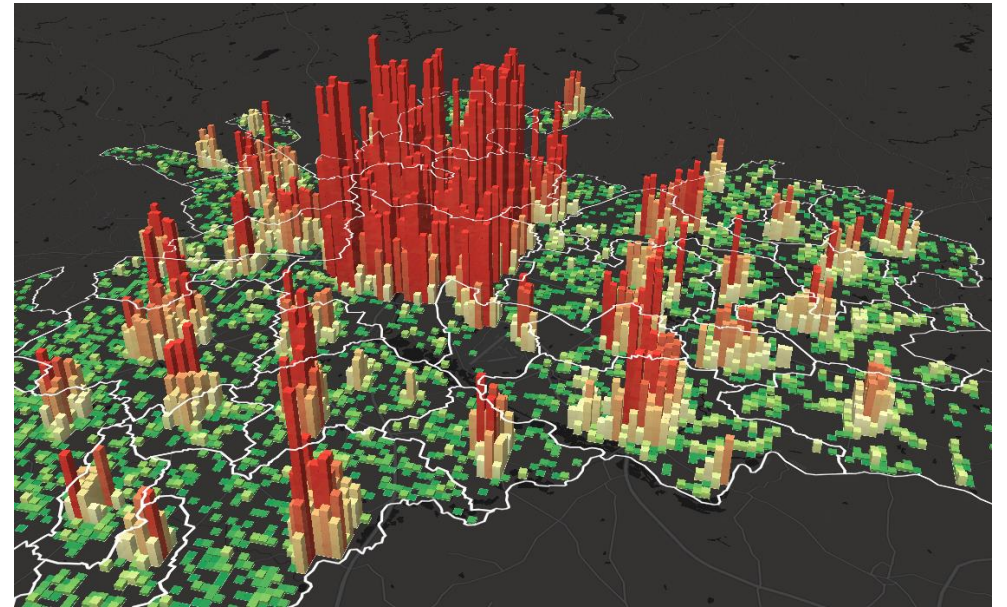




ATELIER : Introduction à la bibliothèque JavaScript MapboxGL



MapBoxGL

MapBoxGL est une bibliothèque JavaScript libre de cartographie en ligne *open-source* utilisant le WebGL pour l'affichage (tuiles vectorielles, affichage 3D)

<https://www.mapbox.com/mapbox-gl-js/>

Exemples: <https://www.mapbox.com/mapbox-gl-js/examples>

Tutoriels : <https://www.mapbox.com/help/tutorials/>

Documentation: <https://www.mapbox.com/mapbox-gl-js/api/>

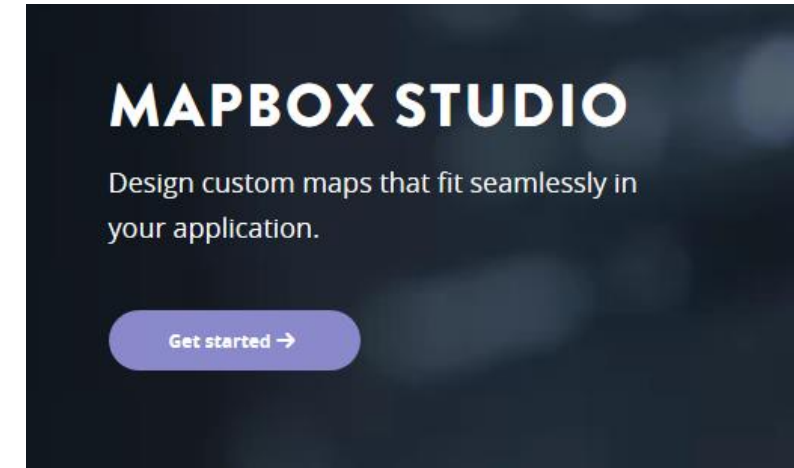


MapBox

L'écosystème Mapbox

- Mapbox Studio
 - Créer des fonds de carte (*style*)
 - Héberger des jeux de données (*tilesets*)
 - Sous forme de tuiles vectorielles

- API MapboxGL.js
 - Bibliothèque JavaScript pour créer des cartes Web
 - La mobilisation de MapboxGL nécessite une clef d'accès = besoin d'un compte Mapbox

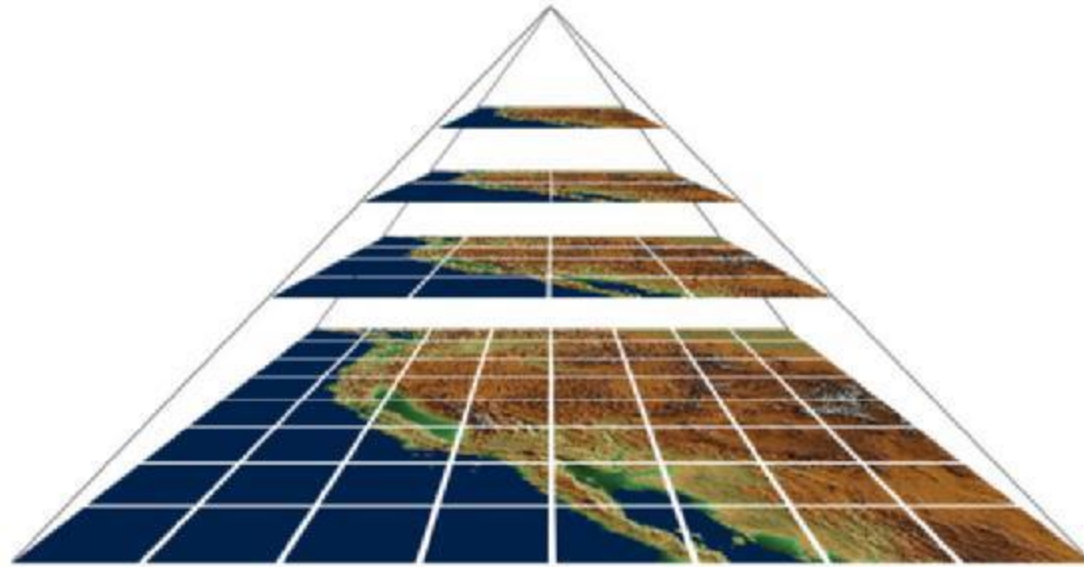


Mapbox GL JS

Current version: `mapbox-gl.js v0.44.0`

Mapbox GL JS is a JavaScript library that uses WebGL to render interactive maps from [vector tiles](#) and [Mapbox styles](#). It is part of the Mapbox GL ecosystem, which includes [Mapbox Mobile](#), a compatible renderer written in C++ with bindings for desktop and mobile platforms. To see what new features our team is working on, take a look at our [roadmap](#).

Webmapping



Pyramide de tuile

<http://maptime.io/anatomy-of-a-web-map/#38>

Webmercator : lat,long + z \leftrightarrow x,y,z

- <http://www.maptiler.org/google-maps-coordinates-tile-bounds-projection/>
 - https://wiki.openstreetmap.org/wiki/Slippy_map_tilenames
 - https://wiki.openstreetmap.org/wiki/Zoom_levels

Tuiles ?

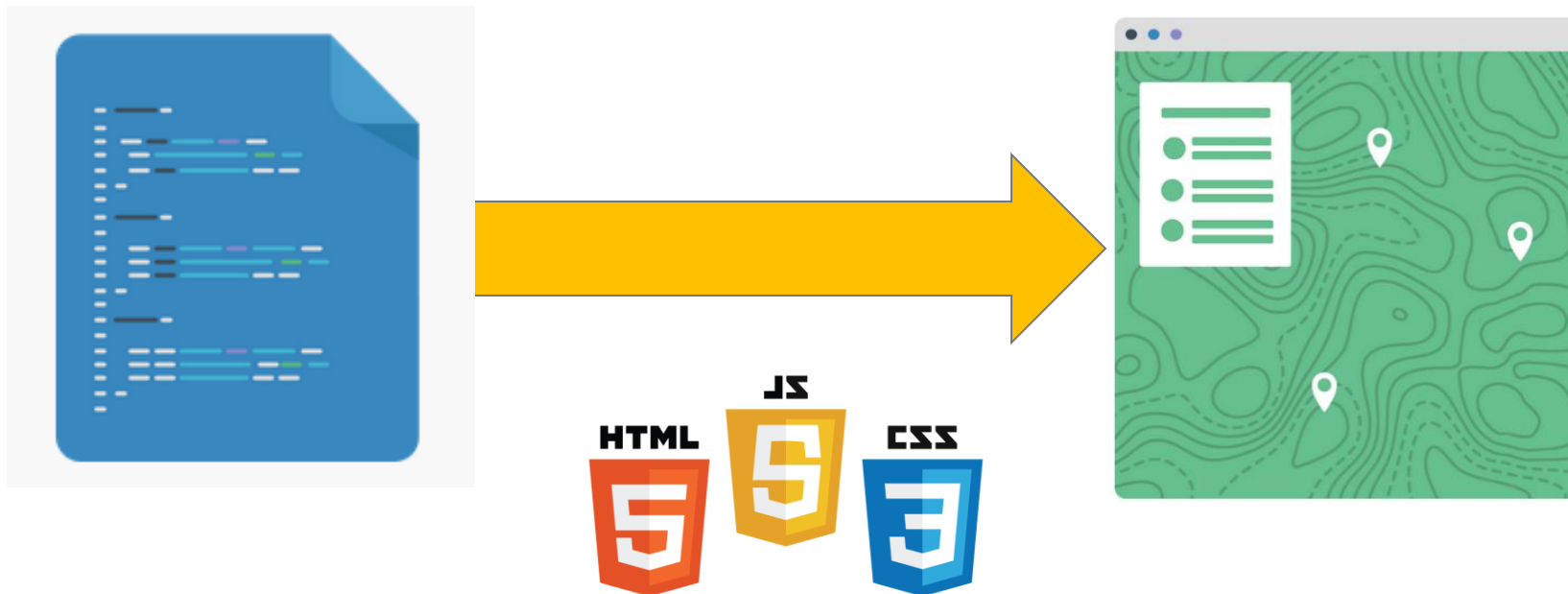
- Tuiles raster
 - Chaque tuile est une image png 256x256
 - (google maps ~ 2005->2013, leaflet,...)
- Tuiles vectorielles
 - Chaque tuile est un fichier de données géographique compressé
 - Séparation fond / forme + poids
 - (google maps 2013, mapbox-gl, tangram, ...)

Quelques exemples

- <https://www.mapbox.com/gallery/>
- <https://bl.ocks.org/mastersigat>
- <https://htmlpreview.github.io/?https://github.com/mastersigat/Plan-interactif/blob/master/Prototype.html#>
- <https://medium.com/@BorisMericskay/extrusion-3d-de-donn%C3%A9es-spatiales-9c67d76431b9>

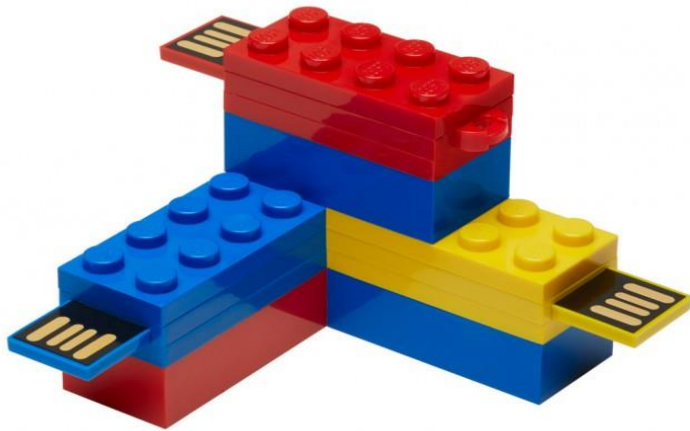
Objectifs atelier

- Publication de données spatiales sur le Web
- De la page HTML à l'application en ligne
- Familiarisation avec le Javascript, l'HTML et le CSS



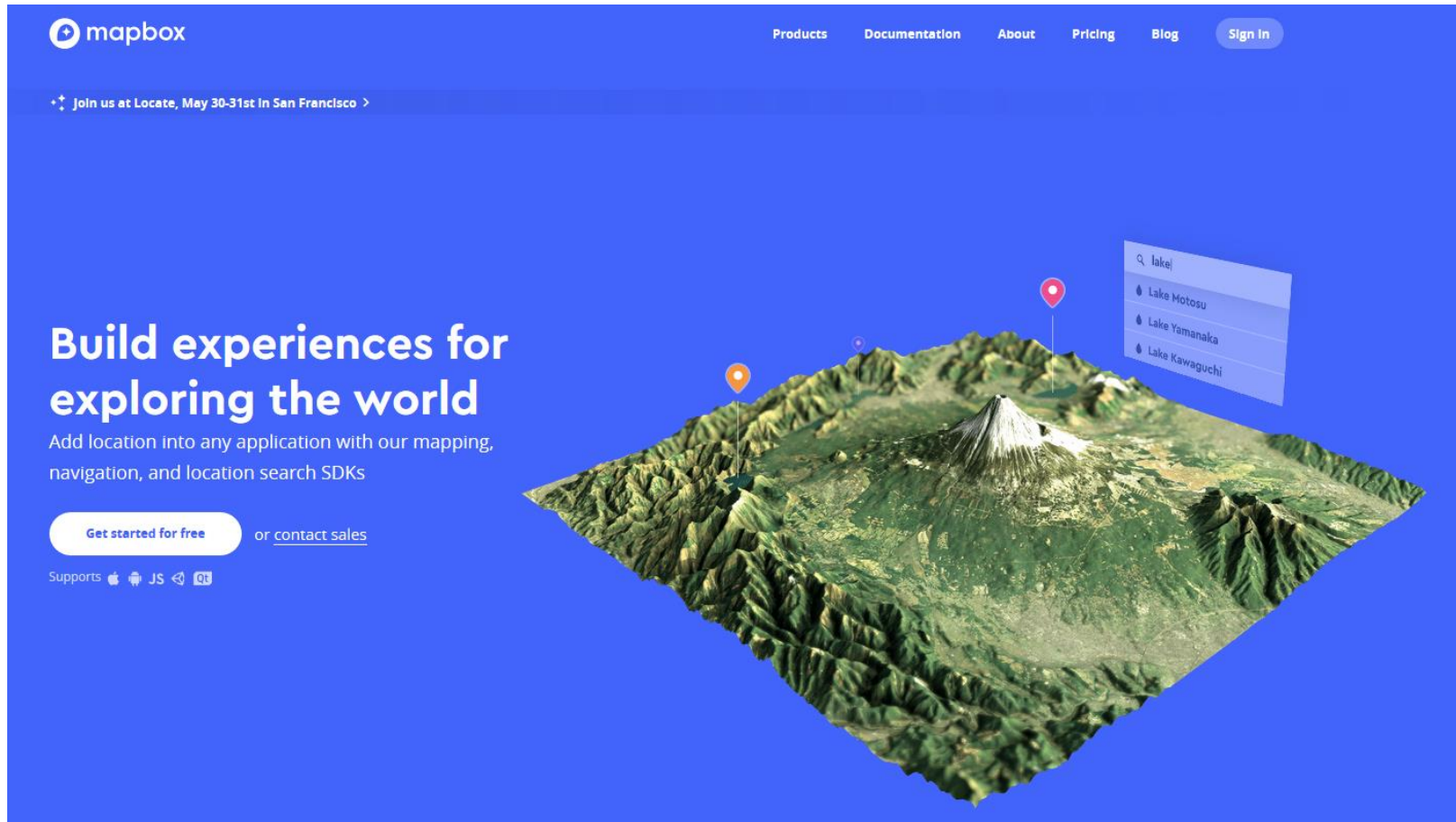
Coder = LEGO

- Vous aller à partir de maintenant « jouer » au LEGO en assemblant des lignes de codes pour construire des cartes sur le Web!



```
4 L.mapbox.accessToken = 'pk.eyJ1IjoibmluYW5vdW41LCJhIjo1SkN4dndmTSJ9.6p1St07M5AuAbDa601m54A';
5 var map = L.mapbox.map('map', 'mapbox.light').setView([48.11,-1.66], 13);
6 // Ajouts des WMS
7
8 var orthophotographie = L.tileLayer.wms('http://geobretagne.fr/geoserver/photo/wms?', {
9   format: 'image/png',
10  transparent: true,
11  layers: 'ortho-ouverte'
12 }).addTo(map);
13
14 var quartiers = L.tileLayer.wms('http://geobretagne.fr/geoserver/rennesmetropole/wms?', {
15   format: 'image/png',
16   transparent: true,
17   layers: 'quartiers_vdr'
18 }).addTo(map);
```

Créer un compte Mapbox



The screenshot shows the Mapbox website homepage. At the top left is the Mapbox logo. The navigation menu includes 'Products', 'Documentation', 'About', 'Pricing', 'Blog', and a 'Sign In' button. A banner below the navigation says 'Join us at Locate, May 30-31st in San Francisco'. The main content area has a blue background. On the left, the text reads 'Build experiences for exploring the world' followed by 'Add location into any application with our mapping, navigation, and location search SDKs'. Below this is a 'Get started for free' button and a link to 'contact sales'. At the bottom left, it says 'Supports' followed by icons for Apple, Android, JavaScript, and OpenStreetMap. On the right, a 3D topographic map of a mountain range is shown with several location pins. A search dropdown menu is open over the map, showing the search term 'lake' and three results: 'Lake Motosu', 'Lake Yamanaka', and 'Lake Kawaguchi'.

mapbox





Products Documentation About Pricing Blog Sign In

Join us at Locate, May 30-31st in San Francisco >

Build experiences for exploring the world

Add location into any application with our mapping, navigation, and location search SDKs

[Get started for free](#) or [contact sales](#)

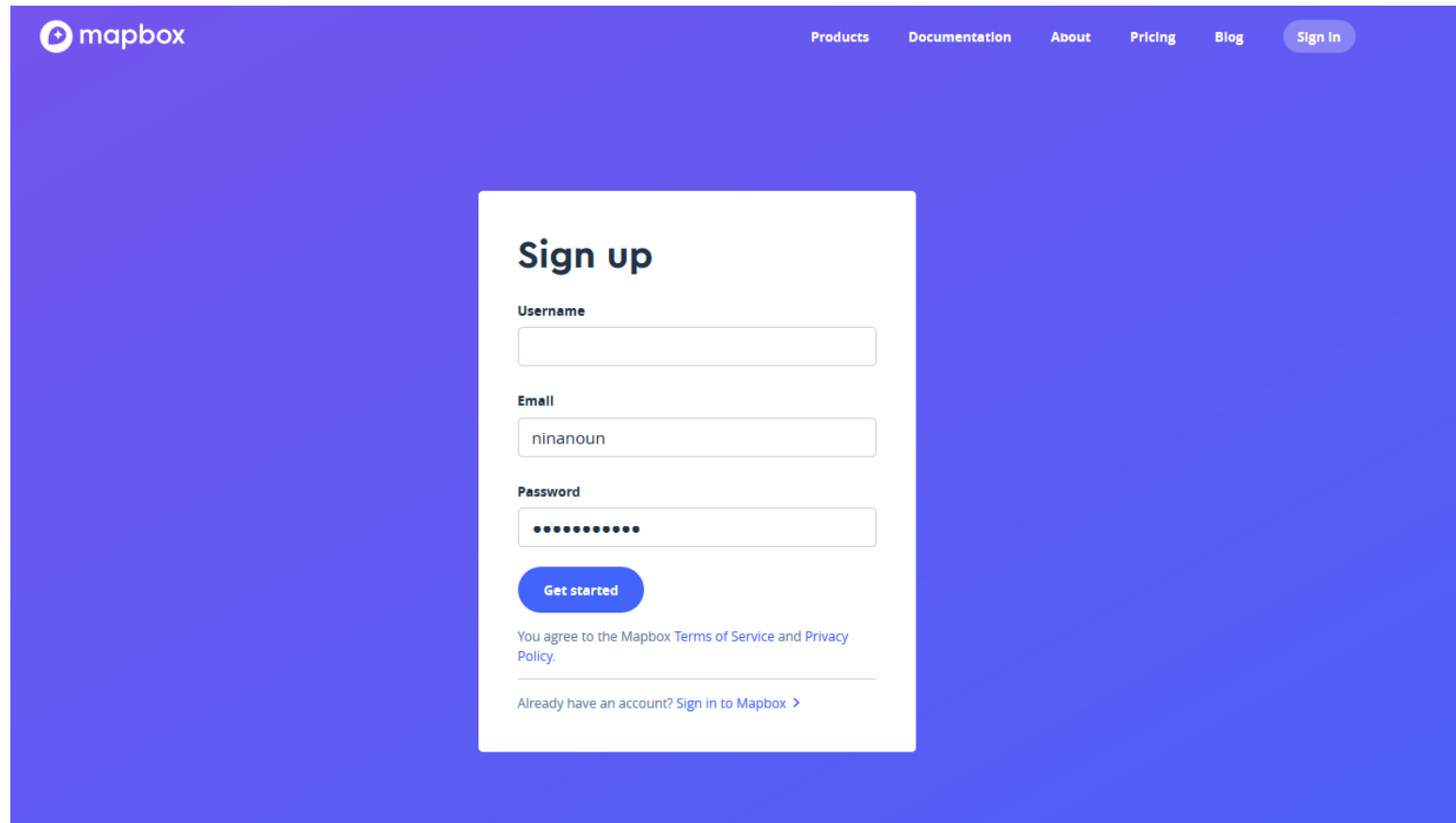
Supports   JS  

lake

- Lake Motosu
- Lake Yamanaka
- Lake Kawaguchi

Créer un compte Mapbox

<https://www.mapbox.com/signup/>

A screenshot of the Mapbox sign-up page. The page has a solid blue background. In the top left corner is the Mapbox logo, which consists of a white circle with a blue arrow pointing right, followed by the text "mapbox" in white. In the top right corner, there is a navigation menu with the following items: "Products", "Documentation", "About", "Pricing", "Blog", and "Sign In" (which is highlighted with a white background). The main content is a white rectangular form titled "Sign up" in bold black text. Below the title are three input fields: "Username" (empty), "Email" (containing "ninanoun"), and "Password" (filled with ten black dots). Below these fields is a blue button with the text "Get started" in white. Underneath the button, there is a line of text: "You agree to the Mapbox Terms of Service and Privacy Policy." followed by a horizontal line. At the bottom of the form, there is a link: "Already have an account? Sign in to Mapbox >".

Limitations d'un compte gratuit

PAY-AS-YOU-GO

Free to start \$0 <i>up to</i>	Web apps 50,000 map views / mo 50,000 geocode requests / mo 50,000 directions requests / mo 50,000 Matrix elements / mo	Mobile SDKs 50,000 monthly active users 50,000 geocode requests / mo 50,000 directions requests / mo 50,000 Matrix elements / mo
Then \$0.50 <i>per</i>	Web apps 1,000 web map views 1,000 geocode requests 1,000 directions requests 1,000 Matrix elements / mo	Mobile SDKs 500 monthly active users 1,000 geocode requests 1,000 directions requests 1,000 Matrix elements / mo

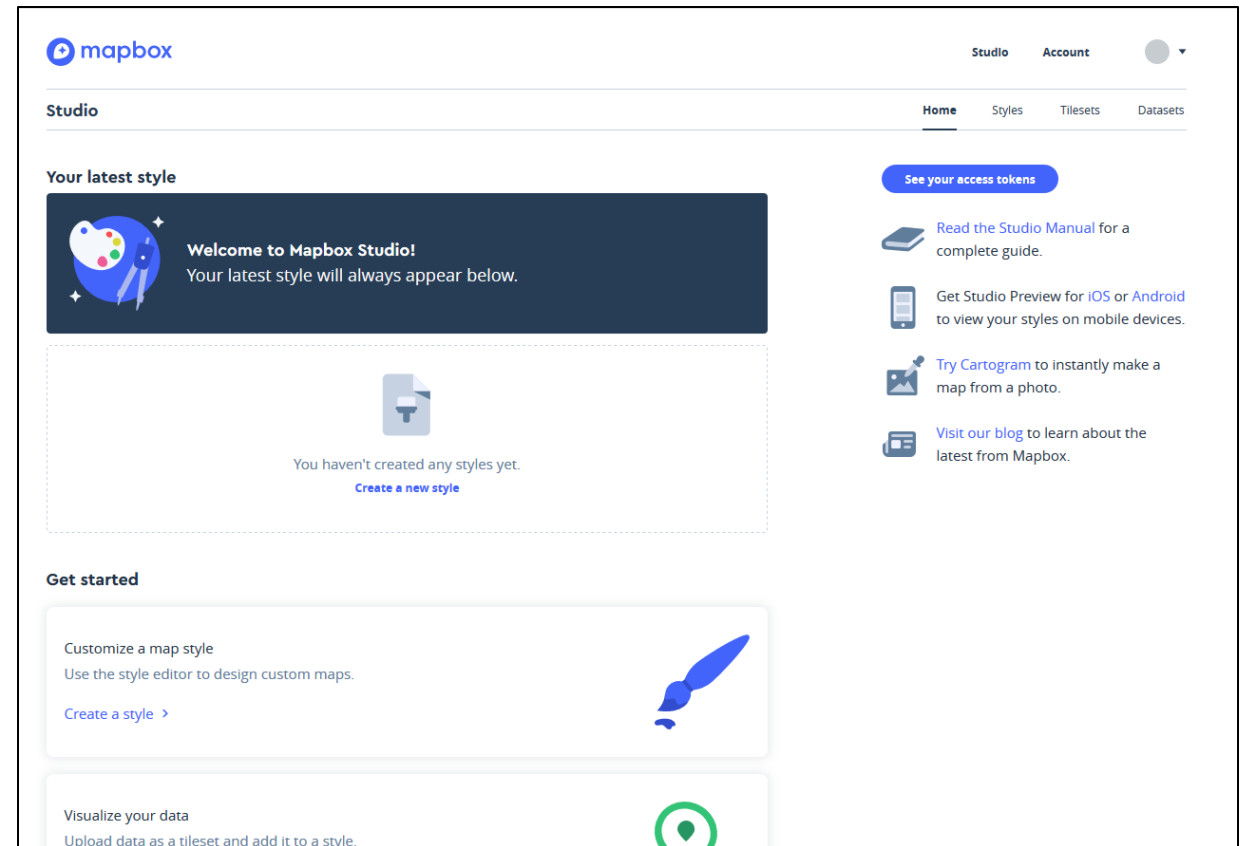
Pay-as-you-go plan includes

Satellite & street maps	Mapbox Studio	50 GB tileset storage
5 GB dataset storage	Unlimited Studio styles	Public/free web & mobile apps

[Current plan](#)

Mapbox Studio

- Environnement en ligne de gestion des :
 - Fonds de carte (*Styles*)
 - Jeux de données (*Tilesets*)
 - Des clefs d'accès à l'API (*Account*)



Mapbox Studio

- Créer et gérer des jeux de données (Tilesets)

mapbox

Studio Account

Studio Home Styles **Tilesets** Datasets

Tilesets

Search

Sort by Name Modified Size [New tileset](#)

5 Default tilesets

- Terrain (RGB-encoded dem)**
Default tileset [Menu](#)
- Mapbox Satellite**
Default tileset [Menu](#)
- Mapbox Terrain V2**
Default tileset [Menu](#)
- Mapbox Traffic V1**
Default tileset [Menu](#)
- Mapbox Streets v7**
Default tileset [Menu](#)

0 tilesets

What is a tileset?

A tileset is a collection of raster or vector data broken up into a uniform grid of square tiles at 22 preset zoom levels. [Read more.](#)

How to create tilesets

Click [New tileset](#) to upload your data. Mapbox renders [vector tiles](#) from your data so you can create styles from it.

You can also use Mapbox default tilesets. Read the [Vector tiles docs](#) to find out more.

How to use tilesets

Once your vector tiles are ready, you can add them to a new or existing style. First open your style in the style editor. Next, you can either create a new layer with this tileset as the source, or you can change an existing layer's data source to this tileset.

Importer des données dans Mapbox Studio

- Mapbox studio permet de stocker 50GO de données vectorielles et matricielles



The image shows the Mapbox Studio interface. On the left, the 'Tilesets' page is visible, featuring a search bar, sort options (Name, Modified, Size), and a 'New tileset' button highlighted with a red box. Below this, four default tilesets are listed: Mapbox Satellite, Mapbox Traffic V1, Mapbox Terrain V2, and Mapbox Streets v7. An orange arrow points from the 'New tileset' button to the right, where a 'New tileset' dialog box is open. The dialog box contains a dashed box for file upload, a folder icon, and instructions: 'Drag and drop a MBTiles, KML, GPX, GeoJSON, Shapefile (zipped), or CSV file here to convert it into vector tiles. To create raster tiles, drag and drop a GeoTIFF file.' A 'Select a file' button is also present.

Tilesets

Search

Sort by **Name** Modified Size

New tileset

4 Default tilesets

- Mapbox Satellite**
Default tileset
- Mapbox Traffic V1**
Default tileset
- Mapbox Terrain V2**
Default tileset
- Mapbox Streets v7**
Default tileset

New tileset [Upload file](#) [Create from dataset](#)

Drag and drop a MBTiles, KML, GPX, GeoJSON, Shapefile (zipped), or CSV file here to convert it into vector tiles. To create raster tiles, drag and drop a GeoTIFF file.

Select a file

Mapbox Studio

- Créer et gérer des fonds de cartes (Styles)

mapbox

Studio Account

Studio Home **Styles** Tilesets Datasets

Styles

Create a new style

Basic Template
The best way to get started. [Create](#)

More ways to create
Pick a template or upload a style.

How to create styles
Customize a template style, upload your own stylesheet, or design from scratch by choosing "More ways to create".
[View Classic styles or projects >](#)

Your styles

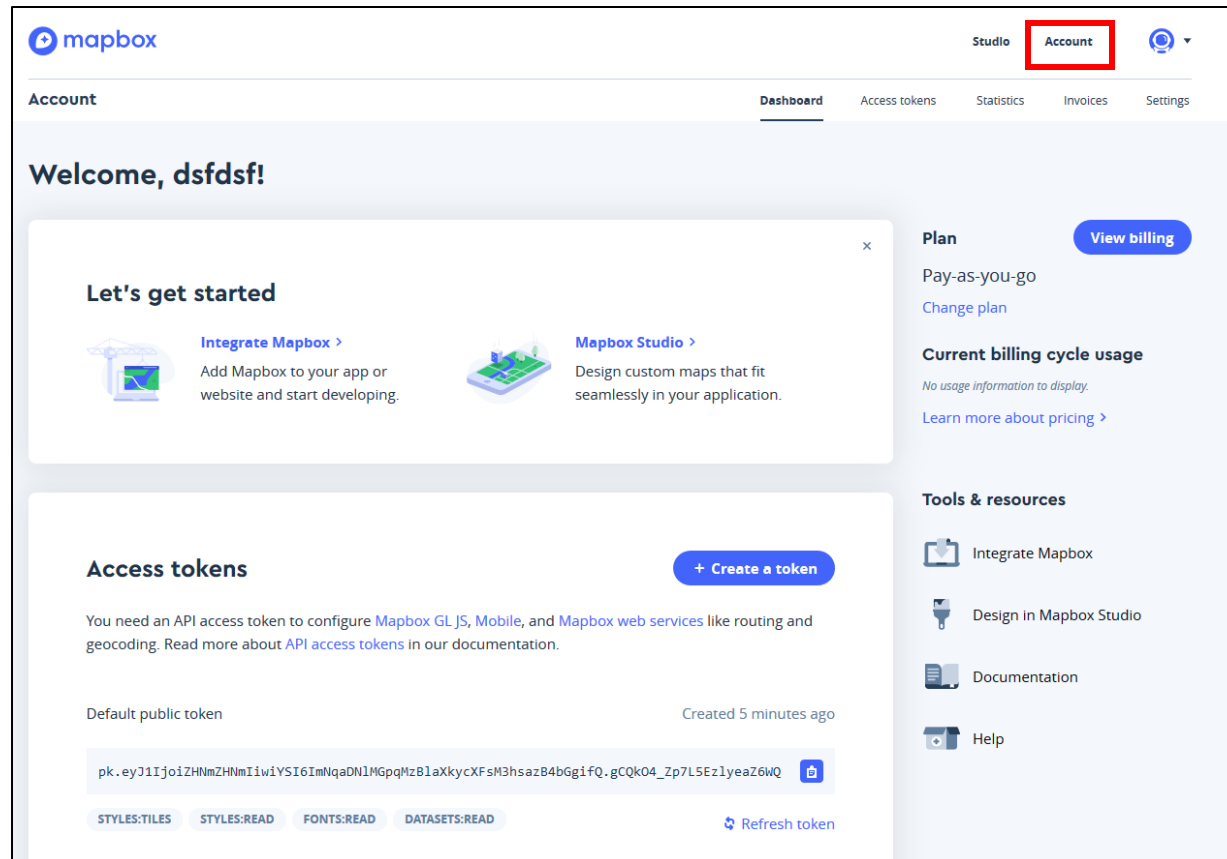
Search Sort by Name Modified

You haven't created any styles yet.
[Create a style](#)

[Changelog](#) [Developer documentation](#) [Studio manual](#) [Contact](#)
[Terms](#) + [Privacy](#) © Mapbox

Mapbox Studio

- Créer et gérer ses clefs d'accès à l'API (Access tokens)



The screenshot displays the Mapbox Studio Account dashboard. At the top, the 'Account' tab is highlighted in the navigation bar. The main content area is titled 'Welcome, dsfdsf!' and features a 'Let's get started' section with two cards: 'Integrate Mapbox' and 'Mapbox Studio'. Below this, the 'Access tokens' section is visible, showing a '+ Create a token' button and a list of tokens. The first token is a 'Default public token' created 5 minutes ago, with a visible token string: 'pk.eyJ1Ijo1ZHNmZHNmIiw1YSI6ImNqaDNlMGpzMzB1aXkycXFzM3hsazB4bGg1fQ.gCQkO4_Zp7L5Ez1yeaZ6WQ'. Below the token string are four permission tags: 'STYLES:TILES', 'STYLES:READ', 'FONTS:READ', and 'DATASETS:READ', along with a 'Refresh token' button. On the right side, there is a 'Plan' section with a 'View billing' button, and a 'Tools & resources' section with links to 'Integrate Mapbox', 'Design in Mapbox Studio', 'Documentation', and 'Help'.

Template de départ

```
<!DOCTYPE html>
<html>
<head>
  <meta charset='utf-8' />
  <title>MapboxGL</title>

  <script src='https://api.tiles.mapbox.com/mapbox-gl-js/v0.45.0/mapbox-gl.js'></script>
  <link href='https://api.tiles.mapbox.com/mapbox-gl-js/v0.45.0/mapbox-gl.css' rel='stylesheet' />

  <style>
  #map {position:absolute; top:0; bottom:0; width:100%;}
  </style>

</head>

<body>
<div id='map'></div>

<script>
  // AccessToken
  mapboxgl.accessToken = 'pk.eyJ1IjoibmluYW5vdW4iLCJhIjoieY2pjdHBoZGlzMnV4dDJxcGc5azJkbWRiYSJ9.o4dZRrdHcgVEKCveOXG1YQ';

  // Configuration de la carte
  var map = new mapboxgl.Map({
    container: 'map',
    style: 'mapbox://styles/mapbox/light-v9', // Fond de carte
    center: [-1.68, 48.12], // lat/long
    zoom: 15, // zoom
    pitch: 50, // Inclinaison
    bearing: -10 // Rotation
  });
</script>

</body>
</html>
```

Template de départ

```
<!DOCTYPE html>
<html>
<head>
  <meta charset='utf-8' />
  <title>MapboxGL</title>

  <script src='https://api.tiles.mapbox.com/mapbox-gl-js/v0.45.0/mapbox-gl.js'></script>
  <link href='https://api.tiles.mapbox.com/mapbox-gl-js/v0.45.0/mapbox-gl.css' rel='stylesheet' />

  <style>
  #map { position:absolute; top:0; bottom:0; width:100%; }
  </style>

</head>

<body>
<div id='map'></div>

<script>
  // AccessToken
  mapboxgl.accessToken =
  'pk.eyJ1IjoibmluYW5vdW4iLCJhIjoiiY2pjdHBoZGZGlzbnV4dDZxcGc5azJkbWRiYSJ9.o4dZRrdHcgVEKCveOXG1YQ';

  // Configuration de la carte
  var map = new mapboxgl.Map({
    container: 'map',
    style: 'mapbox://styles/mapbox/basic-v9', // fond de carte
    center: [-1.68, 48.12], // lat/long
    zoom: 15, // zoom
    pitch: 50, // Inclinaison
    bearing: -10 // Rotation
  });

</script>

</body>
</html>
```

Appel API MapboxGL

Style de la carte

Clef d'accès à l'API

Fond de carte
Niveau de zoom
Centrage de la carte (X,Y)
Inclinaison de la carte
Rotation de la carte

Coder en ligne ou en local

- Utiliser un éditeur de code installé

OU

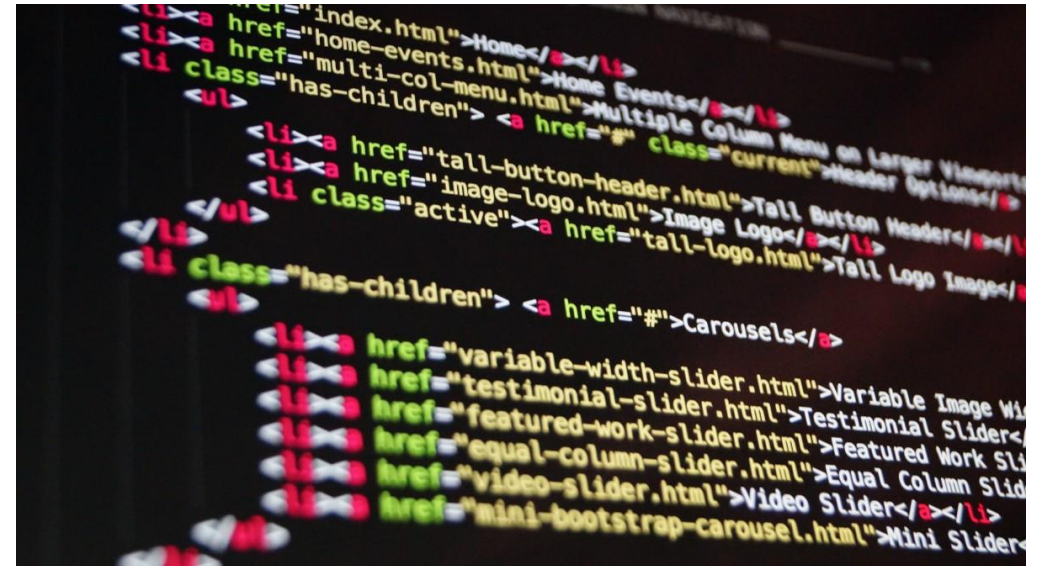
- Utiliser un éditeur de code en ligne

<https://liveweave.com/>

<https://plnkr.co/>

<https://jsfiddle.net/>

...



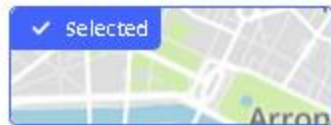
Les fonds de carte

Changer de fond de carte

- Les fonds de cartes de Mapbox > tuiles vectorielles 😊

```
style: 'mapbox://styles/mapbox/dark-v9',
```

→ Attention pas de majuscule au nom du fond de carte



Basic

Simple and flexible starting template.

❖ Streets



Bright

Template for complex custom basemaps.

❖ Streets



Streets

A complete basemap, perfect for incorporating your own data.

❖ Streets, Terrain



Satellite

A beautiful global satellite and aerial imagery layer.

❖ Satellite



Satellite Streets

Global imagery enhanced with road and label hierarchy.

❖ Satellite, Streets



Navigation Preview Day

Traffic on a light streets basemap that highlights congestion.

❖ Streets, Terrain, Traffic



Outdoors

General basemap tailored to hiking, biking, and sport.

❖ Streets, Terrain



Dark

Subtle dark backdrop for data visualizations.

❖ Streets, Terrain



Light

Subtle light backdrop for data visualizations.

❖ Streets, Terrain



Navigation Preview Night

Traffic on a dark streets basemap that highlights congestion.

❖ Streets, Terrain, Traffic



Navigation Guidance Day

Light basemap tailored to in-app navigation.

❖ Streets, Terrain



Navigation Guidance Nig...

Dark basemap tailored to in-app navigation.

❖ Streets, Terrain

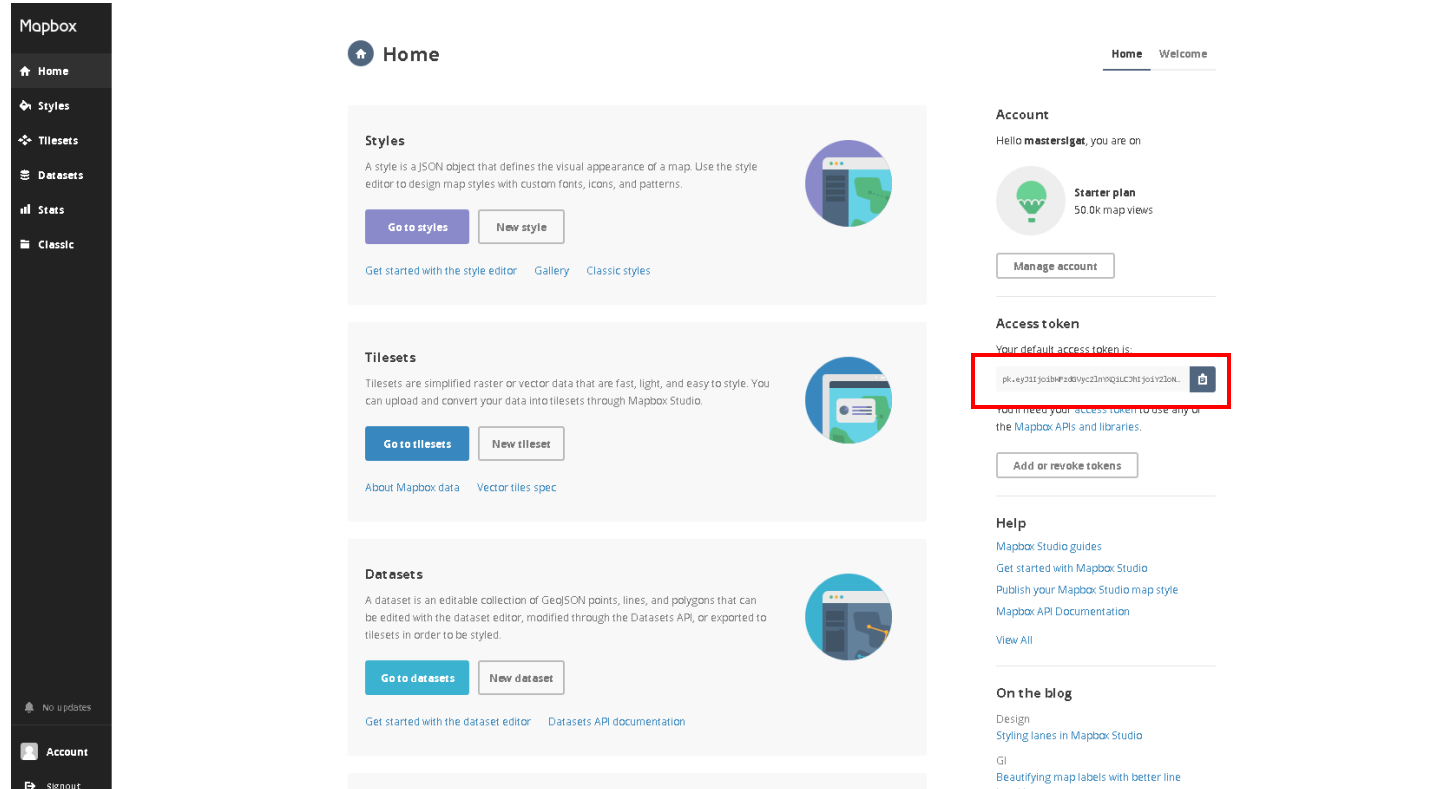
Changer de fond de carte

```
1 <!DOCTYPE html>
2 <html>
3 <head>
4   <meta charset='utf-8' />
5   <title>MapboxGL</title>
6
7   <script src='https://api.tiles.mapbox.com/mapbox-gl-js/v0.44.0/mapbox-gl.js'></script>
8   <link href='https://api.tiles.mapbox.com/mapbox-gl-js/v0.44.0/mapbox-gl.css' rel='stylesheet' />
9
10 <style>
11 #map { position:absolute; top:0; bottom:0; width:100%; }
12 </style>
13
14 </head>
15
16 <body>
17 <div id='map'></div>
18
19 <script>
20   // AccesToken
21   mapboxgl.accessToken = 'pk.eyJ1IjoibmluYW5vdW4iLCJhIjoieY2pjdHB0ZG1zMnV4dDJxcGc5azJkbWRiYSJ9.o4dZRrdHcgVEKCveC
22
23   // Configuration de la carte
24 var map = new mapboxgl.Map({
25   container: 'map',
26   style: 'mapbox://styles/mapbox/satellite-v9',
27   center: [-1.68, 48.12], // lat/long
28   zoom: 15, // zoom
29   pitch: 50, // Inclinaison
30   bearing: -10 // Rotation
31 });
32
33 </script>
34
35 </body>
36 </html>
37
```



Mettre un fond de carte personnel

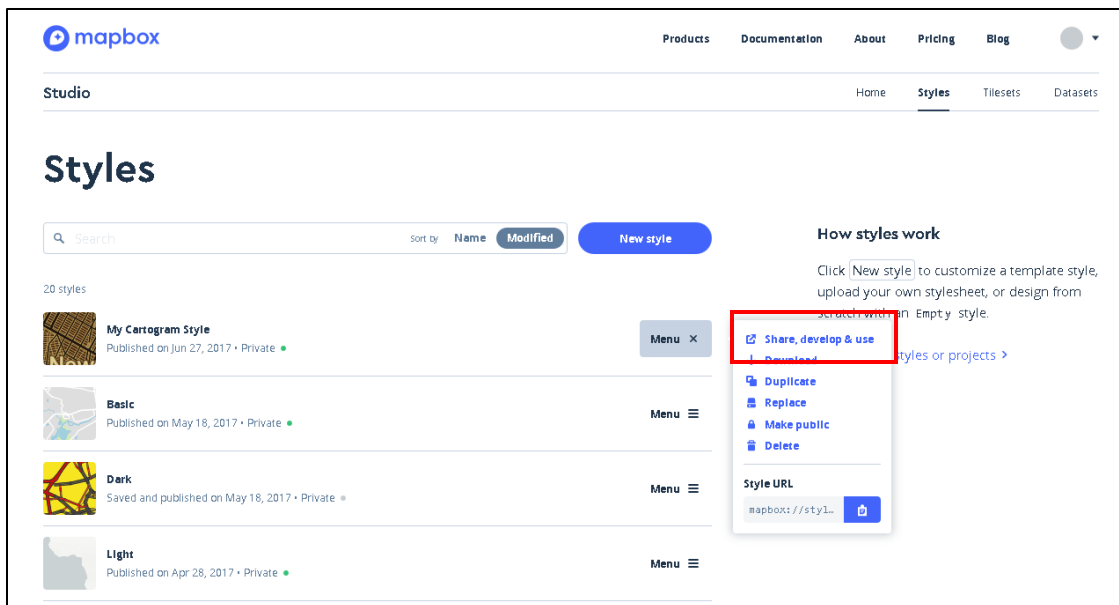
- Mettre votre clef d'accès personnelle à la place de celle fournie



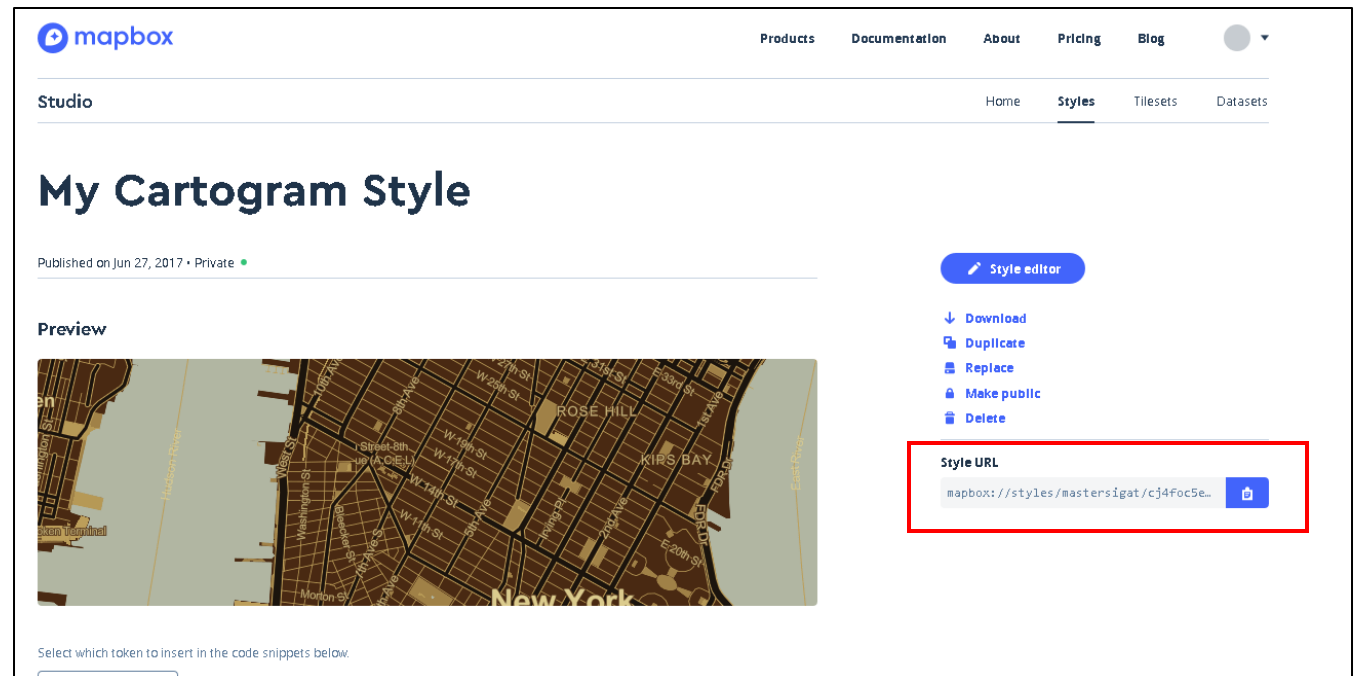
The image shows a screenshot of the Mapbox account management page. On the left is a dark sidebar with navigation links: Home, Styles, Tilesets, Datasets, Stats, and Classic. The main content area is titled 'Home' and contains three sections: 'Styles', 'Tilesets', and 'Datasets'. Each section has a description, a 'Go to [category]' button, and a 'New [category]' button. On the right side, there is an 'Account' section with a welcome message, a 'Starter plan' badge, and a 'Manage account' button. Below that is the 'Access token' section, where the 'Your default access token is:' label is followed by a text field containing a long alphanumeric string. This text field is highlighted with a red rectangular box. Below the text field is a 'Copy' icon and an 'Add or revoke tokens' button. At the bottom of the right sidebar, there is a 'Help' section with links to guides, getting started, publishing styles, and API documentation, and an 'On the blog' section with a link to a design article.

Incorporer un fond de carte personnel

- Récupérer l'URL de votre fond de carte personnel



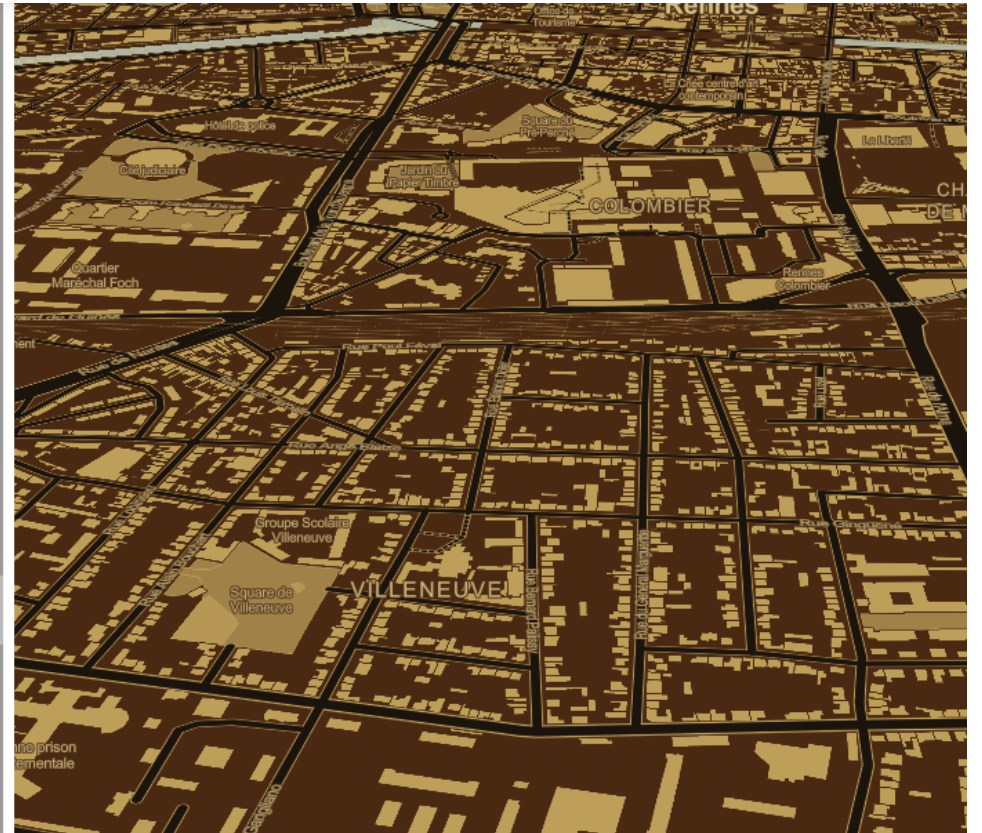
The screenshot shows the Mapbox Studio interface. At the top, there's a navigation bar with 'Products', 'Documentation', 'About', 'Pricing', and 'Blog'. Below that, the 'Studio' header includes 'Home', 'Styles', 'Tilesets', and 'Datasets'. The main heading is 'Styles'. A search bar and a 'New style' button are visible. A list of styles is shown, with 'My Cartogram Style' at the top. A context menu is open over this style, listing options: 'Share, develop & use' (highlighted in red), 'Duplicate', 'Replace', 'Make public', and 'Delete'. Below the menu, the 'Style URL' is displayed as 'mapbox://sty1...' with a copy icon.



The screenshot shows the 'My Cartogram Style' page in Mapbox Studio. The navigation bar and 'Studio' header are the same as in the previous screenshot. The main heading is 'My Cartogram Style'. Below it, the publication date 'Published on Jun 27, 2017 • Private' is shown. A 'Style editor' button is visible. A 'Preview' section shows a map of New York City with a cartogram overlay. On the right side, a list of actions is shown: 'Download', 'Duplicate', 'Replace', 'Make public', and 'Delete'. Below this list, the 'Style URL' is displayed as 'mapbox://styles/mastersigat/cj4Foc5e...' and is highlighted in a red box. A copy icon is next to the URL.

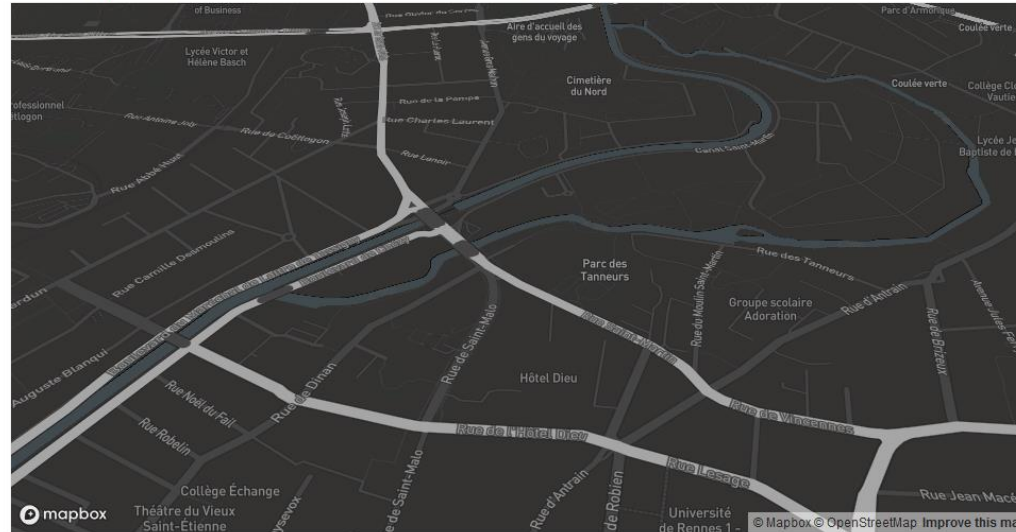
Incorporer un fond de carte personnel

```
1 <!DOCTYPE html>
2 <html>
3 <head>
4   <meta charset='utf-8' />
5   <title>MapboxGL</title>
6
7   <script src='https://api.tiles.mapbox.com/mapbox-gl-js/v0.44.0/mapbox-gl.js'></script>
8   <link href='https://api.tiles.mapbox.com/mapbox-gl-js/v0.44.0/mapbox-gl.css' rel='stylesheet' />
9
10  <style>
11  #map { position:absolute; top:0; bottom:0; width:100%; }
12  </style>
13
14 </head>
15
16 <body>
17 <div id='map'></div>
18
19 <script>
20   // AccesToken
21  mapboxgl.accessToken = 'pk.eyJ1IjoibWFkdGVyc2l1bnYXQ1L0JhIjo1Y2l0NG9mamxwMHP2dHgzYTJh1b2Rteij9.dDYKXX9907pbT6sTAJ4FvA';
22
23   // Configuration de la carte
24  var map = new mapboxgl.Map({
25    container: 'map',
26    style: 'mapbox://styles/mastersigat/cj4foc5eo3hsr2sqliomdgeuvd',
27    center: [-1.68, 48.12], // lat/long
28    zoom: 15, // zoom
29    pitch: 50, // Inclinaison
30    bearing: -10 // Rotation
31  });
32
33 </script>
34
35 </body>
36 </html>
37
```



Exemple

#MapboxGL / Première carte



Built with [blockbuilder.org](#)

[Open](#)

index.html

```
<!DOCTYPE html>
<html>
<head>
  <meta charset='utf-8' />
  <title>Display a map</title>
  <meta name='viewport' content='initial-scale=1,maximum-scale=1,user-scalable=no' />
  <script src='https://api.tiles.mapbox.com/mapbox-gl-js/v0.44.0/mapbox-gl.js'></script>
  <link href='https://api.tiles.mapbox.com/mapbox-gl-js/v0.44.0/mapbox-gl.css' rel='stylesheet' />
</head>
<body <!-- margin: 0; padding: 0; -->
```

<https://blockbuilder.org/mastersigat/3b97a088768a11552fa9c85a1806f3e5>

Ajouter des données

OSM, données hébergées et données en local

Ajout de données OSM

- MapboxGL permet aussi de mobiliser des données OSM
 - Le jeu de données (*tileset*) Mapbox Streets v7 propose un ensemble de couches OSM (routes, bâtiments, labels, hydrologie,...)

Mapbox Streets v7

Default tileset

ID du tileset OSM

Map ID
mapbox.mapbox-streets-v7

Details
Learn about the layers and fields in the Mapbox Streets v7 source

Format ptbf | **Type** vector

Zoom extent
20 - 216
Data will be visible above zoom 16, but may appear simplified. [Learn how to adjust zoom extent](#)

Bounds
-180 0, -85 1, 180 0, 85 1

Layer details

Nom de la couche	Propriétés
admin	4 propriétés
boundary	all others are 0 state(s) a boundary is part of. Format: 'AA' or 'AA-BB'
maritime	Number. Maritime boundaries are 1, all others are 0.
aeroway	1 propriété type One of: runway, taxiway, apron
airport_label	13 propriétés
name_fr	French name of the airport

Mapbox Streets V7 | mapbox.mapbox-streets-v7

admin	aeroway	airport_label
barrier_line	building	country_label
houseum_l...	landuse	landuse_ove...
marine_label	motorway_j...	mountain_p...
place_label	poi_label	rail_station_l...
road	road_label	state_label
water	water_label	waterway
waterway_la...		

Ajout de données OSM

- Ajouter cette commande à la fin du script

On appelle ici les routes issues d'OSM

```
map.on('load', function () {  
  
  map.addSource('mapbox-streets-v7', {  
    type: 'vector',  
    url: 'mapbox://mapbox.mapbox-streets-v7'});  
  
  map.addLayer({  
    "id": "Routes",  
    "type": "line",  
    "source": "mapbox-streets-v7",  
    "layout": {'visibility': 'visible'},  
    "source-layer": "road",  
    "paint": {"line-color": "#FF7F50", "line-width": 1}  
  });  
  
});
```

Ajout de données OSM

- Ajouter cette commande à la fin du script

On appelle ici les routes

```
map.on('load', function () {
```

```
  map.addSource('mapbox-streets-v7', {  
    type: 'vector',  
    url: 'mapbox://mapbox.mapbox-streets-v7'});
```

Définition de la source de données

```
  map.addLayer({  
    "id": "Routes",  
    "type": "line",  
    "source": "mapbox-streets-v7",  
    "layout": { 'visibility': 'visible' },  
    "source-layer": "road",  
    "paint": { "line-color": "#FF7F50", "line-width": 1 }  
  });  
});
```

C couche de données

Ajout de données OSM

```
1 <!DOCTYPE html>
2 <html>
3 <head>
4   <meta charset='utf-8' />
5   <title>MapboxGL</title>
6
7   <script src='https://api.tiles.mapbox.com/mapbox-gl-js/v0.44.0/mapbox-gl.js'></script>
8   <link href='https://api.tiles.mapbox.com/mapbox-gl-js/v0.44.0/mapbox-gl.css' rel='stylesheet' />
9
10 <style>
11 #map { position:absolute; top:0; bottom:0; width:100%; }
12 </style>
13
14 </head>
15
16 <body>
17 <div id='map'></div>
18
19 <script>
20   // AccesToken
21   mapboxgl.accessToken = 'pk.eyJ1IjoibWFzdGVyc2lnYXQ1CjhiIjo1Y2lnOG9mamxwMHP2dHgxTBjY2h1b2Rteij9.dDYKXX9907pbT6sTAJ4FvA';
22
23   // Configuration de la carte
24   var map = new mapboxgl.Map({
25     container: 'map',
26     style: 'mapbox://styles/mapbox/dark-v9',
27     center: [-1.68, 48.12], // lat/long
28     zoom: 15, // zoom
29     pitch: 50, // Inclinaison
30     bearing: -10 // Rotation
31   });
32
33   // Ajout de données OSM
34   map.on('load', function () {
35
36     map.addSource('mapbox-streets-v7', {
37       type: 'vector',
38       url: 'mapbox://mapbox.mapbox-streets-v7'});
39
40     map.addLayer({
41       "id": "routes",
42       "type": "line",
43       "source": "mapbox-streets-v7",
44       "layout": { 'visibility': 'visible'},
45       "source-layer": "road",
46       "paint": { "line-color": "#FF7F50", "line-width": 1}
47     });
48   });
49
50
51 </script>
```



Ajout de données OSM

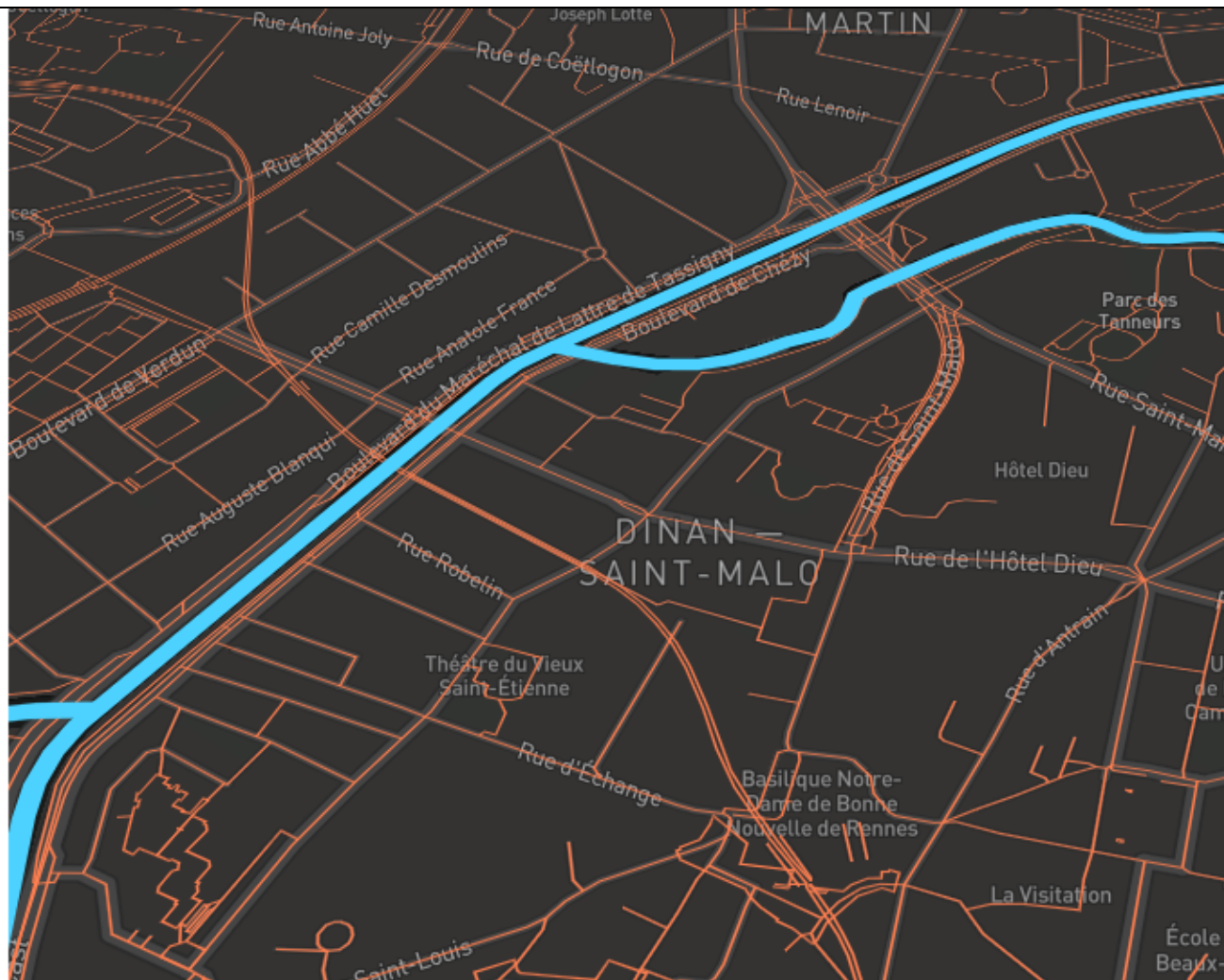
- Ajout du **réseau hydrographique**
 - Ajouter à la suite de l'appel de la couche des routes juste un appel de couche car la source est la même que pour les routes (*mapbox-streets-v7*)

```
// Hydrologie

map.addLayer({"id": "hydrologie",
              "type": "line",
              "source": "mapbox-streets-v7",
              "source-layer": "waterway",
              "paint": {"line-color": "#4dd2ff",
                       "line-width": 3}
});
```


Ajout de données OSM

```
33 // Ajout de données OSM
34
35 map.on('load', function () {
36
37 // Config source
38 map.addSource('mapbox-streets-v7', {
39   type: 'vector',
40   url: 'mapbox://mapbox.mapbox-streets-v7'});
41
42 // Ajout routes
43 map.addLayer({
44   "id": "routes",
45   "type": "line",
46   "source": "mapbox-streets-v7",
47   "layout": {'visibility': 'visible'},
48   "source-layer": "road",
49   "paint": {"line-color": "#FF7F50", "line-width": 1}
50 });
51
52 // Ajout hydrologie
53
54 map.addLayer({
55   "id": "hydrologie",
56   "type": "line",
57   "source": "mapbox-streets-v7",
58   "source-layer": "waterway",
59   "paint": {"line-color": "#4dd2ff",
60     "line-width": 10}
61 });
62
63 });
64
65 </script>
```



Ajout de données OSM

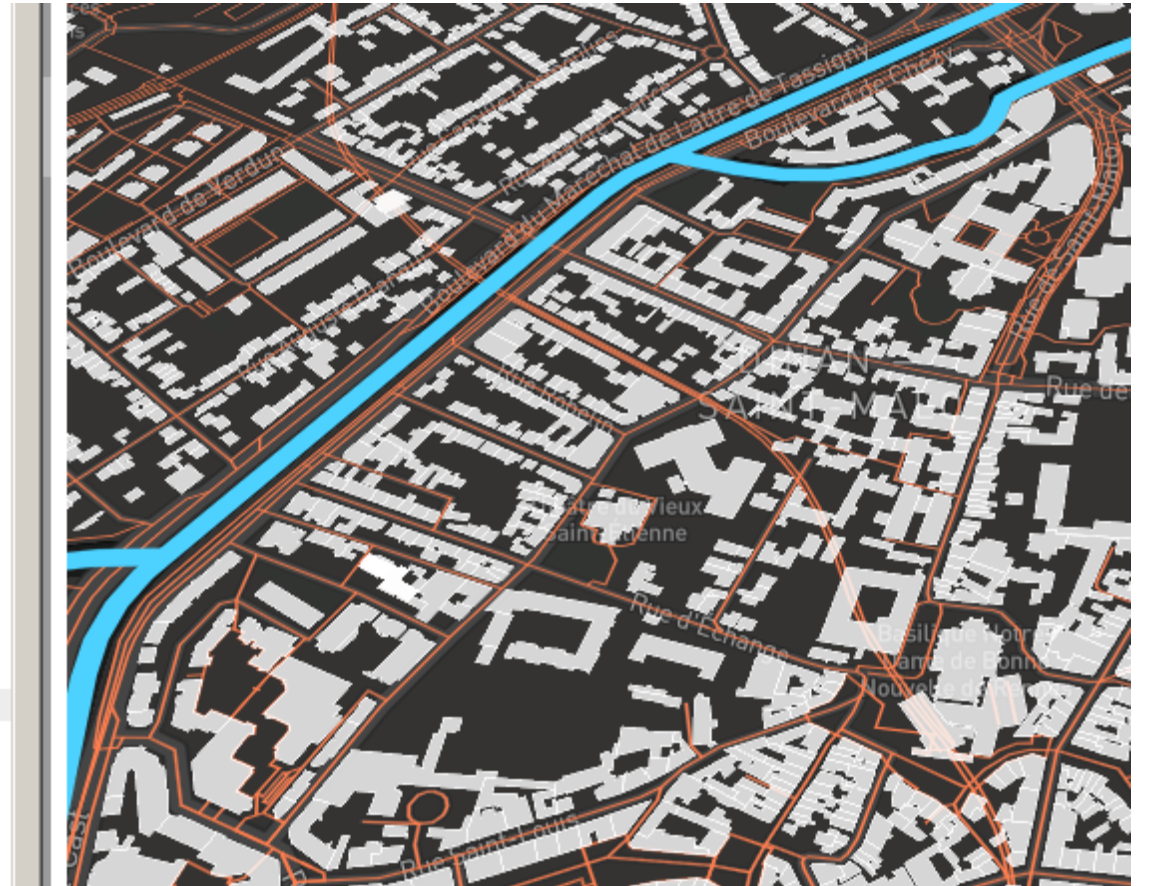
- Ajout les **bâtiments** (ajouter juste un appel de couche car la source est la même que pour les routes)

```
// Batiments

map.addLayer({
  "id": "batiments",
  "type": "fill",
  "source": "mapbox-streets-v7",
  "source-layer": "building",
  "paint": {"fill-color": "#FFFFFF",
            "fill-opacity": 0.8}
});
```

Ajout de données OSM

```
51  
52 // Ajout hydrologie  
53  
54 map.addLayer({  
55   "id": "hydrologie",  
56   "type": "line",  
57   "source": "mapbox-streets-v7",  
58   "source-layer": "waterway",  
59   "paint": {"line-color": "#4dd2ff",  
60            "line-width": 10}  
61 });  
62  
63 // Batiments  
64  
65 map.addLayer({  
66   "id": "batiments",  
67   "type": "fill",  
68   "source": "mapbox-streets-v7",  
69   "source-layer": "building",  
70   "paint": {"fill-color": "#FFFFFF",  
71            "fill-opacity": 0.8}  
72 });  
73  
74  
75 });  
76  
77 </script>  
78
```



Filtrer des données OSM

- Il est possible de filtrer les données pour l'affichage
 - On peut par exemple filtrer les routes selon leur classe



The image shows a screenshot of the Mapbox Streets v7 tileset configuration page. The left sidebar contains navigation options: Home, Styles, Tilesets (selected), Datasets, Stats, and Classic. The main content area displays the 'Mapbox Streets v7' tileset configuration. The 'road' layer is highlighted with a red box, showing its properties and a list of classes. The 'landuse' layer is also visible below it.

Mapbox Streets v7
Default tileset

road
5 properties | This layer contains mostly LineStrings

class One of: 'motorway', 'motorway_link', 'trunk', 'primary', 'secondary', 'tertiary', 'link', 'street', 'street_limited', 'pedestrian', 'construction', 'track', 'service', 'ferry', 'path', 'golf'

layer Number. Specifies z-ordering in the case of overlapping road segments. Common range is -5 to 5. Available from zoom level 13+.

oneway Text. Whether traffic on the road is one-way. One of: 'true', 'false'

structure Text. One of: 'none', 'bridge', 'tunnel', 'ford'. Available from zoom level 13+.

type In most cases, values will be that of the primary key from OpenStreetMap tags.

landuse
2 properties | This layer contains mostly Polygons

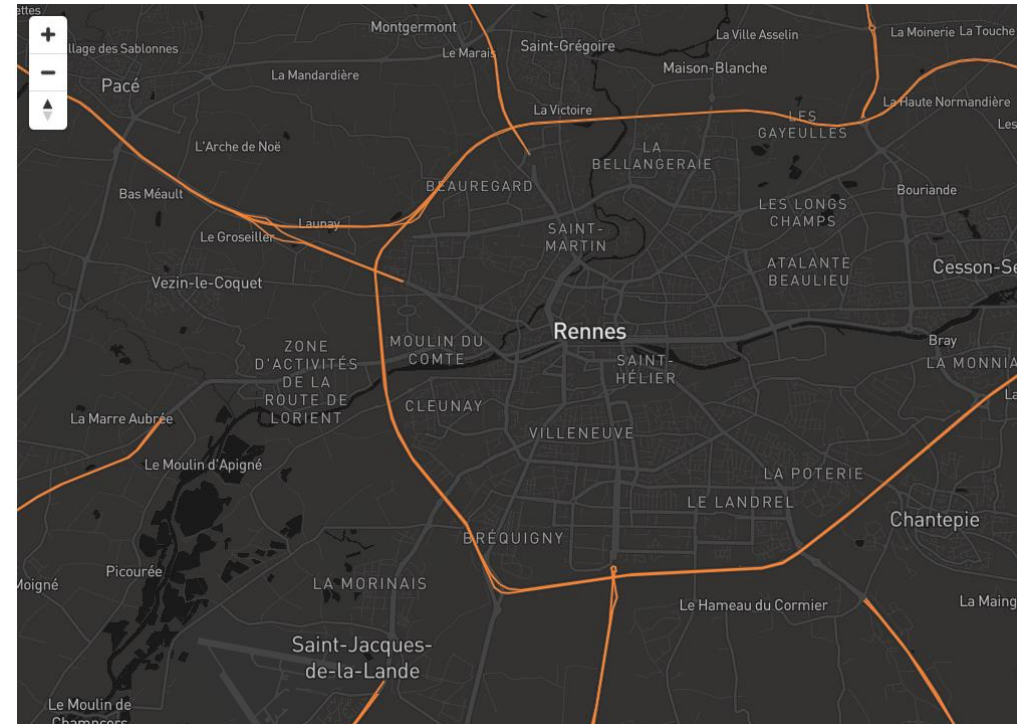
class One of: agriculture, cemetery, glacier, grass, hospital, industrial, park, parking, school, scrub, wood, aboriginal lands

type OSM tag, more specific than class

Filtrer des données OSM

- Je ne veux afficher que les routes à double sens

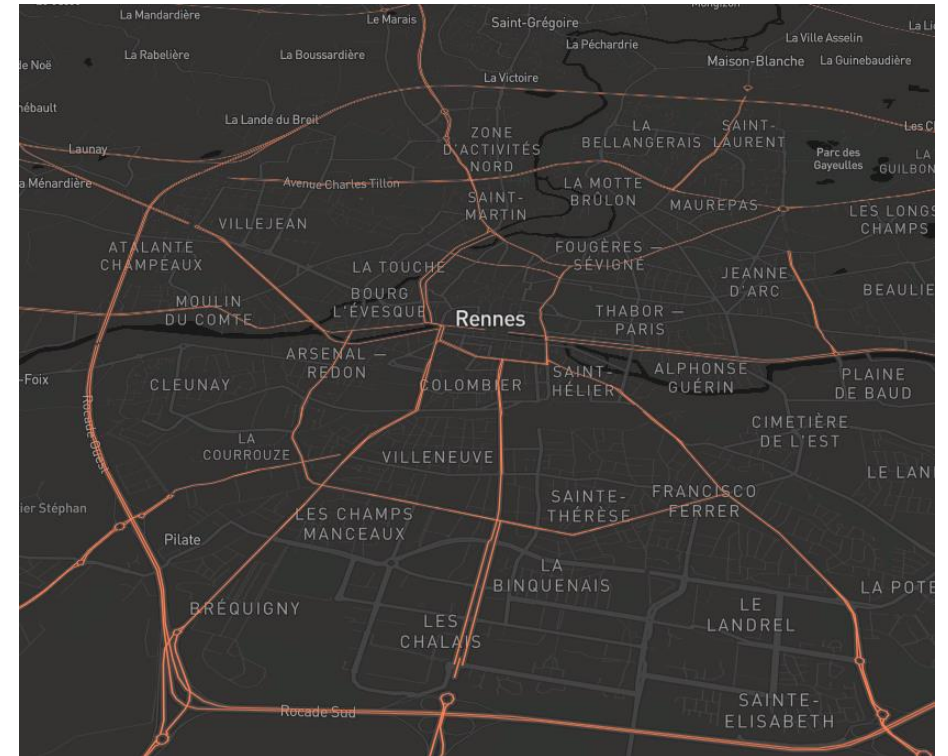
```
map.addLayer({  
  "id": "routes",  
  "type": "line",  
  "source": "mapbox-streets-v7",  
  "source-layer": "road",  
  "filter": ['==', 'class', 'trunk'],  
  "layout": {'visibility': 'visible'},  
  "paint": {"line-color": "#ff8533", "line-width": 1.3}  
});
```



Filtrer des données OSM

- Je ne veux afficher que les routes principale (double sens, principale,...)

```
map.addLayer({
  "id": "routes",
  "type": "line",
  "source": "mapbox-streets-v7",
  "source-layer": "road",
  "filter": ["all", ["in", "class", "motorway", "trunk", "primary"]],
  "layout": {'visibility': 'visible'},
  "paint": {"line-color": "#ff8533", "line-width": 1.3}
});
```



Exemple

#MapboxGL / Afficher et filtrer des données d'OSM



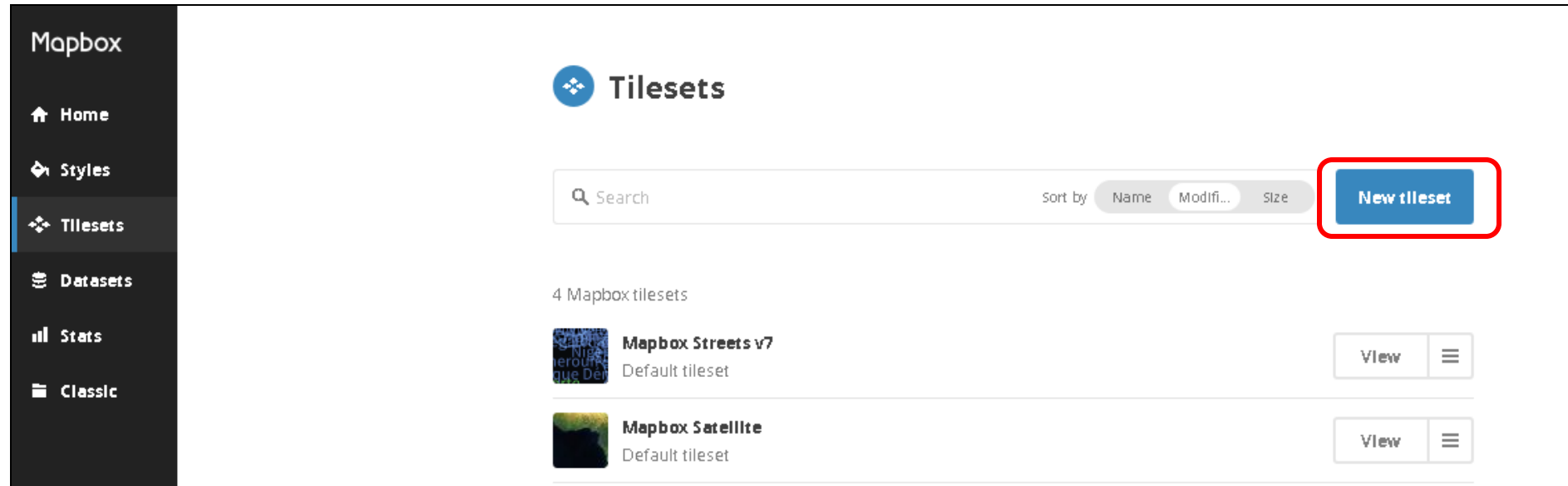
Built with blockbuilder.org

[Open](#)

<https://blockbuilder.org/mastersigat/deff3908c0f5a4ab86b1167069e03a0d/373ca79f998e08aa42742d03891fcdf732dc3f39>

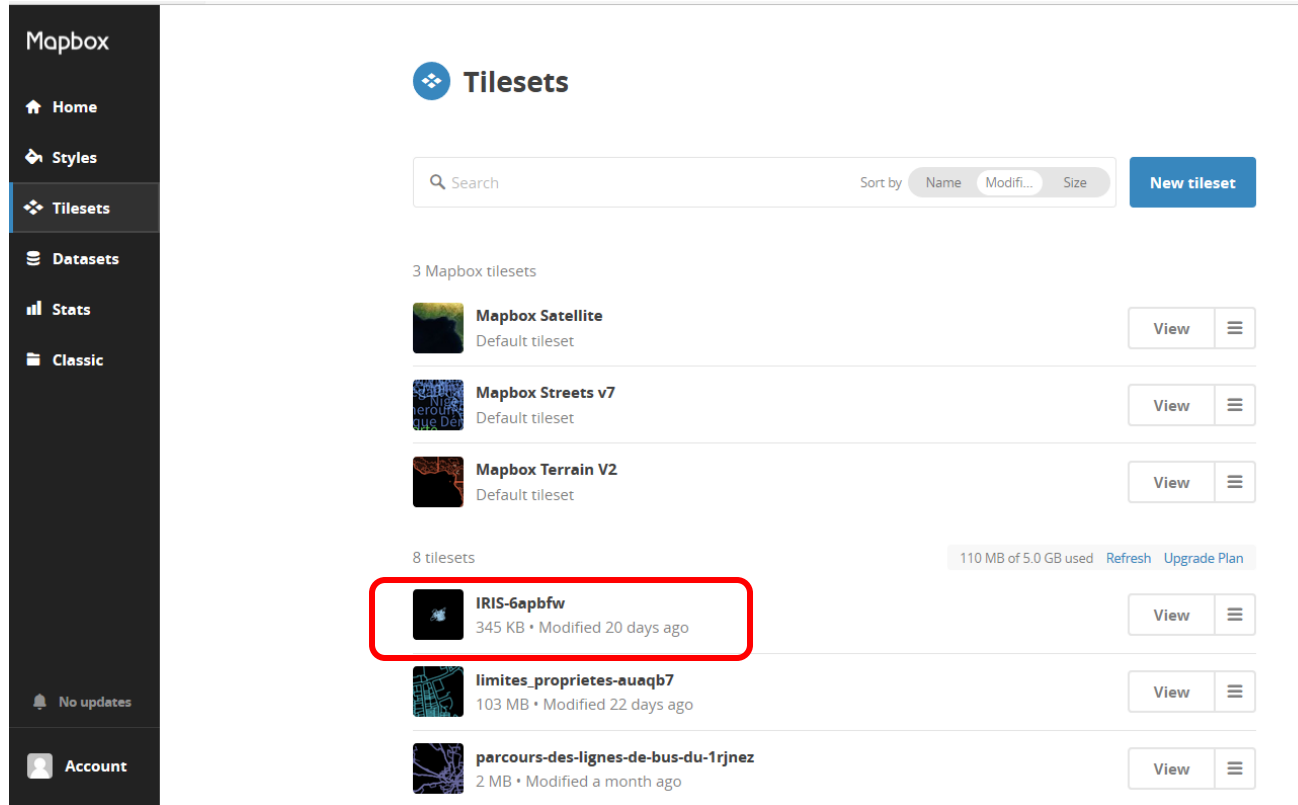
Ajout de données personnelles

- Première étape charger des données comme des Tilesets dans le Studio de Mapbox (csv, geojson, gpx, kml, shapefile zippé)
 - Intégrer le jeu de données des arrêts de bus et celui de la base équipements



Ajout de données personnelles

- Aller chercher les infos dans le studio de Mapbox (Tilesets)



The screenshot displays the Mapbox Tilesets management interface. On the left is a dark sidebar with navigation options: Home, Styles, Tilesets (selected), Datasets, Stats, and Classic. The main content area is titled 'Tilesets' and includes a search bar, sorting options (Name, Modified, Size), and a 'New tileset' button. Below this, there are two sections of tilesets. The first section, '3 Mapbox tilesets', lists 'Mapbox Satellite', 'Mapbox Streets v7', and 'Mapbox Terrain V2', all marked as 'Default tileset'. The second section, '8 tilesets', shows a storage usage indicator '110 MB of 5.0 GB used' and a list of user-created tilesets. The first tileset in this list, 'IRIS-6apbw', is highlighted with a red rectangular box. It is 345 KB and was modified 20 days ago. Other visible tilesets include 'limites_proprietes-aaqb7' (103 MB, modified 22 days ago) and 'parcours-des-lignes-de-bus-du-1rjnez' (2 MB, modified a month ago). Each tileset entry has a 'View' button and a menu icon.

Tileset Name	Size	Last Modified	Default
Mapbox Satellite	-	-	Yes
Mapbox Streets v7	-	-	Yes
Mapbox Terrain V2	-	-	Yes
IRIS-6apbw	345 KB	Modified 20 days ago	No
limites_proprietes-aaqb7	103 MB	Modified 22 days ago	No
parcours-des-lignes-de-bus-du-1rjnez	2 MB	Modified a month ago	No

Ajout de données personnelles

```
map.addSource('Arrets', {
  type: 'vector',
  url: 'mapbox://' iddutileset''});

map.addLayer({
  'id': 'Arrets',
  'type': 'circle',
  'source': 'Arrets',
  'source-layer': 'nomdelacouche',
  'layout': {'visibility': 'visible'},
  'paint': {'circle-radius': {'base': 1.5, 'stops': [[13, 2], [22, 60]]}, 'circle-color': '#000000'}, minzoom:10
});
```

Ajout de données personnelles

The screenshot displays a map interface for a layer named "Bus-5ypx1k". The interface includes a title, a modification timestamp, a preview map, and a sidebar with layer details and actions.

Bus-5ypx1k

Modified a few seconds ago

Preview

Map ID: ninanoun.58wide1k

Details

Format	Type	Size
pbf	vector	514 KB

Zoom extent
z0 ~ z14
Data will be visible above zoom 14, but may appear simplified. [Learn how to adjust zoom extent](#)

Bounds
-1.9,47.9,-1.5,48.3

Layer details

Bus-5ypx1k

8 properties

code	String
codeinsecommune	String
coordonnees	String
estaccessiblepmr	String
id	String
mobilier	String

Nom de la couche

ID de votre Tileset

Ajout des arrêts de bus

```
map.addSource('Arrets', {  
  type: 'vector',  
  url: 'mapbox://ninanoun.58widelk'});
```

Bien renseigner l'ID de votre Tilesets

```
map.addLayer({  
  'id': 'Arrets',  
  'type': 'circle',  
  'source': 'Arrets',  
  'source-layer': 'Bus-5ypx1k',  
  'layout': {'visibility': 'visible'},  
  'paint': {'circle-radius': {'base': 1.5, 'stops': [[13, 2], [22, 60]]}, 'circle-color': '#000000'}, minzoom:12  
});
```

Bien renseigner le nom de votre Tilesets

Ajout des arrêts de bus

```
19 <script>
20 // AccesToken
21 mapboxgl.accessToken = 'pk.eyJ1IjoibmluYW5vdW4iLCJhIjoieY2pjdHBoZG1zmnV4dDZxcGc5azJkbWRIYSJ9.04dZRrdHcgVEKcVveOXG1Y';
22
23 // Configuration de la carte
24 var map = new mapboxgl.Map({
25   container: 'map',
26   style: 'mapbox://styles/mapbox/dark-v9',
27   center: [-1.68, 48.12], // lat/long
28   zoom: 15, // zoom
29   pitch: 50, // Inclinaison
30   bearing: -10 // Rotation
31 });
32
33 map.on('load', function () {
34
35   map.addSource('mapbox-streets-v7', {
36     type: 'vector',
37     url: 'mapbox://mapbox.mapbox-streets-v7'});
38
39   map.addLayer({
40     "id": "routes",
41     "type": "line",
42     "source": "mapbox-streets-v7",
43     "layout": {'visibility': 'visible'},
44     "source-layer": "road",
45     "paint": {"line-color": "#FF7F50", "line-width": 1}
46   });
47
48   map.addSource('Arrets', {
49     type: 'vector',
50     url: 'mapbox://ninanoun.58wide1k'});
51
52   map.addLayer({
53     'id': 'Arrets',
54     'type': 'circle',
55     'source': 'Arrets',
56     'source-layer': 'Bus-5ypx1k',
57     'layout': {'visibility': 'visible'},
58     'paint': {'circle-radius': 5, 'circle-color': '#f5f60d',}
59   });
60
61
62 });
63
64 </script>
65
```



Ajout la couche équipements

```
map.addSource('Equipements', {  
  type: 'vector',  
  url: 'mapbox://ninanoun.4xcn5ude'});
```

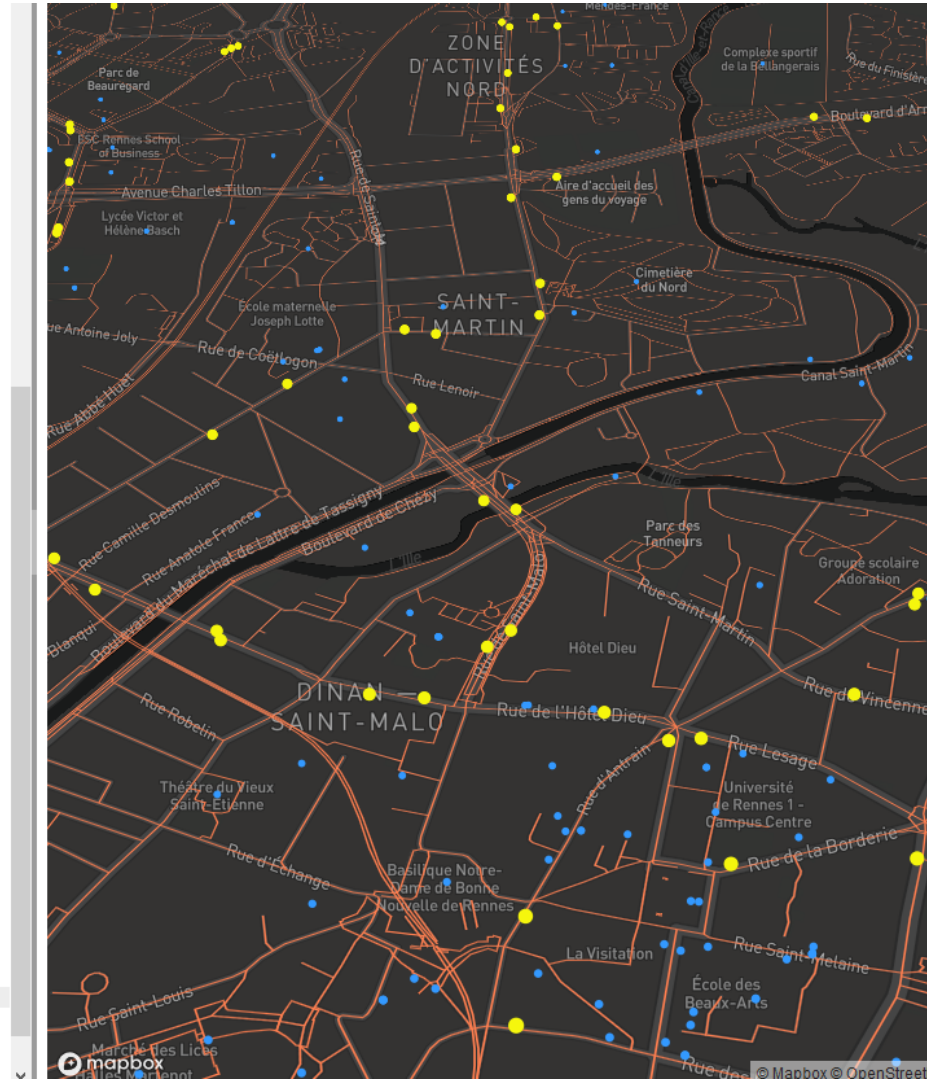
Bien renseigner l'ID de votre Tilesets

```
map.addLayer({  
  'id': 'Equipements',  
  'type': 'circle',  
  'source': 'Equipements',  
  'source-layer': 'base-orga-var-6k0zky',  
  'layout': {'visibility': 'visible'},  
  'paint': {'circle-radius': {'base': 1.5, 'stops': [[13, 2], [22, 60]]}, 'circle-color': '#3399ff'}, minzoom:14  
});
```

Bien renseigner le nom de la couche a afficher

Ajout la couche équipements

```
33 map.on('load', function () {
34
35 // Ajout routes OSM
36
37 map.addSource('mapbox-streets-v7', {
38   type: 'vector',
39   url: 'mapbox://mapbox.mapbox-streets-v7'});
40
41 map.addLayer({
42   'id': 'routes',
43   'type': 'line',
44   'source': 'mapbox-streets-v7',
45   'layout': {'visibility': 'visible'},
46   'source-layer': 'road',
47   'paint': {'line-color': '#FF7F50', 'line-width': 1}
48 });
49
50 // Ajout arrêts de bus
51
52 map.addSource('Arrets', {
53   type: 'vector',
54   url: 'mapbox://ninanoun.58widelk'});
55
56 map.addLayer({
57   'id': 'Arrets',
58   'type': 'circle',
59   'source': 'Arrets',
60   'source-layer': 'Bus-5ypx1k',
61   'layout': {'visibility': 'visible'},
62   'paint': {'circle-radius': 5, 'circle-color': '#f5f60d'}
63 });
64
65 // Ajout couche équipements
66
67 map.addSource('Equipements', {
68   type: 'vector',
69   url: 'mapbox://ninanoun.4xcn5ude'});
70
71 map.addLayer({
72   'id': 'Equipements',
73   'type': 'circle',
74   'source': 'Equipements',
75   'source-layer': 'base-orga-var-6k0zky',
76   'layout': {'visibility': 'visible'},
77   'paint': {'circle-radius': 3, 'circle-color': '#3399ff'}
78 });
79
80 });
81
82 </script>
83
84 </body>
```



Mettre en forme les données

- Pour personnaliser la symbologie des données se référer à la documentation

<https://www.mapbox.com/mapbox-gl-js/style-spec/#layers>

Type d'objets géographiques dans MapboxGL :

- circle (point)
- symbol (point avec pictogramme)
- line (ligne)
- fill (polygone)
- fill-extrusion (polygone 3D)
- ...

Mettre en forme les données

- Changer la taille
- Changer la couleur
<http://www.code-couleur.com/>
- Définir des niveaux de zoom (max/min)

```
'paint': {'circle-radius': {'base': 1.5,'stops': [[13, 2], [22, 60]]}, 'circle-color': '#3399ff'}, minzoom:14
```

Ajouter les limites de propriétés



limites_proprietes-auaqb7

Add to style

Modified on Dec 16, 2016

1 vector layer Stats

- Replace
- Make private
- Delete

Map ID 

ninanoun.a4kdgiot

 limites_proprietes

2 properties | This layer contains mostly LineStrings

Description String

Name String

Format	Type	Size
pbf	vector	103 MB

Zoom extent

z14 ~ z20

Data will not be visible below zoom 14. Data

Ajouter les limites de propriétés

```
//Proprietes

map.addSource('Proprietes', {
  type: 'vector',
  url: 'mapbox://ninanoun.a4kdgiot'
});

map.addLayer({
  'id': 'Proprietes',
  'type': 'line',
  'source': 'Proprietes',
  'source-layer': 'limites_proprietes',
  'layout': {'visibility': 'visible',
  'line-join': 'round', 'line-cap': 'round'},
  'paint': {'line-color': '#FFFFFF', 'line-width': 1.5}
});
```



Ajouts de données 3D

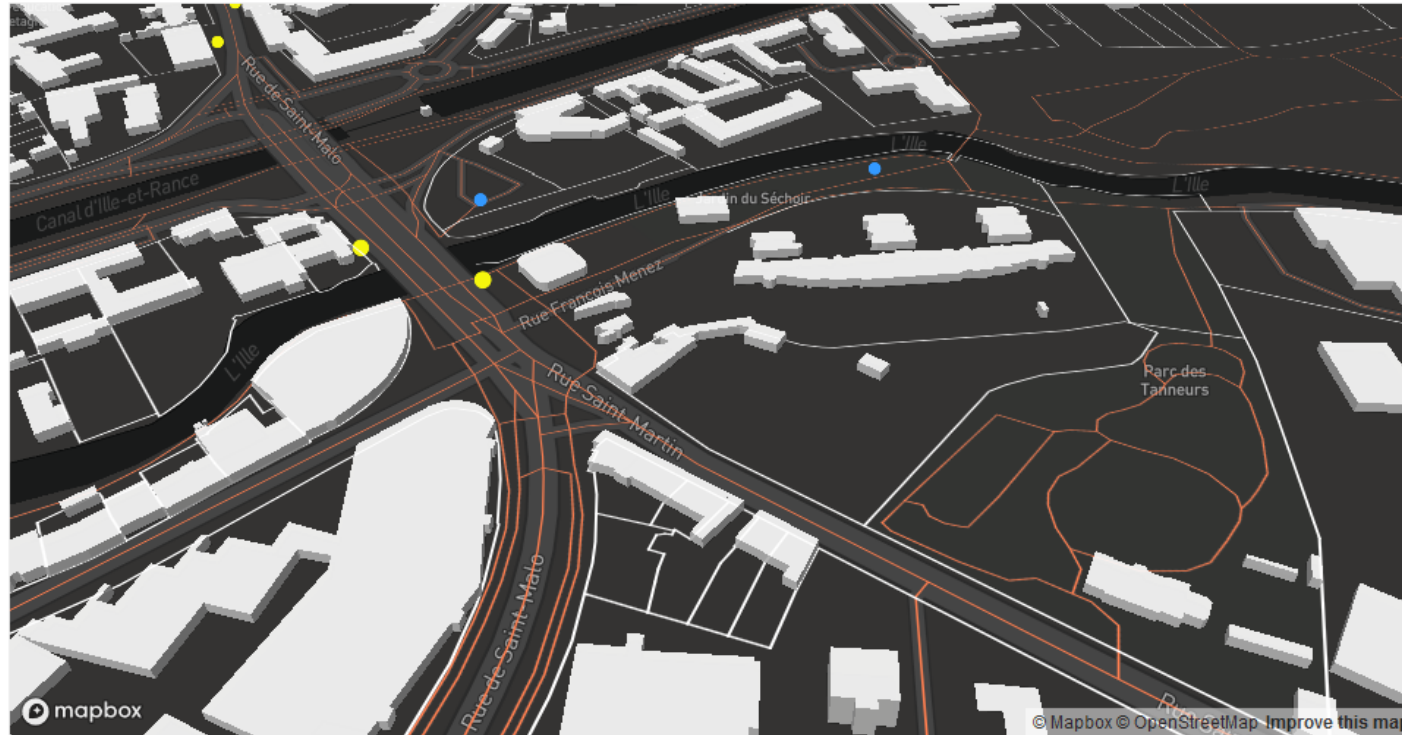
```
// Ajout batiments 3D

map.addLayer({
  'id': 'Batiments_3D',
  'source': 'composite',
  'source-layer': 'building',
  'filter': ['==', 'extrude', 'true'],
  'type': 'fill-extrusion',
  'minzoom': 15,
  'paint': {'fill-extrusion-color': '#555555', 'fill-extrusion-height':
  {'type': 'identity', 'property': 'height'},
  'fill-extrusion-base': {'type': 'identity', 'property': 'min_height'},
  'fill-extrusion-opacity': 0.8
  }
});
```



Exemple

#MapboxGL / Ajout de données personnelles



Built with blockbuilder.org

[Open](#)

<https://bl.ocks.org/anonymous/f2c04bc06e759c2da1c3c9767fe572fa/923cca7180834e94060c4032d0e412e5ee92ae47>

Ajouter des données en local

- Il est possible de mobiliser des jeux de données (Geojson) stockés en local (même dossier que la page html) ou accessible via une URL

```
map.on("load", function() {  
  //Couche EPCI  
  map.addLayer({  
    id: "epci",  
    type: "line",  
    source: {type: "geojson",  
             data: "./epci.geojson"},  
  
    paint: {'line-color': '#000000',  
           'line-width': 1}  
  });  
});
```

```
map.on("load", function() {  
  //Couche EPCI  
  map.addLayer({  
    id: "epci",  
    type: "line",  
    source: {type: "geojson",  
             data: 'URL'  
    },  
    paint: {'line-color': '#000000',  
           'line-width': 1}  
  });  
});
```

Interactivité avec les données

Hover et Click

Interactivité avec les données / Hover

- Hover de d'une couche (survol) = couche arrêts
 - Cette commande doit être placée à la fin du script

```
//Interactivité HOVER

var popup = new mapboxgl.Popup({
  closeButton: false,
  closeOnClick: false });

map.on('mousemove', function(e) {
  var features = map.queryRenderedFeatures(e.point, { layers: ['Equipements'] });
  // Change the cursor style as a UI indicator.
  map.getCanvas().style.cursor = (features.length) ? 'pointer' : '';

  if (!features.length) {
    popup.remove();
    return; }

  var feature = features[0];
  popup.setLngLat(feature.geometry.coordinates)
    .setHTML(feature.properties.organom)
    .addTo(map);

});
```

Interactivité avec les données / Hover

```
90     'type': 'line',
91     'source': 'Proprietes',
92     'source-layer': 'limites_proprietes',
93     'layout': {'visibility': 'visible',
94     'line-join': 'round', 'line-cap': 'round'},
95     'paint': {'line-color': '#FFFFFF', 'line-width': 1.5}
96   });
97
98   // Ajout batiments 3D
99
100  map.addLayer({
101    'id': 'Batimentst_3D',
102    'source': 'composite',
103    'source-layer': 'building',
104    'filter': ['==', 'extrude', 'true'],
105    'type': 'fill-extrusion',
106    'minzoom': 15,
107    'paint': {'fill-extrusion-color': '#FFFFFF', 'fill-extrusion-height':
108    {'type': 'identity', 'property': 'height'},
109    'fill-extrusion-base': {'type': 'identity', 'property': 'min_height'},
110    'fill-extrusion-opacity': 0.9
111  }
112  });
113
114  });
115
116  //Interactivité HOVER
117
118  var popup = new mapboxgl.Popup({
119    closeButton: false,
120    closeOnClick: false });
121
122  map.on('mousemove', function(e) {
123    var features = map.queryRenderedFeatures(e.point, { layers: ['Arrets'] });
124    // Change the cursor style as a UI indicator.
125    map.getCanvas().style.cursor = (features.length) ? 'pointer' : '';
126
127    if (!features.length) {
128      popup.remove();
129      return; }
130
131    var feature = features[0];
132    popup.setLngLat(feature.geometry.coordinates)
133      .setHTML(feature.properties.nom)
134      .addTo(map);
135  });
136  });
137
138  </script>
139
```



Interactivité avec les données / Hover

- Hover de deux couches (survol)

```
//Interactivité HOVER

var popup = new mapboxgl.Popup({
  closeButton: false,
  closeOnClick: false });

map.on('mousemove', function(e) {
  var features = map.queryRenderedFeatures(e.point, { layers: ['Arrets'] ['Equipements'] });
  // Change the cursor style as a UI indicator.
  map.getCanvas().style.cursor = (features.length) ? 'pointer' : '';

  if (!features.length) {
    popup.remove();
    return;
  }

  var feature = features[0];

  popup.setLngLat(feature.geometry.coordinates)
    .setHTML(feature.properties.nom)
    .addTo(map);

  var feature = features[1];

  popup.setLngLat(feature.geometry.coordinates)
    .setHTML(feature.properties.organom)
    .addTo(map);
});
```

Interactivité avec les données / Hover

```
115
116 //Interactivité HOVER
117
118 var popup = new mapboxgl.Popup({
119     closeButton: false,
120     closeOnClick: false });
121
122 map.on('mousemove', function(e) {
123     var features = map.queryRenderedFeatures(e.point, { layers: ['Arrets'] ['Equipements'] });
124     // Change the cursor style as a UI indicator.
125     map.getCanvas().style.cursor = (features.length) ? 'pointer' : '';
126
127     if (!features.length) {
128         popup.remove();
129         return;
130     }
131
132     var feature = features[0];
133
134     popup.setLngLat(feature.geometry.coordinates)
135         .setHTML(feature.properties.nom)
136         .addTo(map);
137
138     var feature = features[1];
139
140     popup.setLngLat(feature.geometry.coordinates)
141         .setHTML(feature.properties.organom)
142         .addTo(map);
143 });
144
145
146 </script>
147
```

Interactivité avec les données / Click

- Click d'une couche (popup) = couche arrêts

```
//Interactivité CLICK

map.on('click', function (e) {
  var features = map.queryRenderedFeatures(e.point, { layers: ['Arrets'] });

  if (!features.length) {
    return;
  }

  var feature = features[0];
  var popup = new mapboxgl.Popup({ offset: [0, -15] })
    .setLngLat(feature.geometry.coordinates)
    .setHTML('<h2>' + feature.properties.nom + '</h2><h3>'
      + "Mobilier : " + feature.properties.mobilier + '</h3><p>'
      + "Accessibilité PMR : " + feature.properties.estaccessiblepmr + '</p>' )
    .addTo(map);
});

map.on('mousemove', function (e) {
  var features = map.queryRenderedFeatures(e.point, { layers: ['Arrets'] });
  map.getCanvas().style.cursor = (features.length) ? 'pointer' : '';
});
```

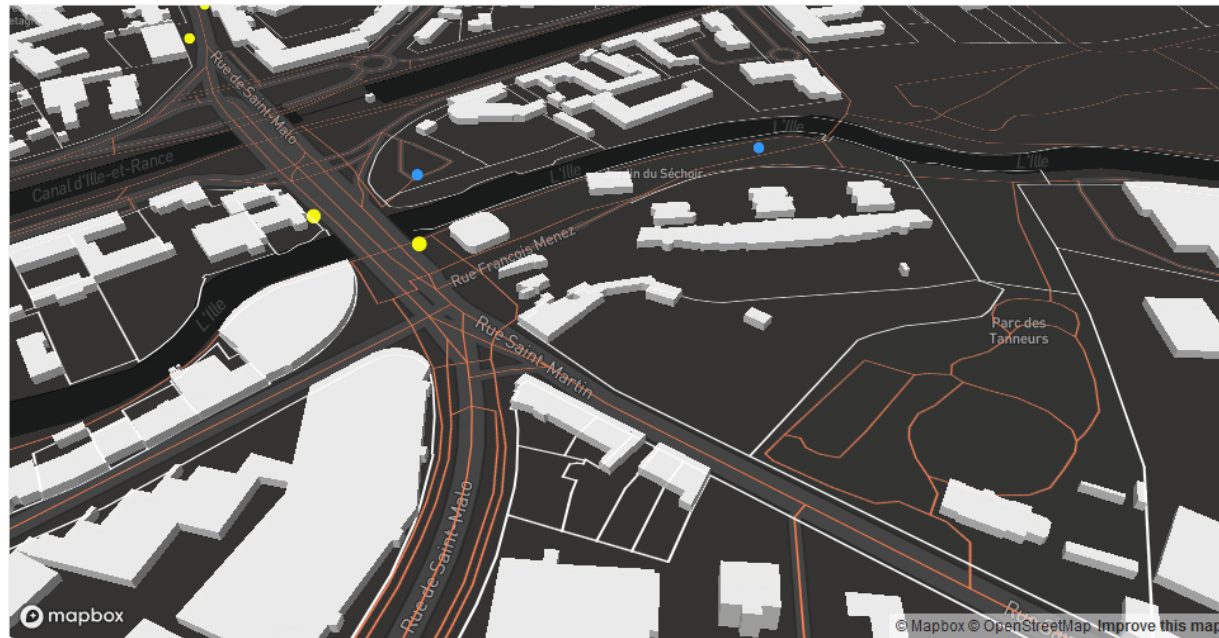
Interactivité avec les données / Click

```
96 });
97
98 // Ajout batiments 3D
99
100 map.addLayer({
101   'id': 'Batimentst_3D',
102   'source': 'composite',
103   'source-layer': 'building',
104   'filter': ['!=', 'extrude', 'true'],
105   'type': 'fill-extrusion',
106   'minzoom': 15,
107   'paint': {'fill-extrusion-color': '#FFFFFF', 'fill-extrusion-height':
108     {'type': 'identity', 'property': 'height'},
109     'fill-extrusion-base': {'type': 'identity', 'property': 'min_height'},
110     'fill-extrusion-opacity': 0.9
111   }
112 });
113
114 });
115
116 //Interactivité CLICK
117
118 map.on('click', function (e) {
119   var features = map.queryRenderedFeatures(e.point, { layers: ['Arrets'] });
120
121   if (!features.length) {
122     return;
123   }
124
125   var feature = features[0];
126   var popup = new mapboxgl.Popup({ offset: [0, -15] })
127     .setLngLat(feature.geometry.coordinates)
128     .setHTML('<h2>' + feature.properties.nom + '</h2><h3>'
129 + "Mobilier : " + feature.properties.mobilier + '</h3><p>'
130 + "Accessibilité PMR : " + feature.properties.estaccessiblepmr + '</p>' )
131     .addTo(map);
132 });
133
134 map.on('mousemove', function (e) {
135   var features = map.queryRenderedFeatures(e.point, { layers: ['Arrets'] });
136   map.getCanvas().style.cursor = (features.length) ? 'pointer' : '';
137 });
138
139
140 </script>
141
142 </body>
143 </html>
```



Exemple

#MapboxGL / Interactivité avec les données
(hover/click)



Built with blockbuilder.org

[Open](#)

<https://bl.ocks.org/anonymous/32ab9ab043074bd5cb38fb153237ef2e/7c1739a41825727cd73aaed9a94af9f91a7f4e99>

Mise en forme poussée des données spatiales

Pictogrammes, catégorisation, graduation, cercles gradués, extrusion
3D, combinaison de deux variables

Utiliser des pictogrammes

- Utiliser la symbologie des symboles (pictos)

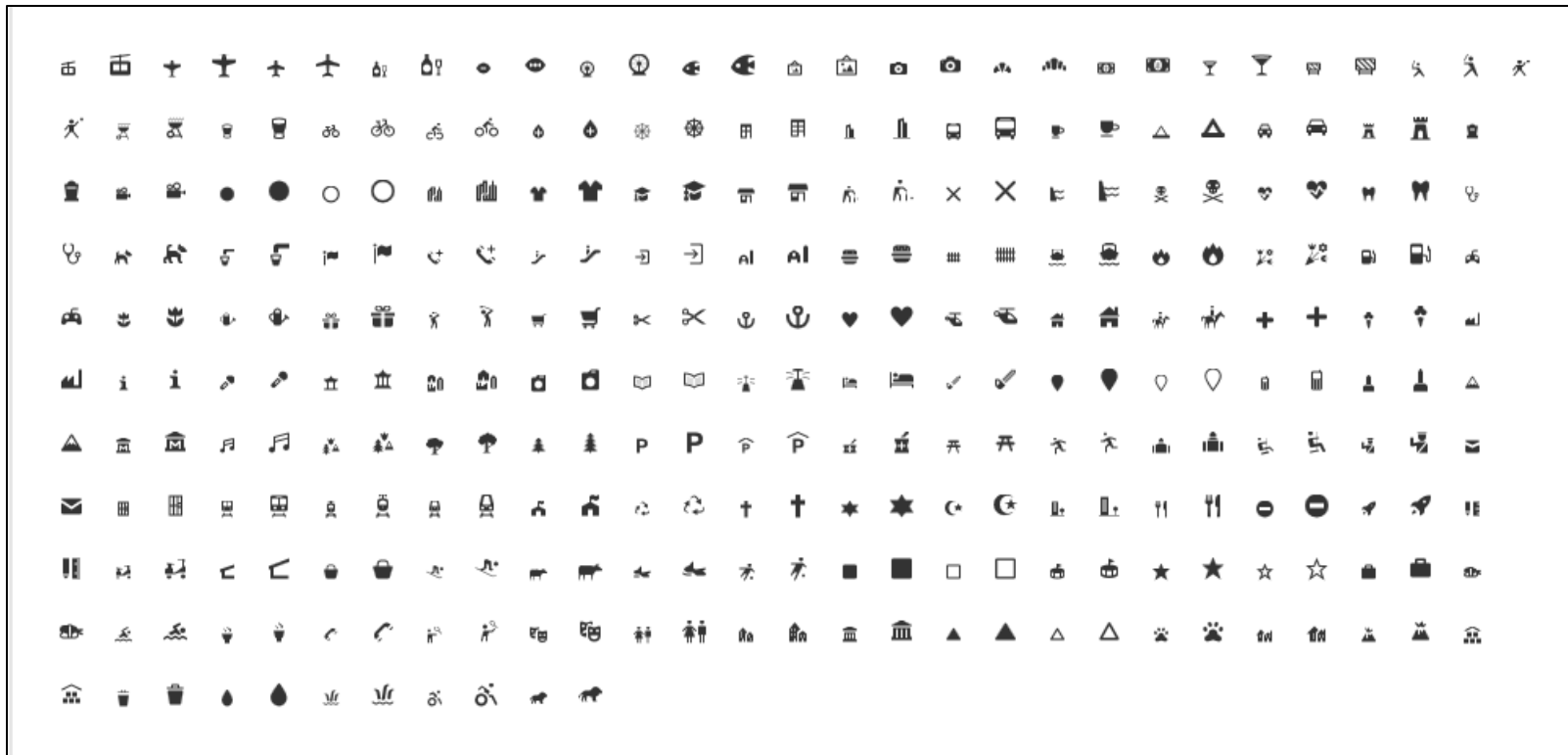
```
map.addSource('Arrets', {
  type: 'vector',
  url: 'mapbox://ninanoun.7mtp5buo'});

map.addLayer({
  "id": "Arrets",
  "type": "symbol",
  "source": "Arrets",
  "source-layer": "topologie-des-points-darret-d-9ya955",
  "layout": { "icon-image": "bus-15",
              "icon-size": 1.5}
});
```

Mise en forme de données personnelles

- Mobiliser la bibliothèque vectorielle Maki

<https://www.mapbox.com/maki-icons/>



Graduation couleur

- Configurer les options de mise en forme
 - Il faut spécifier la **variable mobilisée**, le **type d'échelle**, les valeurs des **bornes** et les **couleurs**

Cercles

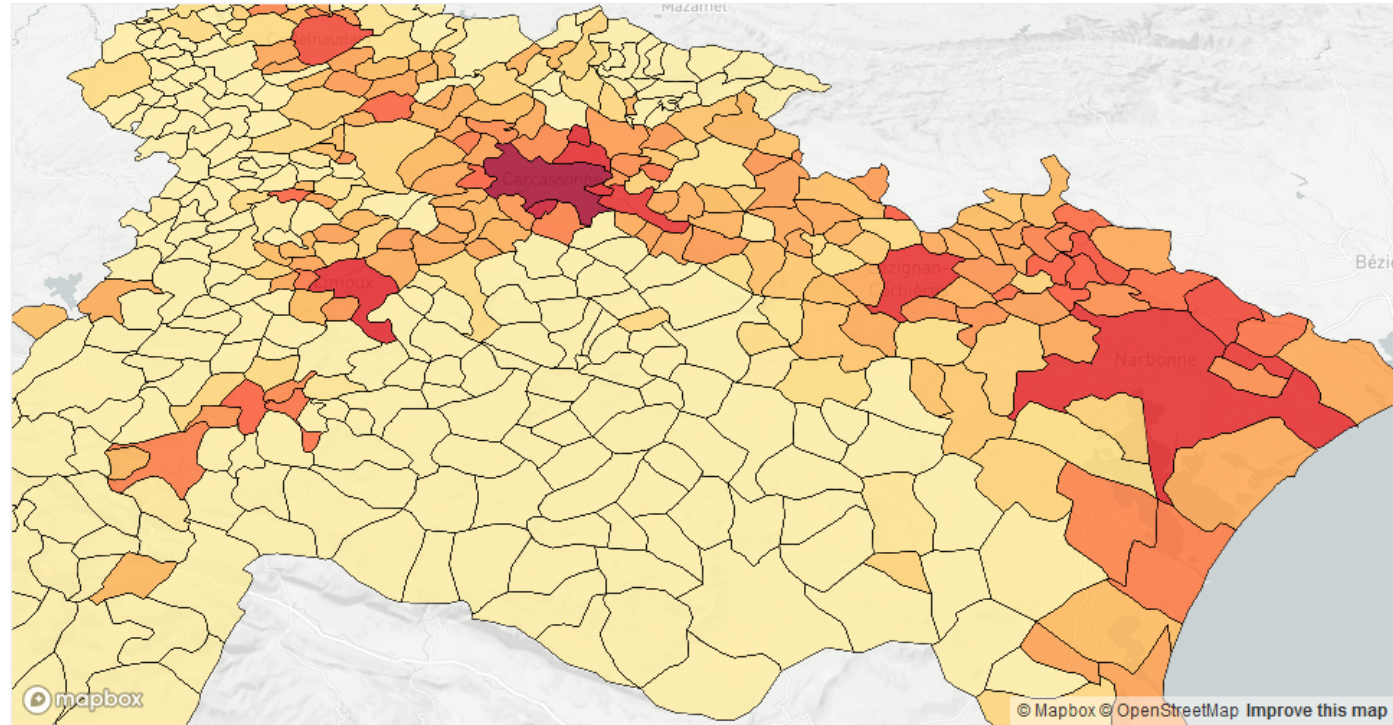
```
'paint': {'circle-radius': {'base': 1.5, 'stops': [[13, 2], [22, 60]]},  
  'circle-color': {'property': 'hauteur',  
    type: 'exponential',  
    stops: [[0, '#edf8e9'],  
      [5, '#c7e9c0'],  
      [10, '#a1d99b'],  
      [15, '#74c476'],  
      [20, '#006d2c']]  
}
```

Polygones

```
'paint': {'fill-color': {'property': 'densite',  
  'stops': [[1, '#1a9850'],  
    [10, '#91cf60'],  
    [20, '#d9ef8b'],  
    [50, '#ffffbf'],  
    [100, '#fee08b'],  
    [150, '#fc8d59'],  
    [200, '#d73027']]},  
  'fill-opacity': 0.9}
```

Exemple

#MapboxGL / Carte choroplèthe



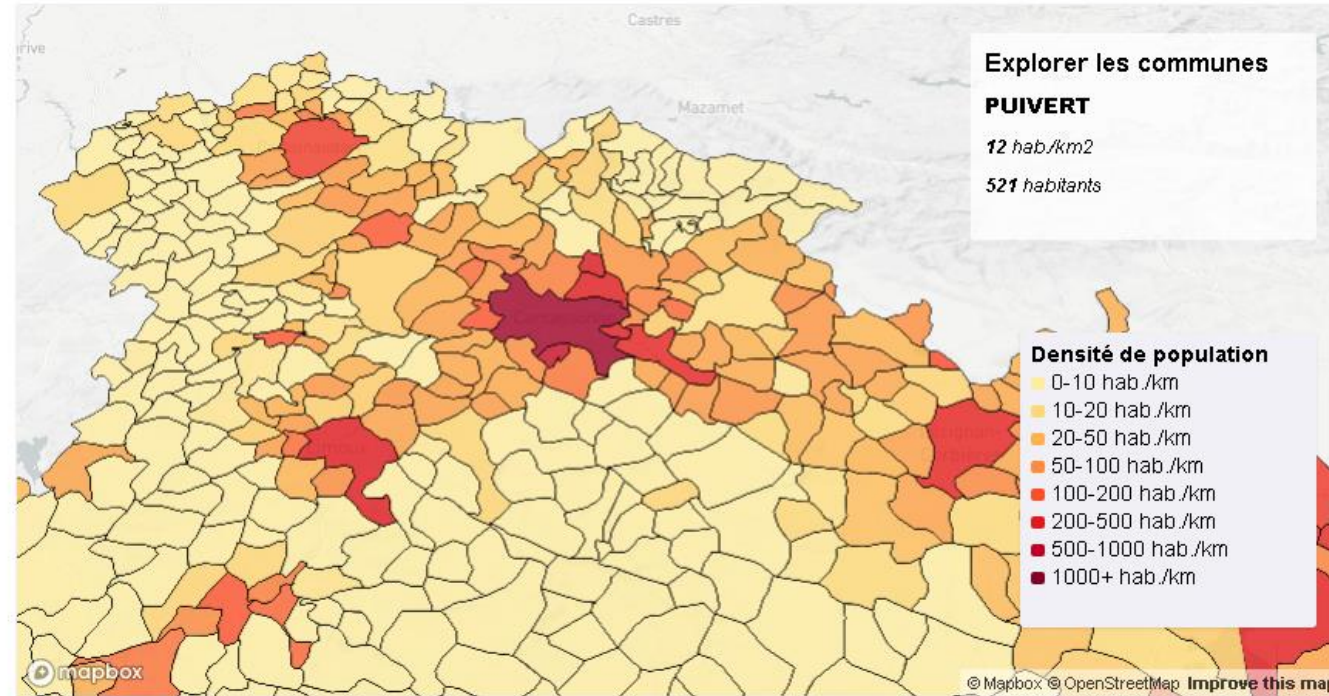
Built with blockbuilder.org

[Open](#)

<https://bl.ocks.org/mastersigat/d6c98f9c0f2e60811fc1da967f3c79d5/f4bfae333f5fccf219481b9e636807d6ed930ad4>

Exemple

#MapboxGL / Carte choroplèthe interactive



Carte choroplèthe interactive

Open [↗](#)

<https://bl.ocks.org/mastersigat/02576120ff70307c85ebb7eeef3d05e>

S'affranchir des fonds de carte de Mapbox

- Objectif = éviter les limites Access Token ;)
- Solution : Mobiliser des fonds de carte en tuiles vectorielles fournis « sans limites » d'utilisation par Etalab

<https://openmaptiles.geo.data.gouv.fr/>

Adresse du flux : <https://openmaptiles.geo.data.gouv.fr/styles/osm-bright/style.json>

```
// Configuration de la carte
var map = new mapboxgl.Map({
  container: 'map',
  style: 'https://openmaptiles.geo.data.gouv.fr/styles/osm-bright/style.json', //
fond de carte
  center: [-1.68, 48.12], // lat/long
  zoom: 15, // zoom
  pitch: 50, // Inclinaison
  bearing: -10 // Rotation
});
```

Fond de cartes, données carroyés

```
map.addSource('inseedata',{  
  "type": 'vector',  
  "url" : 'http://www.comeetie.fr/tileserver-php/inseedata\_metropole.json'  
});
```

Tuiles vectorielles maison construite à partir des données carroyés par agrégation successives. https://github.com/comeetie/insee_formation

Variables disponibles :

- men_basr : # ménages sous le seuil de bas revenus
- men : # ménages
- pop : population résidentes
- rev : revenus total
- m25ans : # population de – de 25ans
- P65ans : # population de + de 65 ans
-

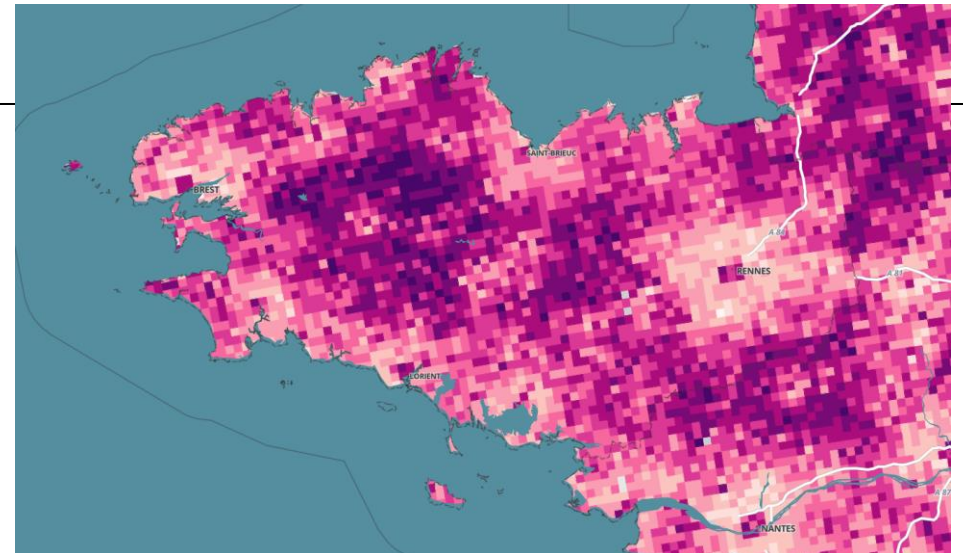
Fond de cartes, données carroyés

```
map.addLayer({  
  "id": "mbasr",  
  "type": "fill",  
  "source": "inseedata",  
  "source-layer": "inseedata",  
  "paint": {  
    "fill-color": ['step',  
      [ '/', ['get', 'men_basr'], ['get', 'men']], '#555555',  
      0, '#fff7f3', 0.045, '#fde0dd', 0.077, '#fcc5c0', 0.11, '#fa9fb5', 0.148, '#f768a1',  
      0.182, '#dd3497', 0.22, '#ae017e', 0.27, '#7a0177', 0.345, '#49006a'],  
    "fill-opacity": 1  
  }  
}, 'waterway');
```

Expression de calcul d'une variable
dynamique, ici simple ratio

Echelle de couleurs, quantiles et colorbrewer

Nom de la couche
sous laquelle faire l'insertion



Exemple

#MapboxGL / Catégorisation de données



Built with blockbuilder.org

[Open](#)

<https://bl.ocks.org/mastersigat/b2d09221e018183559391b1f828e5547/7b69c180be73a3695f6e88eecbd5090c4d01b1cd>

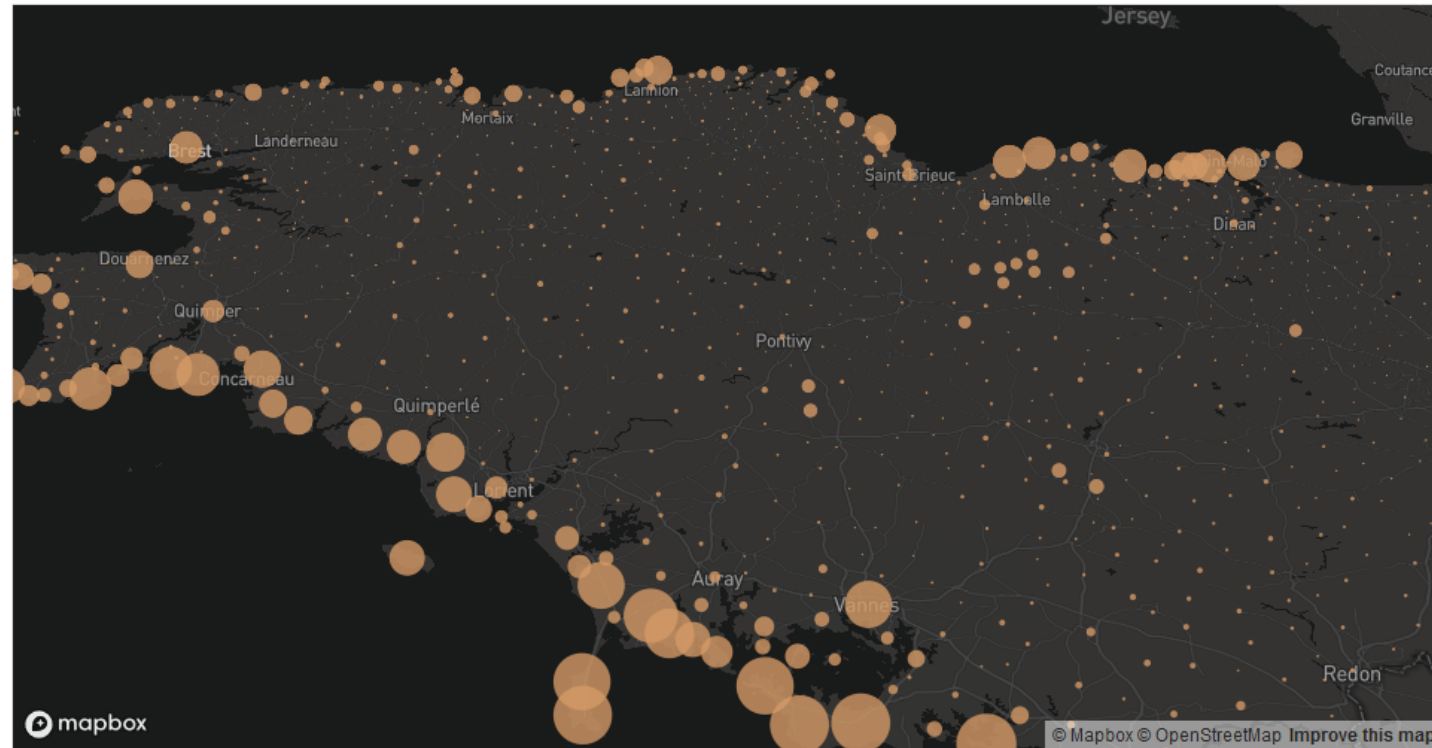
Cercles gradués

- Configurer les options de mise en forme
 - Il faut spécifier la **variable mobiliser** et les valeurs des **bornes** (*valeur, taille du cercle*)

```
paint: {'circle-color': '#D49A66',  
       'circle-radius': {property: 'population',  
                        type: 'exponential',  
                        stops: [[10, 1],[2000, 20]]},  
       'circle-opacity': 0.8}
```

Exemple

#MapboxGL / Cercles gradués



Built with blockbuilder.org

[Open](#)

<https://bl.ocks.org/anonymous/54872b5379a59b0cee850a112af572b0/3ec842a0b6ff9fe82ed7426309c629a7f2a84efe>

Extrusion 3D

- Récupérer le template

#Template / Extrusion MapboxGL



Built with blockbuilder.org

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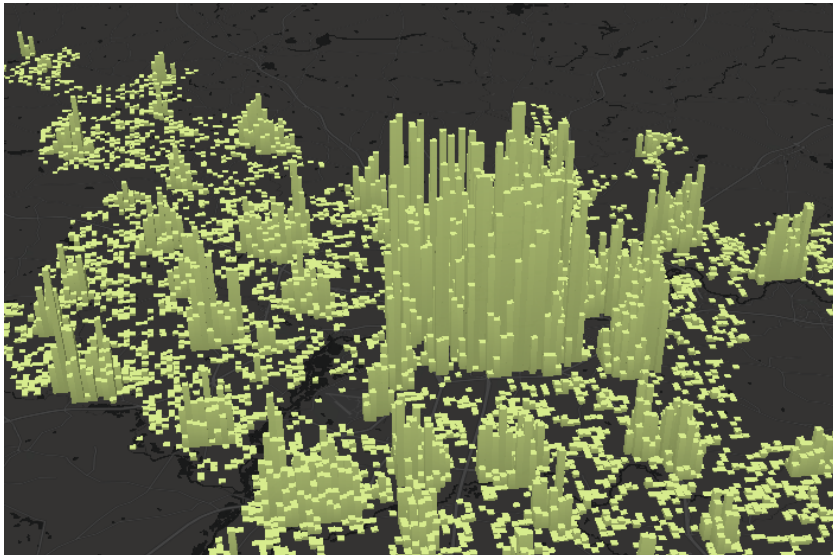
index.html

```
<!DOCTYPE html>
<html>
<head>
<meta charset='utf-8' />
<title>Display a map</title>
<meta name='viewport' content='initial-scale=1, maximum-scale=1, user-scalable=1' />
```

<https://blockbuilder.org/mastersigat/64af1a273f155037214d96406cb4777a/7c3f5c36742ec2dcf231059e903b144118c79d42>

Extrusion 3D

- Configurer les options de mise en forme
 - Il faut spécifier la **variable mobilisée** et les modalités de *l'extrusion (valeur, taille de l'extrusion)*



```
map.addLayer({
  'id': 'extrude',
  'type': 'fill-extrusion',
  'source': 'Carro',
  'source-layer': 'karook-dcnhdj',
  'layout': {'visibility': 'visible'},
  'paint': { 'fill-extrusion-color': '#d9ef8b',
    'fill-extrusion-height': {
      'property': 'Individus',
      'stops': [[1, 0],
        [10, 100],
        [700, 7000]]},
    'fill-extrusion-opacity': 0.95,
    'fill-extrusion-base': 0 }
});
```

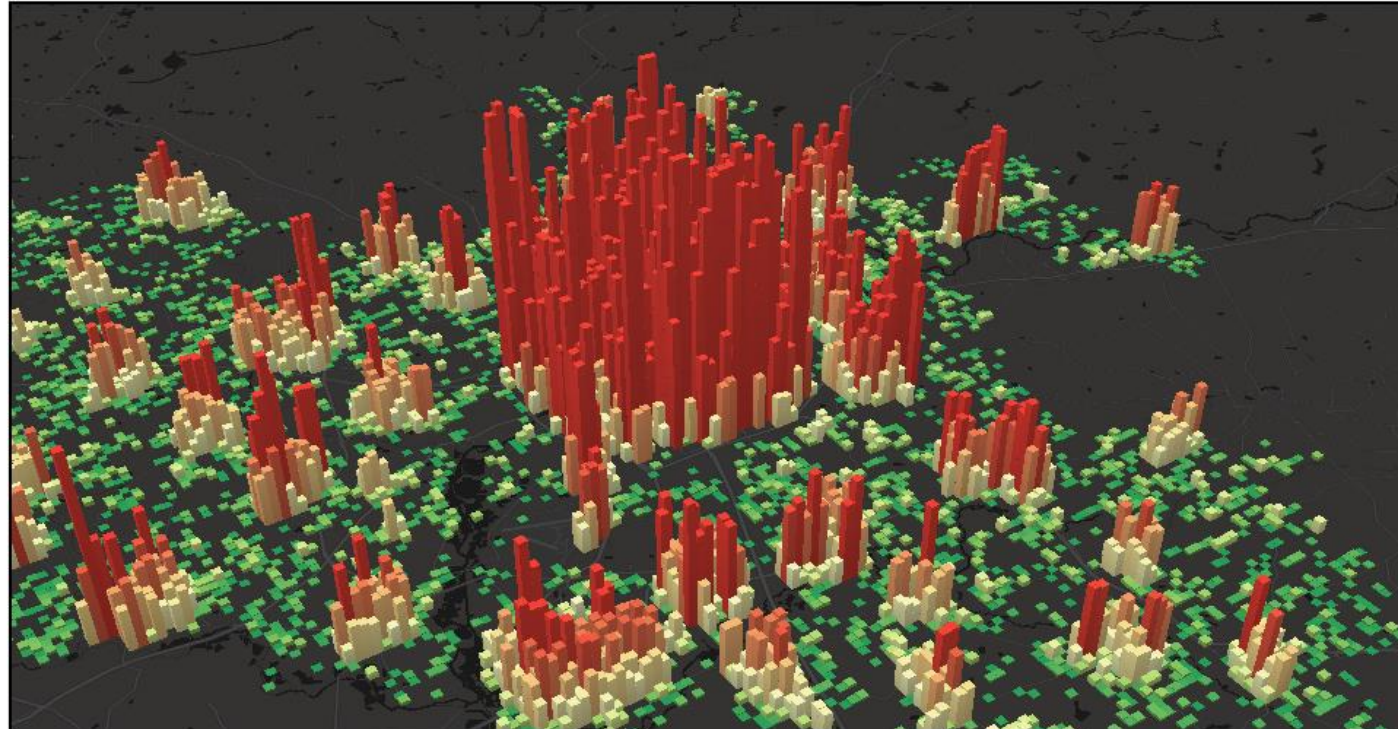
Extrusion 3D

- Ajouter des couleurs

```
'paint': {  
  'fill-extrusion-color': {  
    'property': 'Individus',  
    'stops': [  
      [1, '#1a9850'],  
      [10, '#91cf60'],  
      [20, '#d9ef8b'],  
      [50, '#ffffbf'],  
      [100, '#fee08b'],  
      [150, '#fc8d59'],  
      [200, '#d73027']]  
    },  
  'fill-extrusion-height': {  
    'property': 'Individus',  
    'stops': [[1, 0],  
              [10, 100],  
              ...  
            ]  
  }  
}
```


Exemple

#MapboxGL / Extrusion 3D données



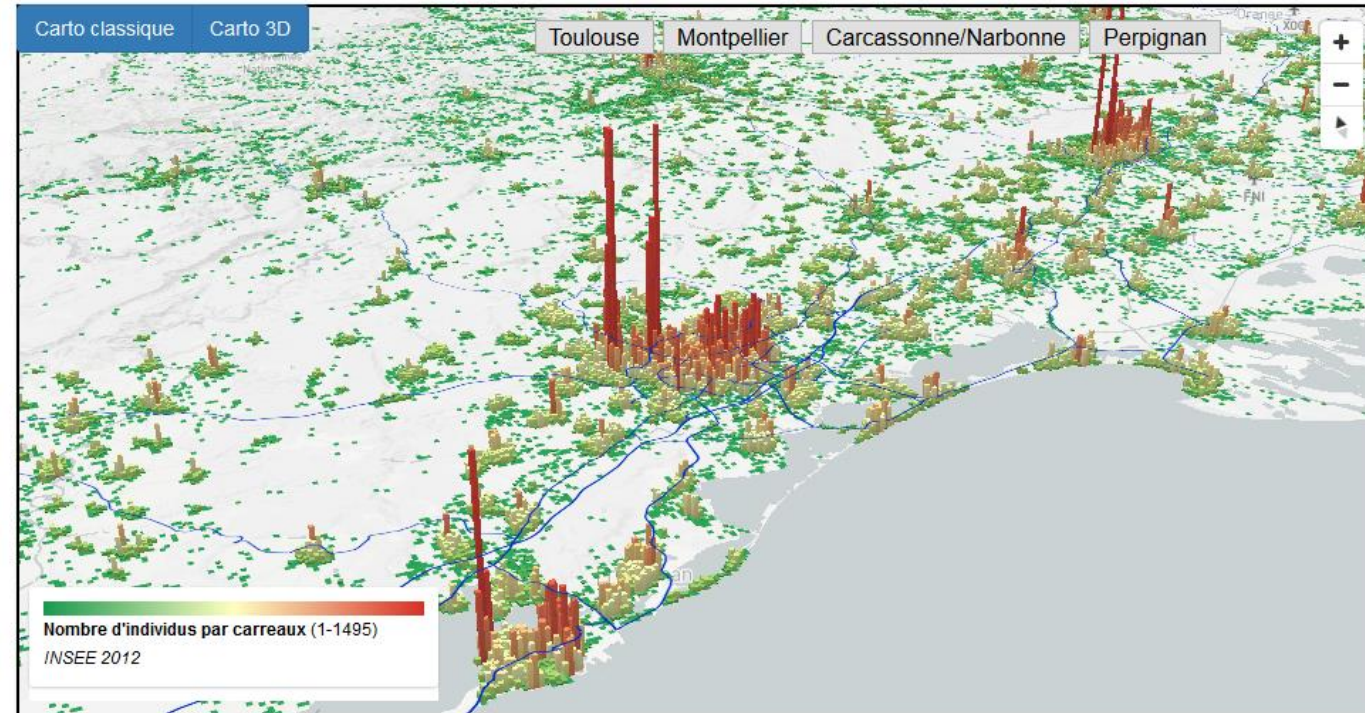
Built with blockbuilder.org

[Open](#)

<https://bl.ocks.org/mastersigat/32c10e630346ff96c5749ba791cb3052/6fc71a60b632aa09540d22aacc619fc7d3552a74>

Exemple

#MapboxGL / Extrusion carreaux



Built with blockbuilder.org

[Open](#)

<https://bl.ocks.org/mastersigat/c5bef54cfad8dd7bd0a9f384a45d771e>

Deux variables

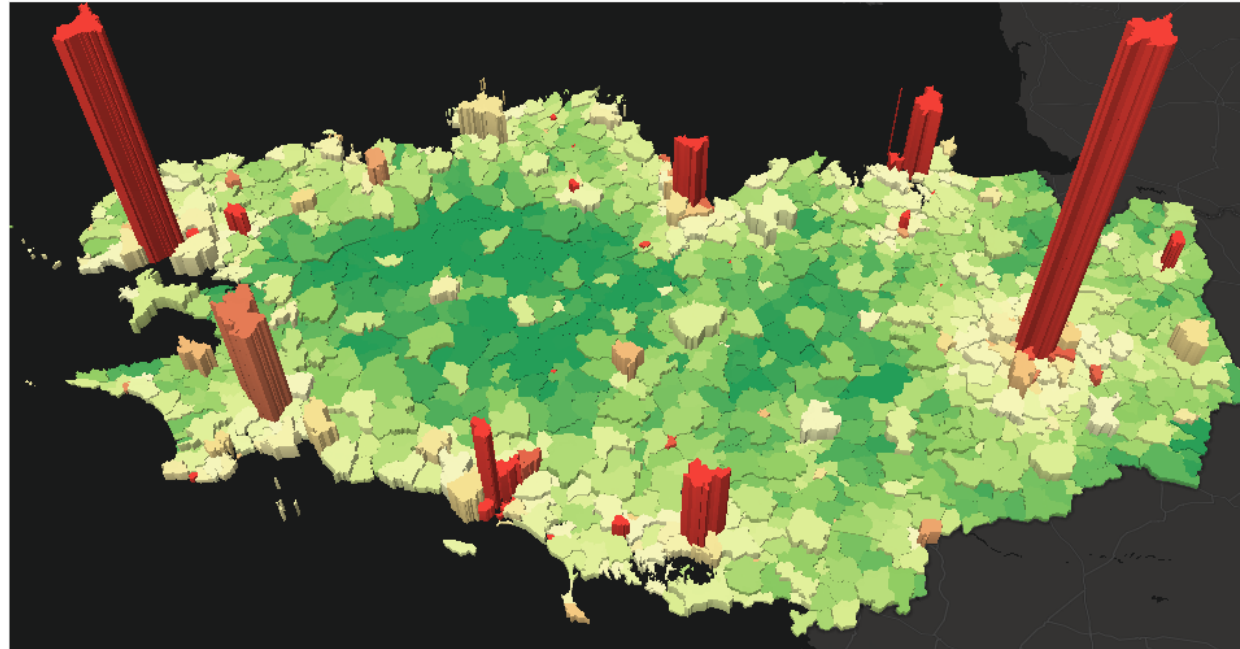
```
map.addLayer({
  'id': 'extrudecommunes',
  'type': 'fill-extrusion',
  'source': 'communes',
  'source-layer': 'TD1_Data-3kid81',
  'layout': {'visibility': 'visible'},
  'paint': {
    'fill-extrusion-color': {
      'property': 'densite',
      'stops': [[20, '#1a9850'],
                [50, '#91cf60'],
                [100, '#d9ef8b'],
                [200, '#ffffbf'],
                [500, '#fee08b'],
                [1000, '#d73027']]},
    'fill-extrusion-height': {'property': 'popOK',
                              'stops': [[100, 10],
                                         [100, 100],
                                         [200000, 100000]] },
    'fill-extrusion-opacity': 0.8,
    'fill-extrusion-base': 0
  }
});
```

Symbologie graduation de couleur (densité)

Symbologie extrusion 3D de la population

Exemple

#MapboxGL / Symbologie deux variables
(graduation et extrusion 3D)



Built with blockbuilder.org

[Open](#)

<https://bl.ocks.org/mastersigat/2eb5c08efe8fcdce104e74a1da83aacf/9456dbafbf83f73492d53310594cf56666fe03c5>

Exemples divers

<https://bl.ocks.org/mastersigat>

 **mastersigat's Blocks**
Updated February 11, 2018

Popular / About

#MapboxGL / Symbologie deux variables (graduation et extrusion 3D)	#MapboxGL / Extrusion 3D données	#MapboxGL / Catégorisation de données	#MapboxGL / Carte choroplèthe
#MapboxGL / Carte choroplèthe	symbologie mapbox	#MapboxGL / Graduation couleur point	#MapboxGL / Graduation2
#MapboxGL / Cercles gradués	#MapboxGL / Catégorisation	#MapboxGL / Données personnelles (mise en forme et interactivité)	#MapboxGL / Afficher et filtrer des données d'OSM
#Leaflet / Ajouter des WMS comme fonds de carte et couches	#MapboxGL / Carte campus	#MapboxGL / Ajouter des données personnelles	#MapboxGL / Ajouter des données OSM
#MapboxGL / Menu de gestion des couches	#MapboxGL / Carte choroplèthe interactive	#MapboxGL / Première carte	#Leaflet / Carte choroplèthe interactive
#Leaflet / Personnaliser les menus	#leaflet / Ajouter un GeoJSON	#Leaflet / Ajouter des marqueurs (interactivité + photo)	# Leaflet / Sélecteur de fonds de carte
#Leaflet / Première carte			

Menu de gestion des
couches

Ajouter un menu pour gérer les couches

- Première étape: définir le style (CSS) de votre menu

```
#menu {
  width: 20%;
  Z-index: 1;
  top: 10px;
  right: 20px;
  position: absolute;
  opacity: 0.9;
  font-size: 14px;
  font-family: 'Helvetica Neue', Arial, Helvetica, sans-serif;
}
#menu a {
  border-radius: 5px;
  display: block;
  color: #000000;
  margin: 5px;
  padding: 10px 10px;
  text-align: center;
  font-weight: bold;
  border: solid 2px;
  background-color: #FFFFFF;
  text-decoration: none;
}
#menu a.active {
  background-color: #000000;
  color: #FFFFFF;
}
#menu a:hover:not(.active) {
  background-color: #000000;
  color: #FFFFFF;
}
```

```
1 <!DOCTYPE html>
2 <html>
3 <head>
4   <meta charset='utf-8' />
5   <title>MapboxGL</title>
6
7   <script src='https://api.tiles.mapbox.com/mapbox-gl-js/v0.44.0/mapbox-gl.js'></script>
8   <link href='https://api.tiles.mapbox.com/mapbox-gl-js/v0.44.0/mapbox-gl.css' rel='stylesheet' />
9
10  <style>
11    #map { position: absolute; top: 0; bottom: 0; width: 100%; }
12    #menu {
13      width: 20%; margin-right: auto; margin-left: auto;
14      Z-index: 1; top: 10px; right: 10px; position: absolute;
15      border-color: #FFFFFF; background-color: #808080 ;
16      font-size: 12px; font-family: 'Helvetica Neue', Arial, Helvetica, sans-serif; }
17
18    #menu a {
19      display: block; color: #FFFFFF; padding: 8px 16px;
20      text-align: center; font-weight: bold;
21      border-style: solid; border-color: #000000; }
22
23    #menu a.active { background-color: #CC6600;
24      color: #FFFFFF; }
25
26    #menu a:hover:not(.active) {
27      background-color: #CC6600;
28      color: #FFFFFF; }
29
30  </style>
31 </head>
32
33 <body>
34 <div id='map'></div>
35
36 <script>
37   // AccessToken
```


Ajouter un menu pour gérer les couches

- Deuxième étape: créer un Div pour votre menu et placer la dans la Div de la carte

```
<div id="menu"></div>
```

```
81     <button id='Rennes2'>Université Rennes 2</button>
82 </div>
83
84 <div id="map"><div id="menu"></div></div>
85
86 <script>
87
88 // Appel de la carte
```

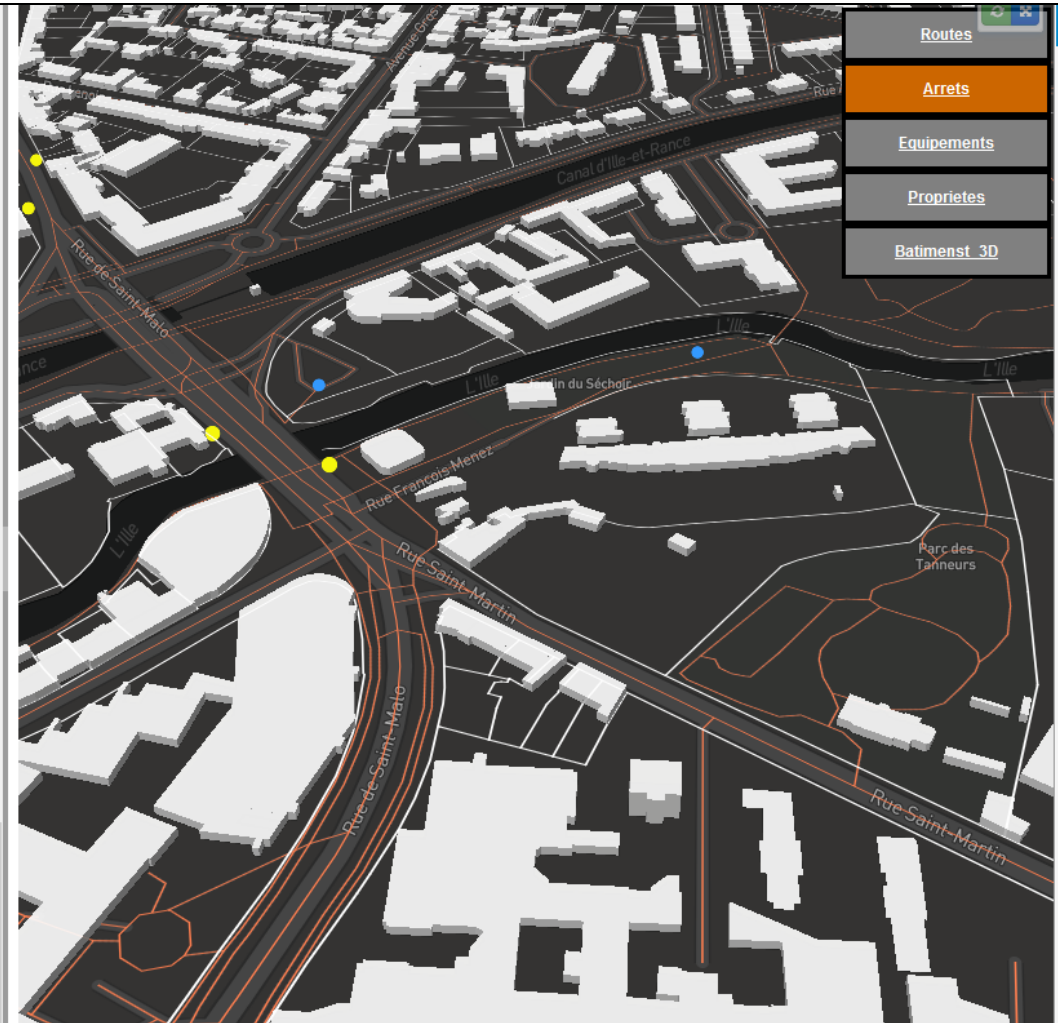
Ajouter un menu pour gérer les couches

- Dernière étape : Ajouter à la fin du script la commande pour configurer votre menu

```
var toggleableLayerIds = ['Routes', 'Arrets', 'Equipements', 'Proprietes', 'Batiments_3D'];  
  
for (var i = 0; i < toggleableLayerIds.length; i++) {var id = toggleableLayerIds[i];  
  
    var link = document.createElement('a');  
    link.href = '#';  
    link.className = 'inactive';  
    link.textContent = id;  
  
    link.onclick = function (e) {var clickedLayer = this.textContent;  
        e.preventDefault();  
        e.stopPropagation();  
        var visibility = map.getLayoutProperty(clickedLayer, 'visibility');  
        if (visibility === 'visible') {  
            map.setLayoutProperty(clickedLayer, 'visibility', 'none');  
            this.className = "";} else {this.className = 'active';  
            map.setLayoutProperty(clickedLayer, 'visibility', 'visible');} };  
  
var layers = document.getElementById('menu'); layers.appendChild(link); }
```

Ajouter un menu pour gérer les couches

```
160
161
162 //Interactivité CLICK
163
164 map.on('click', function (e) {
165     var features = map.queryRenderedFeatures(e.point, { layers: ['Arrets'] });
166
167     if (!features.length) {
168         return;
169     }
170
171     var feature = features[0];
172     var popup = new mapboxgl.Popup({ offset: [0, -15] })
173         .setLngLat(feature.geometry.coordinates)
174         .setHTML('<h2>' + feature.properties.nom + '</h2><h3>'
175 + "Mobilier : " + feature.properties.mobilier + '</h3><p>'
176 + "Accessibilité PMR : " + feature.properties.estaccessiblepmr + '</p>' )
177         .addTo(map);
178 });
179
180 map.on('mousemove', function (e) {
181     var features = map.queryRenderedFeatures(e.point, { layers: ['Arrets'] });
182     map.getCanvas().style.cursor = (features.length) ? 'pointer' : '';
183 });
184
185
186
187 var toggleableLayerIds = ['Routes', 'Arrets', 'Equipements', 'Proprietes', 'Batimentst_3D'];
188
189 for (var i = 0; i < toggleableLayerIds.length; i++) {var id = toggleableLayerIds[i];
190
191     var link = document.createElement('a');
192     link.href = '#';
193     link.className = 'inactive';
194     link.textContent = id;
195
196     link.onclick = function (e) {var clickedLayer = this.textContent;
197         e.preventDefault();
198         e.stopPropagation();
199         var visibility = map.getLayoutProperty(clickedLayer, 'visibility');
200         if (visibility === 'visible') {
201             map.setLayoutProperty(clickedLayer, 'visibility', 'none');
202             this.className = '';} else {this.className = 'active';
203             map.setLayoutProperty(clickedLayer, 'visibility', 'visible');} };
204
205     var layers = document.getElementById('menu'); layers.appendChild(link); }
206
207
208 </script>
```



Ajouter un menu pour gérer les couches

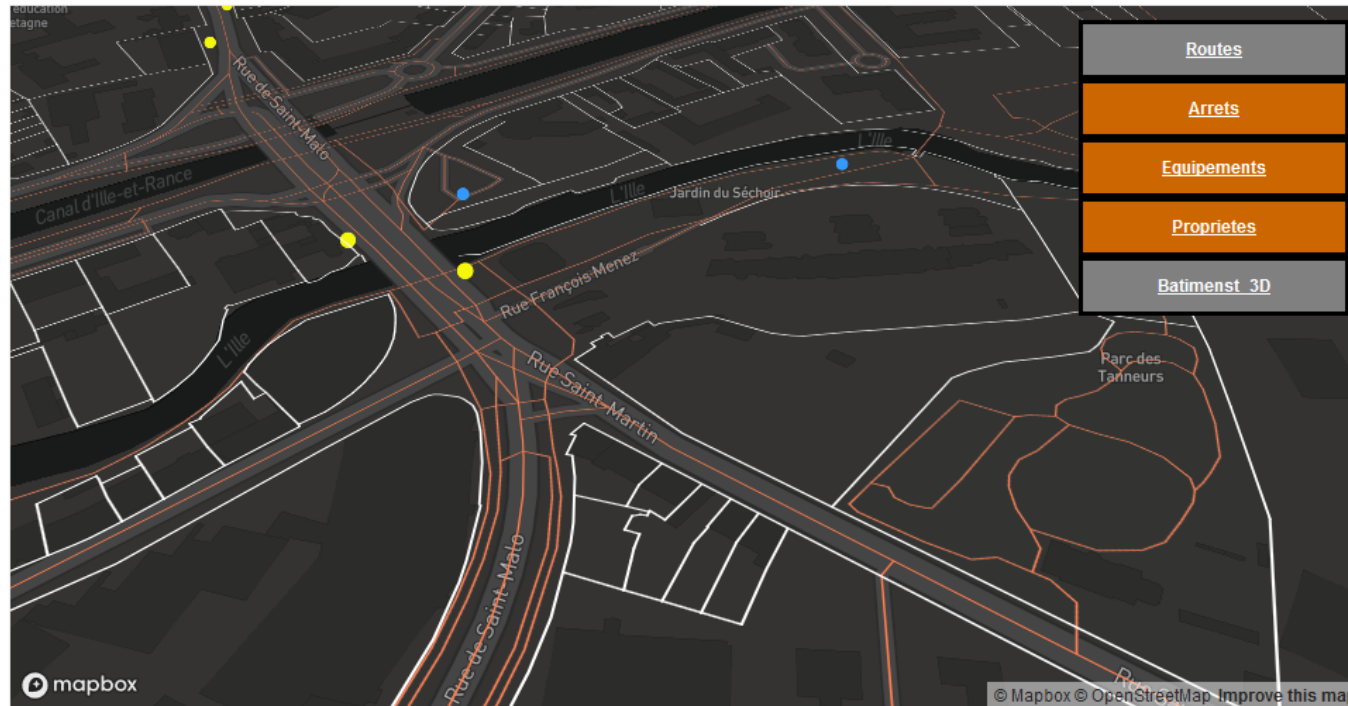
- Pour personnaliser si les couches sont active ou pas il suffit de le préciser dans la commande de visibilité *layout*
 - *visible* = couche active
 - *none* = couche non visible

```
map.addLayer({'id': 'Arrets',  
             'type': 'circle',  
             'source': 'Arrets',  
             'source-layer': 'Bus-5ypx1k',  
             'layout': {'visibility': 'visible'},  
             'paint': {'circle-radius': 7, 'circle-color': '#5f60d'}});
```

```
map.addLayer({'id': 'Arrets',  
             'type': 'circle',  
             'source': 'Arrets',  
             'source-layer': 'Bus-5ypx1k',  
             'layout': {'visibility': 'none'},  
             'paint': {'circle-radius': 7, 'circle-color': '#5f60d'}});
```

Ajouter un menu pour gérer les couches

#MapboxGL / Gestion des couches avec menu



Built with blockbuilder.org

[Open](#)

<http://blockbuilder.org/anonymous/2a2aa65314bd60f6808dd7dc9b3b6241>

Ajout d'outils

```
// Ajout boutons navigation a la fin du script
```

```
var nav = new mapboxgl.NavigationControl();  
map.addControl(nav, 'top-left');
```

```
// Ajout Echelle cartographique a la fin du script
```

```
map.addControl(new mapboxgl.ScaleControl({  
  maxWidth: 120,  
  unit: 'metric'}));
```

```
137     return;  
138   }  
139  
140   var feature = features[0];  
141   var popup = new mapboxgl.Popup()  
142     .setLngLat(feature.geometry.coordinates)  
143     .setHTML(feature.properties.nom)  
144     .addTo(map);  
145 });  
146  
147 map.on('mousemove', function (e) {  
148   var features = map.queryRenderedFeatures(e.point, { layers: ['Arrets'] });  
149   map.getCanvas().style.cursor = (features.length) ? 'pointer' : '';  
150 });  
151  
152 // Ajout boutons navigation a la fin du script  
153  
154 var nav = new mapboxgl.NavigationControl();  
155 map.addControl(nav, 'top-left');  
156  
157 // Ajout Echelle cartographique a la fin du script  
158  
159 map.addControl(new mapboxgl.ScaleControl({  
160   maxWidth: 120,  
161   unit: 'metric'}));  
162 |  
163  
164 </script>  
165 </body>  
166 </html>
```



MapboxGL

100m

VILLE JEAN

Carte
Visualisation de données spatiales avec MapboxGL.js

Les onglets géographiques

Onglets géographiques

- L'idée est de proposer des boutons pour aller directement à un endroit sur la carte
 - Première étape rajouter une boutons dans la div *map*

```
<div>  
  <button id='Gare'>Quartier Gare-Centre</button>  
  <button id='Rennes1'>Université Rennes 1</button>  
  <button id='Rennes2'>Université Rennes 2</button>  
</div>
```

```
1  
2 </head>  
3  
4 <body>  
5  
6  
7 <div id='map'>  
8 <div>  
9   <button id='Gare'>Quartier Gare-Centre</button>  
0   <button id='Rennes1'>Université Rennes 1</button>  
1   <button id='Rennes2'>Université Rennes 2</button>  
2 </div>  
3 <div id="menu"></div>  
4 </div>  
5  
6 <script>  
7   // AccessToken  
8   mapboxgl.accessToken = 'pk.eyJ1IjoibmluYW5vdW4iLCJhIjoiY2p  
9  
10  // Configuration de la carte
```

Onglets géographiques

- Seconde étape, rajouter dans le script (à la fin) la configuration des onglets géographiques

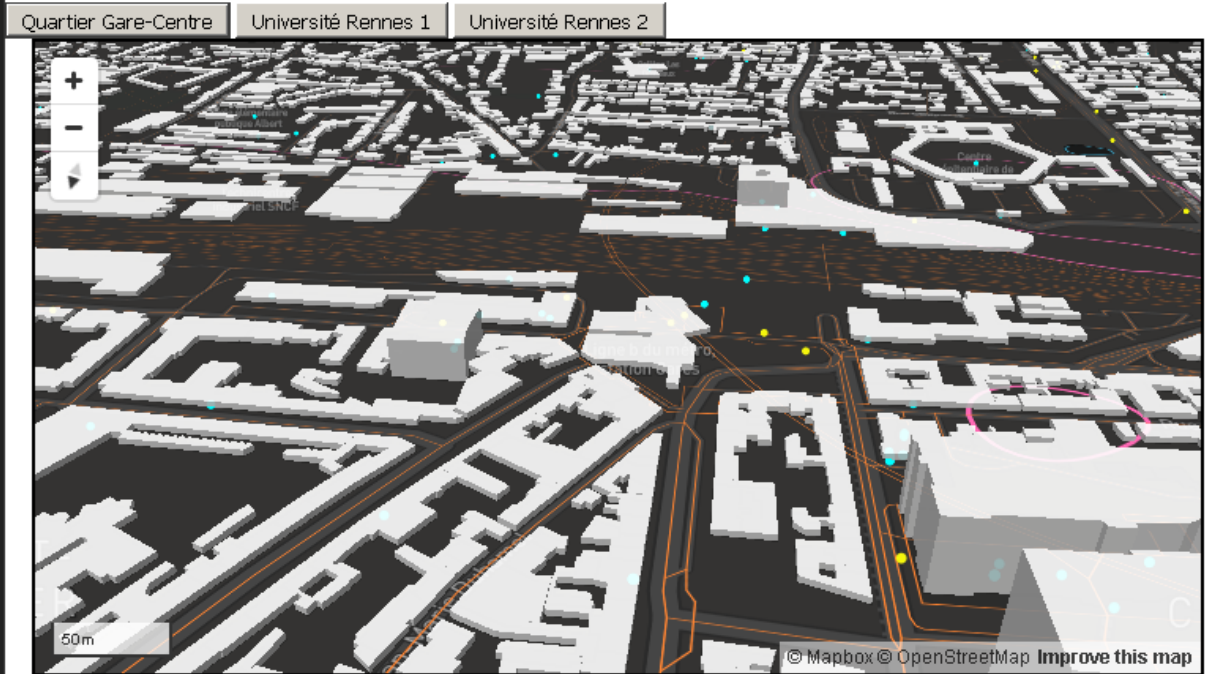
```
// Configuration onglets géographiques

document.getElementById('Gare').addEventListener('click', function ()
{ map.flyTo({zoom: 16,
              center: [-1.672, 48.1043],
              pitch: 145,
              bearing: -197.6 });
});
```

Onglets géographiques

```
172     .setLngLat(feature.geometry.coordinates)
173     .setHTML(feature.properties.nom)
174     .addTo(map);
175 });
176
177 map.on('mousemove', function (e) {
178     var features = map.queryRenderedFeatures(e.point, { layers: ['Arrets'] });
179     map.getCanvas().style.cursor = (features.length) ? 'pointer' : '';
180 });
181
182 var nav = new mapboxgl.NavigationControl();
183 map.addControl(nav, 'top-left');
184 map.addControl(new mapboxgl.ScaleControl({
185     maxWidth: 120,
186     unit: 'metric'}));
187
188
189 // Configuration onglets géographiques
190
191 document.getElementById('Gare').addEventListener('click', function ()
192 { map.flyTo({zoom: 16,
193     center: [-1.672, 48.1043],
194     pitch: 145,
195     bearing: -197.6 });
196 });
197
198 </script>
199
```

Visualisation de données spatiales avec MapboxGL.js



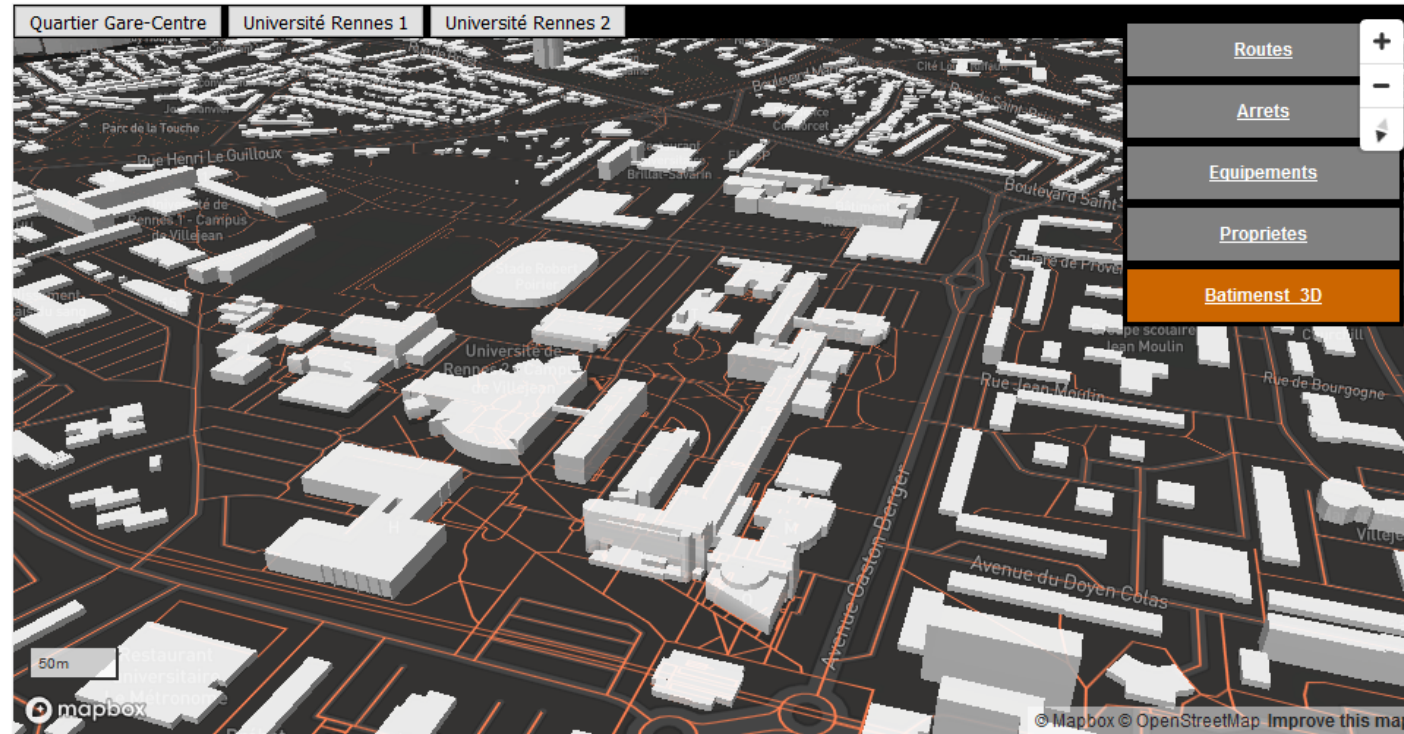
Onglets géographiques

- Configurer les deux autres onglets géographique (Rennes 2 et Rennes1)

```
9 // Configuration onglets géographiques
10
11 document.getElementById('Gare').addEventListener('click', function () {
12     map.flyTo({zoom: 16,
13     center: [-1.672, 48.1043],
14     pitch: 145,
15     bearing: -197.6
16     });
17 });
18
19 document.getElementById('Rennes1').addEventListener('click', function () {
20     map.flyTo({zoom: 16,
21     center: [-1.6396, 48.1186],|
22     pitch: 145,
23     bearing: 197.6
24     });
25 });
26
27 document.getElementById('Rennes2').addEventListener('click', function () {
28     map.flyTo({zoom: 16,
29     center: [-1.7023, 48.1194],
30     pitch: 45,
31     bearing: 50
32     });
33 });
34
35 </script>
```

Exemple

#MapboxGL / Onglets géographiques



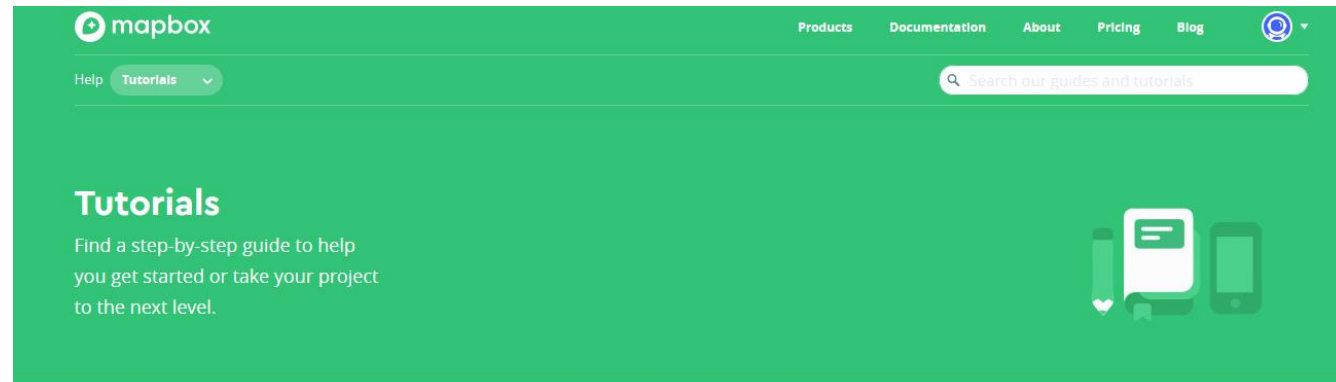
Built with blockbuilder.org

[Open](#)

<https://bl.ocks.org/anonymous/ced9aaa2574f2709ec7f0e25dbf5e84b/96d8ff9ffa7ee1f7f849ed0c999897dfddd61982>

Tutoriels

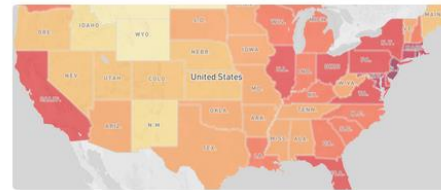
<https://www.mapbox.com/help/tutorials/>



The screenshot shows the top section of the Mapbox Tutorials page. It features a green header with the Mapbox logo on the left and navigation links for Products, Documentation, About, Pricing, and Blog on the right. Below the navigation is a search bar with the placeholder text "Search our guides and tutorials". A "Tutorials" dropdown menu is visible on the left side of the header. The main content area has a green background with the word "Tutorials" in large white text, followed by a sub-header: "Find a step-by-step guide to help you get started or take your project to the next level." To the right of this text is an illustration of a smartphone and a tablet.

- Categories
- All
 - Web apps (18)
 - Map design (13)
 - Uploads (12)
 - Mobile apps (11)
 - Third party integration (7)
 - Data (5)
 - Unity (4)
 - Directions (4)
 - Analysis (3)
 - Satellite (2)

Web apps (18)



Beginner </> No code

Make a choropleth map, Part 1: create a style



Beginner </> Varies

Add custom icons or markers

