

The Heat Story

Observing summer temperatures in Ahmedabad

No. 15 ; 2018

Landscape Environment Advancement Foundation, LEAF

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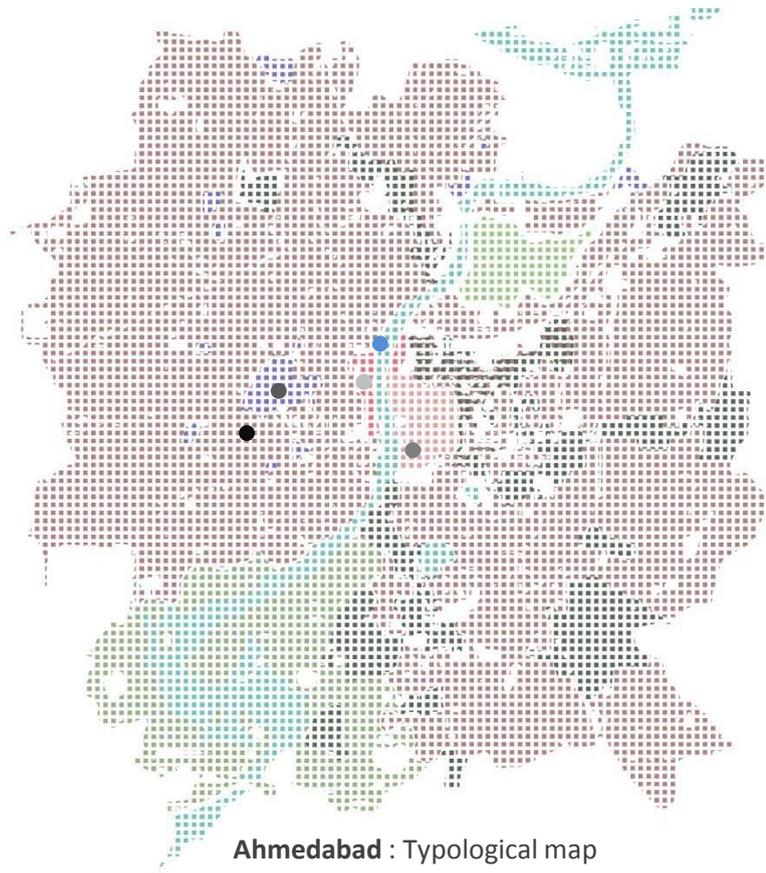
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Orientation of a space relative to the direction of the sun causes distinctive shadow patterns. The areas which are shaded constantly through the day tend to show a lesser reading of temperature than areas that receive minimum shadow.

Materiality of a space is one of the factors that also results in temperature changes. Every material has an inherent property known as thermal conductivity. Thermal conductivity is the rate at which heat passes through a specified material, expressed as the amount of heat that flows per unit time through a unit area with a temperature gradient of one degree per unit distance (W/mK). This means that if a material has high thermal conductivity, the rate at which heat energy passes through the material is high and hence it retains less heat, making it cooler than materials with less thermal conductivity.

Five urban locations in the city are chosen to understand the distinct nature of heat that is observed in each of these locations. These observations are recorded through drawings and maps.

Observations have been made in the month of June 2018 where the average high temperature recorded in Ahmedabad was 42°C and the average low temperature recorded was 28°C. Recordings were taken at 11:00 am, 2:00 pm and 5:00 pm. During afternoon, the sun starts moving towards the west and reaches its highest position in the sky during high noon. Ten thermometers were placed on specific locations on site and temperatures were recorded across the site simultaneously at these times. Heat patterns are made based on the temperatures obtained. Each site shows a different heat pattern depending on its materiality and orientation.



Observing material properties

This map shows the difference in thermal conductivity of materials found on the site. The two/three storeyed bungalows are primarily made of brick and concrete – materials which have very less thermal conductivity (0.2-0.1 W/mK). These materials heat up the surroundings and do not allow the heat stored in the afternoon to escape. But due to the tree cover present on site, this effect is balanced. By the process of evapotranspiration, the water present on the leaves of trees is converted to water vapour thereby cooling the surroundings.

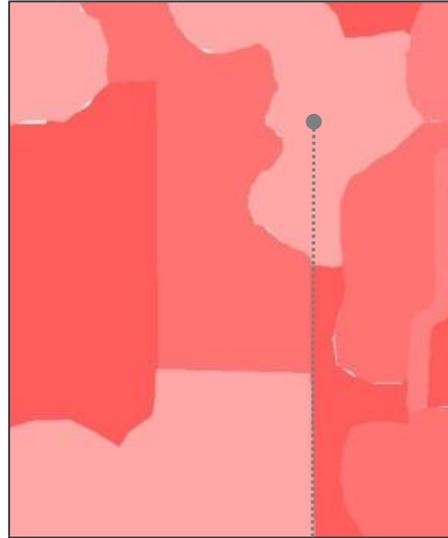


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-  - > 3 W/mK
-  - 2.0-1.0 W/mK
-  - 0.4-0.3 W/mK
-  - 0.2-0.1 W/mK

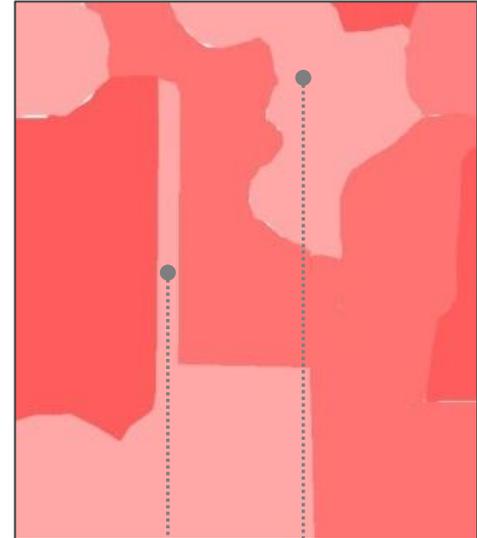
Observing temperatures of a particular zone

At 11:00 am, 11/06/2018

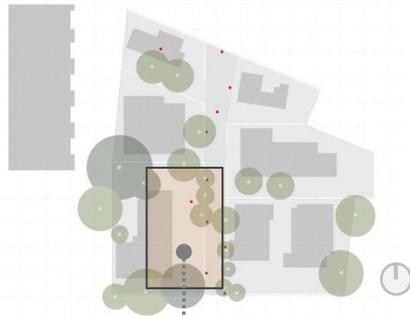


Temperature difference of upto 10°C is observed in areas shaded under trees.

At 2:00 pm, 11/06/2018



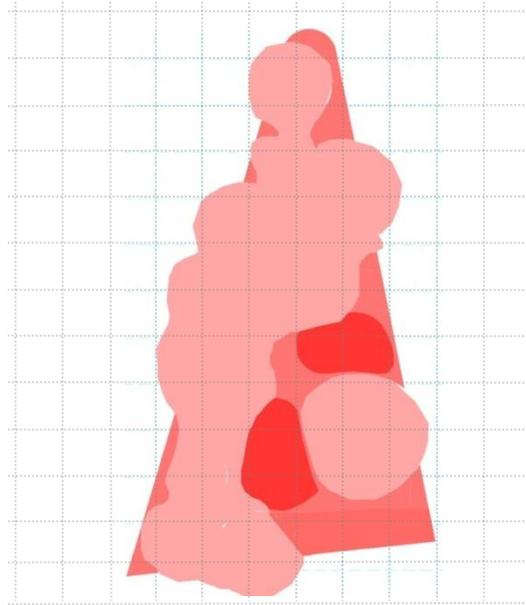
Decrease in temperature is directly proportional to the shadow cast by the building and trees.



Area- 2000 sq. mts
Sparse tree cover
Vacated bungalow.

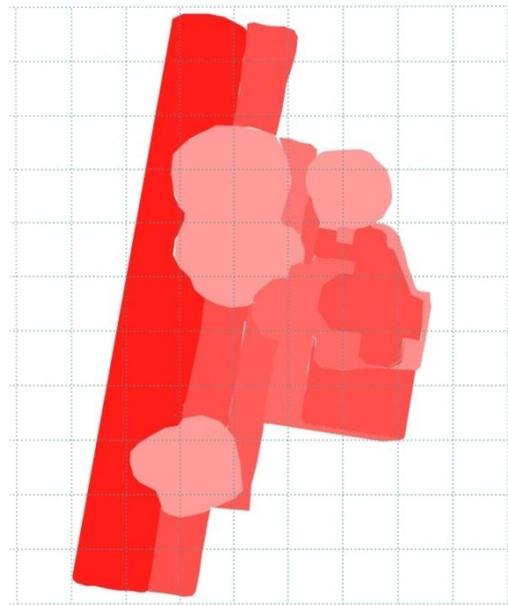
Observations

At 2:00 pm, 13/06/2018



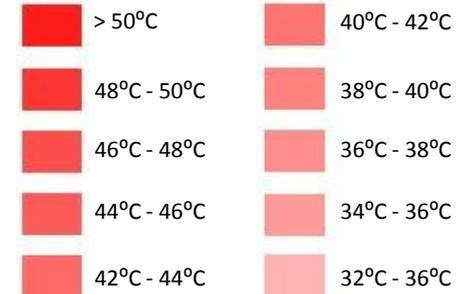
Institutional Area, Ambavadi

At 2:00 pm, 12/06/2018



Commercial Area, C.G. Road

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August 2018