

HOW TO DESIGN A CAMPAIGN



**used by:
(beekeepers, queen bees)**

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Once you have a Hive and Bees eager to start measuring, you will have to design a campaign.

A campaign is a pre-defined period of time in which the air pollution measurements take place. A campaign can vary in length, ranging from an afternoon to a month.

For longer measurements we suggest to divide the long period into shorter campaigns, for users to be able to disengage if they want to. Longer campaigns might lead to your Bees quitting your campaign.



CAMPAIGN TYPES: AREA CAMPAIGN

There are a number of possible campaign types supported by Socio-Bee.

The first type is called an 'area campaign'. For this campaign the purpose is to investigate a particular area in your neighbourhood and research the air quality in the area.

In the SocioBee web environment you can define such an area to perform the Hive measurements.

It is important to make that area not too big. In general, it is better for the outcomes to have a lot of measurements in a smaller area than just a few measurements in a larger area.

A large area can also be intimidating or ask too much of your bees to perform sufficient number of measurements. It also depends on the number of bees in your Hive so its hard to give advise on the area size.



CAMPAIGN TYPES: DIRTY SOURCE CAMPAIGN

The second type of campaign is called an 'dirty source campaign'. For this campaign the purpose is to investigate a particular pollution source in your neighbourhood in a defined area and research the impact of that source on the air quality in your campaign area.

Pollution sources can be varied in nature:

A source can be a road with intensive traffic using combustion engines that dirties the air.

A source can be a hot spot with a lot of waiting traffic with combustion engines like a crossroad with traffic lights.

A source can be a temporary source like a building site, a festival, a football match in the local stadium, or other event-like occurrences.

A source can be a continuous source of emission like a factory or a plant.

A source can be house-based sources (chimney bearing houses) emitting fireplace/wood burning, oil, petrol or coal-based emissions.

It depends on your locality which type of investigation you want to conduct with your Hive.



CAMPAIGN TYPES: 'CLEAN SOURCE' CAMPAIGN

The third type of campaign is called a 'clean source campaign'. For this campaign the purpose is to investigate a particular 'clean' source in your neighbourhood in a defined area and research the impact of pollution on air quality in that source in your campaign area.

A clean source can be a local park. It can be a nearby forest, a meadow or a childrens playground.

The purpose of such a campaign can be to investigate how the air quality in these spots is effected by nearby influences in terms of pollution.

It depends on your locality which type of investigation you want to conduct with your Hive.



CAMPAIGN TYPES: 'BARRIER' CAMPAIGN

The fourth type of campaign is called a 'barrier campaign'. For this campaign the purpose is to investigate the influence of -often green- barriers on the spread of air pollution from other areas.

Barriers can be rows of trees or shrubbery, or a green zone of grass, park or another barrier

The purpose of such a campaign can be to investigate how the air quality in your area is influenced (or not) by the presence of such an area, for example comparing the air pollution data on both sides of the barrier to see if there is an effect in protection from the barrier.

It depends on your locality which type of investigation you want to conduct with your Hive.



CAMPAIGN VARIABLES TO CONSIDER

In the design of a campaign several variables must be set to define the scope of the measurements. As a Hive you will formulate one or more hypotheses (predictions) they will test by executing the measurements. (More on this in the How to do the Science Loop).

Some variables that you with the Hive can define beforehand that will influence the measurement campaign:

- Frequency of the measurements

How often will the measurements be taken?
Every day? Once a week?

Time of day of the measurement

The time of day can have a strong influence on the outcomes. In front of a school in the morning, parents bringing their kids to school in a car can offer completely different results compared to two hours later.



CAMPAIGN VARIABLES TO CONSIDER

Seasonal /weather effects on the measurements.

Temperature, humidity, wind conditions, summer or winter, all these variables have an effect on your air quality measurements.

note: your WSN is not friends with heavy rain. Try to avoid taking measurements if moist can enter the openings in your WSN sensor. See also our tutorial [How to Measure!](#)

The more consistent your Hive measurements are, the better your scientific results. We can not force our bees to follow strict orders, but this is important to keep in mind.

In science, consistency and precision are King.



Examples

A campaign wants to measure the impact of traffic. The particular source, a busy junction, is susceptible to rush hour peak. The Hive should consider measuring before, during and after rush-hour.

A campaign that runs around a school should include measurements before and after school hours, and specifically during drop-off and pickup hours.

A campaign that runs in an area with a hot summer and not a lot of wind will result in different outcomes when repeated in wintertime under more windy conditions (smog versus no smog risk).

A campaign area where green zones separate roads from pedestrian traffic should consider measurements on both sides of the greenery under comparable conditions.



Expert tips:

Some environmental variables you and your Hive should consider that will influence the measurement campaigns while running are:

- Sunshine can cause some pollutants to undergo chemical reactions, resulting in the development of smog
- Higher air temperatures can speed up chemical reactions in the air
- Rain typically results in less pollution since it washes away particulate matter and can also wash out pollutants that are dissolvable
- Wind speed, air turbulence, and mixing depth all affect how pollutants disperse, or spread out from an area

Good luck in designing your campaigns!

