Permeable Concrete in Small-Scale Parking Lots

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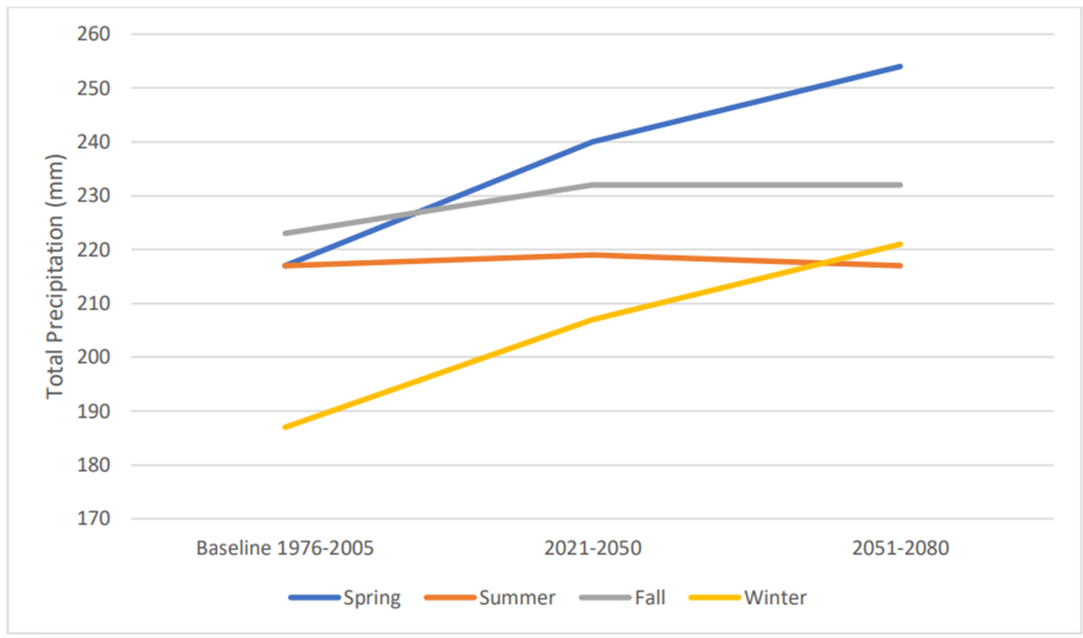
PROBLEM

How might we reduce the strain on Hamilton's stormwater systems by improving and incorporating stormwater management considerations into new construction projects?

- Hamilton's stormwater systems face challenges due to heavy rainfall & pollution
- Hard surfaces (asphalt, concrete, rooftops) increase runoff into sewers and lakes
- Lack of absorption increase flooding & water accumulation
- Issues such as the above pose many for those living in the city of Hamilton



Hamilton is expected to face increased instances of rain in the next 30 years, similar to the last 50!

SOLUTION

To address this issue, after extensive research into funding and facts, as well as current organizations such as Green Venture and Residential Rebate Program, we have proposed the idea of implementing permeable concrete in small-scale parking lots. This solution:

- Applies permeable concrete to an ideal location of low traffic flow and weight carrying requirement
- Introduces a possible solution utilizing an environmentally-friendly and previously applied product
- Allows stormwater to drain through its surface and into underlying soil or to be detained, reducing water accumulation and pollution
- Proves vital for low-income neighbourhoods
- Has the potential to earn Canadian Green Building Council LEED sustainable sites credits

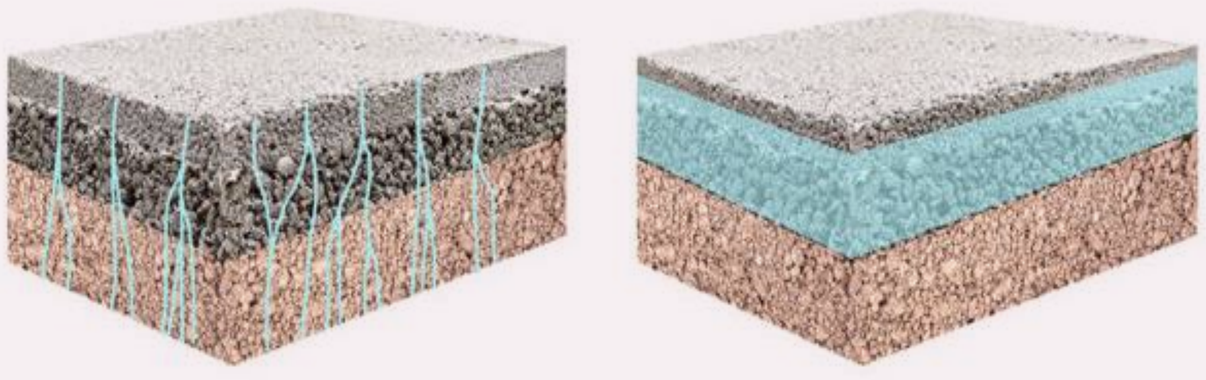


Fig 1: (On the right) a diagram depicting non-permeable concrete preventing water from flowing through and down to the soil, or potentially into stormwater captures. (On the left) a diagram depicting how permeable concrete allows for water to seep through, preventing flooding and build-up.

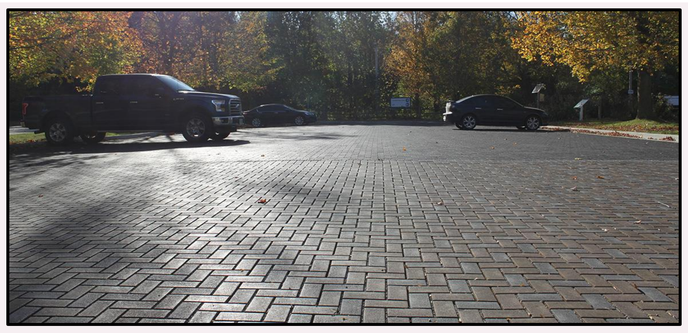
NEXT STEPS

1. First, begin to secure sites for project implementation. This includes:
   - Assessing small-scale parking lots in need of repair
   - Finalizing which few lots to begin trial solutions by replacing with permeable concrete

2. Next allocate funds and resources to begin reconstruction

3. Prepare data collection methods to evaluate the effectiveness of the remodeled parking lots in reducing stormwater runoff and preventing standing water

4. Alter and adjust solution after evaluating its effectiveness.
   - As a result, see if bigger scale projects such as roadways and large parking lots can be tackled next.



Potential Parking Lot Look

REFERENCES

Stormwater Management. Stormwater Management | City of Hamilton. (2024, July 9). https://www.hamilton.ca/home-neighbourhood/water-wastewater-stormwater/stormwater-management

ICLEI Canada. (2021). *Climate science report for the City of Hamilton*. hamilton.ca. https://www.hamilton.ca/sites/default/files/2022-10/climate-change-impact adapatation-plan-science-report.pdf

Permeable Pavements. LID SWM Planning and Design Guide. (n.d.). https://wiki.sustainabletechnologies.ca/wiki/Permeable_pavements

Tredje Natur. (2020, March). *Permeable concrete*. https://www.tredjenatur.dk/en/2020/03/permeable-concrete/

Sustainable Technologies Evaluation Program. (n.d.). *Green parking lot*. https://sustainabletechnologies.ca/living-labs/green-parking-lot/

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