

# CALCULATING OUTDOOR SUMMER TOURISM SAVINGS IN LA RESULTING FROM SMART SURFACES ADOPTION

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## Goals:

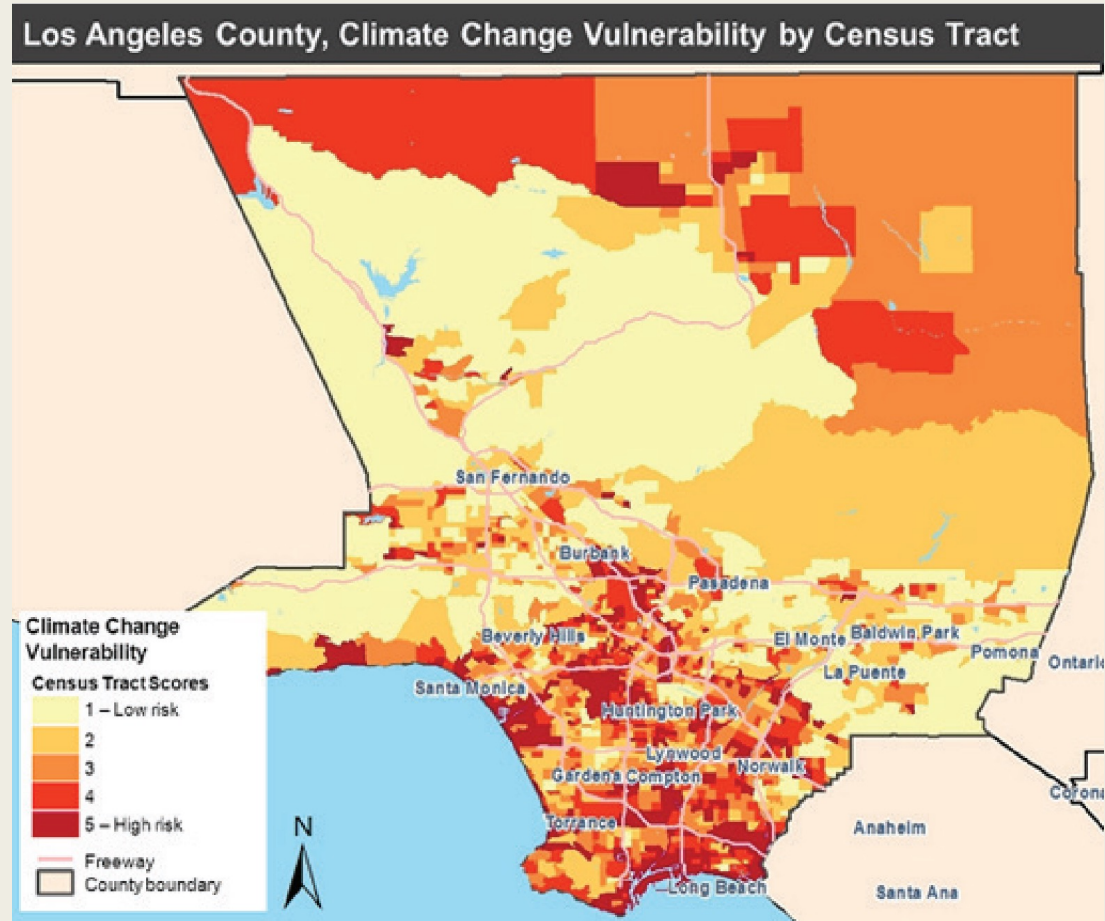
1) Use raw data secured from the LA zoo to quantify the effect that climate change-driven increases in extreme heat will have on revenue from the zoo and, more generally from outdoor summer tourism in Los Angeles

2) Estimate value of avoided tourism revenue loss that can be expected to result from a city-wide adoption of Smart Surfaces

How: Using attendance data from the LA Zoo and daily weather data, making a model in R Studio, and analyzing in Excel

# Climate Vulnerability in Los Angeles

A [UCLA Report for the Los Angeles Region](#) predicts an increase in daily maximum temperatures of 2.2-2.7°C by 2050 (RCP 8.5, 1981-2000).



# Outdoor Summer Tourism in Los Angeles



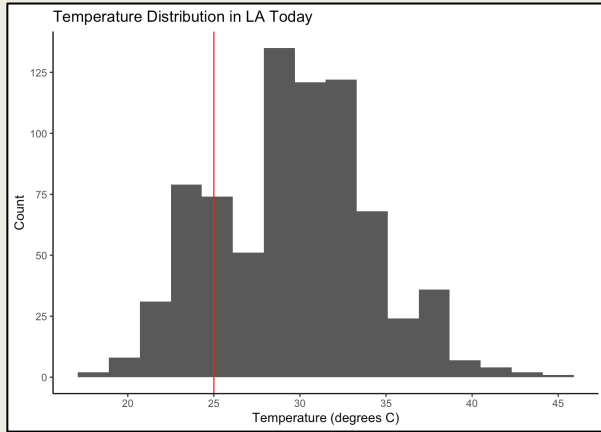
We have estimated the outdoor tourism industry in Los Angeles provides an annual revenue of \$1 Billion with half coming during June-October and subject to the effects of extreme heat.

# Assumptions for Analysis

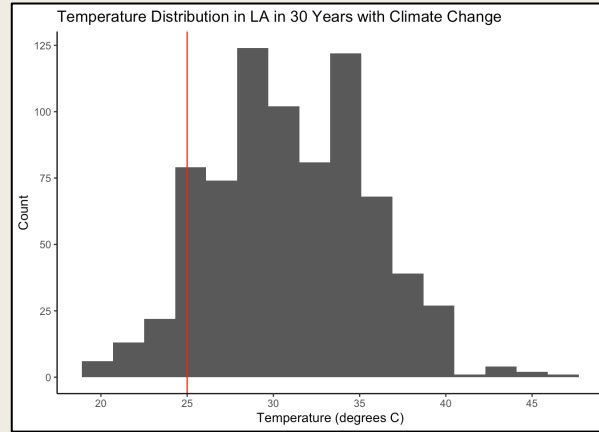
- 1 Temperatures will increase by 1.5°C by 2052 (below the 2.2 - 2.7 °C estimate from the UCLA Climate Report of Los Angeles),
- 2 Attendance has a negative relationship with daily maximum temperatures above temperatures of 25°C
- 3 The average ticket price of the LA Zoo is \$20 and increases only at same rate as inflation
- 4 Daily maximum temperature distribution remains constant in the future

# Temperature Distributions in Los Angeles

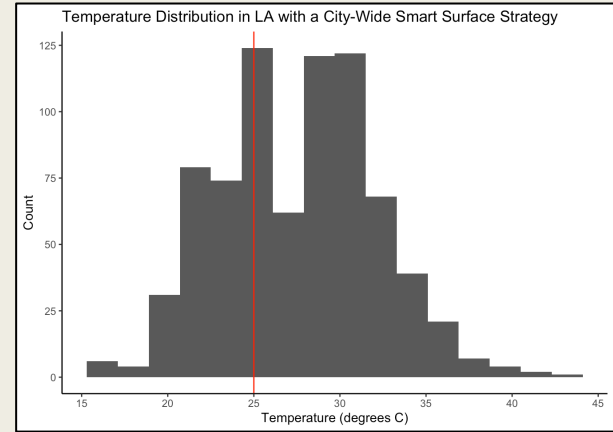
The projected effects of climate change will increase daily maximum temperatures by  $1.5^{\circ}\text{C}$  while adoption of Smart Surfaces will decrease temperatures by  $2^{\circ}\text{C}$



82% of values  $> 25^{\circ}\text{C}$



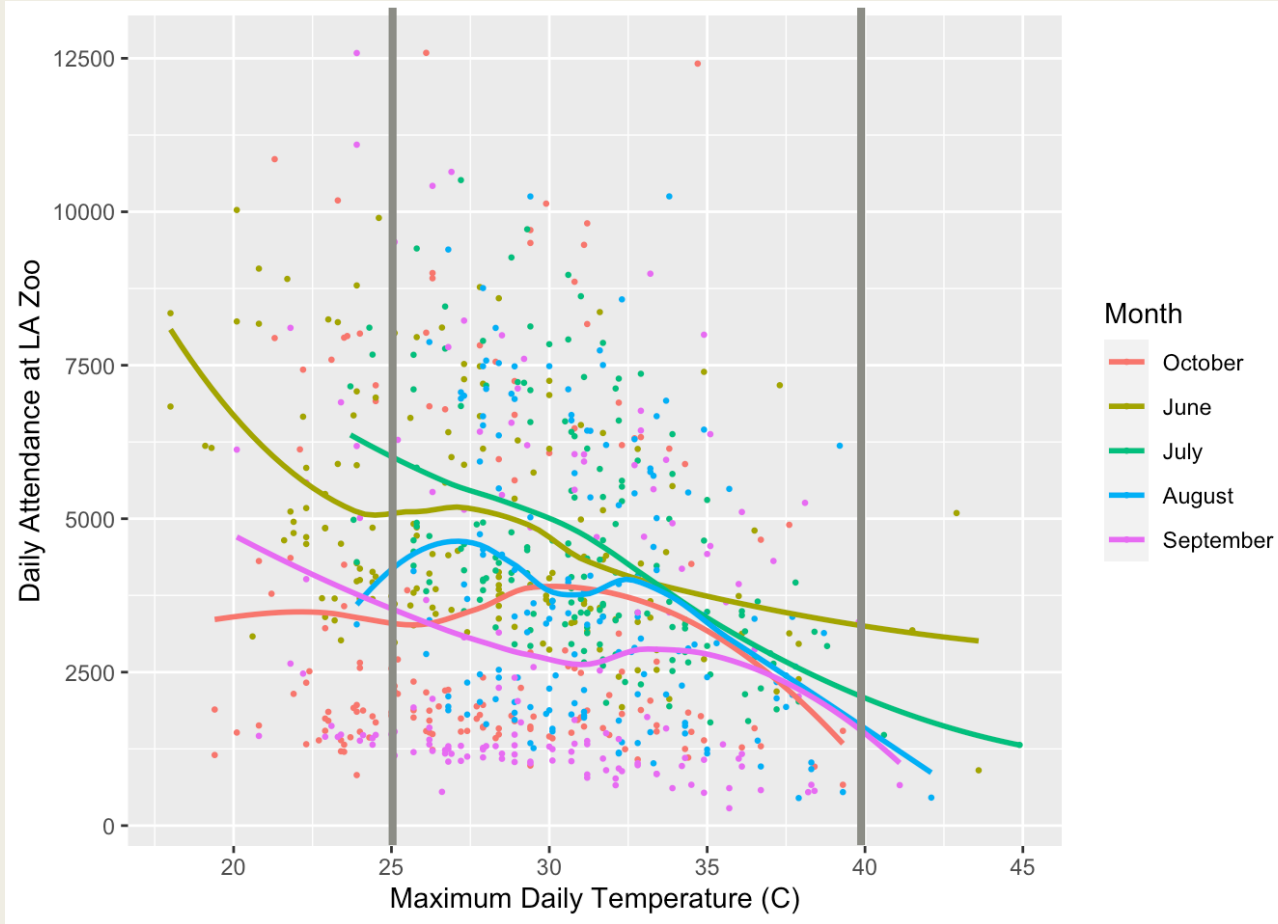
91% of values  $> 25^{\circ}\text{C}$



68% of values  $> 25^{\circ}\text{C}$

Red line is at  $25^{\circ}\text{C}$

# Estimate Effects of Heat on Zoo Attendance

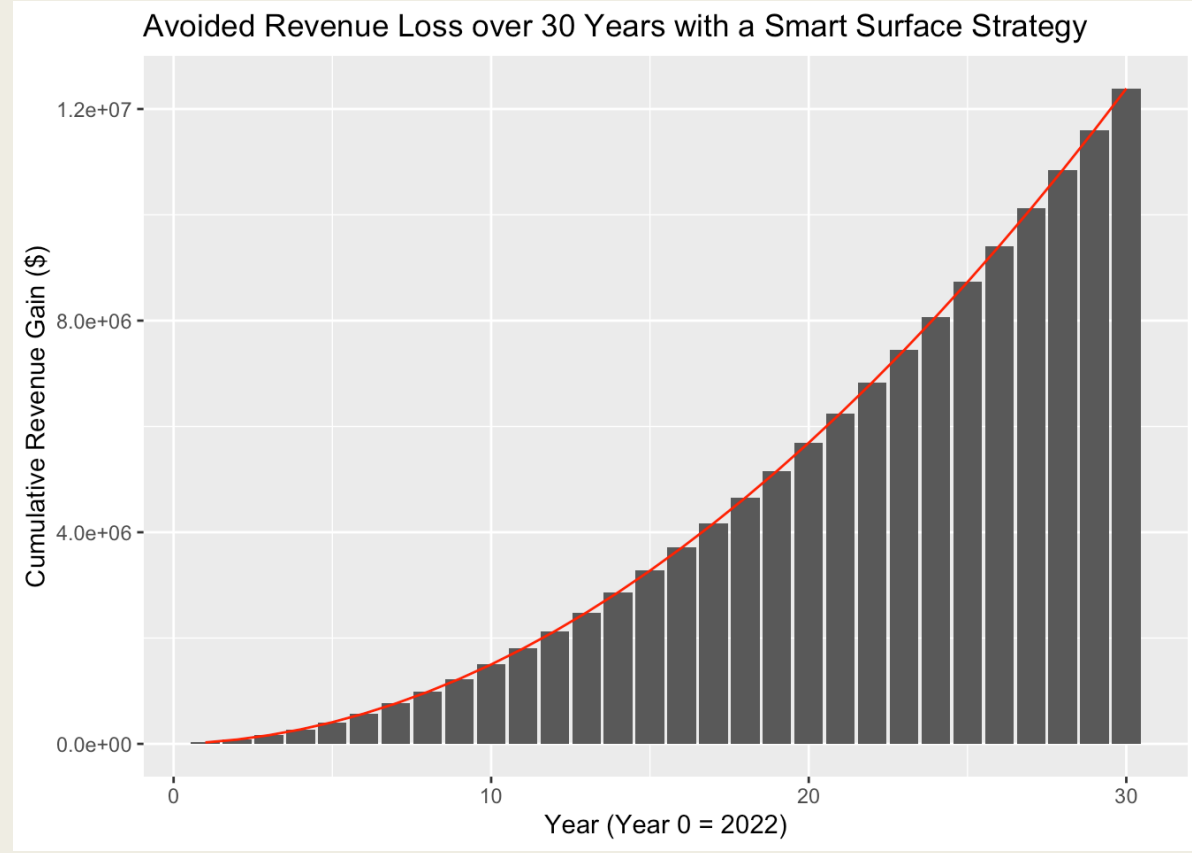


Compared to the median daily attendance, for each degree increase between 25-40°C, there is a 4.7% (2.6% per degree between 77-104°F) decrease in attendance and revenue.

# Avoided Revenue Losses for the LA Zoo from Adoption of Smart Surfaces

By adopting Smart Surfaces—green, porous, and reflective surfaces, trees, and solar PV—city-wide, Los Angeles can reduce daily maximum temperatures by 2°C.

Thus, by 2052, we expect a net present value of ~ \$12,500,000 for the Zoo and for revenue to have increased by 9% during June-October.





# Financial Implications for LA Outdoor Tourism Industry

If no actions are taken, then it is projected that the outdoor tourism industry in Los Angeles would lose ~ \$425 million NPV through 2052 from a 10% decrease in revenues in June-October relative to BAU. Smart Surfaces means this loss is **avoided**

Adoption of Smart Surfaces would decrease temperature below today's summer temperature and as a result there would be **an increase in tourism revenue**. The increases projected to result from adoption of a Smart Surface strategy would result in an NPV of ~ \$405 million over thirty years and a 19% increase in revenues in June-October relative to BAU.

**The combination of avoided tourism revenue losses and projected increases in revenue from Smart Surfaces provide a combined NPV estimate over 30 years of \$830 million**