

Your Virtual Event's Environmental Footprint

Your effort supports U-M's greenhouse gas reduction goal:

Reduce scope 1 and 2 greenhouse gas emissions by 25% by 2025.



What impact does a virtual event have on carbon emissions and other environmental impacts? And what can you do to minimize your event's footprint?

The U-M President's Commission on Carbon Neutrality recommends promoting video conferencing as an alternative to in-person meetings and travel. Due to the pandemic, many of us are now more comfortable with virtual meetings and events, opening up new opportunities.

Event Environmental Footprint Factors

In most cases, virtual events have a smaller environmental footprint than in-person events. An exception: smaller meetings in which all attendees are local and hosts take action to make the event sustainable.

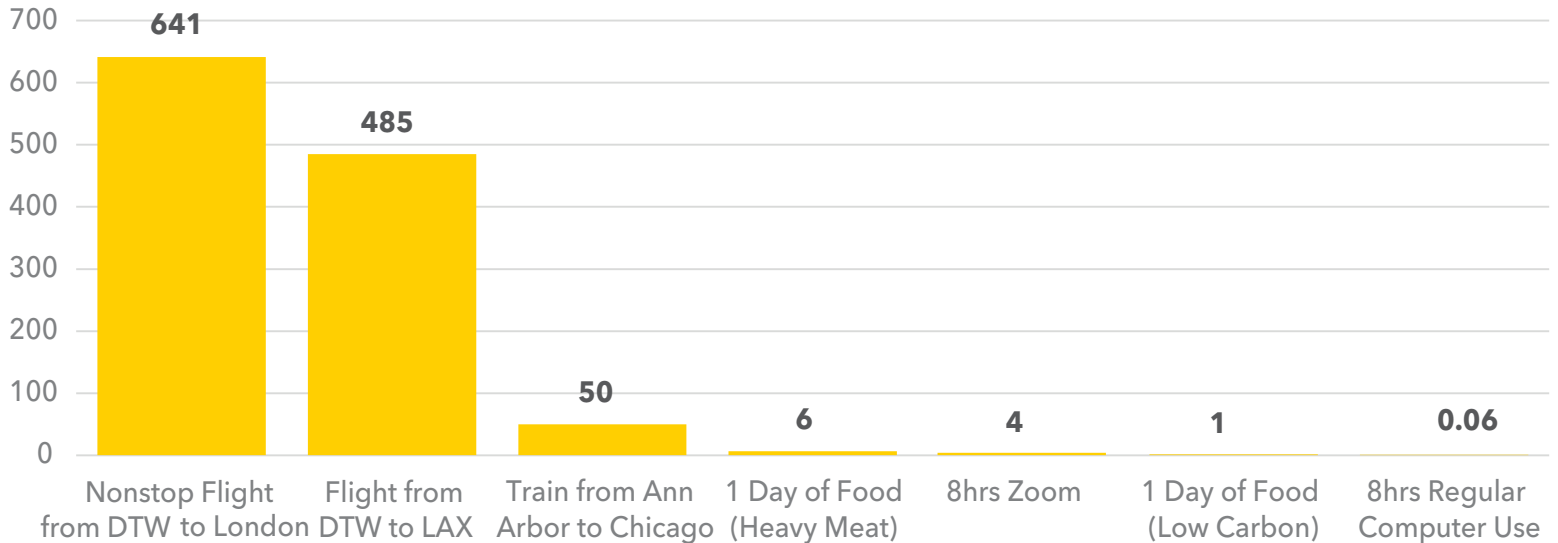
For example, an event with local attendees which makes efforts to be sustainable has a negligible difference in footprint compared to a virtual event.



Factor	In-Person	Virtual
Travel (largest by far if anyone is flying)	Travel impacts vary greatly depending on distance. Local is the least, followed by regional. The greatest carbon impact will be from anyone traveling by air. If many attendees are traveling by air, this factor becomes the largest footprint.	None
Space	Heating and cooling are typically the most carbon-intensive needs for any building space, especially large event rooms. The greater your space usage, the larger this footprint. If traveling, attendees also stay in hotels. Emissions from space usage can be mitigated by choosing venues that source from renewable energy.	None. (Typically, attendees of a virtual event do so in a space they already use on a daily basis, so no additional heating/cooling is needed.)
Tech and Lighting	If your event uses large projectors, electrified exhibit spaces, or advanced AV or lighting equipment, your energy use will go up.	Although attendees probably use their computers daily, they are likely generating additional carbon emissions by additional video-conferencing, streaming, and data exchange. The more live-video and large data exchange (e.g. emailing large video and PowerPoint files to all attendees), the greater the carbon footprint. Still, it's miniscule compared to in-person.
Food	Food provided at the event can create additional carbon emissions compared to what your attendees would eat on a normal day, especially if there is lots of food waste, disposable packaging, and/or higher impact food choices (e.g. beef, cheese).	None
Materials and Waste	Production and disposal of materials distributed at an event can really add up, especially if they include lots of paper printouts, decorations, or giveaways.	None, typically

Carbon Footprint Examples

Carbon Footprints kg/person



OTHER COMMON EMISSION SOURCES

Car from A2 to Detroit 17 kg	1 night hotel room 16 kg	1 day operating large conference center 19,900 kg/day	1 day operating Palmer Commons 3440 kg/day
--	------------------------------------	---	--

Event Type Footprints

Because each event and each attendee is different, it is difficult to predict or calculate the footprint of your specific event. Instead, here are examples of events that have had full carbon impact analyses.

Very large international scientific conference (26,000 people)

69,300t travel (most from international flights)

99.9% savings if virtual

Prevented emissions = 1,445 American families' annual emissions

Large international conference (5,000 people)

7,188t travel + 523.9t venue/hotel/energy use

124.4t for intense virtual reality conference (98% savings)

Prevented emissions = 158 American families' annual emissions

Regional meeting (Chicago, w/ 500 people from Midwest)

0.78t travel (all driving, some carpooling) + 7.6t venue/hotel/food for 1 night/2 days

90% savings if virtual

Prevented emissions = 0.2 American families' annual emissions

Shrinking a Virtual Event's Footprint Even More

A study by Global CO2 Initiative researchers at the U-M College of Engineering showed that over 60% of carbon emissions from a larger virtual conference are associated with network data transfers (uploading and downloading data such as video calls, streaming, etc.). Their study also includes a [calculator](#) for estimating the carbon footprint of your event.

Internet use accounts for over 3% of global greenhouse gas emissions—and has only grown since the pandemic. Although still a small piece of the pie, now is a good time to instill carbon-friendly habits!

- Have attendees turn off their webcams if not needed, like during a keynote speaker or long presentation.
- Encourage attendees (especially those watching on small screens) to watch videos in standard definition (SD) instead of high definition (HD).
- Provide opportunities for text-based communication through services such as Discord or Slack.
- Ask presenters to compress media files before sharing with attendees.
- Remind attendees to delete unneeded emails and files after the event.

Turning off the camera
can save up to

96%

of an attendee's footprint.

Reducing the Impact of a Hybrid or In-Person Event

What about a hybrid event? Or if it really needs to be in-person?

- If your event draws people from all over, consider having regional hubs instead of all in one location. This can eliminate the carbon emissions from air travel while maintaining the benefits of in-person collaboration.
- Consider hosting your event in person only every other year. This not only lowers your footprint by half, it also increases participation and equity by allowing less well-funded colleagues to attend in the virtual years. (e.g. European Astronomical Society 2020 was the largest in history.)
- If in-person, skip giveaways, send out materials digitally, and serve low-carbon food. See the [U-M Office of Campus Sustainability - Sustainable Event Tips](#) for more ideas.



Resources and Links

Additional Resources

[TerraPass Carbon Calculator](#) (not an endorsement, simply an example)

[EPA Greenhouse Gas Equivalencies Calculator](#)

[U-M Carbon Neutrality Plans](#)

[Nearly Carbon Neutral Conference Guide](#) (from UC Santa Barbara)

[Michigan Catering - Low Carbon Menus](#)

[U-M ITS Videoconferencing Guides](#)

[Reducing Carbon Emissions of Academic Travel](#)

Educational Links

<https://www.icao.int/environmental-protection/Carbonoffset/Pages/default.aspx>

https://www.ucsusa.org/sites/default/files/2019-10/greentravel_report.pdf

<https://ccafs.cgiar.org/bigfacts/#theme=food-emissions>

<https://www.sciencedaily.com/releases/2021/01/210114134033.htm>

<https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100U8YT.pdf>

<https://www.hotelfootprints.org/footprinting>

<https://ocs.umich.edu/resources/sustainability-data/building-energy-data/>

<https://github.com/milankl/CarbonFootprintAGU>

<https://www.kqed.org/science/1966164/covid-19-is-pushing-scientific-conferences-online-maybe-thats-where-they-belong>

<https://educatorsinvr.com/2020/03/09/green-conference-reducing-carbon-emissions-with-a-virtual-conference/>

<http://css.umich.edu/factsheets/carbon-footprint-factsheet>

<https://www-tandfonline-com.proxy.lib.umich.edu/eprint/XXF73ZJR8ZBZAMHFHCA8/full?target=10.1080%2F00207233.2020.1864190&>

<https://www.sfu.ca/sca/projects---activities/streaming-carbon-footprint.html>

<https://www-nature-com.proxy.lib.umich.edu/articles/d41586-020-02057-2?sf236038067=1>

<https://www.biorxiv.org/content/10.1101/2020.04.02.022079v1.full.pdf>

<https://www-nature-com.proxy.lib.umich.edu/articles/s41550-020-1207-z>