

# Rental Affordability Curve

**Duration** 00:29:50

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**Corey Aber** [00:00:00] Sara, there's been something that's bothered me a little bit over the years on the podcast.

**Sara Hoffmann** [00:00:05] What's that, Corey?

**Corey Aber** [00:00:06] I'm glad you asked. It actually has to do with affordability, and that's a topic that we've covered a lot over the years on the podcast and how that's changed over time, how it's different in different markets. But there's an aspect of this that I wonder, can we be a little bit more precise at different income levels? You know, is there a little bit more nuance to this that that maybe it's possible to cover? What do you think?

**Sara Hoffmann** [00:00:30] That's something that's been on my mind and my team's mind as well. And good thing because today is just the day to talk about it. Hello and welcome to this episode of the Freddie Mac Multifamily Podcast. I'm Sara Hoffmann.

**Corey Aber** [00:00:45] And I'm Corey Aber and today we're going to dig into the topic of affordability, a topic that we've covered a lot, but we're going to look at it a little bit differently today. And we are joined by perhaps the most common guest on the podcast, not sure we'd have to go back and look at the numbers, but Kevin Burke from our Research & Modeling team. So, Kevin, thank you so much for being here today.

**Kevin Burke** [00:01:04] Of course. Thank you for having me.

**Corey Aber** [00:01:06] There's a lot that goes into the measurement of affordability and a lot of groups that have looked into this, different measures over time, different metrics. So, I'd like before we get into any of the new innovations that we're working on and that you've looked at, just give us a little bit of grounding on what's out there today and how we frequently think about affordability and measure it.

**Kevin Burke** [00:01:28] Sure. So, there are many metrics around the industry that are used to measure rental affordability. Some of the more widely used ones, maybe the single most widely used one, comes from Census. Census, of course, every year, you know, collects tons of data on population, on households and, you know, at the household level, they look at rent and income and they have a metric to compare these two. So, it's just the median rent burden for the nation and of course, they break it out by a bunch of different geographies.

But with that, we're able to see, say, at a national level what the median rent burden is typically around 30% or so and every year we don't see a whole lot of deviation from that. Even across metro areas, we don't see a whole lot of deviation, figures generally in the mid-twenties to mid-thirties. There are a lot of other, you know, metrics out there like from other organizations, like non-government. For example, the National Low Income Housing Coalition publishes their GAP Report every year in which they look at different segments of the renter population and how the number of households compares to the number of rental units that are available and affordable to them. So, for extremely low-income renters, which are the renters making 30% of AMI (area median income), they have a pretty chronic, pretty severe shortage

of affordable housing. So, every year it's generally, you know, somewhere around like 33 available and affordable rental units for every 100 extremely low-income households.

So, you know, it's pretty, pretty big shortage. Another metric is from the Joint Center for Housing Studies at Harvard, they look at the number of rental units that are renting for \$600 or below. And what they found is that that rate has been slowly declining over the years. The rate back in 2011 was 32%. For the most recent report it's now at 22% of the rental stock. So that's just some of the most like widely used metrics from around the industry.

**Sara Hoffmann** [00:03:44] So, Kevin, we've done a lot of work in-house in trying to understand the affordability challenge. And as you mentioned, there's a lot of industry participants out there who are also trying to grapple the magnitude of this challenge and trying to understand it better, all with the focus that that's where housing supply, and understand, and where they can put their resources to help affordable housing challenges at those income levels.

But what we're going to talk about here, how is that different or how does that address something that's not represented in those other studies?

**Kevin Burke** [00:04:17] So a lot of the other metrics used in the industry are kind of like center-of-the-distribution metrics. They have, you know, just like a specific mark that they look at. You know, maybe it's, you know, looking at renters at a certain AMI level and, you know, just kind of using that as a cut off and saying, 'Okay, yeah, at this level, you know, how many units are affordable, how many are not affordable?' What we wanted to do is broaden that.

So, we wanted to look not just at like a single point, at a single mark, we want to take that away entirely and look at the entire distribution. So, we look at the distribution of rents, we look at the distribution of incomes in a certain geographic area and see how the two compare with each other. You know, for example, looking at the median rent burden from Census, that's a great metric. I mean, all the metrics that I mentioned earlier, like this is, of course, not to disparage them at all because they're, you know, great in their own right. I've over the years, used them many times in my research. But all metrics are going to have, you know, benefits, they're going to have drawbacks. And when we look at Census, you know, like that certain metric of median rent burden, it's really just one number. And that's all you get for, you know, like a certain metro area. Like I said, if you're comparing like two metro areas, it's just comparing number to number.

With the Affordability Curve. We are looking at the entire distribution of rent and income and trying to identify different parts of that distribution where some more like pain points are. You know, do we see like large shortages at the very lowest center of the distribution, which is very common across metros, you know, but does that continue further up the income spectrum? When comparing to metros or just looking at one metro in particular, we're really able to take a deeper dive into how affordability can change across metro, but even within the same metro.

**Corey Aber** [00:06:26] Kevin, I think we've given you a nearly impossible task today to explain something that is very visual without being on camera and without having any visual aids. So, I'm going to make the task even harder — can you try and help our audience imagine what the Affordability Curve looks like in a picture? And I know that we'll have a paper out on this, and people can actually look and maybe sort of listen to Kevin's voice talking about the paper as they read it the same time. But in the event that anybody is driving in their car or on the train without the paper, what is the Affordability Curve look like?

**Kevin Burke** [00:07:01] I will try my best. So, there's two components of this curve. So, you know, like I said before, it's, you know, everything affordability wise: We're looking at rent and we're looking at income. So, on the horizontal axis, that's where we have the percentile of income. And, you know, so that would range from 0 to 100, so we're capturing the entire distribution. On the vertical axis, we have the

rent percentiles, so, you know, again, from 0 to 100. Essentially the Affordability Curve is kind of like a sinusoidal wave.

**Corey Aber** [00:07:41] Kevin, hang on one second. I think I understand sinusoidal curve from the one stats class I took 20 years ago. But like, can we start with just like we've got an X axis, we've got a Y axis, so we're drawing a graph here. There's some kind of standard view of that graph, like what's the baseline that we compare this rent and income to, and how to how do those things come together?

**Kevin Burke** [00:08:07] So the baseline is — that's the easiest part because that is just a straight 45-degree angle line. So, it starts at the bottom left, so at the 00 point, to the upper right of the curve.

**Sara Hoffmann** [00:08:21] And what would that line represent?

**Kevin Burke** [00:08:23] So that's like the baseline, or we can call it the parity line. So that means that at any given percentile of income, the number of units that are affordable at that income is exactly equal. So, in other words, if you take the 40th percentile of income, for example, that parity line means — like if you're on that parity line, it means that at the 40th percentile of income, there are exactly 40% of the rental units that are affordable to that household. So really, that line means that there is like an exactly appropriate amount of...or appropriate number of rental units that are affordable to a given population.

**Sara Hoffmann** [00:09:23] So that would kind of mean like almost a utopian form of affordability, rental affordability out there. So, at any income, you would have enough units to house people that would make that affordable for them?

**Kevin Burke** [00:09:37] Yes. I mean, really truly utopian would be even better to the point where it doesn't matter what your income is, you could afford any rental unit. Of course, in the real world that's not practical, so we would call this 45-degree line, we'd call it the parity line, and we'd say that that yeah, like that's sort of what you're, you're shooting for. You want an adequate supply of units all along the distribution of renters.

**Corey Aber** [00:10:09] So take me through the rent and income distribution on that. So, it sounds like basically what we're trying to measure here is, do we have enough supply at each level for the income that that people are making? I would imagine as you make more money, there's more supply available. But what you're plotting with the Affordability Curve, it sounds like you're trying to compare rent and income, figure out where there is and is not enough supply for those levels, or in some cases, a surplus.

**Kevin Burke** [00:10:40] That's right. So, at any point below this parity line, that means that there is an inadequate supply of housing that is affordable for that population. So going back to the prior example, if you're looking at the 40th percentile of income, you know, and so that would by definition comprise 40% of all renters. If you're not at 40% of the rental units, if you're only at like 20%, let's just say, so you're below the parity line and what that means is that 40% of the renters are able to afford only 20% of the rental units. So that's, of course, problematic in that those 40% of renters, you know, they're not all going to be able to find housing that's affordable to them and of course, they will have to find housing that is outside of what they can afford based on the 30% assumption.

But we do very commonly see towards the lower end of the income spectrum, it is very, very common for there to not be an adequate supply of rental units. So, you know, let's say like the 10th percentile of income, if you look at like across metros, it's very rare that you're going to have 10% of the rental units be affordable to them. Really at the beginning, at the very low end of the curve, it is very flat. So, like in the nation and in the vast majority of metros, there's just not enough affordable housing for those renters at the very lowest end of the distribution.

Conversely, at the high end of the distribution, renters, let's say that are, you know, at like the 90th percentile of income and above really have very little difficulty affording rent. And so, you know, if you're at the 90th percentile of income, pretty commonly you'll be at maybe like the 99th or maybe even the 100th percentile of the rental units. So that means that, you know, if you're a renter, you're making, you know, you're earning more than 90% of renters, you can afford every rental unit. So, the curve at that point is going to be above that parity line.

So, this is a pretty consistent finding. Like if we just look at like the national curve, if we look across metros at the very low end of the income distribution, it's pretty flat. You know, it's below that parity line. Somewhere in the middle, it crosses the parity line. So, you now have a relative surplus of units and then it kind of starts to flatten out again towards the end of the curve. And until it hits 100% of the rental units and then, you know, it's, you know, so for the higher-income households, everything is affordable to them.

**Sara Hoffmann** [00:13:53] I, I won't lie to our listeners I've seen the curve, but I'm thinking maybe what we can do is — so we've described the parity line, Kevin you just described how then the affordability curve kind of takes off from there. Can you maybe just in relation to that parity line kind of at the national level, explain again, kind of that trend — it starts off below and then will eventually come up and intersect?

**Kevin Burke** [00:14:17] Yes, that's right. So, it starts at the 00 point and again, it's very flat in the beginning. So, if you're looking — up until like the maybe like seventh percentile or so of income, there are really like little to no rental units that are affordable. I don't have the numbers in front of me, but it's maybe around 1% or so. So, at that very low end, you know, very, very big shortage of affordable housing. A little bit past that, you know, that the curve it starts to catch up a little bit more with that parity line. So, as you go up the income distribution, it does get closer and closer until it passes it at about the 60th percentile of income.

So that means that in the nation, you know, a renter making more than 60% of other renter households, at that point they can afford 60% of the rental units. And then after that point, really it only gets better. So, at the national level, we don't see it dip below the parity line. Again, it stays above until we get to 100%, so, you know that being the highest earning renter. So yeah, we see this pretty consistent pattern, so again, where, you know, low end of the income distribution, where we're below the parity line. At some point it catches up to the parity line. The point at which it catches up at the nation is around 60%, metro to metro, it can vary a lot.

**Corey Aber** [00:16:07] What's really interesting about that, when you look at metro to metro too is the variation, I think you see in shortage of supply at different levels, right? That that curve doesn't look the same across the country. It might look different in Kansas City than it does in Boston, right?

**Kevin Burke** [00:16:22] That's right. So, the middle section of the curve is immensely different for different metros. So, you know, some of the metrics that we highlight in the paper are like Oklahoma City. That is a metro that is generally considered pretty affordable, and it shows up as very affordable in our analysis. You know, and it's especially for larger metros, it's known as one of the more affordable ones. And so, you know, we talked about how the nation, the Affordability Curve crosses the parity line at around the 60th percentile of income. In Oklahoma City, it's just before the 40th percentile. So, the smaller that number is, the better, because that means that there are fewer renters who are experiencing a, you know, a deficit of housing, like a shortage of housing.

So, contrast that with a metro like Miami and, you know, Miami doesn't cross the parity line until past the 85th percentile of income. So, the good majority of renters in Miami face an insufficient supply of affordable housing. And so certainly me speaking about it doesn't do it justice. It's pretty striking when you see the graph and how, you know, at the low end, Miami and Oklahoma City look very similar. Up until about the 20th percentile of income or so they're like right on top of each other. But at that point, they

separate, and the separation is visually very, very large, only to converge again at the very end of the distribution.

**Corey Aber** [00:18:15] So some ways just to capture that, what you can see when you look across metros is like near universal shortage at the lower end, that story is pretty much the same everywhere. The story starts to change as you get higher up the income scale, right, where you start to see some markets more affordable, have adequate supply in theory, right, at a lower income level than other markets.

**Kevin Burke** [00:18:41] Yes, that's right.

**Sara Hoffmann** [00:18:43] So we know from the Affordability Curve that almost all metros start off low, below the parity line, and cross over the parity line typically — and then typically end above the line. This helps solidify that there is a greater need at the bottom end of the distribution, which we all in the industry have seen. But besides the intersection point, how does the Affordability Curve help differentiate affordability challenges across different metros?

**Kevin Burke** [00:19:10] The Affordability Curve is very dynamic and there are many metrics that we can derive from it. We've talked a good bit about the intersection point — so that's the point at which the Affordability Curve passes the parity line, and we start to have a relative surplus of housing — that measures the percentage of renters who face an insufficient number of affordable units, but other metrics show us severity.

So, for example, we could look at the section of the Affordability Curve to the left of the intersection point, which is the area, you know, with the shortage of housing, and determine how big of a shortage there is. Without getting into the math of it too much, if the area between the curves is small, then even if the intersection percentile suggests that renters face a shortage of housing, the magnitude of the shortage never really gets to be too bad. Conversely, if the area between the curves is large, then this signals that renters in this segment of the distribution not only face a shortage, but that the shortage is particularly bad.

One good example of how these metrics tie together to help us paint a better picture of affordability comes from looking at two metros that we examined in the paper. So that's Austin and Nashville. The Census median rent burden has Austin as a little bit more affordable than Nashville. So, Austin has a median rent burden of 29.2%, whereas Nashville has a median rent burden of 30.2%. So just from that single metric, we might say, okay, Austin looks to be a little bit more affordable. But when we look at the Affordability Curve, we see that their intersection points are not that different. Nashville's intersection point is a little bit lower, so that signals better affordability, but perhaps more importantly, the severity of the shortage in Nashville is not as high in magnitude as in Austin.

So, we can see this from the smaller area between the Affordability Curve and the parity line to the left of the intersection point. So, this signals better affordability in Nashville compared with Austin. But interestingly, the answer still depends on where in the distribution we focus, since Austin does show better affordability at higher income levels.

**Corey Aber** [00:21:43] This is a classic Simpsons paradox it sounds like. We're looking at it in one number, it tells you one story, but look a little bit deeper you get a slightly different story here — that that's kind of what you're saying about Austin and Nashville, thanks to the Affordability Curve.

**Kevin Burke** [00:21:56] Yeah. So, I mean, really with the Affordability Curve we're we're trying to just take a, you know, a deeper dive into affordability and, you know, maybe expose some patterns that, you know, we haven't really seen before and can't really be seen with conventional metrics.

**Sara Hoffmann** [00:22:13] So, Kevin, we talked a lot about the percentiles of income. Is there a way to translate this into AMI, the area median income? Because that's kind of the language that we all speak when we think of affordability.

**Kevin Burke** [00:22:25] Yeah, so all of these certainly can be converted into AMI. You know, we can look at the graph in terms of, you know, maybe not, okay, income percentiles and rent percentiles, but really just, you know, plotting, AMI and saying, 'Okay, you know what — at each AMI level, what is the, you know, relative surplus or shortage of units?' And so, when we look across metros and we've said before about how, you know, at the low end of the income distribution metros look the same. When we convert it into AMI, you know, none of the trends are really different. We're more of just kind of standardizing it to an industry standard.

And so, you know, looking at the graph of AMI, we would see that a metro like Oklahoma City would break even at around 50% of AMI. And so, when I mean break even, I mean, you know, kind of going back to the intersection point we were talking about before. So, the Affordability Curve would pass the intersection point at the 50th percentile — or I'm sorry, at 50% of AMI. The nation would be a little bit higher, so it would, the intersection point would be at 70% of AMI. And going back to Miami, there we still see that there is a large you know, even at 70% of AMI, that's actually the point in Miami at which the gap of you know, renters and the units they can afford, that gap is largest at around 70% of AMI, and Miami does not get into positive territory — that is like it doesn't hit the intersection point — until 130% of AMI. So, you know everything with Affordability Curve you know certainly can be converted into AMI terms.

**Corey Aber** [00:24:34] That that point about Miami and AMI think is very telling because it really pinpoints when you think about where you need to add supply to the market or where you need to look at rent preservation the most is not necessarily in sort of the classic AMI levels that you might think of, like 30% or 60% AMI, there's a real need just a bit up the spectrum there.

**Kevin Burke** [00:25:00] Yeah, that's right. And so that is, you know, I think one of the other benefits of the Affordability Curve is, you know, this, this kind of holistic approach, looking at like the whole distribution. We can identify these points at which, you know, the shortages are most severe. Because, you know, in some metros it's really only at the lowest end and then, you know, like pretty quickly you start to see some surpluses. So, you know, a place like Oklahoma City would be an example of that.

And I mean, there's certainly some larger metros that are, you know, even before 50% AMI reach the intersection point. But, you know, there's other metros where you know, yeah, at the lowest end of the income spectrum, there's a lot of stress, you know, but that stress continues. And there are times where even like that stress gets worse, you know, at certain pockets. You know, yeah, maybe even at like 100% AMI, there's still a lot of need for affordable units at that point.

**Sara Hoffmann** [00:26:06] So, Kevin, a curveball question for you, if you will. What was the most interesting or shocking finding that you got from doing this report?

**Kevin Burke** [00:26:16] Maybe the most surprising finding was seeing just how different metros were — like really how different they were, you know, kind of in the middle part of the distribution and how similar they are at the ends. You know, because you look at some other metrics that are more of just kind of like, you know, single number, like, you know, center of distribution, and you don't really see like that big of a difference. And like, you know, just with, you know, like, like limited data like that, you can't really tell a whole lot of like, you know, differences across metros.

But, you know, to see that a place like, you know, Oklahoma City or, you know, a place like Pittsburgh or Cincinnati, like these metros that are generally considered to be more affordable behave in a really similar way as Miami or Honolulu. You know, like these metros that are generally considered to be, you know,



not very affordable like, you know, but only certain parts of the curve. So, like, only like the beginning, only at the end of it and then, you know, in the middle, there's just this enormous chasm. And in some of these less affordable markets, you know, you hear like news stories about them and just kind of being in the industry, you know, what's what areas are considered more affordable, which ones are considered less affordable, but just to really see that visualized on the curve, just some of the stark differences I thought were a little bit surprising.

**Sara Hoffmann** [00:27:52] Yeah, I tend to agree with that because like you said, we can see a number and you can see kind of where affordability or rent burden falls out across metros. But to actually see the curves and how much they can differ, I thought was really shocking when I reviewed and read the paper.

**Kevin Burke** [00:28:08] Ultimately, the goal of the Affordability Curve is to take a deeper dive into affordability and help industry participants understand affordability challenges better across the nation. And there's a lot that that goes into the curves, a lot we did to try to make them as accurate and comprehensive as possible. You know, in the paper we talk pretty in depth about, you know, bedroom adjustments and earners adjustments. We also take into account cost-of-living differences between areas. So, you know, really, we wanted to introduce a new metric that takes a holistic approach to really understand this important issue better.

**Corey Aber** [00:28:48] Kevin, thank you so much for explaining the Affordability Curve and for doing the work. I think this really shows some interesting dynamics in what's going on across the country in different markets. Helps us all understand where we have supply shortages, at what income levels we have supply shortages. I think there's an aspect of this that that, you know, across the industry and across the policy world, there's stuff to leverage here to think about where to target interventions, where to target programs. So, a lot of great stuff here. So, thank you very much for doing the work. Thanks very much for being on the podcast again.

**Kevin Burke** [00:29:22] Of course. Thank you.

**Corey Aber** [00:29:24] The Freddie Mac Multifamily podcast is produced and supported by a team of our Freddie Mac colleagues, including our production leads Jenny Nguyen and Raquel Sands and audio producer Dalton Okolo.

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