



Mass timber building construction is an emerging trend around the world – is it time for more timber in Canada?

The story on multi-storey timber buildings by **Michael de Lint, Director, Building Regulatory Reform & Technical Standards - Residential Construction Council of Ontario (RESCON) & President of De Lint Consulting Inc.**



Image: Brook McIlroy

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In 2017, Canada boasted the tallest mass timber building in the world. Vancouver's 18 -storey [Brock Commons Tallwood House](#) residence building was completed in 2017 using engineered mass timber. The mass timber structure building is composed of CLT floors supported on glue laminated timber columns and was completed in just 66 days.

A building is considered a mass timber building when the primary load bearing structure is made of mass timber (including engineered wood) rather than steel or concrete. Mass timber buildings are gaining popularity in major cities around the world, with structures of up to 80 storeys being considered in several cities including Chicago, London, and Tokyo. The City of Bordeaux in southwestern France is planning to build wooden buildings with a total of 270,000 square feet, over the next 15 years.

Since 2017, mass timber building construction has had uneven uptake across Canada. The model National Building Code (mNBC) is slated to be updated in early 2021. The new mNBC allows

for 12 storey mass timber buildings, but it is up to the provinces and territories themselves to adapt these updates into their own building regulations.

British Columbia and Quebec have already, through alternative approval processes, permitted the construction of tall timber buildings. Several years ago, Quebec introduced a wood charter that required public projects to consider a mass timber or wood option. British Columbia recently established protocols with five municipalities to allow them to implement the mNBC provisions for 12-storey mass timber buildings. In addition to BC's Brock Commons building, Quebec projects include Montreal's Arbora, an eight-storey mass timber building and Quebec City's Origine, a 12-storey mass timber building on a one-storey concrete podium.

Why should other provinces and territories follow suit?

The potential for mass timber and prefabricated wood construction in many cities across Canada is significant. For example, the Greater Toronto Area has a major housing supply deficit, particularly infill mid-rise building types, buildings that are ideally suited to mass timber construction. Like many cities in Canada, Toronto has many arterial roads that are lined with predominantly two or three story buildings. In addition, you often find detached home right beside major transit station areas such as Woodbine subway station and many GO stations. Current out of date zoning by-laws discourage the development of mid-rise buildings, including mass timber buildings. If out of date zoning by-laws were updated and these arterial roads and major transit station areas were redeveloped with mid-rise buildings, these areas could accommodate over 100,000 additional housing units across the GTA. Another advantage for constructing more mass timber buildings for mid-rise infill development is that mass timber construction is much faster, cleaner and quieter construction. This results in less disruption to nearby residents and businesses.

The next steps for Toronto and the GTA is to quickly update zoning and align it with the provincial growth plans. It's important for Ontario to move forward on these changes to the regulatory code to allow for mass timber structures and to follow the lead of British Columbia and Quebec.

Mass timber construction, including midrise buildings in the GTA, could also be a key driver of industry for rural communities in Northern Ontario and across Canada where timber can be sustainably sourced, but we need to remove planning and building code impediments to midrise mass timber construction. There are several types of pre-engineered mass timber products. One of these is: glue laminated timber (glulam) which is composed of dimensional lumber bonded together with moisture resistant adhesives. Glulam is commonly used for floors, beams, columns and arches. Like other mass timber products, Glulam is extremely strong, stronger than steel at comparable weights.

Making building structures out of thin air



In Finland sustainable forests are expanding at the same time that mass timber production is increasing.

There can also be a number of environmental and construction advantages to pivoting towards mass timber. Pre-engineered mass timber buildings are about one-fifth the weight of comparable concrete buildings, which means that foundation size and cost can be substantially reduced. The production of cement, a principal component of concrete, requires a large amount of energy and is estimated to account for 7% of man-made CO₂ emissions. On the other hand, the production of mass timber materials is largely natural. Under a quite miraculous process called photosynthesis, carbon dioxide is absorbed by chlorophyll in the leaves of trees, and along with water from the roots is involved in a chemical reaction that produces food for the plant and allows the plant to grow. Therefore, carbon dioxide drawn from the air is one key building blocks of wood. So in real sense, mass timber buildings are largely created out of thin air, thanks to the miracle of chlorophyll and photosynthesis. In sustainably managed forests, more trees are planted than are harvested. For example, Finland, which has enormous forests and substantial mass timber production capacity, tree cover has been expanding at the same time that mass timber production has been increasing.

Moving forward on Mass Timber

It's time for other provinces and territories across Canada to follow the lead of BC and Quebec, by revising regulatory provisions to encourage the construction of mass timber buildings. If sourced from sustainably managed forests, mass timber can be a strong driver of both urban and rural economies.