

1. For each hour, create a comfort map for your site and map the outdoor activities on the map. Is there any relationship between thermal comfort and behavior?

The area where we observed is chilly and windy, and mostly shaded. There were very few people spending time in the courtyard area, except for those who were passing through. Therefore, we concluded that there was a strong relationship present between thermal comfort and behavior.

2. As a designer what would be your top 2 design proposals to make the space more comfortable for outdoor activities?

- Interestingly, we discovered that Solar Tracking Skylights could be used in this case. While counterintuitive because of their primarily interior function, we discovered that mirrors are sometimes placed below the skylights to redirect the sunlight to otherwise shadowed areas. This system uses a solar powered GPS unit under the clear dome to track the sun and orient several mirrors to reflect the light. These mirrors can reflect the sun's ray down into this outdoor area from sunrise to sunset. Therefore, people can enjoy more sunshine and hopefully find more comfort in the plaza.

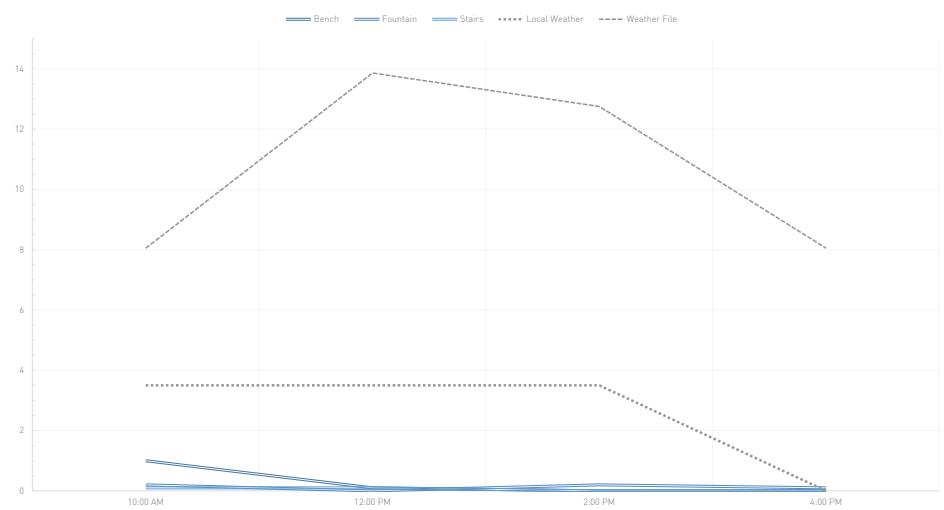
- During the winter, the cold wind is blowing through the plaza, so it will be helpful to place some mobile, outdoor heating systems next to the benches, stairs, and adjacent to the fountain, which were all areas that we assessed people may be sitting on warmer days.

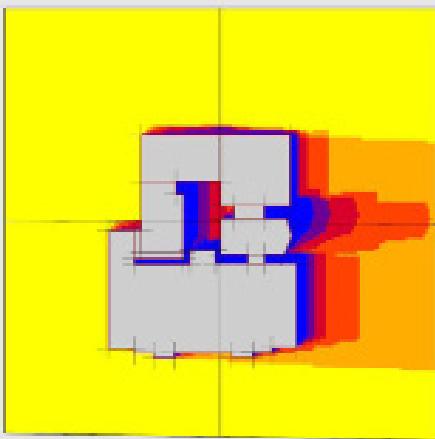
3. Is there a difference between local weather data, weather file and the station weather data? How much is the difference?

Yes. The temperatures that we measured, particularly earlier in the day, were warming than what local weather was reporting. For example, around noon, our device showed that the weather in the courtyard was about 77 degrees when local weather was reporting a temperature of 70 degrees. This was the largest discrepancy in terms of the temperature, but the wind was only off as the local weather reported much higher wind than we observed. The weather file consistently reported higher temperatures and windspeeds, however it did seem to align with our data later in the afternoon. Please see graphs below for further details.

Location	Variable	10:00 am	12:00 pm	2:00 pm	4:00 pm
BENCH	Surface Temperature (°F)	83.0	96.8	97.9	90.7
	Wind Speed (mph)	1.0	0.1	0.0	0.0
	Air Temperature (°F)	86.5	77.0	75.9	76.3
	Humidity (%)	60.3	56.8	54.2	55.5
FOUNTAIN	Surface Temperature (°F)	82.4	93.4	94.0	88.6
	Wind Speed (mph)	0.2	0.0	0.2	0.1
	Air Temperature (°F)	87.0	77.9	76.6	77.5
	Humidity (%)	57.8	52.7	52.9	52.2
STAIRS	Surface Temperature (°F)	85.5	84.9	91.0	87.7
	Wind Speed (mph)	0.1	0.1	0.0	0.0
	Air Temperature (°F)	87.6	79.5	77.9	77.9
	Humidity (%)	56.0	53.2	52.5	52.7

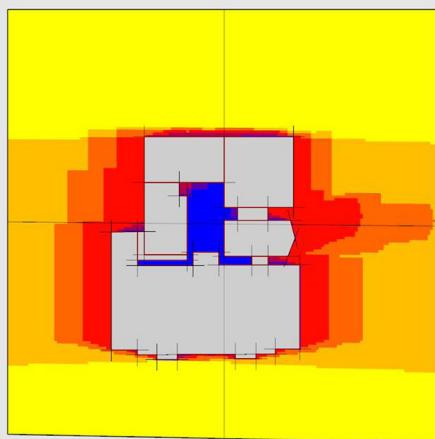
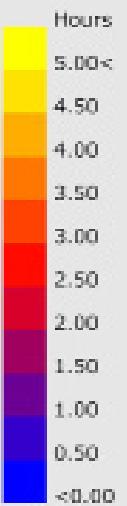
Source	Variable	10:00 am	12:00 pm	2:00 pm	4:00 pm
LOCAL WEATHER	Air Temperature (°F)	78.1	82.9	84	84
	Humidity (%)	68	56	51	47
	Wind Speed (mph)	3.5	3.5	3.5	0.0
WEATHER FILE Avg.	Dry Bulb Temperature (°F)	69.98	73.04	71.06	69.08
	Relative Humidity (%)	61	53	57	63
	Wind Speed (mph)	8.05	13.86	12.75	8.05

SURFACE TEMPERATURE**WIND SPEED****AIR TEMPERATURE****RELATIVE HUMIDITY**



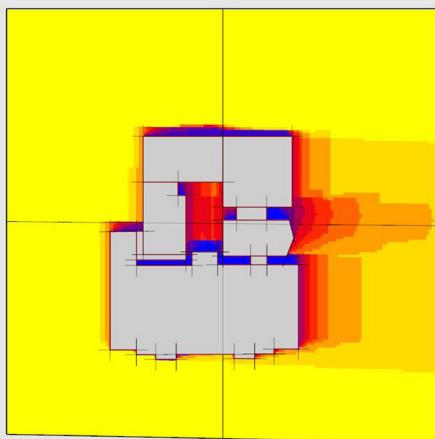
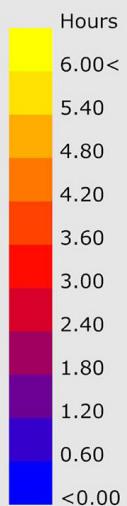
SunlightHours Analysis

10:00 am



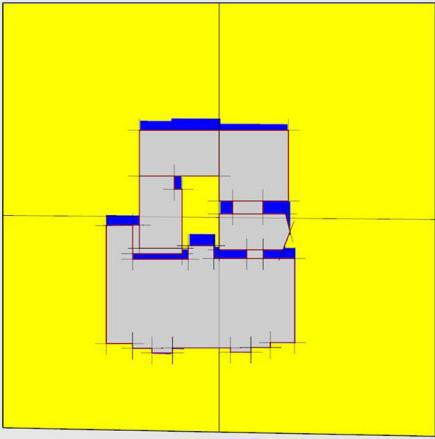
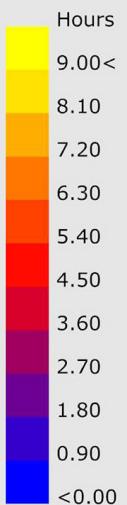
SunlightHours Analysis

12:00 pm



SunlightHours Analysis

2:00 pm



SunlightHours Analysis

4:00 pm

