

Intelligence MEMOS



From: Peter Weltman
To: Infrastructure Observers
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Re: **WHAT OUR WINTER TIRES AND INFRASTRUCTURE HAVE IN COMMON**

I just booked my appointment to have my winter tires swapped with summer tires. Toronto had little snow this year and whatever arrived melted within a few days, so I feel like I didn't get my money's worth from snow tires this year. But I know the investment isn't wasted, it's critical for safety and reliability.

Without snow tires, my chance of losing control in a big storm rises a lot. I may get into a collision. It would cost me money for repairs, and my insurance could increase. Worst-case scenario, I could also be injured, miss work, and forego some income.

Installing snow tires cost me about \$70. If I calculate the potential risks, it's well worth it. The same is true when building and adapting infrastructure in the face of climate change.

We know that maintaining assets in a state of good repair is critical for reliability. During my time as Financial Accountability Officer of Ontario (FAO), my goal was to inspire data-driven policy development, but with so many unknowns around climate change, little research existed – particularly around costing. As a result, we partnered with engineering firm WSP to tackle a big question: What is the incremental budget hit from maintaining existing transportation infrastructure in light of climate change over a century? How much more do we need to add to our long-term budget outlook?

The result was [Costing the Impact of Climate Change on Public Infrastructure](#), a complex study, involving multiple data sources, specifically around the volume, quality, and value of publicly owned assets in Ontario. Some of the data was very good, much of it was not. Using a variety of analytical tools to try to make sense of it, what we learned was that it would be less expensive in the long-run to proactively adapt public infrastructure, rather than waiting for it to fail and then having to replace it.

Specifically, the FAO report estimates that on a constant dollar basis, average annual climate-related costs are highest under the no adaptation strategy (\$4.1 billion per year, or 16 percent above a stable climate base case) and lowest under the proactive adaptation strategy (\$3 billion per year, or 11 percent above a stable climate case) in a medium emissions scenario.

My \$70 for installing snow tires was not a significant expense for me, so the risk/reward calculation was easy. It's a different discussion when we consider significant design and material changes to the way we build infrastructure.

We know from the FAO study that road and transportation infrastructure is vulnerable to the increased rainfall we expect from climate change. We also have some idea of what it would cost to start to adapt to withstand this extra rain. But what we don't know is the cost of not adapting, especially if we're faced with an extreme weather event. Unfortunately, we tend to ignore uncertainty because we can't measure it. And if we can't measure it, we can't quantify it; therefore, we don't have enough certainty around the risk/reward calculation to decide whether to invest in upgrading or rebuilding existing infrastructure. So for the most part we just keep building as we always have.

Today, building regulation in Ontario is based on historical weather data. We need to update the regulations to look forward, rather than back. Installing a pipe that is four inches wider than current code so that it can carry more water doesn't cost much at the outset but will very likely prevent or reduce the potential for that infrastructure to fail, causing floods, washing out roads and rail lines.

We saw that happen in British Columbia in November 2021, when very large rainstorms washed away highways, bridges and train tracks. This took one month to repair and cost approximately \$2 billion. We also know that most of the existing flood-prevention infrastructure was woefully inadequate, which we knew years before the flood. Upgrading that infrastructure would have cost hundreds of millions of dollars and would have been complicated by the fact that much of it was shared across the US border. In hindsight, the cost/benefit of adapting the infrastructure, while not as inexpensive as putting on snow tires, was a no-brainer and would have avoided that \$2-billion cost.

So, what's the common thread?

We need better data about the infrastructure we own. We need to update regulations, so we are building for the world that is to come, and we need to get much better at quantifying uncertainty – not ignoring it.

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