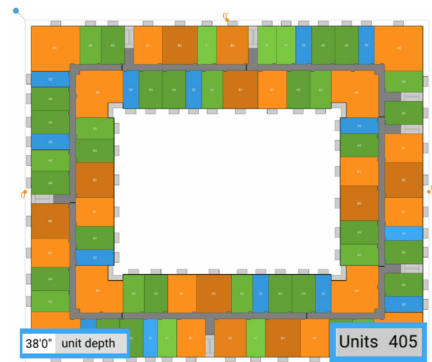
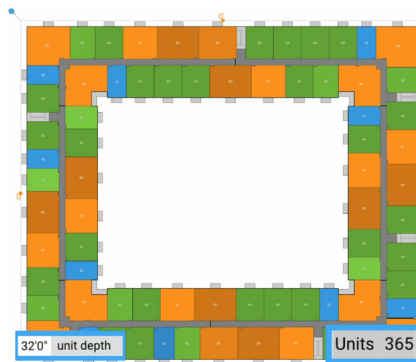
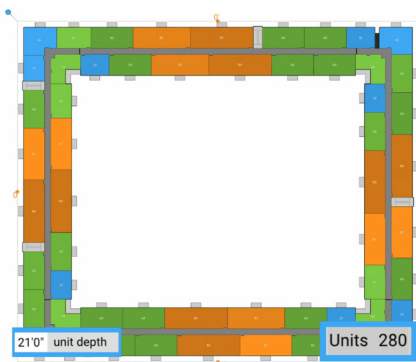
As you can see from one of TestFit's studies below, there are significant gains to be had in terms of net efficiency from 10-20 ft deep units, but these gains become less significant after 20'.

### PROS

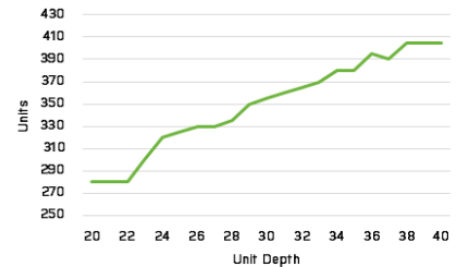
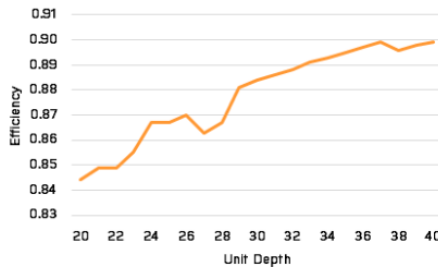
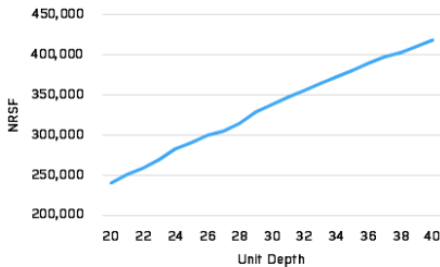
Increasing the depth of units has the hidden effect of more units. By increasing your depth of units while still targeting the same unit square footage you create thinner units and therefore, in a long enough run, gain units. This can also be described as an increase in NRSF.

### CONS

The thinning out of units sounds appealing on a parametric / dynamic level but when we start to drill down into the unit layouts some minimums need to be considered for sizing in order to maintain livability as well as rents



Comparison between unit depth and the number of units possible



Comparison between NRSF, efficiency, and units within unit depth

### CORE METRICS

Deeper units affects your core metrics in the following ways:

DEEPER UNITS	IMPACT	NOTES
NRSF	++	Increases net rentable
Capex	+	Marginal increase
Efficiency	++	
Risk	--	Can be difficult to lease

# BUILDING

## 7 NARROWING CORRIDORS

Narrowing corridors can be the quickest way to increase your net rentable. Many developers prefer 6' but there are some major considerations to be aware of in the cons.

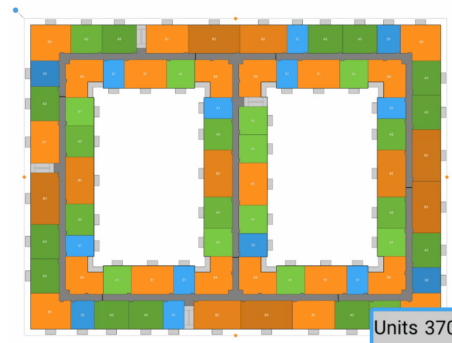
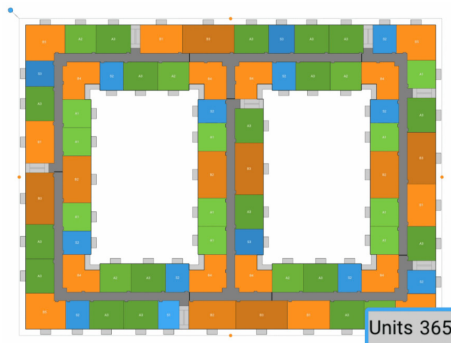
### PROS

Corridors are the literal spine of a building. That spine drives travel distances and is referred to as the common area because every tenant uses it! Getting creative with the corridor can increase your NRSF by giving more floor area to units rather than unrentable, but necessary, corridors.

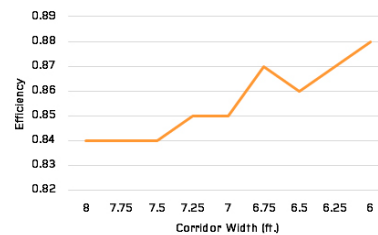
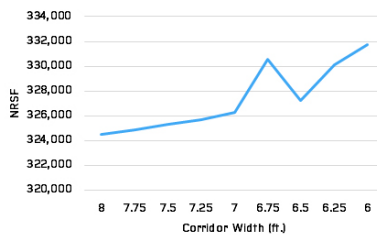
### CONS

**Narrowing corridors can be a hindrance to both tenant experience as well as buildability:**

1. A narrow corridor can make the experience of walking to your unit feel like a tunnel. Especially if the corridor doesn't have windows. No one wants to live in a cave.
2. Too narrow of a corridor can make moving in difficult. Don't let your tenants get stuck pulling a Ross...
3. Many prepackaged firewall systems don't work well with a 6' corridor.
4. Pro tip: recess your unit entries to ensure a dynamic wall experience. TestFit units do this by default!



Comparison between different corridor widths and number of units possible



Comparison between NRSF, efficiency, and units within corridor width

Narrowing the corridors affects your core metrics in the following ways:

NARROWING CORRIDORS	IMPACT	NOTES
NRSF	+++	Significant increase
Capex		Unchanged
Risk		Tenants might have to squeeze by one another, fire doors need special niches
Efficiency	++	The best change to improve efficiency
Intangibles	--	Don't go so narrow that tenants can't move their furniture in

### CORE METRICS

# BUILDING

## 8 SINGLE-LOADED CORRIDORS

Adding single-loaded corridors where a double-loaded corridor doesn't fit is marginally more expensive. There are some scenarios where single loaded corridors are quite helpful.

### PROS

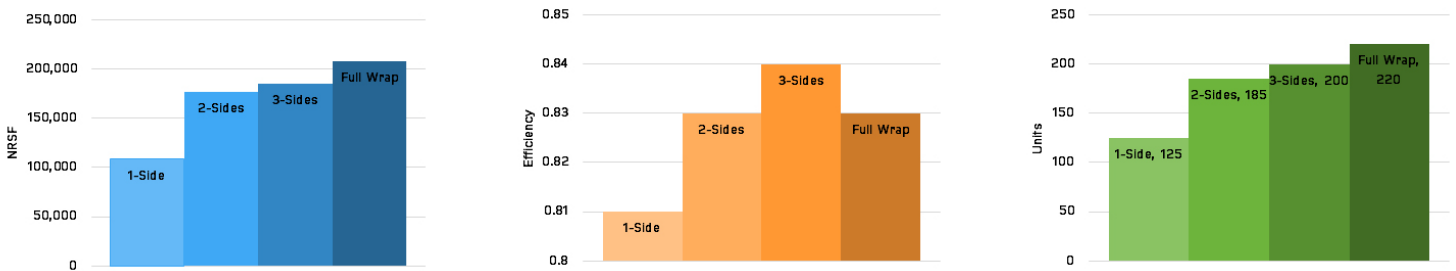
On tight or odd shaped sites, sometimes the best way to add density is to add single-loaded corridors. The most common use of a single loaded corridor is a long a parking garage. But in some urban areas a single-loaded leg may be used to maximize density while preserving views or minimum courtyard dimensions.

### CONS

Cost, both in terms of construction and efficiency. Having a single loaded corridor means the SF of the corridor is being offset by half as many units.



Relationship between increased single-loaded corridors and unit count



Comparison between NRSF, efficiency, and units within 1-side, 2-side, 3-side, and full wrap single corridors

### CORE METRICS

Changing double-loaded corridors to single-loaded can affect your core metrics as follows:

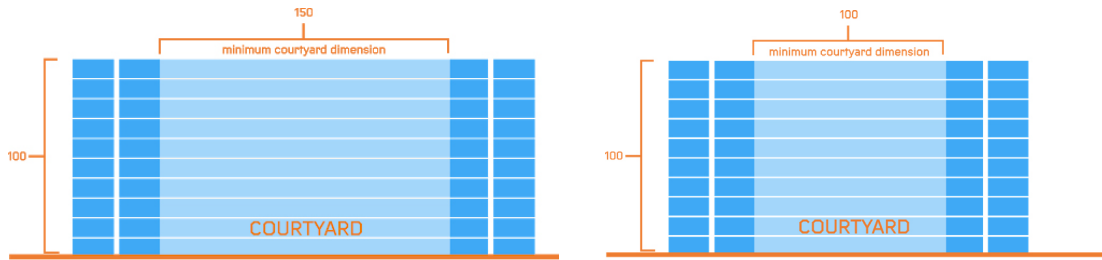
SINGLE LOADED CORRIDORS	IMPACT	NOTES
NRSF	+++	Significant increase
Capex	+	Higher construction cost
Risk	+	More risky than its double-loaded cousin
Building Efficiency	--	Significantly worse than double-loaded
Intangibles		Can hide a parking garage quite effectively

# SPACES

## 9

### COURTYARD SIZES (COURTYARD ASPECT RATIO)

The Courtyard Aspect Ratio is the direct relation to the height of the building from the base of the courtyard to the minimum distance from building to building. Illustrated below, that ratio is commonly 1:1. For example a 65' tall building would require a 65' distance between all non-perpendicular facades.

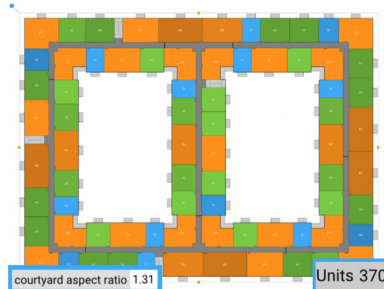
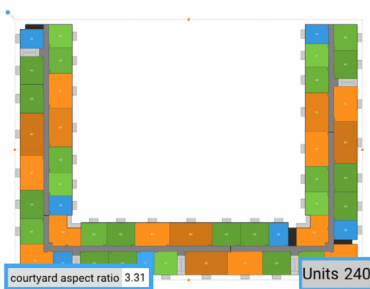


#### PROS

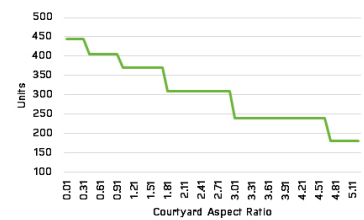
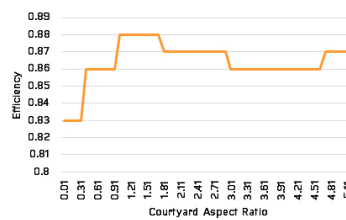
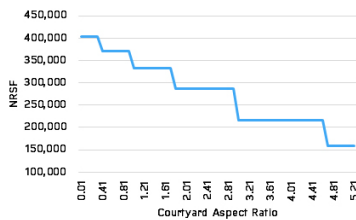
Reducing the ratio allows for a more dense building on site. Especially on projects that, by decreasing the ratio, allow for another wing to be added to the building.

#### CONS

The courtyard aspect ratio is commonly seen as the daylighting ratio. It is a “hot-take” metric to ensure your lowest level of residential still receives daylight. Too small of a ratio can result in light wells and cave-like units.



Relationship between courtyard ratio and unit count



Comparison between NRSF, efficiency, and units within courtyard aspect ratio

#### CORE METRICS

Changing double-loaded corridors to single-loaded can affect your core metrics as follows:

SINGLE LOADED CORRIDORS	IMPACT	NOTES
NRSF	+++	Significant increase
Risk	+	Risk Transferred to lease up if tenants can see into one another's units
Intangibles	-	If too small, the value of the courtyard units will go down



## 10 REDUCE AMENITY SPACES

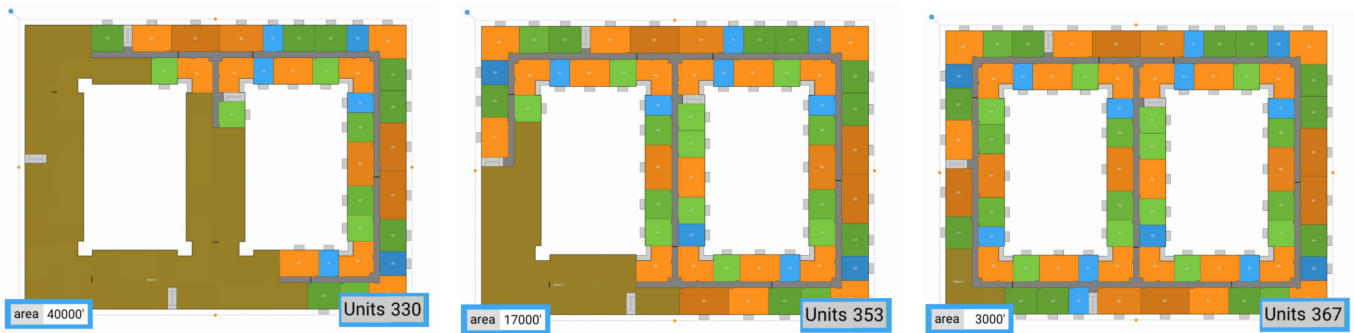
Workout facilities used to be seen as a core component in multifamily, but post-pandemic, some are opting for more personalized, flexible services. You can also outsource gym facilities using companies like Amenify, but note that doing so shifts cost from capex to opex. In short, you really need to think about your marketing and target demographic.

### PROS

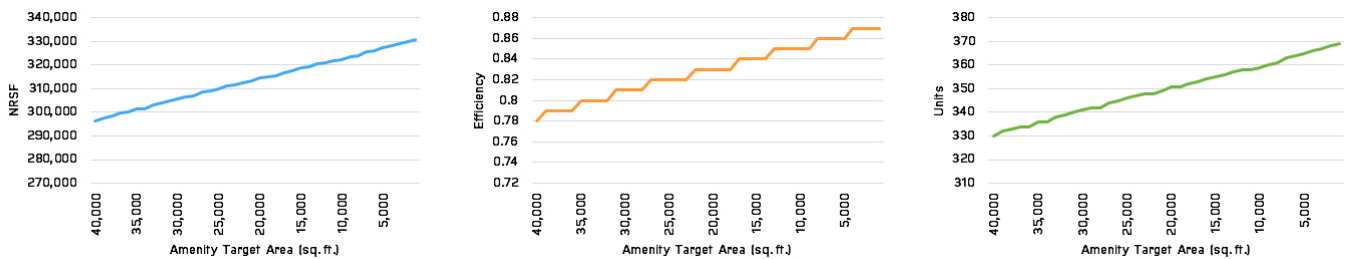
Can increase your net rentable, may be less demand for generic workout facilities.

### CONS

Can decrease the appeal for future renters. Custom facilities like Peloton in group settings are on the rise. Basically, it depends on your target demographic.



Relationship between amenity space size and unit count



Comparison between NRSF, efficiency, and units within amenity target area

### CORE METRICS

Removing amenities will affect your core metrics in the following ways:

REMOVING AMENITIES	IMPACT	NOTES
NRSF	+++	Significant increase
Capex	----	Amenities are expensive
Risk	+++	All of your competitors have these amenities
Building Efficiency	++	More units
Opex	+	If outsourcing gym facilities, increases opex
Intangibles	---	Few residents actually use amenity areas

## 11 IN-UNIT LAUNDRY

Consider putting laundry units in the units instead of separate community laundry.

### PROS

Adding laundry to units can be a lucrative value add. Especially in dense cities with old housing stock such as NY, LA and Chicago, having in unit laundry is a major tenant desire and can drive higher rents. Also by adding laundry to units instead of having a shared laundry facility on site, you can instead convert that otherwise unrentable space to units. Stackable W/D are great space savers so are the two-in-one

### CONS

Having more appliances is more of an upfront cost as well as an increase in your operations expenses due to more maintenance and liability. But weighing that increase against the increase in NRSF and

### CORE METRICS

Removing community laundry amenities and transferring them into units affects your metrics as follows:

LAUNDRY INSIDE UNITS	IMPACT	NOTES
NRSF	++	An increase
Capex	+	Must install air exhaust ducts
Risk	---	The world is moving this way in the name of convenience
Building Efficiency	+	
Intangibles	---	Might make the property appear more luxury

# SPACES

## 12 REINVENT OPERATIONAL SPACES

There are many options to reinvent your leasing or operations office. You can reduce it, digitize it, or utilize amenity space as the office.

### PROS

Digitizing, moving your operations team off-site, or having them be in the amenity space allows you to open up more units for income. machines!

### CONS

Having operations and leasing offsite can make response times slower and can result in a decrease in efficiency in your leasing agents time. If it's onsite, you will likely need more room in the amenity space.

### CORE METRICS

Digitizing or repurposing your leasing space can affect your core metrics as follows:

DIGITIZE LEASING / USE AMENITY SPACE AS OFFICE	IMPACT	NOTES
NRSF	+++	What was the leasing office is not rentable
Capex	~	Moves from Capex to Opex if offsite
Risk	----	No leasing agent on site might be too contemporary for some tenants
Opex	+	Opex increases if offices moves offsite / digitized
Building Efficiency	+	All areas that were leasing should be converted to rentable
Intangibles	+	The world will end up here eventually. Now could be the time to do it

# UNITS

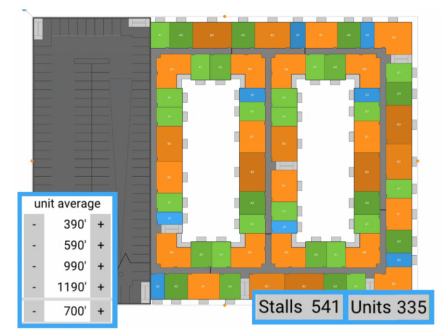
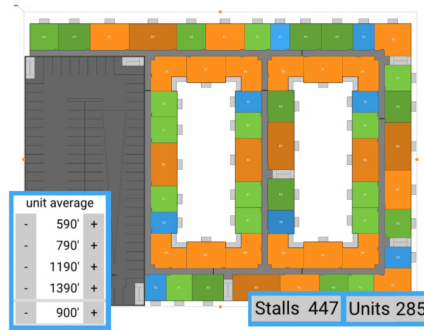
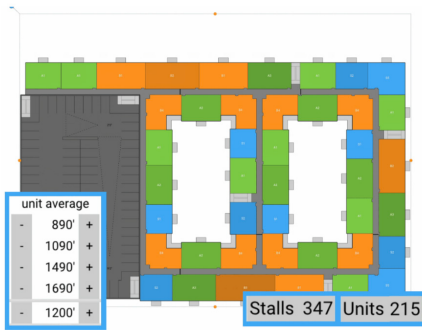
## 13 LOWER UNIT SF AVERAGE

### PROS

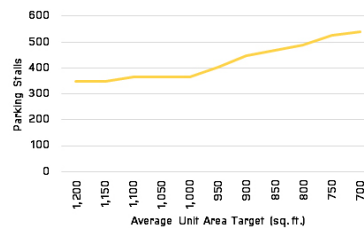
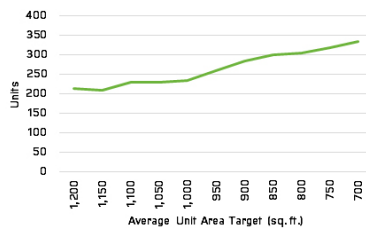
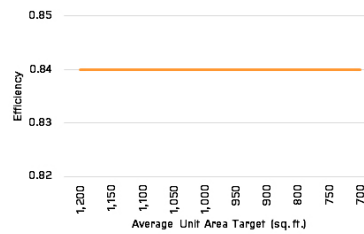
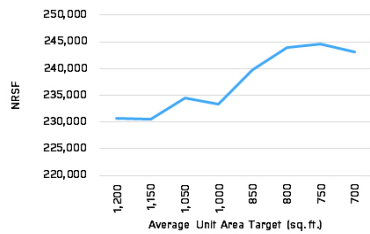
Decreasing the overall unit square footages produces results similar to that of increasing unit depth. The difference being you are not actually increasing the building floor plate. By decreasing the unit's SF you are allowing your floor area to increase its NRSF density.

### CONS

Watch out for small units. It can be exciting to see a large increase in the number of units in a building but if those units aren't leasable you're really only shooting yourself in the foot.



Relationship between unit SF average and stall and unit counts



Comparison between NRSF, efficiency, units, and parking stalls within average unit area target

### CORE METRICS

Lowering the unit square footage impacts your core metrics as follows:

LOWERING UNIT SF	IMPACT	NOTES
NRSF		Remains marginally unchanged
Capex	+++	More parking stalls
Risk		Market fit
Building Efficiency		Remains unchanged

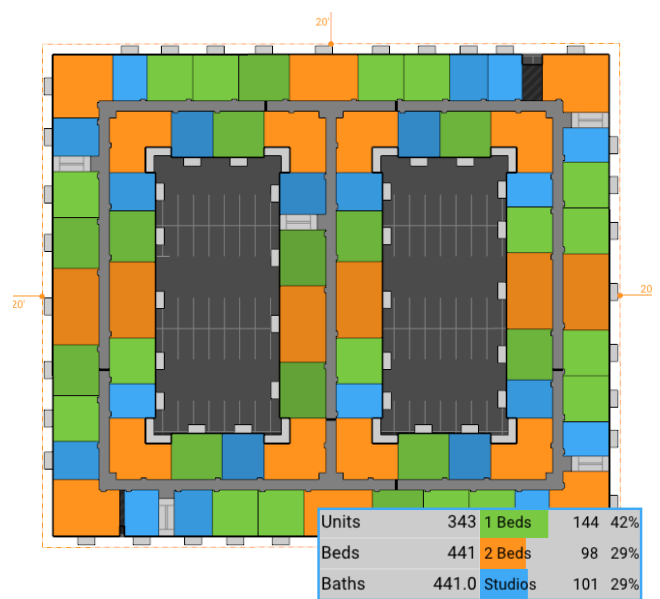
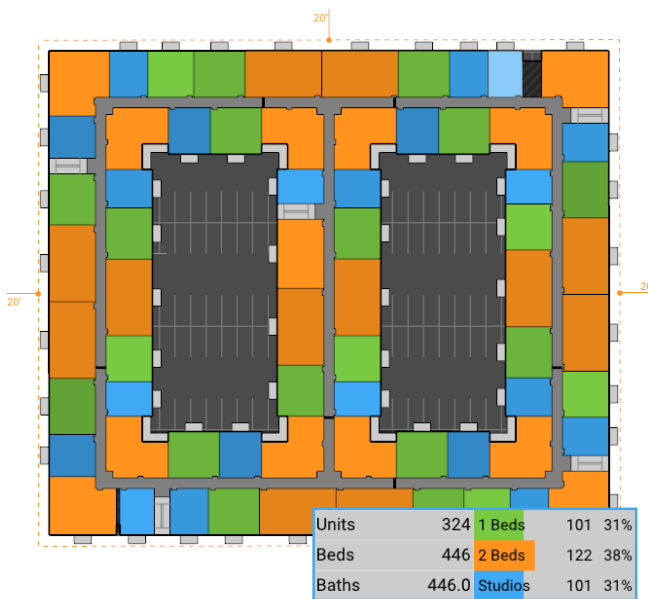
## 14 UNIT MIX ALLOCATION

### PROS

Changing your unit mix to smaller units allows for more than just more doors. It's truly a balancing act of units to maximize the value of the building. The decisions made here are very dependent on your market.

### CONS

Different styles of units have varying target markets and will affect your marketing. But more so a diverse unit mix allows for a better use of your net rentable area. For instance too many 2 bedroom units could result in unallocated space in a building because the units cannot efficiently fill out the building form. AKA watch out for a drop in building efficiency!



Relationship between unit mix and unit counts

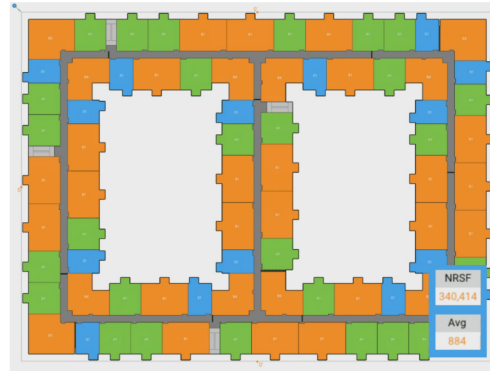
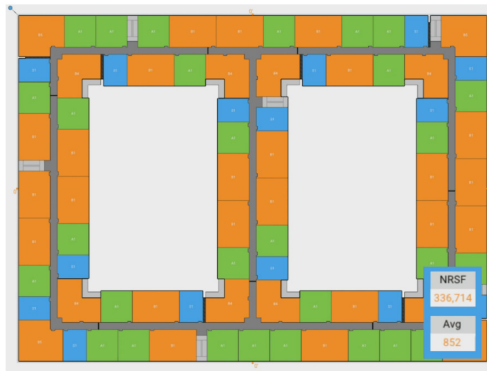
## 15 ADD BAYS ON UNITS

### PROS

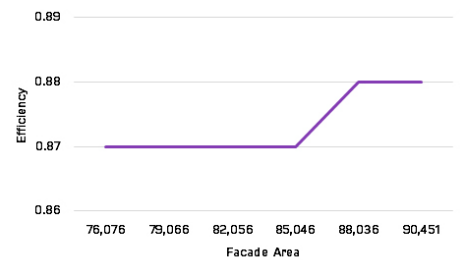
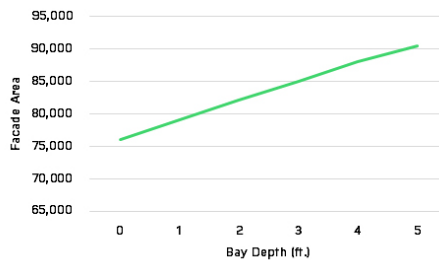
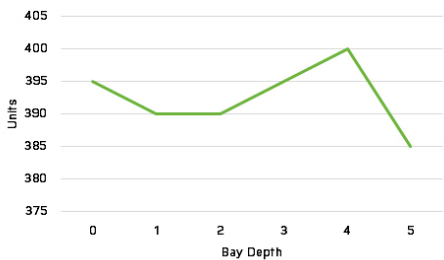
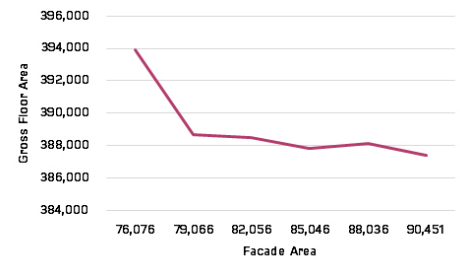
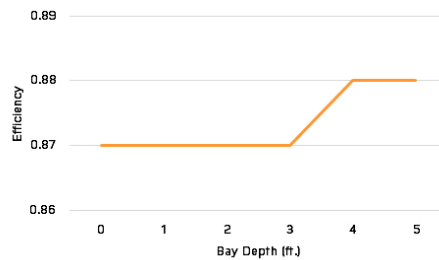
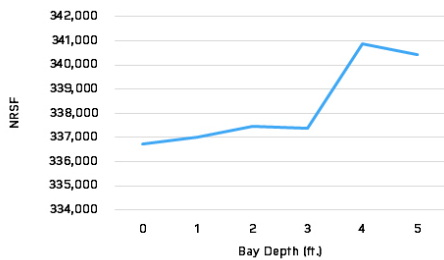
Adding bays is a great way to add net rentable as well as light into units. They also add facade intrigue, and frankly, look good when pulled off well.

### CONS

Increased capex, and it could result in restrictive courtyards



Relationship between adding bays and NRSF



Comparison between NRSF, efficiency, units, gross floor area and facade area within bay depth and facade area

### CORE METRICS

Adding bays in units affects your core metrics as follows:

ADDING BAY WINDOWS	IMPACT	NOTES
NRSF	+/--	Improvement to individual units, but could cause project-level nrsf loss
Capex	+	Significant skin increase
Risk		Water intrusion, additional facade
Building Efficiency	+	Slightly deeper units on average
Intangibles		Better looking buildings when done well

## 16 REINVENT OPERATIONAL SPACES

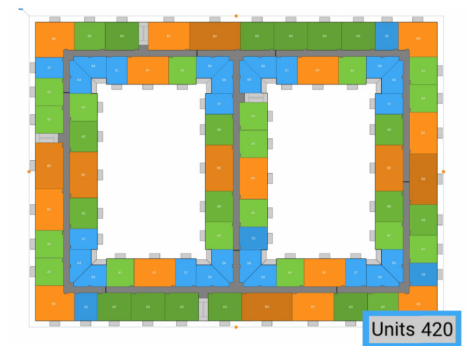
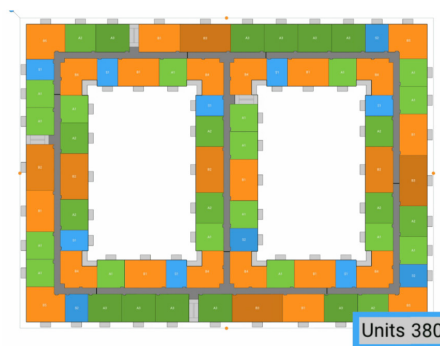
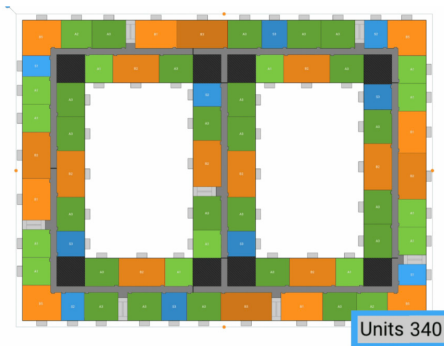
Protip: Check out our dedicated blog post on the math & solving of inside corner units: multifamily's problem child.

### PROS

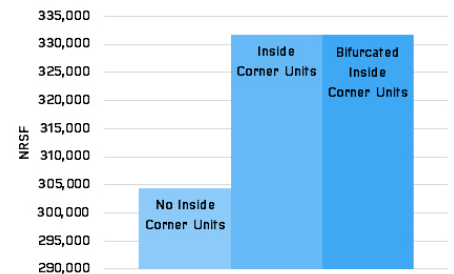
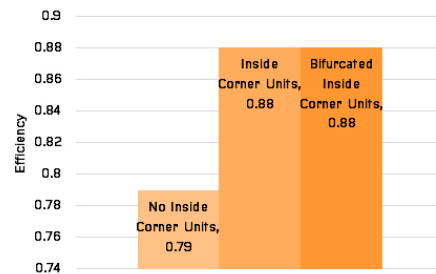
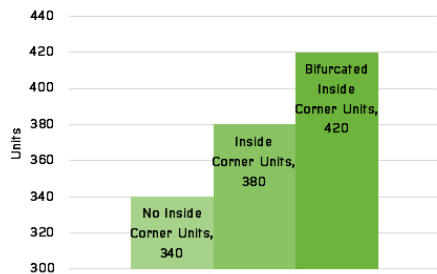
These are the most effective units in terms of yield on costs. They require less facade than other units but offer the same rent for square cost. These units can be leveraged as well by bifurcating to create two high yield, low-cost units.

### CONS

What is a pro is also a con here. With less facade for these units, they struggle to get enough light. Bifurcating to create two studios rather than a 2 bedroom can help but light is also something to consider. Pro-tip: Avoid acute angles for these corners. 90 degrees or above



Relationship between inside corner utilization and unit count



Comparison between units, efficiency, and NRSF with different inside corner types

### CORE METRICS

Adding inside corner units affects your core metrics as follows:

SINGLE LOADED CORRIDORS	IMPACT	NOTES
NRSF	+	
Building Efficiency	+	Massive increase
Intangibles		Harder to rent bifurcated studios



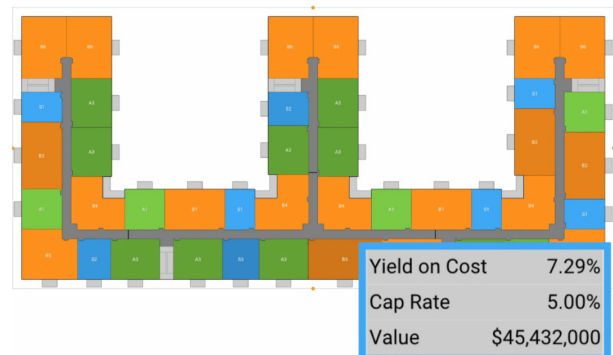
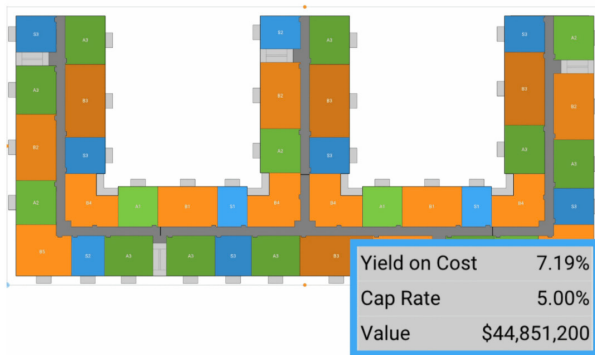
## 17 ADD INSIDE CORNER UNITS

### PROS

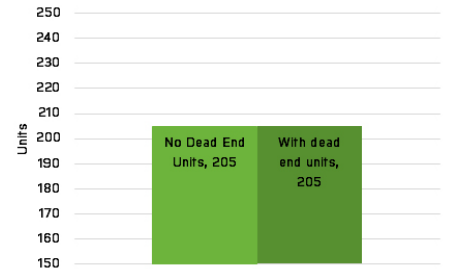
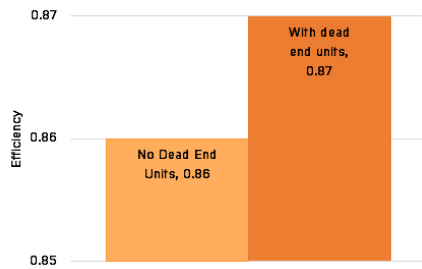
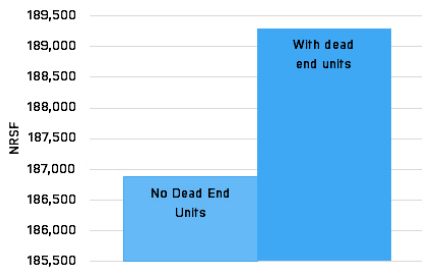
Gives you about a percentage point increase in efficiency. If you run a double corridor to the end of the building, don't have any opportunity to recapture that space that could be rented.

### CONS

You typically lose a window. However, you can add windows in areas people are likely to linger, like elevators, rather than the end of the hall.



Comparison between buildings with and without end caps



Comparison between NRSF, efficiency, units within existence of end caps

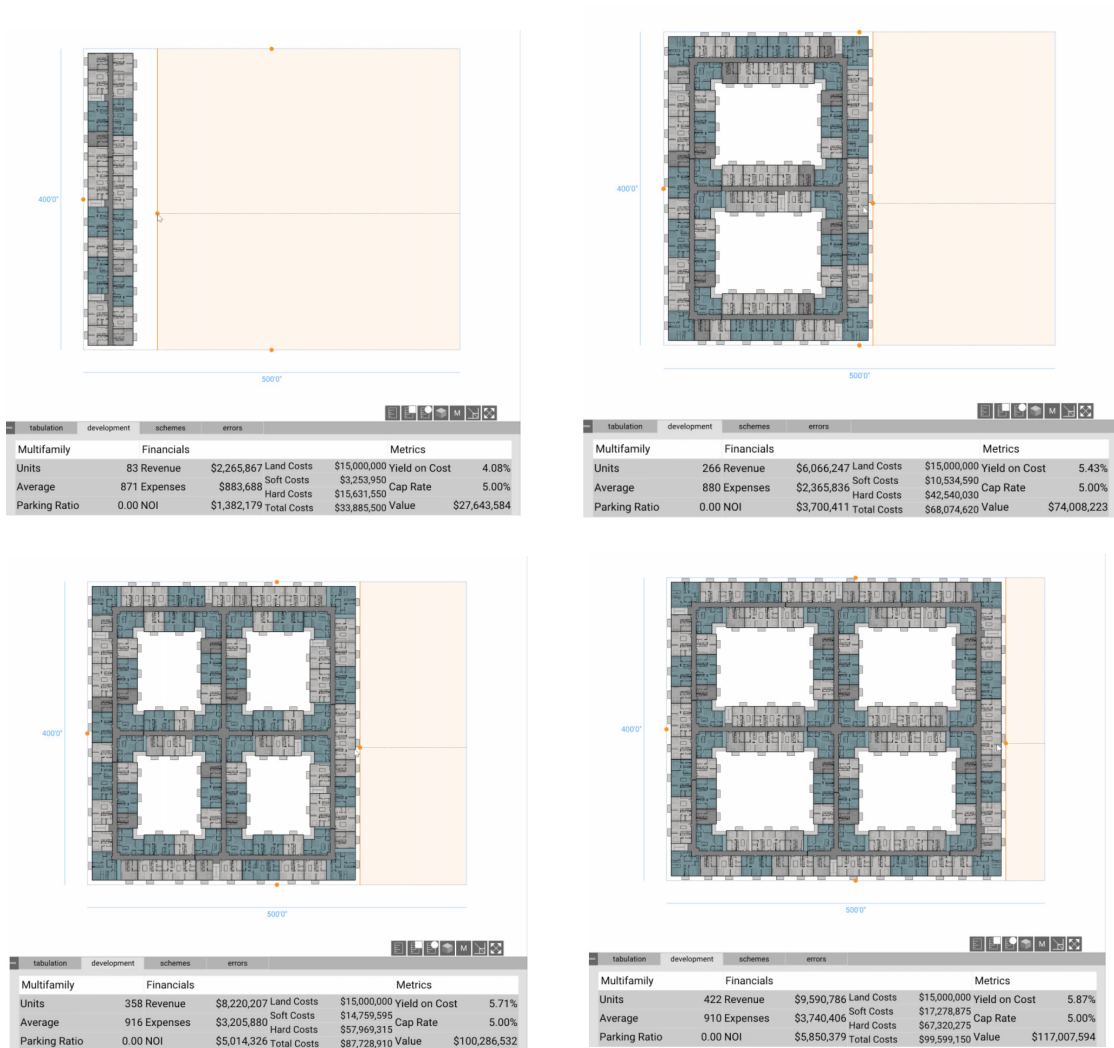
### CORE METRICS

Adding end cap units affects your core metrics as follows:

ADDING INSIDE CORNER UNITS	IMPACT	NOTES
NRSF	++	Removes common corridor and replaces with NRSF
Risk	--	These are the first units leased up
Building Efficiency	+	This design move is highly recommended, as it shortens corridors, and could result in fewer vertical elements
Intangibles		Makes for excellent unit plans with glass on two sides

## 18 REINVENT OPERATIONAL SPACES

Final Pro Tip: Any changes you make to the building's design, will be reflected immediately in TestFit's Deals tab so you can monitor the impact of your changes on Yield on Cost.



### BALANCING ACT

Increasing net efficiency while maintaining the appeal for your targeted market and personas is always going to be a balancing act. Hopefully you can combine some of these tips and tricks to increase your net rentable while not detracting from (or even adding to!) your tenants' experience.

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