

A Balloon Test

Where does the wind flow?

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Landscape Environment Advancement Foundation, LEAF

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Introduction

Ahmedabad, as a city is spread across a flat horizontal terrain with hot and dry climate conditions. The city consists of many different regions, varying in parameters such as urbanity, density, materiality and functionality. All of these parameters influence the behavior of the wind in one way or another.

The predominant average wind direction in Ahmedabad varies throughout the year. Major change in the direction of wind occurs when the seasons change. Minor changes can be seen on a daily as well as hourly basis. From March to October, for a period of 6-7 months, the wind flows from the West, and Southwest direction. The period from October to December has winds flowing dominantly from the East direction. For the remaining 2 months, January and February wind flows from the North.

The data stated above is on the basis of wind maps generated by meteorological department. This data is represented for entire cities and towns on a larger scale but it does not define the localized wind directions and wind intensities at smaller urban parts or areas. The meteorological department uses different tools and devices to gather data and store it by using a suitable data logger.

The aim of this document is to observe the behavior of wind in different areas of the city with different parameters that can potentially influence the wind. It hopes to determine localized wind directions and wind intensity in different areas of the city.

It will look at the following-

- Factors that influences the direction and intensity of wind.
- Find out whether the wind is affected by temperature, humidity and precipitation level.
- Observe patterns of wind flow at different times of day.

The study began by identifying different areas in the city, and understanding parameters that can influence wind such as density of area (built up vs. open space ratio), materiality/physical context of the area and height of buildings in the area.

The study includes wind maps of three areas at different times of day. It allows for documentation and comparison of wind patterns for different times of day, within these areas.

Map of Ahmedabad



1. Parimal Garden
2. South Bopal
3. Ratan Pol



Source: Google Earth

Base Map



Parimal Garden

A garden situated on the western central part of the city, Parimal Garden consists of a dense layer of trees on the periphery, and a large pond and lawns within its boundaries. On the south and east side of the garden, a wide road goes around the edges. Built up mass is located on the south of the road. Heights of the buildings in this area vary from G+0 to G+9.

Contrasting materiality of this area, such as varying heights of the buildings, dense tree cover, and a large water body, influences wind in many ways. A variety of wind patterns are observed in this area.

Because of the dense layer of trees and large water body, temperature of a particular area within the park drops down. This influences the behavior of wind and causes changes in direction and intensity. Trees and buildings on different sides of the road create a wind funnel. If the direction of the funnel is aligned with the broad wind direction, then it can increase the intensity of wind.



1.
 Direction of wind: From Northwest
 Intensity of wind: Medium
 Time: 10:10 AM
 Description: On a pathway covered with trees, near entrance of garden.



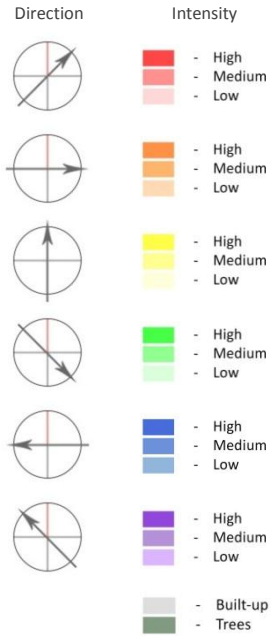
2.
 Direction of wind: From East
 Intensity of wind: Medium
 Time: 10:50 AM
 Description: In the middle of garden, at the edge of the pond.



3.
 Direction of wind: From Southwest
 Intensity of wind: High
 Time: 11:10 AM
 Description: On a pathway around open lawns.



4.
 Direction of wind: From South
 Intensity of wind: High
 Time: 11:25 AM
 Description: On a side of the road, which is perpendicular to the primary road.

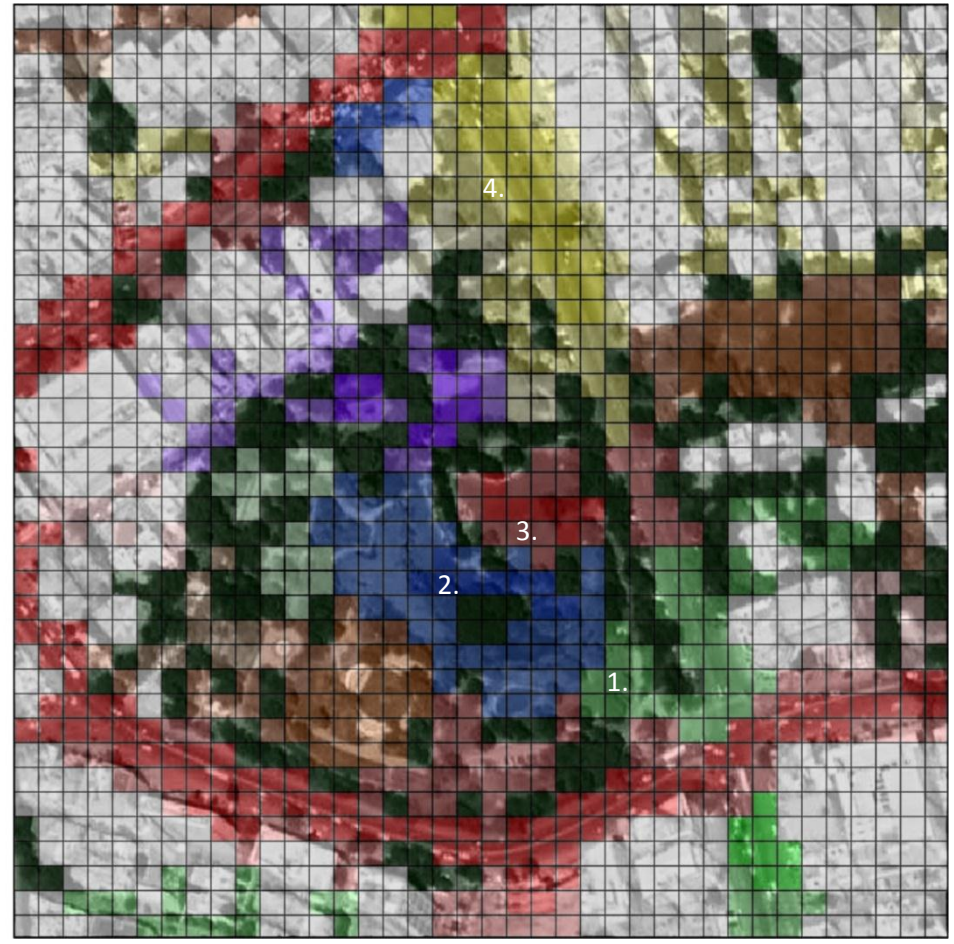


Key Plan



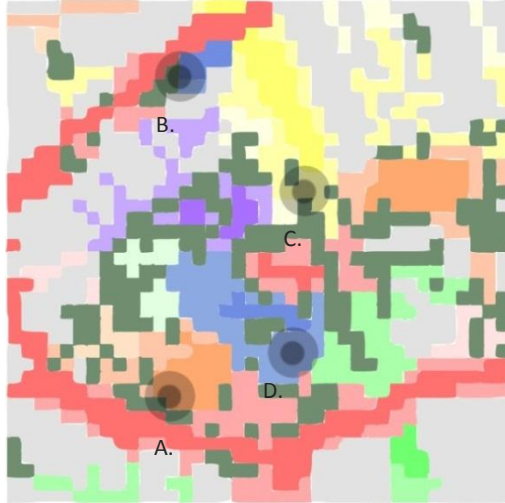
Wind Map

10:00 AM to 11:30 PM



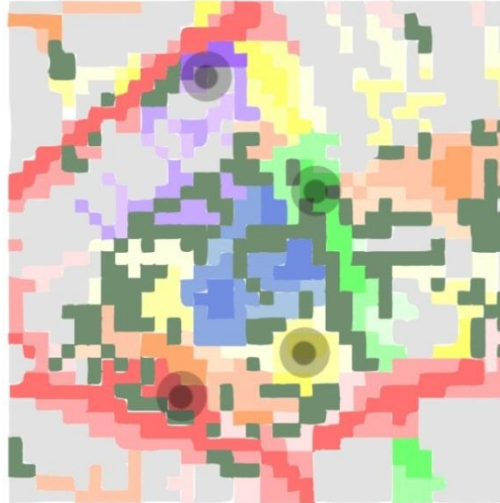
Parimal Garden

10:00 AM to 11:30 AM



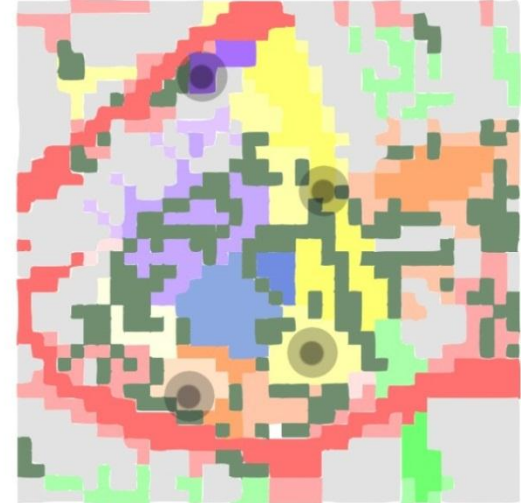
Temperature: 25-27° C
Cool breeze
High intensity

04:00 PM to 06:00 PM



Temperature: 40-43° C
Hot breeze
Medium intensity

09:00 PM to 10:30 PM



Temperature: 28-30° C
Warm breeze
High intensity

- A. West to East – high, Southwest to Northeast – high, West to East – low.
B. East to West – high, Southeast to Northwest – medium, Southeast to Northwest – high.
C. South to North – medium, Northwest to Southeast – high, South to North – high.
D. East to West – medium, South to North – high, South to North, medium.



Grey - Built-up
Green - Trees



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