

Web Mapping & Analysis

Data Backends II - APIs

Dani Arribas-Bel

Today

- The Web as a source for data
- Web APIs
- API examples

The Web as a source for data

New forms of data

- New forms of data **enabled** by **web** technologies
- **Digital** life, digital traces, digitalised life (Lazer & Radford, 2017)
- Much of these data are available as an ***accident*** (Arribas-Bel, 2014)

Sources

Arribas-Bel (2014):

- *Citizens as sensors*
- Businesses moving online
- Open (government) data

“Citizens as sensors”

- Web 2.0 → (data) consumers are *also* creators
(Goodchild, 2007)
- Much of everyday life now recorded in a database
- (Parts of) these databases can be accessed

The image shows a web browser window with two tabs open. The left tab is the main Twitter homepage (<https://twitter.com>) and the right tab is the Twitter Developer website (<https://developer.twitter.com>). Both pages are displayed in light mode.

Twitter Homepage (Left Tab):

- Header:** Twitter. It's what's happening. | Log in
- Main Message:** See what's happening in the world right now
- Call-to-Action:** Join Twitter today.
- Buttons:** Sign up (blue), Log in (white)
- Features:** Follow your interests, Hear what people are talking about, Join the conversation

Twitter Developer Website (Right Tab):

- Header:** Developer | Log in
- Section:** Developers
- Main Message:** Tap into what's happening.
- Text:** Publish and analyze Tweets, optimize ads, and create unique customer experiences.
- Callout:** Twitter Developer Labs is live: [Learn more >](#)
- Footer:** Use cases

Page Footer (Bottom of the image):

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Instagram

Sign up to see photos and videos from your friends.

[Log in with Facebook](#)

OR

Mobile Number or Email

Full Name

Username

Password

[Next](#)

By signing up, you agree to our [Terms](#). Learn how we collect, use and share your data in our [Data Policy](#) and how we use cookies and similar technology in our [Cookies Policy](#).

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Instagram

Sandbox Invites [Manage Clients](#) [Log in](#)

API Endpoints

Once you've registered your client it's easy to start requesting data from Instagram. All endpoints are only accessible via [https](https://api.instagram.com) and are located at api.instagram.com. For instance: you can retrieve photos with a given hashtag by accessing the following URL with your `access_token` (replace ACCESS-TOKEN with your own):

```
https://api.instagram.com/v1/self/media/recent?access_token=ACCESS_TOKEN
```

The Instagram API requires an `access_token` from authenticated users for each endpoint. We no longer support making requests using just the `client_id`.

Note

The URL examples throughout this documentation use ACCESS-TOKEN as a placeholder. For these examples to work, you need to substitute the value with your own `access_token`. In your application, you should have each user go through an authentication and authorization flow in order to receive a valid `access_token`.

Limits

Please refer to the [limits documentation](#) for information on rate limits that apply to API requests.

Deleting Objects

We do our best to have all our URLs be [RESTful](#). Every endpoint (URL) may support one of four different http verbs. GET requests fetch information about an object, POST requests create objects, PUT requests update objects, and finally DELETE requests will delete objects.

Structure

The Envelope

Every response is contained by an envelope. That is, each response has a predictable set of keys with which you can expect to interact:

```
{
  "meta": {
    "code": 200
  }
}
```

Fitbit Official Site for Activity Tracker

Give voice to your goals with the new **Versa 2** smartwatch featuring Amazon Alexa Built-in. [SHOP NOW](#)

fitbit

NEW

NOW WITH ALEXA & ENHANCED SLEEP TRACKING

fitbit versa 2

The new health and fitness smartwatch that gives voice to your goals with Amazon Alexa Built-in.

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NEW fitbit premium
A brand new customised programme for your unique body
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NEW fitbit aria air
An easy-to-use smart scale for everyone
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Know your body better
A smartwatch, scale, Sleep Score, Fitbit Premium and more
[SEE WHAT'S NEW](#)

Fitbit motivates you to reach your health and fitness goals by tracking your activity, exercise, sleep

Web API

developer

Getting Started Build Manage Community Q

Reference

- Device API
- Companion API
- Settings API
- Web API**
- API Basics
- Authentication
- Activity
- Body & Weight
- Devices
- Food Logging
- Friends
- Heart Rate
- Sleep
- Subscriptions
- User
- Troubleshooting Guide

Web API Reference

Introduction

Fitbit provides a Web API for accessing data from Fitbit activity trackers, Aria scale, and manually entered logs. Anyone can develop an application to access and modify a Fitbit user's data on their behalf, so long as it complies with [Fitbit Platform Terms of Service](#).

Quick Start

1. [Review the basics](#) about how the Fitbit Web API works.
2. [Register your application](#) to get API client credentials. You will need a Fitbit account (free) to register an app.
3. Implement an [OAuth 2.0 authorization flow](#) to allow people to give your app permission to access data on their behalf.
4. Make HTTP requests to access data. The different types of data available via the Web API are listed in the navigation. You can also try the [API Explorer](#).
5. If you have a server app and want to be notified when people have new data available, implement the [Subscriptions API](#).

If you need help, we're [here](#) for you.

< [Settings API](#)

“Businesses moving *online*”

- Business activities digitalised (or entirely digital)
- Records stored in databases, that can also be accessed
- Active/passive collection (eg. IoT)



Earn Money by Driving or Get a +

Uber https://www.uber.com/gb/en/ Log in Sign up

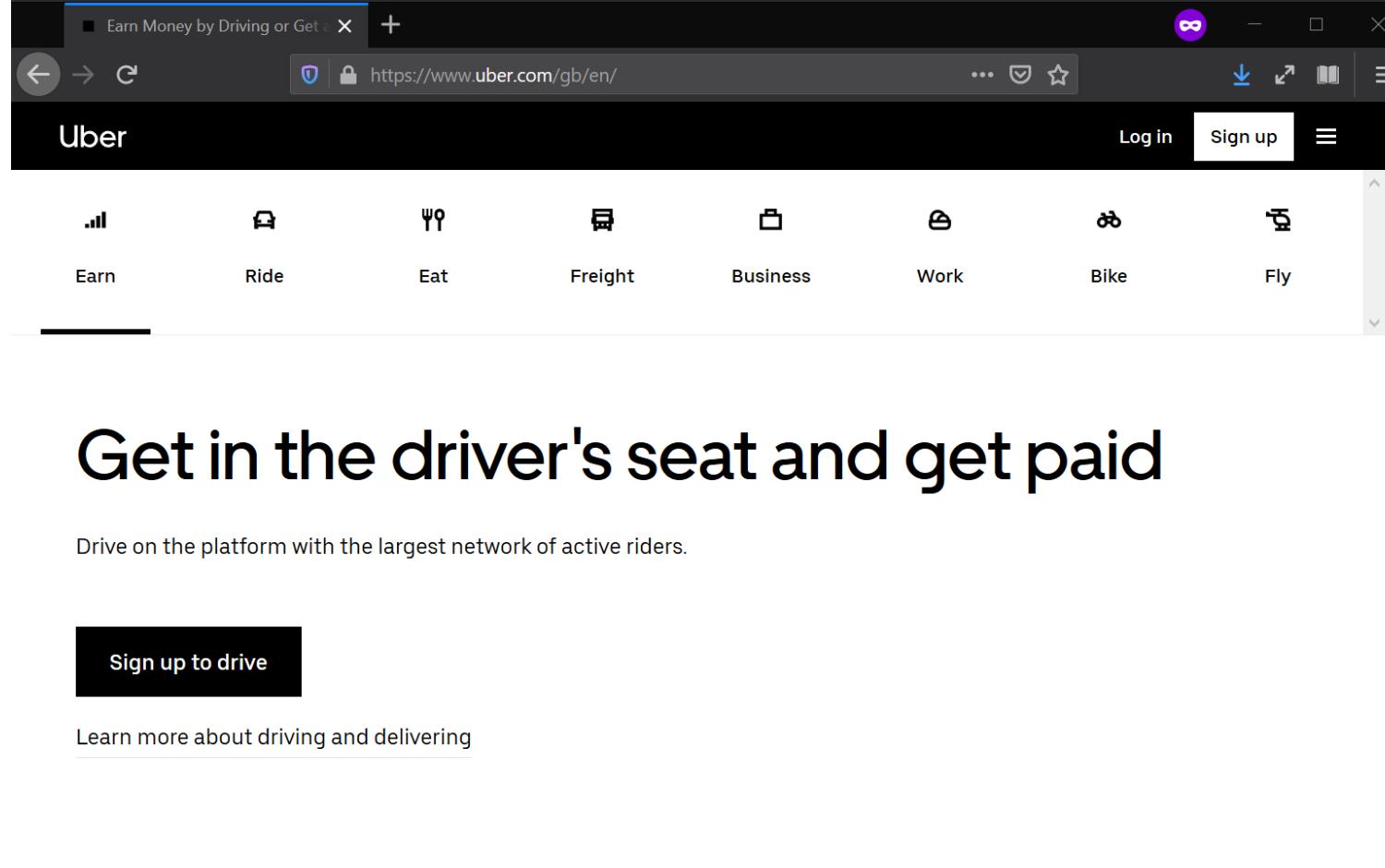
Earn Ride Eat Freight Business Work Bike Fly

Get in the driver's seat and get paid

Drive on the platform with the largest network of active riders.

[Sign up to drive](#)

Learn more about driving and delivering



Uber Movement: Let's find smart ways forward, together. +

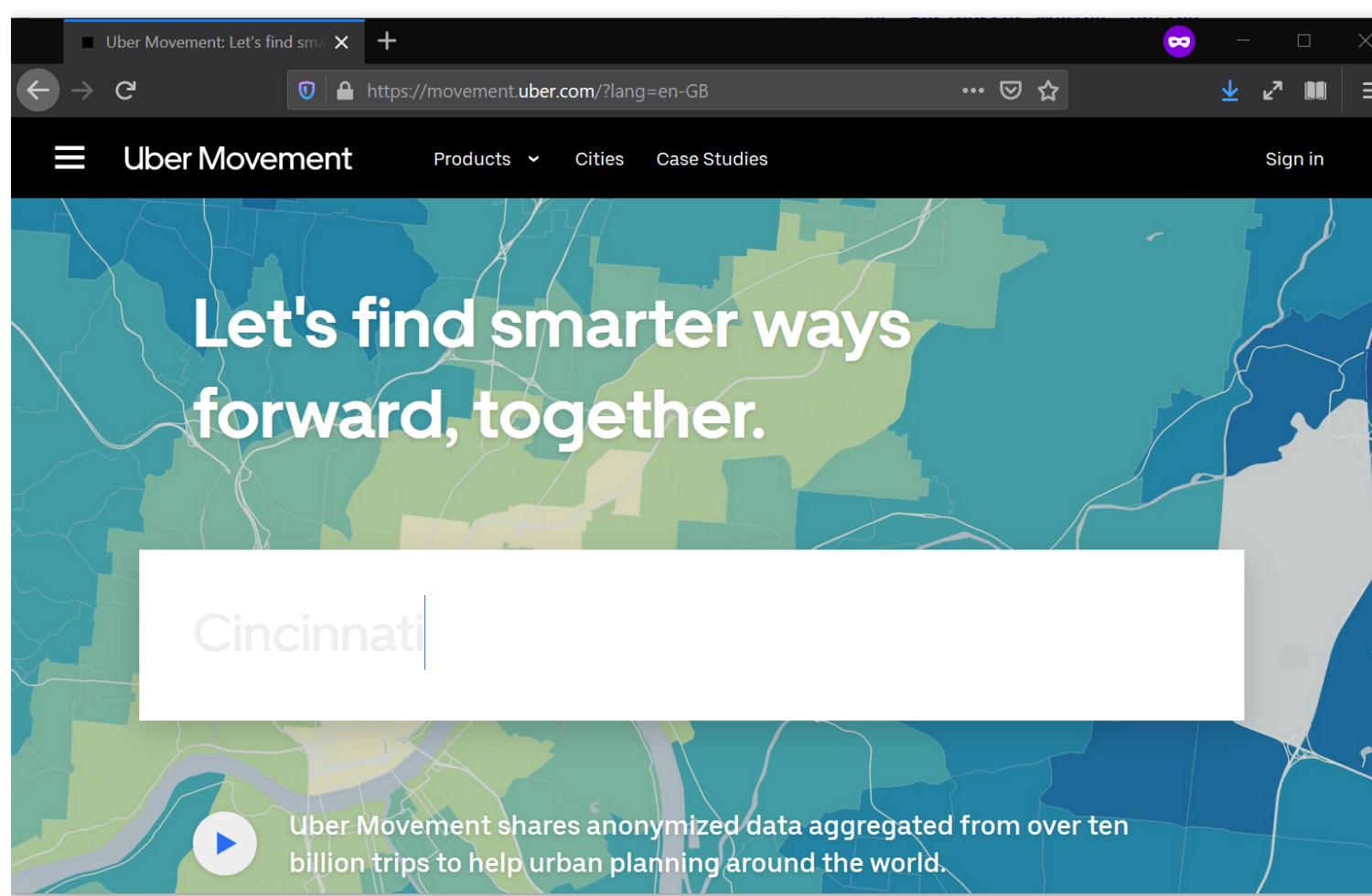
https://movement.uber.com/?lang=en-GB ... Sign in

Uber Movement Products Cities Case Studies

Let's find smarter ways forward, together.

Cincinnati

Uber Movement shares anonymized data aggregated from over ten billion trips to help urban planning around the world.



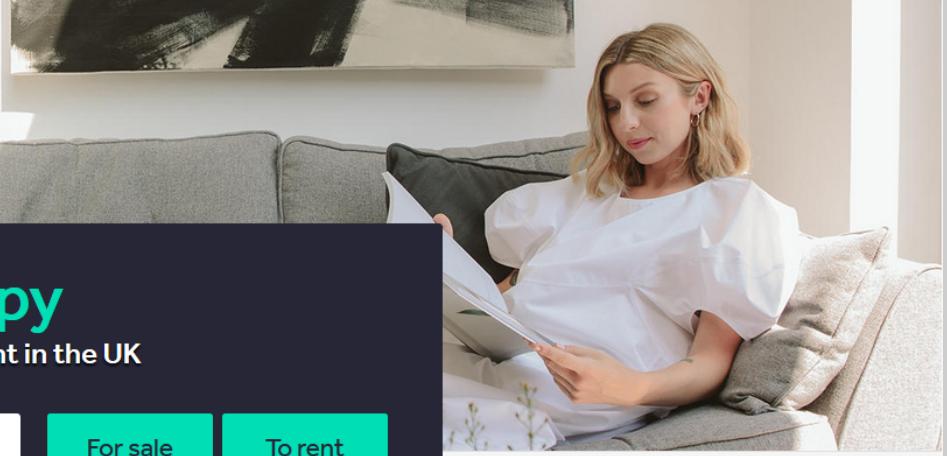
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Where can I live?



Governments “opening up”

- Public institutions releasing internal data under open licenses
- Variety of reasons (transparency, economic value, service...)
- Not to take for granted!



Share this page

Place overview

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Search

Search for a place



Welcome to data.police.uk

This is the site for open data about crime and policing in England, Wales and Northern Ireland.

You can download [street-level crime, outcome, and stop and search data](#) in clear and simple CSV format and explore the [API](#) containing detailed crime data and information about individual police forces and neighbourhood teams.

You can also download data on police activity, and a range of data collected under the [police annual data requirement \(ADR\)](#) including arrests and 101 call handling.

All the data on this site is made available under the [Open Government Licence v3.0](#).



DOWNLOADS

[Download Police.uk data in batches](#)



API DOCS

[Access Police.uk data via an API](#)



CHANGELOG

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OS OpenData support

OS OpenData are a set of free digital maps of Great Britain, available for anyone to use, for any purpose.

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f t in

Challenges

- Bias
- Licensing
- Access

Bias

- Who's represented?
- Who's missing?
- How is the data used?

Street Bump

www.streetbump.org

About Sign In

Where's Street Bump being used?

549 trips, 37,016 bumps, 0 potholes filled, and 0 roadway problems identified

99 bumps reported in 101–199 Curtis Dr, Truro, NS over 5 years ago

A map of Truro, NS, showing the location of 99 Street Bump reports. The map includes several streets such as Curtis Dr, Upham Dr, Ritchie Bay, Cobeguid Dr, Cobeguid St, Marigold Dr, Tulip Pl, and Crowell Dr. A specific location on Curtis Dr is highlighted with a green marker and labeled 'STREET BUMP'. Other markers include 'CKTY & CKTO FM Radio' and 'E Lynds Enterprises'. The map also shows 'For development purposes only' areas. A Google logo is visible at the bottom left.

Want to use Street Bump to improve your community? [Contact Us](#)

What's Street Bump?

Street Bump is a crowd-sourcing project that helps residents improve their neighborhood streets. Volunteers use the Street Bump mobile app to collect road condition data while they drive. The data provides governments with real-time information to fix problems and plan long term investments.

A graphic showing a smooth, asphalt-like surface with small houses and trees. A large white play button is centered on the surface. Below the graphic, the text 'HELP KEEP YOUR STREETS SMOOTH' is displayed.

Download on the [App Store](#)

Learn More

Licensing

- How accessible data can be used, what for
- “Free beer”, not “free speech”
- Evolving landscape

Google Maps/Earth Additional Terms of Service

Last Modified: January 21, 2019

Thanks for using Google Maps and Google Earth ("Google Maps/Google Earth").

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4. the Google Privacy Policy (the "Privacy Policy").

Please read each of these four documents carefully, starting with the Universal Terms. The Universal Terms clarify, for example, your intellectual property ownership rights in the content you upload, and your responsibilities when using Google content or third-party content or when using Google Maps/Google Earth while driving.

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 - d. do many other things described in the [Using Google Maps, Google Earth, and Street View](#) permissions page.
- 2. Prohibited Conduct.** Your compliance with this Section 2 is a condition of the license granted in Section 1. When using Google

Access

- Vehicles used to make data available are **programmatic** (APIs)
- Mostly based on **web** technologies
- Additional set of **skills** required

Web APIs

Web APIs

Programmable interfaces to web services

- Machine-to-machine communication over the web
- Expose access to (parts of) databases, or output of computations
- Bridge between *client* and *server*

How APIs work

- Authenticate (potentially linked to billing)
[Optional]
- Send query as URL
- Receive request ((Geo) JSON, .csv)

Web APIs: an example

Over HTTP (e.g. REST): the query is a URL:

```
https://services1.arcgis.com/  
    ESMARspQHYMw9BZ9/arcgis/rest/services/  
    LSOA_DEC_2011_EW_BSC/FeatureServer/0/  
    query?  
    where=1%3D1&  
    outFields=&  
    outSR=4326&  
    f=json
```

[URL]

Web APIs: language “bindings”

- **Library** in a programming language
(e.g. Javascript, Python, R) to interact with an API
- **Wrapper** in the language around HTTP endpoints
- Expose API in **familiar** form for developers of that language

Web APIs: some thoughts

- Very useful to access new forms of data
- All different, but some patterns are broadly general
- Programming skills help to automate data access

API examples

API examples

Access to:

- Data
- Maps
- Computations



Public Health Data API

Areas

Show/Hide | List Operations | Expand Operations

Data

Show/Hide | List Operations | Expand Operations

Entities

Show/Hide | List Operations | Expand Operations

IndicatorMetadata

Show/Hide | List Operations | Expand Operations

GET /api/indicator_metadata/by_indicator_id Get the indicator metadata for a list of indicator IDs

GET /api/indicator_metadata/by_group_id Get indicator metadata for one or more profile groups

GET /api/indicator_metadata/all Get indicator metadata for all the indicators available

GET /api/indicator_metadata_text_properties Get a list of the properties that are available for indicator metadata

GET /api/indicator_search Finds indicators for each area type that match specific words

GET /api/indicator_metadata/csv/by_indicator_id Get a CSV file of metadata for the specified indicators

GET /api/indicator_metadata/csv/by_group_id Gets a CSV file of metadata for all the indicators in the specified profile group

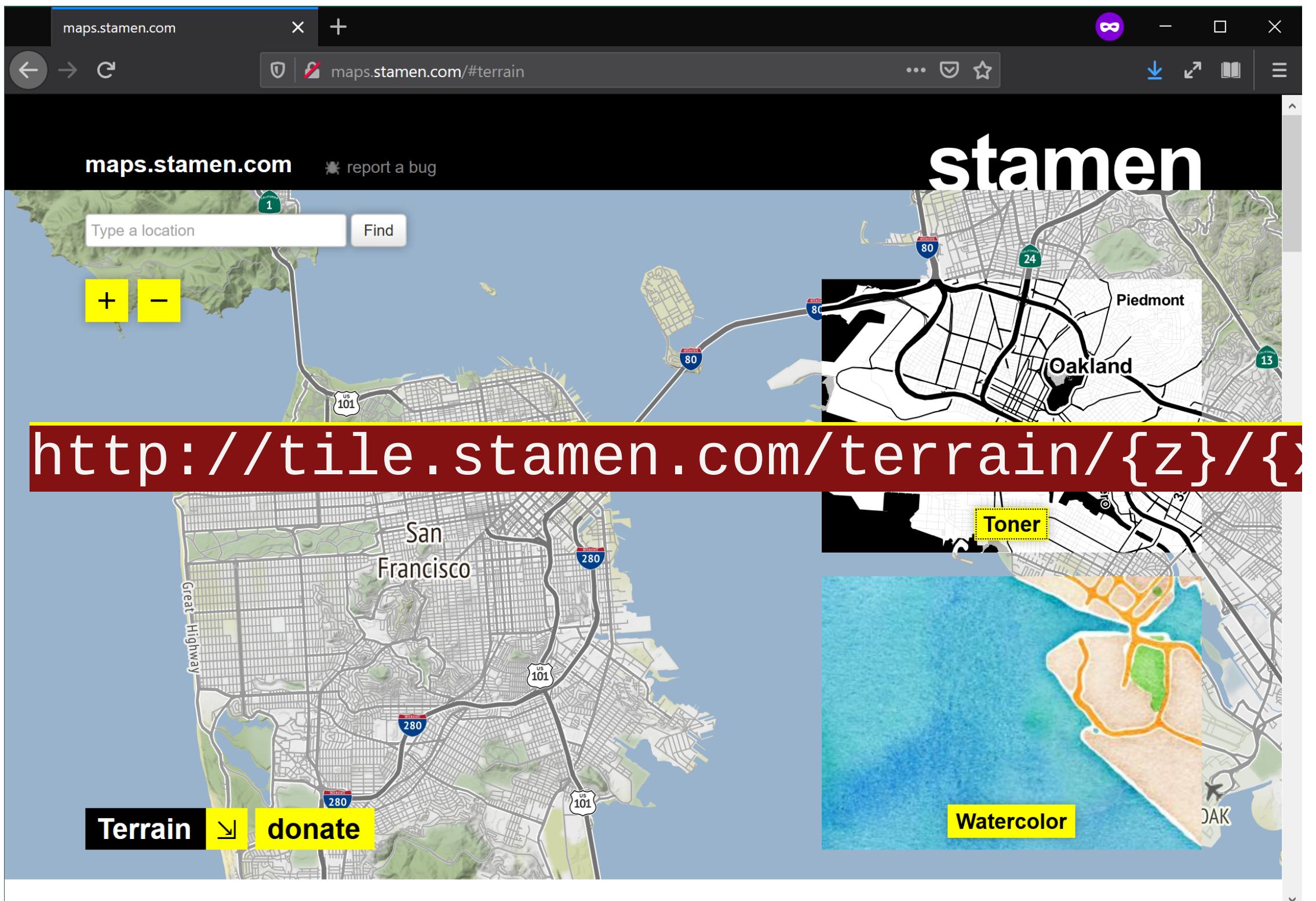
GET /api/indicator_metadata/csv/by_profile_id Get a CSV file of metadata for all the indicators in the specified profile

GET /api/indicator_metadata/csv/all Get a CSV file of metadata for all the indicators available

GET /api/indicator_names/by_group_id Get a list of the indicators in the specified profile groups

Profiles

Show/Hide | List Operations | Expand Operations



Routes & Directions | Google | X +

https://cloud.google.com/maps-platform/routes/

Google Cloud Sign in

Google Maps Platform Overview Products Pricing Docs Blog Contact sales Get started

Routes

Help your users find the best way to get from A to Z with comprehensive data and real-time traffic

GET STARTED

40 million miles of roads

Build with reliable navigation information wherever you are.

25 million updates daily

Count on accurate, real-time location information.

1 billion monthly active users

Scale confidently, backed by our infrastructure.



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