Heated Sidewalks Brief

Purpose of Project: Currently, the University of Ottawa uses salt to remove snow. There are many disadvantages to using salt, therefore heated sidewalks is the solution.

Need Statements:

- We want it to be able to last at least five years.
- We want to be able to remove and be able to store it.
- The final product should be easy to repair if there are problems.
- We want it to be safe. People are going to be walking over them, it should have some kind of grit to it, or something else that will prevent slipping.
- We want something that we can clean and be able to maintain.
- We want it to be cost-efficient.

Prioritizing Needs:

Importance	Need
1	We want it to be safe.
2	We want to be able to last at least five years.
3	We want it to be cost - efficient.
4	The final product should be easy to repair if there are problems.
5	We want something that we can clean and be able to maintain.
6	We want it to last at least 5 years.

Benchmarking - User Perception vs. Solar Sidewalks, Heated Sidewalks, and Heated Mats:

User Specifications	Solar sidewalks	Heated Sidewalks	Heated Mats
Safety	Yes	Yes	Yes
Modularity	No	No; It is encased in concrete.	Yes

Energy Use	Solar powered and battery. Low energy use when the sun is out.	Electric, Glycol, or water. High energy use.	Low; It does use up electric energy but due to its thermostatic material, it can preserve heat and the electricity being supplied can be turned off.
Removal and Storage - in summertime, has to be removed and stored/ compact solution	Cannot be removed and stored away	Cannot be removed as it is installed into the concrete or asphalt of the sidewalk.	Yes they can be removed and stored away during the winter.
Maintainable - easy to clean	Yes	No it cannot be reached.	Yes they can be cleaned with water.
Longevity of at least 5 years	Yes (up to 15 - 20 years)	Yes (up to 25-30 years)	Yes (up to 7-8 years)
Cost	Installation price: $7-$9 a watt, so a 5kW system would cost $25,000 to $35,000. More money will be used for batteries. Long term pricing is very low.	$10 per square foot plus the electricians fees and the cost of the controls, sensors and thermostat. Additional costs for building a new sidewalk. Heated sidewalks have a high capital cost that needs to be paid upfront, which is not financial stress that can be taken up by the university.	It can cost around $700 to $1,500 for large mats. For one instance, it costs $145 for a 20-inch x 60-inch mat.
Ease of repair	Yes; each part can be separated and repaired individually	No; if something needs to be repaired, it is very expensive and an entire part of the sidewalk has to be destroyed.	Yes, if there is a need for repair, it can be repaired individually without the destruction of surrounding bodies.

Problem Statement:

A modular, scalable and deployable heated sidewalk is needed in order to replace the use of salt. This sidewalk should be cost-efficient and durable to combat the negatives of salt.