# Social Distancing Metrics

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Due to the COVID-19 pandemic, people are currently engaging in social distancing. In order to understand what is actually occurring at a census block group level, SafeGraph is offering a temporary Social Distancing Metrics product.

This product is delivered daily (3 days delayed from actual). Daily data is available going back to February 1, 2020.

The data was generated using a panel of GPS pings from anonymous mobile devices. We determine the common nighttime location of each mobile device over a 6 week period to a Geohash-7 granularity (~153m x ~153m). For ease of reference, we call this common nighttime location, the device's "home". We then aggregate the devices by home census block group and provide the metrics set out below for each census block group.

To preserve privacy, we:

* exclude any census block group where we have fewer than 5 devices and
* apply differential privacy to all of the device count metrics other than the device\_count.

If as a result of the differential privacy applied:

* device\_count < part\_time\_work\_behavior\_devices + full\_time\_work\_behavior\_devices +completely\_home\_device\_count or
* device\_count < sum(counts in bucketed\_distance\_traveled) or
* device\_count < sum(counts in bucketed\_home\_dwell\_count),

we then increase the device\_count to the applicable sum (this only occurs in census\_block\_groups with small device\_counts).

## Schema

|  |  |  |  |
| --- | --- | --- | --- |
| **Column Name** | **Description** | **Type** | **Example** |
| origin\_census\_block\_group | The unique 12-digit FIPS code for the Census Block Group. Please note that some CBGs have leading zeros. | String | 131000000000 |
| date\_range\_start | Start time for measurement period in ISO 8601 format of YYYY-MM-DDTHH:mm:SS±hh:mm (local time with offset from GMT). The start time will be 12 a.m. of any day. | String | 2020-03-01T00:00:00-06:00 |
| date\_range\_end | End time for measurement period in ISO 8601 format of YYYY-MM-DDTHH:mm:SS±hh:mm (local time with offset from GMT). The end time will be the following 12 a.m. | String | 2020-03-02T00:00:00-06:00 |
| device\_count | Number of devices seen in our panel during the date range whose home is in this census\_block\_group. Home is defined as the common nighttime location for the device over a 6 week period where nighttime is 6 pm - 7 am. | Integer | 100 |
| distance\_traveled\_from\_home | Median distance traveled from the geohash-7 of the home by the devices included in the device\_count during the time period (excluding any distances of 0). We first find the median for each device and then find the median for all of the devices. | Integer | 200 |
| bucketed\_distance\_traveled | Key is range of meters (from geohash-7 of home) and value is device count. If a device made multiple trips, we use the median distance for the device. | JSON {String: Integer} | {"<1000": 40, "1001-2000": 45, "2001:8000": 15, "8001-16000": 0, "16001-50000": 0, "<50000": 0} |
| median\_dwell\_at*bucketed* distance\_traveled | Key is range of meters and value is the median dwell time in minutes of the devices that traveled the given distance from the geohash-7 of the home. | JSON {String: Integer} | {"<1000": 300, "1001-2000": 60, "2001:8000": 120, "8001-16000": 5, "16001-50000": 5, "<50000": 60} |
| completely\_home\_device\_count | Out of the device\_count, the number of devices which did not leave the geohash-7 in which their home is located during the time period. | Integer | 40 |
| median\_home\_dwell\_time | Median dwell time at home geohash-7 in minutes for all devices in the device\_count during the time period. For each device, we summed the stops at home and then found the median of the sums. | Integer | 1200 |
| bucketed\_home\_dwell\_time | Key is range of minutes and value is device count of devices that dwelled at geohash-7 of home for the given time period. For each device, we summed the stops at home and then found the median of the sums. | Integer | {"<60": 0, "61-360": 0, "361-720": 10, "721-1080": 40, ">1081": 50} |
| at\_home\_by\_each\_hour | A mapping of hour of day to the number of devices at geohash-7 home in each hour over the course of the day in local time. First element in the array corresponds to the hour of midnight to 1am. | JSON [Integer] | [ 90, 90, 90, 80, 80, 70, 70, ...] |
| part\_time\_work\_behavior\_devices | Out of the device\_count, the number of devices that spent one period of between 3 and 6 hours at one location other than their geohash-7 home during the period of 8 am - 6 pm in local time. This does not include any device that spent 6 or more hours at a location other than home. | Integer | 10 |
| full\_time\_work\_behavior\_devices | Out of the device\_count, the number of devices that spent greater than 6 hours at a location other than their home geohash-7 during the period of 8 am - 6 pm in local time. | Integer | 10 |