

Parking Lot Heat Crisis

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Vision: By 2050, the City of Framingham will consolidate 75% of parking lots that have 300+ parking spots into parking garages with solar canopies. Additionally, Framingham will add solar canopies to 50% of parking lots that have 100+ parking spots. The solar panels will provide parking lot owners with clean energy that will decrease their total electricity expenses. Parking garages have the important additional benefit of freeing up parking lots to be converted into green spaces, such as parks, or new infrastructures, like apartments. The reduction of asphalt in direct sunlight will decrease urban heat island effects.



Urban heat islands are areas which are significantly hotter than surrounding suburban or rural areas. The increased heat is caused by a significant amount of paved land, such as roads, parking lots, and dark colored buildings, and a noticeable lack of green spaces/infrastructure. Sunlight becomes trapped heat in paved and other dark surfaces during the day and then is emitted later during the night, dramatically increasing temperatures and prolonging heat waves. The National Oceanic and Atmospheric Administration (NOAA) records for July 2022 show that temperatures were hotter in Massachusetts urban areas than rural areas.¹ For example, the largely urban Middlesex County was, on average, 2 to 5 degrees Fahrenheit hotter than the primarily rural Hampshire County. It might not seem like a large difference, but this trend stays consistent throughout multiple years, and even a few degrees can have detrimental consequences not only to the environment but also to people.

According to the Center for Disease Control (CDC), older adults often struggle to adjust to sudden temperature changes, and children have more difficulty regulating their body temperatures, resulting in possible respiratory illnesses developing when exposed to prolonged extreme temperatures.² Outdoor and manual workers, such as construction workers, low-income or homeless individuals, and people who already experience health-related problems are especially at risk. In total, more than 5,600 people die every year in the U.S. because of heat-related illness.³ Extreme temperatures also cause a higher need for cooling, which creates a financial burden for low-income communities and a strain on the electrical grid.

To minimize the effects of urban heat islands in Framingham, our team proposes the following: by 2050, Framingham will consolidate 75% of parking lots that have 300+ spots into parking garages with solar canopies. The leftover parking lots will be converted into green areas, such as parks or general forestry. In addition, Framingham will add solar canopies to 50% of parking lots that have 100+ spots.

Creating solar parking garages will decrease the amount of asphalt and concrete that is exposed to the sun, will create new green spaces and overall reduce the effects of urban heat islands. The addition of solar canopies will provide Framingham residents and businesses with renewable and affordable energy, and allow easier additions of technology such as electric car charging stations. The green spaces placed in the freed-up parking lots will decrease surrounding temperatures, resulting in a reduction of heat-related health risks. Both elements of our proposal will reduce the amount of CO₂ in the atmosphere that is responsible for trapping heat in the atmosphere causing global temperatures to rise. The reduction of CO₂ will also lead to more clean and breathable air.⁴

Reducing large amounts of dark surfaces exposed to the sun and replacing them with solar parking garages and solar canopies will generate cleaner energy, lower electricity bills for many, reduce the amount of CO₂ in the atmosphere, and allow for easier access to technology like electric car charging stations. Additionally, it frees up space to be used for new parks that will improve physical and mental health, and reduce the effects of urban heat islands. While our proposal is originally for Framingham, we hope this project can be expanded and used in many other urban areas in the future.

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Sources

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