Moore's Law

The Co-founder of Intel, the largest manufacturer of PC microprocessors, made an observation in 1965 commonly referred to as Moore's Law.

Moore's law in simple terms refers to the doubling of processing power of an affordable CPU every two years.

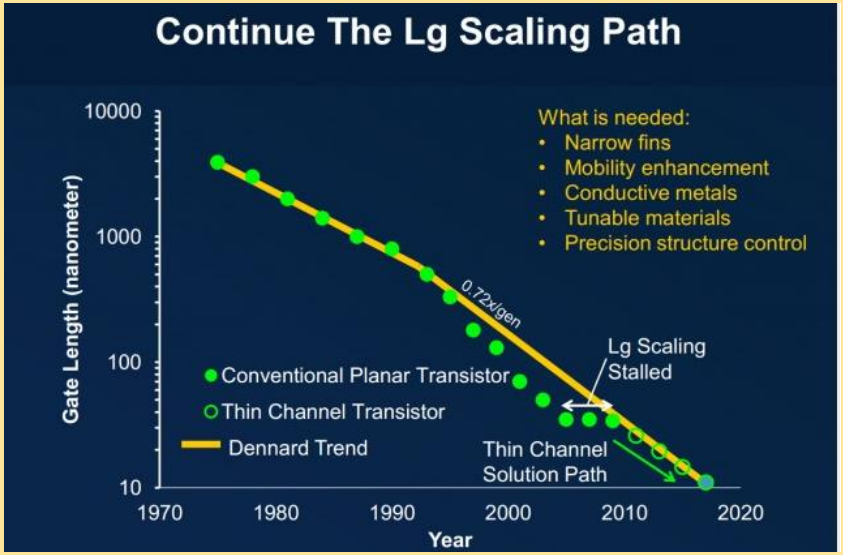
However more accurately, it is the doubling of the number of transistors per square inch on integrated circuits that has occurred ever since the integrated circuit was invented. Moore predicted this trend would continue for the foreseeable future.

Moore's law refers to transistors not necessarily speeds.

If you look at the processor speeds between 1970's and 2000, it appears the processing speeds (clock frequencies) have doubled or more every two years. This trend is not so between 2000 and 2010. Ranging from 1.3gHz to 2.8Ghz and in 2015 to 3.5Ghz. The clock speeds have barley doubled in the space of 10 years.

However, the number of transistors per square inch has, and the processing power has. This is because there have been significant developments in multi-core chips, pertaining of more than one processor on a chip.

This is why it is more accurate to apply the law to transistor sizes/density rather than speeds.



In recent years, the density of transistors has become so great that it has become harder to produce transistors of such a small size (28nm – 10nm). Therefore, the pace of Moore's law has slowed down and now cycles around every 2.5 years opposed to 2. The pace slowed down mainly when transistor sizes it 45nm.

Today hardware has to be designed in a multicore manner to keep up with Moore's law. Consequently, software must be written in a multi-threaded manner to make use of the advantage of multiple processors in a chip.

There was a plateau in transistor size between 45nm and 28nm. A new technology of transistors came into action called FinFET transistors allowing the jump to 22nm and preceding to 14nm.

FinFET transistors (Fin field effect transistors use a smaller silicon structure shaped like a fin, called a gate electrode). They allowed multiple gates on a single transistor and so aided Moore's law.

Beyond ~7nm a new FinFET material will be needed to continue Moore's law, such as silicon-germanium.