Snowmelt Systems: The Need for Accessible Pedestrian Pathways in Ann Arbor

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THESIS
By implementing snowmelt systems, the City of Ann Arbor and the University of Michigan campus could improve pedestrian safety by minimizing ice-related accidents, address environmental hazards caused by increased water and soil salinity, and save money on future infrastructure costs.

BACKGROUND & ANALYSIS
Between 2010 and 2016, downtown Ann Arbor’s population grew 8.2 percent annually, meaning more pedestrians than ever before and an even greater need for improved infrastructure.¹ The University of Michigan has also seen a steady increase in enrollment over time, with an increase of 1,284 students from 2016 to 2017.² It is in the city’s best interest to ensure their safety.

Michigan State, comparable to the University of Michigan in terms of size and annual snowfall, has added 160,000 square feet of snowmelt systems to their campus to provide safer pathways for students. Not only are there public safety positives from heated sidewalks, but there are also many economic and environmental externalities with road salt as well. In similar urban areas, 70 percent of salt applied to roads stays within the region’s watershed. This salty water harms aquatic plants and animals. Furthermore, salt can get trapped in waterways and form dead zones.³

Between 1991 and 2004, 40 percent of urban and suburban streams reported chloride levels at or above EPA recommended levels.⁴ Due to a cold winter climate, Ann Arbor’s sidewalks also often fall victim to freeze thaw cycles that cause cracking. Intelligent snowmelt systems such as the one we propose would reduce the effect of the freeze thaw cycle, and thus the frequency at which sidewalks require repairs. Implementing these heated pathways in high traffic areas downtown will benefit businesses as well. In Holland, Michigan, for example, much of the funding for their heated pathways came from businesses in the downtown area, which saw a rise in customer traffic during the winter season after implementation.

TALKING POINTS
• Snowmelt systems would allow more easily accessible pedestrian infrastructure, which would have direct and wide-ranging benefits for many players in the local economy emphasizing local businesses.

• Ann Arbor is already in the process of a major downtown infrastructure overhaul, making this a convenient time to implement snowmelt systems under pedestrian pathways.

• The city of Ann Arbor, including the campus and hospital area, has a high volume of pedestrian commuters and ensuring their safety should be a priority.

• The salts and chemicals currently being used on pathways cause costly and inconvenient replacement projects and large-scale environmental damage as salt is washed into runoff.
POLICY IDEA

To solve the aforementioned problems, we propose implementing a snowmelt system in the city of Ann Arbor. This would involve installing a system of pipes under the sidewalks, which would carry domestic hot water from buildings to melt snow and ice on the surface of sidewalks. These systems would ideally be first installed in areas of high pedestrian traffic in the downtown and campus areas. Planned to coincide with the city's infrastructure overhaul set to complete by 2020, the snowmelt systems would be installed with each portion of new road or building construction.

POLICY ANALYSIS

A snowmelt system in downtown Ann Arbor is the best possible solution. In attempt to compensate for the tremendous annual snowfall, Ann Arbor overextends itself, spending upwards of $1.5 million on trucks and plows in one year. The city could save itself thousands just as Holland, Michigan has done so far. Holland has a snowmelt system amounting to about 10.5 acres and costs the city between $20,000 to $80,000 annually. The policy at hand is only concerned with certain downtown areas, so it is safe to assume that the operating costs for the Ann Arbor project would be less than $20,000. As the area to be heated is relatively small, no additional hot water, other than what is already produced for domestic use, would be needed, thereby keeping operating costs low. The city would save on a snowmelt system, compared to the millions of dollars it spends on manual snow removal. However, initial installation of the systems will likely entail a large cost, as the process requires ripping up existing sidewalks to lay down pipes. In terms of the environment and sustainability, by utilizing hot water from buildings that would otherwise return to the power plant unused, the efficiency of power plants increases and energy waste is reduced. The snowmelt system will also allow for businesses to flourish during a time that is normally slow due to winter weather. In areas of Chicago, small business fronts report better sales due to heated pathways.

NEXT STEPS

In order to gain support for these snowmelt systems in the city of Ann Arbor, several individuals and agencies need to be contacted in order to gain their support. Ultimately, The Ann Arbor City Council needs to be on board with this project. To accomplish this, we plan to reach out to City Council members, especially those on the energy and infrastructure committees. Additionally, to expand the snowmelt systems to the University of Michigan campus, we will contact and work closely with University Facilities and Operations, which oversee the Central Campus Power Plant, the North Campus Power Plant, and the Architecture Engineering and Construction department. All of which are instrumental in providing the energy, resources, and knowledge to implement these snowmelt systems in and around the U-M campus. With all of these organizations and individuals on board, a cohesive policy and mitigation plan could be drafted to best implement these systems throughout downtown and campus area of Ann Arbor.

KEY FACTS

- In 2012, the Ann Arbor City Council voted to purchase 11 new dump trucks and 4 front mounting snowplows for $1.55 million.

- In 2015, Ann Arbor put more than $2 million dollars into year four of a five-year citywide repair program funded by a special sidewalk millage approved by voters in 2011.

- There can be a $500 ticket to Ann Arbor property owners if there has been over one inch of snowfall that has not been cleared from sidewalks after 24 hours.
ENDNOTES


