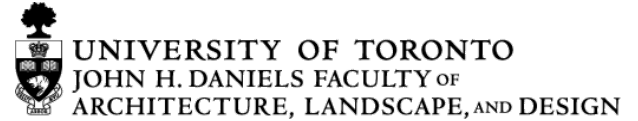


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News From MTI

Hello Mass Timber Colleagues!

TimberCon September 2022

A promotional graphic for TimberCon 2022. It features a dark, low-angle photograph of a timber roof structure. A large, bright yellow triangle is overlaid on the left side, containing the text "REDUCING EMBODIED CARBON THROUGH MASS TIMBER" in bold, dark blue letters. Below this, "TimberCon 2022" is written in a smaller, dark blue font. At the bottom left, it says "In partnership with" followed by the Mass Timber Institute logo. On the right side, in white text, it says "SEPTEMBER 28" and "EARN AIA HSW LU".

**REDUCING EMBODIED
CARBON THROUGH
MASS TIMBER**

**TimberCon
2022**

In partnership with

SEPTEMBER 28

EARN AIA HSW LU

TimberCon 2022, hosted by The Architect's Newspaper in partnership with the Mass Timber Institute, will foreground exemplary timber projects across North America; identify best-case practices for their assembly; and spotlight emerging technologies within this exciting field.

This one-day virtual event that shows off the most exciting mass timber projects and technological

advancements and includes panels ranging from mass timber's new heights to timber's role in net zero carbon goals. Join us virtually on September 28th and earn 6 AIA HSW CEUs! [Register here.](#)

A Conversation with Shoshanna Saxe



There is a growing push to understand the impacts of the constructed environment on our planet. Working to navigate these complex networks, Shoshanna Saxe shares some of her thoughts. Shoshanna is an Associate Professor in the University of Toronto's Department of Civil and Mineral Engineering, and Canada Research Chair in Sustainable Infrastructure.

Shoshanna's work focuses on the environmental sustainability in infrastructure; her background is in heavy civil infrastructure having spent the early part of her career designing subway stations. She has written at the detailed level of optimizing space and material as well as provided big-picture commentary on topics such as smart cities. She has expertise in life cycle assessment for the built environment, starting with transportation systems and more recently buildings. Shoshanna argues that we need to take seriously the importance of life cycle thinking is what we choose to build and how we choose to build it. Ultimately, Shoshanna works to find opportunities in infrastructure planning and construction to meet sustainability goals. This month, we sat down with Shoshanna to discuss her work:

MTI: One of the tools used to evaluate sustainability is Life Cycle Assessment. In your writing on infrastructure, you propose that LCA stages should be more circular and less linear. Can you elaborate on what this means to you?

Shoshanna: Life cycle assessment was designed for small consumer products (such as Coca-Cola cans or milk cartons), and we need to adjust this for larger scale projects. The holistic impacts of buildings and urban infrastructure are different than those of smaller items. I look at LCA to ensure that the methods are appropriate for the scale in which they are being used and to make sure we're analyzing enough of the problem to come up with solutions that make things better in the real world (not just on paper).

MTI: What does this look like in the industry?

Shoshanna: We need to introduce more consequential thinking which asks, "what are the full impacts of building (or not building) this project? What can we do to make it more sustainable?" Swapping for more sustainable materials in buildings for example, is a good start, but if one project corners the entire market for a sustainable material overall there's little benefit overall. Also, sustainable materials while a big step forward will not get us to

80% GHG reductions on their own. That's why in my group's work we look at how can we also reduce the materials in the buildings and optimize how are we using them.

In the pursuit of a more sustainable built environment a key question is can we figure out how to do more with less? The average Canadian has 57m² of living space, which is one the biggest in the world. Looking to deliver more housing and more services to more people, we must ask: can we have higher quality space so we don't need so much of it? Smaller buildings need less material and less embodied GHG emissions. Or we could serve more people in the same sized building.

There are also strategies to build similar buildings with less material, such as choosing to place less of the building underground or reducing transfer slabs and therefore reducing the concrete needed. In our research for example, we've found up to 40% of a building's materials are underground largely driven by parking requirements and height restrictions. We could choose to build differently.

MTI: How do we move forward in housing more and more people in our cities while keeping sustainability at the forefront of all development?

Shoshanna: Infrastructure is destiny, we get the future we build. How we live, move and work is largely determined by what infrastructure options we have. If a city is built for more people to live and work near more infrastructure (e.g. bike lanes, public transit), they will use it with sustainability benefits for all. For sustainable cities and lives we need to more intensively use the infrastructure we already have (buildings, transport, sewers etc.), and when we build new make sure it is well connected to existing opportunities.

MTI: What role does mass timber have to play, if any, in sustainable development?

Shoshanna: Wood can be lower GHG intensity than steel and concrete and can lead to buildings that are faster to build and lighter. So mass timber has an important role to play in low GHG construction. But mass timber alone will not be enough especially given how much we plan to build in the coming decades. There are no magic materials; we will need a cornucopia of solutions.

MTI: Who are the main actors involved in infrastructure development who can help grow sustainably?

Shoshanna: We need to start at the political level (city, province). We need owners on board. Then builders and maintainers, then you need the whole food chain from the material suppliers, as well as voters and civil society. One of the big challenges with the built environment is that there are so many players who are necessary to moving towards sustainability. We really need the entire construction ecosystem to work together.

MTI: Any new projects in the pipeline?

Shoshanna: I'm currently in the middle of a 5-year project about the understanding of construction resources in the built environment and the housing/infrastructure deficit. For example, around 1.5 million homes need to in the next 10 years in Ontario and each of these will need to be connected to good transportation and water infrastructure. That is a lot of needed construction and primary resource use. The environmental cost of this is at odds with the climate crisis. If we build the way we usually build, we will ruin the environment. If we under build, it will be socially unacceptable and economically ruinous. My research group is looking at practically how do we balance these needs? How can we build enough within the limits of the climate? What approaches in turns of building form, urban form, structural design, and material selections can deliver both enough infrastructure and

not too much GHG?

Shoshanna is currently seeking partners to establish the Centre for the Sustainable Built Environment and gathering consortium partners to sit on the board for research. Interested parties can reach her at s.saxe@utoronto.ca.

TPS Multifunction Paramedic Station

By Diamond Schmitt

The design scheme for the TPS Multifunction Paramedic Station by Diamond Schmitt and gh3* was developed from net-zero strategies. It is a direct response to the specific energy requirements of this building type and site, resulting in a design with exceptional environmental performance that distinctly emerges along Highway 401.



*The Toronto Paramedic Services (TPS) Multifunction Paramedic Station Aerial View. Image provided by Diamond Schmitt and gh3**

The building takes shape in the form of a mass timber structure that reduces embodied carbon by 34% when compared to a steel structure. It is defined by a dynamic sawtooth roofscape that faces south, and has been optimally angled and rotated to support photo-voltaic arrays and maximize solar capture. The roof design also enables the integration of clerestory windows that allow natural light to flood into all interior spaces. The architectural silhouette is further informed by the tilt of a south facing solar wall that conserves an additional 15% of the building's energy.



*The Toronto Paramedic Services (TPS) Multifunction Paramedic Station Atrium. Image provided by Diamond Schmitt and gh3**

Organized around a linear skylit atrium, the programmatic functions of the station include an administrative and education block positioned to the south, with vehicle bays accommodating 40 ambulances and 20 supervisor vehicles located adjacent to the north. To reduce the amount of energy lost through the 12 overhead vehicle doors, interior vestibules are introduced on both sides of each vehicle bay—the first ambulance facility in Canada to do so—conserving 17% of the building’s overall energy.

The TPS Multifunction Paramedic Station has been envisioned to be socially and spatially equitable, inclusive for administrators, staff, and visitors alike—an ambitious design that provides a positive and architecturally uplifting space both in its impact on the environment and for all who use it.

News From the Institute

1. Educational Module

*An Overview of Sustainable Forestry
in Canada for Architecture and
Engineering Students*

Prepared by:
The Mass Timber Institute at the University
of Toronto with a focus on the study of
architectural, landscape, and design for
the Canadian Wood Council

Module Authors:
Shen Shiao
Shirley Foster
Dr. Anne Brown



MASS
TIMBER
INSTITUTE

Canadian Wood Council
Council canadien du bois

We are excited to announce our educational module - An Overview of Sustainable Forestry in Canada for Architecture and Engineering Students - is now available for [download from the MTI website](#). The module includes a full slide deck with lecture notes to be used by educators to help students make informed decisions about wood in a broader context.

2. Mass Timber Today Podcast



MTI will be launching the Mass Timber Today Podcast this fall! The podcast aims to examine global perspectives on mass timber concerning climate change, embodied carbon and forests, and practical impediments to adapting mass timber around supply chains and experience.

Other Updates

- [Catch a screening of *Forest for the Trees*](#) in theatres this September! The documentary, produced by renowned photographer Rita Leistner, takes a close look at the lives of Canadian west coast tree planters.
- Scientists based in Singapore develop a transparent fireproof coating for wood. [See the article.](#)

Mass Timber Institute Website



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