

Abstract of Thesis Presented to the Graduate School
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REGULATING HEAT ISLANDS: IDENTIFYING
LAND DEVELOPMENT REGULATIONS AS MITIGATION TECHNIQUES

By

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Urban heat islands are sections of larger urban areas that experience higher than normal temperatures. Heat islands negatively impact public health, outdoor utility, the built environment, and more. Mitigating heat islands has traditionally occurred using piecemeal techniques, increasing the presence of vegetation and the reflectivity of surfaces while lowering the amount of impervious surface. I propose a more comprehensive action of mitigation using land development regulations. I focus on establishing a correlation between these two variables, but do not propose individual policy action or implementation.

Using solar reflectivity as an approximation of the urban heat island effect, I sampled 30 residential parcels from St. Petersburg, Fl, measuring and categorizing surfaces from each. The resulting data was a reflectivity score for each parcel. I used a correlation model to understand how land development regulations and the solar reflectivity scores from the sample were connected. The resulting model exhibited a clear and significant correlation between zoning and solar reflectivity and less clear, but still significant, correlations between parcel size, floor area ratio, and setback regulations with solar reflectivity.

The results suggest that land development regulations could exist as a mitigating factor of urban heat islands. Clear enough results to suggest policy implementation were not exhibited. Identifying the relationship between land development regulations and urban heat islands is the key value of this study. Future research on this topic is worth completing to gain a better understanding of the relationships exhibited between land development regulations, solar reflectivity, and the urban heat island effect.