ODT Flow REST APIs

Each API performs a specific task such as aggregating the flows for a selected place and downloading flow data for a selected geographic area. All APIs return data in CSV (comma-separated values) format. The API is specified in the "operation" parameter in the request (see examples below).

APIs

- **get_flow_by_place**

Return the aggregated movement between the selected place and other places.

- **get_daily_movement_by_place**

Return the daily inter-unit movements between the selected place and other places or the selected place's daily intra-unit movements.

- **get_daily_movement_for_all_places**

Return the daily movements for all places of a specific geographic level (currently return intra movement).

- **extract_odt_data**

Return the selected OD flows in either temporally aggregated format or daily format. The study area can be specified by a bbox. For SafeGraph daily flows, the days selected need be less than 31.

- **extract_odt_data_url**

Same as extract_odt_data, but returns a download URL and number of records instead of directly returning the csv data. Works better for extracting large amounts of flows.

API Parameters

- **source**

    - twitter
    - safegraph

- **scale**

For twitter:
- world_country
- world_first_level_admin
- us_state
- us_county

For safegraph:
- us_state
- us_county
- us_tract_tx
- us_tract_sc

- **place**

The selected place id for the query.

- For US county, use five-digit county FIPS as the place id;
- For US state, use two-digit state FIPS;
- For world countries/territories, use the ISO code (e.g., USA, ITA).
- For the first-level subdivisions of world countries/territories, use ISO code (e.g., USA.41_1).

- **direction**

Indicates the flow direction. Possible values:

- *outflow*: Population flows from the selected place to other places in the selected ODT cube.
- *inflow*: Population flows from the other places to the selected places in the selected ODT cube.

- *both*: Include both inflow and outflow in the selected ODT cube.
- *intra*: Population flows within the selected place. (this is only for get_daily_movement_by_place operation).

• begin & end

Available time period for Twitter: from 01/01/2019 – 12/31/2019, 01/01/2020 – 12/31/2020. Available time period for SafeGraph: from 01/01/2019 – 12/31/2019, 01/01/2020 – 02/24/2021.

For the *od_daily_movement_by_place* operation, begin and end can cross multiple years. Other operations need to be within same year.

• bbox

Specify the area of interest. Only for the operations of *extract_odt_data* and *extract_odt_data_url*.

Format: south, north, west, east. Examples:

- 20.193,49.331,-125.195,-64.101
- -90,90,-180,180

• type

Indicate the type of data to be downloaded. Only for the operations of *extract_odt_data* and *extract_odt_data_url*.

- aggregated
- daily

Query Examples
All queries return data in CSV format.

- ## get_flow_by_place

Return the aggregated movement between the selected place and other places.

http://gis.cas.sc.edu/GeoAnalytics/REST?operation=get_flow_by_place&source=twitter&scale=us_state&place=54&begin=01/01/2020&end=01/10/2020&direction=both

http://gis.cas.sc.edu/GeoAnalytics/REST?operation=get_flow_by_place&source=safegraph&scale=us_tract_sc&place=48113007604&begin=01/01/2020&end=03/31/2020&direction=both

http://gis.cas.sc.edu/GeoAnalytics/REST?operation=get_flow_by_place&source=twitter&scale=world_first_level_admin&place=USA.41_1&begin=01/01/2020&end=03/31/2020&direction=inflow

- ## get_daily_movement_by_place

Return the daily inter-unit movements between the selected place and other places or the selected place's daily intra-unit movements.

http://gis.cas.sc.edu/GeoAnalytics/REST?operation=get_daily_movement_by_place&source=safegraph&scale=us_county&place=12086&begin=01/01/2020&end=01/30/2020&direction=both

http://gis.cas.sc.edu/GeoAnalytics/REST?operation=get_daily_movement_by_place&source=safegraph&scale=us_tract_sc&place=45063020505&begin=01/01/2020&end=01/30/2020&direction=inflow

http://gis.cas.sc.edu/GeoAnalytics/REST?operation=get_daily_movement_by_place&source=twitter&scale=world_country&place=USA&begin=01/01/2020&end=01/30/2020&direction=outflow

- ## get_daily_movement_for_all_places

Return the daily movements for all places of a specific geographic level (currently return intra movement).

http://gis.cas.sc.edu/GeoAnalytics/REST?operation=get_daily_movement_for_all_places&source=twitter&scale=us_state&begin=11/01/2019&end=03/10/2020

http://gis.cas.sc.edu/GeoAnalytics/REST?operation=get_daily_movement_for_all_places&source=safegraph&scale=us_county&begin=01/01/2020&end=02/01/2020

http://gis.cas.sc.edu/GeoAnalytics/REST?operation=get_daily_movement_for_all_places&source=twitter&scale=world_first_level_admin&begin=01/01/2020&end=02/01/2020

- **extract_odt_data**

Return the selected OD flows in either temporally aggregated format or daily format.

http://gis.cas.sc.edu/GeoAnalytics/REST?operation=extract_odt_data&source=twitter&scale=us_county&begin=01/01/2019&end=01/02/2019&bbox=20.19346,49.33148,-125.19531,-64.10156&type=daily

http://gis.cas.sc.edu/GeoAnalytics/REST?operation=extract_odt_data&source=safegraph&scale=us_tract_sc&begin=01/01/2019&end=01/02/2019&bbox=20.19346,49.33148,-125.19531,-64.10156&type=aggregated

http://gis.cas.sc.edu/GeoAnalytics/REST?operation=extract_odt_data&source=twitter&scale=world_first_level_admin&begin=01/01/2019&end=01/02/2019&bbox=20.19346,49.33148,-125.19531,-64.10156&type=aggregated

- **extract_odt_data_url**

Same as *extract_odt_data*, but returns a download URL and number of records instead of directly returning the csv data.

http://gis.cas.sc.edu/GeoAnalytics/REST?operation=extract_odt_data_url&source=twitter&scale=us_county&begin=01/01/2019&end=01/02/2019&bbox=20.19346,49.33148,-125.19531,-64.10156&type=daily

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