In debates about urban density we often find comments about buildings being too tall or not tall enough, about too many people in a neighbourhood or too few, about streets and buildings being overcrowded or empty.

We are told that Melbourne is building at four times the density of Hong Kong , or that density is good
and will make us happy. As these debates over density in Australian cities continue, what is most often missing is any clear understanding of what people mean when they use the word "density".

Is it the volume or height of buildings? Or is it the numbers of people? One person's high density may be another's sprawl; the same tall building may be experienced as oppressive or exhilarating; a "good crowd" for one can be "overcrowded" for another. One is reminded of Humpty Dumpty's logic in Through the Looking Glass:

When I use a word it means just what I choose it to mean – neither more nor less.

What such debate most needs is greater density literacy. Density is a concept borrowed from physics where the meaning is clear – mass divided by volume. Yet when transferred to the city nothing is so simple.

Are we talking about buildings or people?

First, we need to clarify whether we are talking about concentrations of people or of buildings. If we take population densities first, these are generally measured as residents per hectare based on census data.

But we also need to distinguish between "internal" and "external" densities – the numbers of people in a room or apartment versus those in an urban precinct. If you look at new high-rise housing in the evening, you can find many apartments unoccupied. At the other extreme, internal crowding largely defines a slum. Building density does not mean population density.

Population densities cannot be based on residents alone since the numbers of people in a given neighbourhood at a given time include those who work there or are visiting. In a mixed-use neighbourhood, residents may be a small proportion of the population density.

There are also population density rhythms as people move from place to place throughout the day and week. The same urban precinct can be densely populated during work hours and empty on weekends. Population density is not only the number of residents but fluctuates over time and with functional mix.

And how do you measure building density?

When we shift attention to building densities, we soon encounter some unavoidable jargon. The most common measure of building density is the “floor area ratio” (known variously as FAR, FSI, FSR and plot ratio) – the ratio of floor area to land area. This is the most widely used measure for limiting the bulk of development on any given plot.

However, it does not control the building height, “footprint” (the area occupied by the building) or “coverage” (the proportion of land covered by buildings). Thus it is quite possible to build high-rise low-density (with very low coverage or small footprints) or low-rise high-density (with high coverage or large footprints).

Most high-rise public housing from the 1960s and 70s is roughly the same FAR as the low-rise housing that was demolished to build it.

Building height is not a measure of density, although sometimes the two align. Confusions here abound; press reports (such as here and here) regularly equate FAR with height control.

Another common measure of density is dwellings per hectare. This is often used as a means of assessing population and building densities at the same time. But it does neither, unless we know the size of dwellings and of households. Thus dwellings per hectare is a very blunt measure of density , although a useful proxy for comparing housing projects.

Then there is the distinction between gross and net densities. Urban planning controls are focused on the net density on a particular site. Yet such measures are of little use in understanding how cities work because they do not include the public space of streets and parks.

The gross density is always lower than net density and it is the one that matters in debates over urban density. While we might be packed in on a particular site, the street network of a car-based city tends to keep us apart. Net density is not an effective measure of urban density.

As we measure densities of people or buildings at larger scales, we also incorporate water bodies, freeways and unbuildable sites, so the average density diminishes. Where one draws the boundary is a crucial decision in measuring urban density, or in getting the answer one wants.

Even urbanists such as Paul Mees can be guilty of this when using broad metropolitan density measures to advocate for public transport at suburban densities.
Elizabeth Farrelly
, a vocal proponent of higher density, compares it to the thread-count of luxury sheets (her minimum is 1,000), yet her only measure for urban density is “dwellings per hectare” – whatever the scale, net or gross.

Here we encounter the politics of density literacy and return to the logic of Humpty Dumpty:

The question is which is to be master – that’s all.

There is no single scale at which to measure urban density, but the larger the scale the lower the density. The best approach is to understand density as multi-scalar: for any location there is an internal density, a net density, a walkable density and a metropolitan density.

High density is no guarantee of urban buzz

Finally, there is the question of streetlife density – of people in public space, of crowds and crowding. Here the complexities multiply. While we can measure the outcomes in pedestrians per minute or per square metre, we are far from understanding the ways in which streetlife is geared to building and population densities.

These connections depend at least on numbers of jobs and visitors, functional mix, car dependency, access networks and walkability. Yet this is where density delivers its greatest benefits in social and economic encounters – what we often call the urban “buzz” or “intensity” – along with disbenefits such as congestion.

In Australian cities we have become quite good at generating high density without intensity . Think of car-dominated high-rise districts where few people use the street. Yet we also have good inner-city examples of intensity without high density.

For many people, density has become a negative word. Those who want more of it often use other words and phrases: the “ compact city ”, “ urban intensification ”, “ transit-oriented development ” and the “ 30-minute city ”.

This can be useful language but the question of what it means remains. The challenge is to raise the standard of urban density literacy – not to make density mean one thing but, as Alice might put it, to understand the ways it is made to mean so many different things.

The authors do not work for, consult, own shares in or receive funding from any company or organization that would benefit from this article, and has disclosed no relevant affiliations beyond the academic appointment above.

Read more http://theconversation.com/urban-density-matters-but-what-does-it-mean-58977